THE DEVELOPMENT OF A QUALITY FUNCTION DEPLOYMENT (QFD) MODEL FOR THE IMPLEMENTATION OF A MOBILE AUGMENTED REALITY (AR) TOURISM APPLICATION IN THE CONTEXT OF URBAN HERITAGE TOURISM

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DECLARATION

I hereby declare that this PhD research is my own and original work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person and that it has not been submitted to any previous application for a higher degree.

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ABSTRACT

Technology has been widely implemented in tourism to enhance the tourism product and tourist experience. However, it remains a challenge for many tourism businesses in urban heritage areas to identify technological solutions and successfully implement them into their business strategy. Particularly for urban heritage sites, it is often challenging to provide information within and around a heritage site without disturbing or destroying the heritage image. Augmented Reality (AR) was identified as a suitable technology to overcome this challenge. However, while AR is not considered a new technology in many industries, and mobile tourism applications with AR functions exist, it has provided limited benefits to tourists due to the lack of using AR functions meaningfully. In addition, the development of wearable devices is increasingly focused on the use of augmented and virtual reality to enhance the user experience. Therefore, there is a need to explore methods of meaningful implementation of such technologies for the tourism industry. This study will investigate current standards of AR technology and tourist requirements in order to examine how to develop meaningful mobile AR tourism applications. For the development of a beneficial product, Quality Function Deployment (QFD), as a tool within Total Quality Management (TQM) was identified as the suitable theoretical background for the purpose of this study. QFD was developed in the theory of quality management, in particular TQM. QFD has since been employed across many industries including the hospitality and tourism sector in a number of studies. However, it has not yet been implemented in the urban heritage tourism context, presenting a knowledge gap. As QFD is designed to incorporate the customers' view into the product design stage, the aim is to design a meaningful product that is valuable for the visitor and benefit the destination. Therefore, this research aims to eliminate the gap by generating a QFD model for the development of mobile AR tourism applications in the context of urban heritage tourism. Dublin was selected as the research site due to its rich urban heritage. After Dublin's re-branding strategy in 2013, it has marketed itself with the brand image of 'Digital Dublin' in order to encourage the implementation of technology for the purpose of promoting urban heritage tourism. Therefore, Dublin was considered as the suitable research site

for the purpose of this study. To achieve the research aim, a mixed method approach was employed for the primary research including semi-structured interviews, focus groups and questionnaires. The study was divided into three research phases. Research phase 1 investigates requirements of tourists, mobile AR application developers and industry experts from Dublin's tourism industry for the development and use of mobile AR tourism applications in urban heritage tourism. 26 in-depth interviews were conducted with international tourists visiting Dublin in addition to 9 interviews with mobile AR application developers and industry experts from Dublin. Findings were analysed using thematic analysis, providing the knowledge base for Research Phase 2 – focus groups. The second research phase was conducted with tourists as a post-experience study. It aimed to confirm identified tourist requirements from the literature and Research Phase 1, and examine additional findings to design the questionnaire for the quantitative Research Phase 3. Research Phase 3 was conducted with domestic and international tourists in Dublin and provided an importance rating of identified tourist requirements for the development of the final QFD model for mobile AR tourism applications in the urban heritage tourism context. The outcomes from the quantitative research were analysed using confirmatory factor analysis (CFA) to reduce tourist requirements for the final QFD model. By identifying tourist requirements and translating them into respective technical characteristics, this study provides a set of technological elements in hierarchical order for the design of meaningful mobile AR tourism applications in urban heritage tourism. The final 18 requirements are in close alignment with the outcomes of the qualitative research of this study highlighting the need of immediate access to information regardless of time and place, while being able to filter the available information to the tourists' interest and needs. The final QFD model for the development of mobile AR tourism applications in urban heritage tourism was presented as the outcome of this research. The main contribution to theory is the extension in the identification process of customer requirements for the QFD model. While previous studies in QFD have mainly focused on product functions, such as software and hardware capabilities, the QFD model in this study aims to provide a balance between functional requirements and behavioural characteristics of tourists that are driven by psychological aspects. This study not only explored tourist requirements as in previous studies, but furthermore user resistance factors

that would result in avoiding mobile AR tourism applications in urban heritage tourism. Including these criteria as customer attributes in the HOQ, the QFD model was extended to include behavioural and psychological attributes of customers, which is valuable for further implementation of QFD particularly in social studies. This research will furthermore contribute to professionals, Destination Marketing Organisations (DMO) as well as mobile AR application developers alike, by providing a model for the development of mobile AR applications in the context of urban heritage tourism that has incorporated tourist requirements as well as mobile AR application developer considerations. Furthermore, it needs to be acknowledged that the requirements are not limited to mobile AR applications, but are considered particularly valuable for further research in the area of mobile application development for tourism purposes and are expected to be partially transferable to other technology implementations for tourism products.

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LIST OF ABBREVIATIONS

AR	Augmented Reality
VR	Virtual Reality
MAR	Mobile Augmented Reality
SPC	Statistical Process Control
QM	Quality Management
TQC	Total Quality Control
TQM	Total Quality Management
ISO	International Organisation of Standardisation
QFD	Quality Function Deployment
VOC	Voice of Customer
HOQ	House of Quality
SQC	Substitute Quality Characteristics
AHP	Analytic Hierarchy Process
IT	Information Technology
ICT	Information and Communication Technology
UHT	Urban Heritage Tourism
PLS	Partial Least Squares
FR	Function Requirements
CR	Content Requirements
UR	User Resistance
TP(n)	Tourist Interview Participant (n)
EP(n)	Expert Interview Participant (n)
F(n)P(n)	Focus Group (n) Participant (n)
UK	United Kingdom

CHAPTER 1 – INTRODUCTION

1.1 Introduction

It was argued that the tourism industry in particular in urban heritage areas has been facing many challenges due to its increasing competitiveness and efforts for sustainable development (Pantano and Servidio, 2010). On the other hand, tourists are presented with an increased choice of information due to the development of technology and implementation of such in various sectors to enhance the overall tourist experience. However, it remains a challenge for many tourism businesses in urban heritage areas to identify technological solutions and successfully implement them into their business strategy. This study aims to analyse tourists' and application developers' requirements in order to develop a model for mobile tourism applications using Augmented Reality (AR), one of the latest technological trends in the mobile market, for the urban heritage tourism context. The study will therefore focus on the identification and prioritisation of tourist requirements of domestic and international tourists in Dublin.

The first chapter will provide the background of the study and the identification of the research gap in order to justify the relevancy and importance of this research. Furthermore, research aims that are designed to lead to the final outcome of the study will be presented in section 1.3. In order to assist the overall clarity and understanding of the study development, section 1.4 will present the detailed structure of the study.

1.2 Research Background and Justification of the Study

In today's society, mobile devices have become a significant part of our everyday lives. Due to the constant interaction with smartphones and other mobile devices everyday, it has become crucial to identify ways to make handsets and applications more beneficial and meaningful for the user. Tourism has been one of the many

industries that has explored the implementation of modern technology in the tourism product. However, compared to the amount of available tourism applications, only a fraction is used on a regular basis. This is particularly the case for urban areas where tourists and locals travel through on a daily basis. It is therefore crucial to understand factors that result in repeated use of applications as well as factors that deter the future use. There is a need to investigate and clearly understand customer requirements before developing a new product in order to increase customer satisfaction and reduce costs for businesses.

This study will be conducted in the context of urban heritage tourism. Heritage tourism has existed as one of the first forms of tourism within the cultural tourism umbrella, and is not regarded as a new concept in the tourism industry (Prentice, 1994). While various categories exist within 'heritage tourism', this study will focus on the area of urban heritage tourism. Urban heritage development is closely related to the means and methods to maintain and sustainably develop heritage sites in and around the urban area (Pendlebury et al., 2009). Gospodini (2004) argued that cities that are especially attractive tourist spots need considerable effort and management in order to deal with the pressure on its capacity that results from high visitor numbers. As weekend trips are getting more popular among international and domestic tourists, urban destinations struggle to maintain heritage sites due to the large amount of visitors, while other destinations constantly look for new ways to attract tourists. Gretzel et al. (2009) discussed the implementation of information and communication technologies (ICT) for the community and its heritage development, while Paskaleva and Azorin (2010) supported the argument that destinations require to make use of the increasing digital environment in order to stay competitive in the global market. Ali and Frew (2014) noted that implementation of ICTs to enhance the tourism product has become a key research area for the sustainable development of destinations. Therefore, they argue that it is crucial for eTourism researchers to investigate how technology can be practically implemented to continuously develop tourism in a sustainable way. Although many urban destinations are trying to implement new types of technology for tourist attractions, such as mobile applications, they are often neglected by tourists and widely unused due to its limited transferability to other contexts as well as lack of awareness and limited benefit to the tourist. While

developing and implementing technology in the tourism product results in high costs for DMOs, they are left with little benefit for the destination. Therefore, it is crucial to explore ways to ensure a high product quality and alignment with user needs, in order to design meaningful products for the end user. As Quality Function Deployment (QFD) is designed to incorporate the customers' view into the product design stage (Decision Lens, 2010), the aim is to create a meaningful product that is valuable for the visitor and can benefit the destination.

QFD is a customer-developer-driven tool that transforms user and developer requirements into respective technical elements. It has been founded and largely implemented in manufacturing in order to provide a consumer-focused product in a cost-effective manner (Sullivan, 1986; Kaulio, 1998). However, QFD has since been successfully implemented in other industries, such as computer software and hardware development as well as pharmaceuticals and aerospace due to its benefit of identifying errors in the development stage saving large amount of costs in the production process (Kivinen, 2008). Although QFD has been researched across many industries (Zheng and Pulli, 2005; Simons and Bouwman, 2006; An et al., 2008), including in the hospitality and tourism sector in a number of studies (Pawitra and Tan, 2003; Das and Mukherjee, 2008; Paryani et al., 2010; Chang and Chen, 2011; Crick and Spencer, 2011), it has not yet been studied for the development of a mobile AR tourism application in the urban heritage tourism context. Furthermore, as QFD originated in the manufacturing industry, the focus of identifying customer attributes has relied heavily on product features and functions. Attempts have been made to consider psychological factors of customers in the process of identifying requirements, such as the Kano model that categorises customer requirements into three levels of customer satisfaction. However, this study extends this idea and clearly defines a categorisation into content requirements (CR), function requirements (FR) and user resistance (UR) factors in the identification of tourist requirements. This aims to provide a balanced view of requirements in mobile AR applications based on behavioural attributes that are driven by tourist interests. This research aims to eliminate the knowledge gap of adopting the main tool of the QFD model, the House of Quality (HOQ) to develop mobile AR applications in the context of urban heritage tourism. Dublin was selected as the research site in the area of urban heritage tourism due

to its rich urban heritage as well as its initiative to re-brand itself as 'Digital Dublin' in 2013 to promote the implementation of technology throughout the city (Kennedy, 2012). Marketing itself as a 'test bed of innovation' (Curtis, 2012) as part of their Smart-City initiative, Dublin's call for implementing technology to promote their urban heritage sites was in close alignment with the study objectives.

Geo-location (GPS) based applications for information search and gaming such as 'Foursquare' and 'ARGH – Augmented Reality Ghost Hunter' have slowly introduced AR into the tourism industry accelerating its public awareness through sharing on social media platforms (Crowley and Selvadurai, 2009; Gazzard, 2011). As of 2014, the majority of smartphones provide navigation based on GPS-map based systems, which are able to pinpoint the user's exact location and therefore are able to provide a platform for AR overlays. AR has increasingly become an area of interest in technological developments not only for the current era of smartphones, but further for the use of wearable computing through largely researched devices such as Google's Glass and Microsoft's Hololens (Wrenn, 2012; Siluk, 2015). With introduction of early AR practices such as QR-codes, projecting images and short animations, it has triggered the need for further research into the opportunities it could provide for tourist experiences not only as a 'wow-factor', but for alternating and enhancing the experience. However, while AR has already been used in many industries, it has made little impact on the tourism industry despite its capabilities to project computerised content into the immediate surrounding. Although a number of studies with regards to AR applications in tourism have been conducted in early stages (Vlahakis et al., 2001; Reitmayr and Schmalstieg, 2004; Fritz et al., 2005), the majority of previous studies focused on the investigation of technical capabilities and its implementation opportunities from a technological perspective rather than on the requirements from a tourist perspective to enhance the overall experience. Other studies for the enhancement of the tourist experience have largely focused on the support of tourism products through AR functions, such as the provision of information on the surrounding and reviving historical sites through computer-generated graphical overlays (Noh et al., 2009; Choubassi et al., 2010; Marimon et al., 2010). However, as AR has passed the 'hype' stage, it is important to investigate ways of using the technology to increase the benefit for users. In recent

years, AR has shown promising implementation areas in tourism through a number of studies conducted for indoor as well as outdoor environments (Yovcheva et al., 2014; Chung et al., 2015; Jung et al., 2015; Jung and Leue, 2015; Leue et al., 2015). However, studies on user requirements from the consumer perspective for AR implementation are still limited. Van Krevelen and Poelman (2010) argued that it has been challenging to define AR properly, as its full capabilities had not yet been determined. AR has to date been largely defined as a means to overlay mostly graphical content to enhance the real environment (Stone et al., 2009). Nonetheless, the implementation of AR has already been found to provide potential benefits to various industries mainly through the use of mobile devices, such as smartphones (Noh et al., 2009; Choubassi et al., 2010; Marimon et al., 2010). Although research and development of mobile AR has since advanced significantly, meaningful employment of AR for commercial uses are just starting to emerge and are often found to provide limited benefits to the user. Therefore, one of the theoretical contributions of the study will be the identification of tourist requirements that are sought in mobile AR tourism applications in the urban heritage tourism context. These are used to provide technical design elements that need to be implemented in the application. Furthermore, this study will compare and contrast tourist requirements to developer requirements to outline alignments as well as differences in their expectations. This is considered valuable for future research of AR applications in tourism particularly in the area of wearable computing. It is often difficult for urban heritage destinations to provide information within and around a heritage site without disturbing or destroying the heritage image. Since AR is able to overlay the physical environment using the digital space, it has long been regarded as potential method to provide easily accessible information for visitors (Noh et al., 2009; Choubassi et al., 2010; Marimon et al., 2010). Considering the current and future direction of technological development, this study's main contribution to theory will be to provide a QFD model using the HOQ for the development of mobile AR tourism applications in the context of urban heritage tourism. By identifying tourist requirements it will present a hierarchical list of technical design elements that are crucial for the development of mobile AR applications.

1.3 Research Aims

The overall research consists of five aims, which are designed to reach the final research outcome of the study. This section will discuss each aim and the means to achieve each one of them.

1. **To critically review existing theories in quality management.**

This aim will focus on the development of the theoretical framework underlining the study. In order to achieve the first aim, chapter 2 critically reviews relevant literature in the area of quality management. Critical investigation of quality management theories was required in order to examine the development of quality enhancing theories and determine the most suitable theoretical perspective for the purpose of this study. Early theories in quality management that have influenced the development of Total Quality Management (TQM) and concepts considered for quality product development are critically reviewed in order to build a profound knowledge of quality management. This is followed by an in-depth review of the QFD model to propose a HOQ for the development of mobile AR tourism applications in the urban heritage tourism context as the outcome of this study. It will further provide a list of user requirements that have been identified in the literature of mobile computing. Books, journals and online articles in the domain of IT product development and quality management will be accessed to investigate theories that have been generated to discuss outcomes and challenges of quality management.

2. **To critically explore Augmented Reality (AR) applications in urban heritage tourism.**

Aim 2 was designed to fully understand AR as technology and its current implementation in the urban heritage tourism context for public use. For the achievement of aim 2, the adoption of AR in tourism is discussed with particular

focus on the urban heritage tourism context. The aim will be achieved in chapter 3, which discusses the development and types of AR technology, and chapter 4, discussing the origin and development of urban heritage tourism. In addition, it will provide insights into AR research in the urban heritage tourism context to date by critical review of existing literature in this area. While technology has been seen as potential tool to support sustainable development and competitiveness in many tourist destinations, AR is still considered a new technology in tourism even after many years of research in this industry and requires more in-depth investigation to enhance the tourist experience. Therefore, chapter 3 will provide further discussion on the implementation use cases of AR in the industry, particularly for tourism, while chapter 4 will critically examine urban heritage tourism as the research context.

3. To analyse tourists' requirements for AR applications in urban heritage tourism.

Aim 3 was developed to investigate tourist expectations of tourism applications in general and identify their requirements for developing mobile AR applications in the urban heritage tourism context. This aim will provide the basis for the development of the QFD model to propose a customer-focused product, which incorporates customer needs in the design stage. In previous studies, such as Marimon et al. (2010), AR in tourism has been focused on researching the capabilities of AR functions for the potential use in tourism. However, the benefits of using such applications and needs of tourists have been largely disregarded. Aim 3 of this study intends to close the gap and identify tourist requirements for mobile AR applications through conducting semi-structured interviews. Therefore, the outcomes of aim 3 will be analysed and put in contrast to requirements in the mobile computing context that were identified in the literature review (section 2.8) in order to propose a list of tourist requirements for mobile AR applications in urban heritage tourism. The analysis and identification of tourist requirements for mobile AR tourism applications as perceived by international tourists will be presented in chapter 6. After developing a mobile AR tourism application demonstrator based on the identified requirements, focus

groups are conducted as post-experience study. The aim is to test the demonstrator and investigate additional requirements, which are then put in contrast to the tourist interview outcomes. Chapter 7 provides a detailed analysis of focus group findings in which participants could test the demonstrator application. This examines whether additional requirements are evident after the actual experience of a mobile AR tourism application.

4. To investigate key design requirements considered by AR application developers and industry experts when developing AR applications in urban heritage tourism.

Aim 4 is designed to explore application developer and industry expert requirements for mobile AR tourism applications and put them in contrast to the identified tourist requirements. The main focus of the study will remain on tourist requirements since the QFD model is a customer-centered tool and therefore, it is crucial to clearly identify the tourist needs. However, the requirements of industry experts and perceived values of AR application developers were used for the development of an application demonstrator to conduct a post-experience study. Therefore, semi-structured interviews with mobile AR application developers and industry experts in Dublin were designed to achieve aim 4. The goal within the QFD model will be the prioritisation and translation of tourist requirements into technical design elements in the application to determine which technical elements are crucial to include, and identify areas of importance in the development of mobile AR tourism applications.

5. To develop a QFD model to implement mobile AR applications into the context of urban heritage tourism.

While QFD has been studied for many years for the improvement of quality during the product design stage in the manufacturing industry, it has not yet been applied in the urban heritage tourism sector for the development of mobile AR applications. Prior QFD studies in other tourism areas, such as for measuring

customer satisfaction and for developing tourism products have shown promising results for successful implementation of QFD in the tourism industry (Pawitra and Tan, 2003; Sharma and Das, 2005; Das and Mukherjee, 2008; Hong, 2009). However, QFD has not yet been employed for the development of mobile AR applications in the context of urban heritage tourism, which indicates a knowledge gap. The current study aims to develop a QFD model using the HOQ which was identified as the main tool in QFD. Therefore, the identified tourist requirements from the data analysis and cross examination will be given an importance rating through quantitative questionnaires and be reduced using Confirmatory Factor Analysis (CFA) in order to ensure a vigorous and academically sound reduction of requirements. They will be entered into the HOQ before translating them into technical design elements to generate a hierarchy list based on importance ratings. The model will provide a prioritisation of requirements that are to be included for the development of mobile AR tourism applications in the urban heritage tourism context. Its transferability to other urban heritage destinations apart from Dublin will be discussed in chapter 9.

1.4 Structure of the Study

The current research consists of 10 chapters: 1. Introduction; 2. Quality management theories and models; 3. Augmented reality; 4. Urban heritage tourism; 5. Methodology; 6. Interview analysis; 7. Tourist focus group analysis; 8. Quantitative data analysis and implementation; 9. Integrated synthesis of the research findings; and 10. Conclusion, reflection and recommendations. The study was structured to represent the original development of the research to help visualise the stepping-stones on which the study was built in order to achieve the overall study objective. This section will briefly present the purpose and content of each of the ten chapters.

The first chapter introduces the study, its purpose and justification. While AR has been argued to hold high potential and usefulness in the tourism environment, use cases of successfully implemented and widely used AR applications are limited. Therefore, this study has the potential to serve as guideline for industry

practitioners as well as academia for the development of mobile AR tourism applications in the urban heritage tourism context. By providing an insight into the background of Quality Function Deployment, Augmented Reality and Urban Heritage Tourism, it outlines the research gap and justification of the study. Furthermore, the aims of the study are introduced and discussed to provide milestones throughout the study leading to the overall outcome of the research.

Chapter 2 presents the critical review of existing literature in quality management and discusses the key theories that emerged and influenced the theoretical framework employed in this study. Early theories in quality management with focus on TQM and concepts considered for quality product development are discussed before moving into an in-depth investigation of QFD with emphasis on its development, implementation areas and the creation of the HOQ, as the main tool in QFD.

The third chapter provides an overview of AR and its current use cases in the tourism context. It reviews the general use of technology in the tourism industry to date and discusses use cases of mobile AR implementations in tourism to illustrate the importance and potential benefits of AR in the mobile tourism context. This chapter sets the framework for the further development of mobile AR tourism applications in the urban heritage tourism context.

Chapter 4 examines urban heritage tourism, the context of the study, by investigating cultural tourism as the umbrella of heritage tourism leading to the discussion of the heritage model. It highlights the significance of urban heritage tourism and the opportunity of mobile AR applications to enhance the tourist experience in this area. Therefore, the chapter leads to the presentation of Dublin as the research site representing an urban heritage setting. Presenting Dublin's city initiative in digital innovation, it discusses the location as suitable research destination for this study.

The fifth chapter discusses and evaluates the methodological procedure for this study. The underlining applied research methods are discussed including research philosophy, approach and strategy. The selected philosophical view and approach

are critically reviewed, as they provide the research perspective and guideline through the secondary and primary data collection. In addition, the research process is presented step-by-step explaining the methods that were employed to reach the final outcome of the study. Furthermore, the data analysis procedure, methodological limitations, ethical considerations and sampling strategies that were employed in the research are discussed.

Chapter 6 provides a detailed analysis of the conducted interviews with international tourists in Dublin as well as with AR application developers and industry experts. It presents an identification of requirements for mobile AR tourism applications. In addition, developer and industry expert requirements are structured and presented to provide a holistic view of requirements for the development of an application demonstrator used for conducting a post-experience study. Common themes are identified in the interviews and further discussed in the post-experience study.

Chapter 7 presents the key findings from the tourist focus groups that were conducted as post-experience study. This part of the study was designed to cross-examine the findings from chapter 6 and investigate whether new themes and additional requirements were evident after participants experienced the developed mobile AR tourism application demonstrators. The findings are compared to the outcomes of the tourist interviews and key tourist requirements are identified as the result of both research phases.

A quantitative research in form of questionnaires is conducted to prioritise the identified tourist requirements. The eighth chapter focuses on the quantitative data analysis and the design of the QFD model for the development of mobile AR tourism applications in the urban heritage tourism context. Therefore, the gathered statistical data is analysed using SPSS 22, and SmartPLS 2.0 in order to extract meaningful findings. Tourist requirements are redued and prioritised through CFA using SmartPLS 2.0. The reduced tourist requirements are henceforth implemented as customer needs in the HOQ to design the final model for the development of mobile AR tourism applications in the urban heritage tourism context.

Chapter 9 provides a detailed discussion of the study findings linking to the final QFD model for the development of mobile AR tourism applications in the urban heritage tourism context. The designed QFD model and its implications are discussed particularly with regards to qualitative outcomes of tourist and expert requirements in comparison to the findings of the quantitative research. Furthermore, current mobile AR tourism applications in the market that were reviewed in the literature are put in contrast to the study outcomes leading to the discussion of future mobile AR applications particularly regarding the transferability of study outcomes to wearable computing.

Finally, chapter 10 concludes the research by reviewing the research aims and discussing how each aim has been achieved throughout the study. In addition, the contributions of the research for academia and industry practitioners are presented. Furthermore, limitations of the thesis are discussed reflecting on the process of the overall study. Lastly, recommendations are provided with regards to future research, as well as recommendations for the implementation of mobile AR tourism applications in urban heritage destinations.

1.5 Summary

This chapter provides the introduction of the research. The background of the study was explained covering the context, justification, and the theoretical foundation of the study that will underpin the research. The theoretical background will be provided in quality management. Within the concept of TQM, QFD was selected to provide the theoretical framework for the study. This research is conducted in the area of urban heritage tourism as the context of the study and provides a QFD model to develop mobile AR tourism applications in urban heritage tourism contexts. The aims are presented to achieve the overall objective of the study, and the overall structure of the study is outlined.

The main purpose of the study is the development of a HOQ, as the main tool within QFD, for the implementation of mobile AR tourism applications in the urban heritage tourism context. The study outcomes will be anticipated as the design of a customer-oriented model that is based on a hierarchy of tourist requirements. As a result, a list of technical attributes that are required in mobile AR tourism applications in urban heritage tourism contexts will be generated.

In order to understand the theory and context of the study in more detail, the following three chapters will present an in-depth investigation of the current available literature by reviewing academic and other relevant literature. Each following chapter hereafter, will build towards the overall outcome of the study. Through critical review of existing literature, the following chapter (Chapter 2) will lead towards the achievement of the first aim for the study - To critically review existing theories in quality management. In order to build a theoretical foundation of the study, section 2.2 will focus on the investigation of theories for quality development by discussing early ideas of quality management and how they influenced TQM and QFD.

CHAPTER 2 – QUALITY MANAGEMENT THEORIES AND MODELS

2.1 Introduction

For the purpose of this study, it is required to review the context and background of the chosen theory of Quality Function Deployment (QFD) underlining this study. As QFD is regarded as a tool within Total Quality Management (TQM), the origins of TQM will be reviewed by examining traditional quality management theories within business management and product development that have influenced TQM. The main influential theories will be discussed including Juran Trilogy, Zero Defects, Deming's 14-point Philosophy, Quality Circles, and Total Quality Control. After investigating how each of the theories influenced TQM, the chapter will lead to an in-depth discussion of tools within TQM and the justification of QFD as underlying framework of the study. This chapter provides the theoretical foundation for the fundamental understanding of quality theories leading to the QFD model and the House of Quality (HOQ), which is regarded the main tool within QFD to develop mobile AR tourism applications in urban heritage tourism. It will conclude with a presentation of critical requirements identified in the literature in the mobile computing context, as a foundation for the primary research of the study.

2.2 Origins of Quality Management Theories

The idea of quality in business management originated in Japan and has made an impact on Western economy just after the 1980s. Prior to the rising success of Japanese companies worldwide, this topic had been largely ignored (Beckford, 2010). However, after the mid twentieth century, it has gained importance in many industries as catalyst for boosting economic growth. Since its identification, businesses have developed strategies and adopted various views on quality, its implementation into the business culture as well as processes for management and maintaining quality standards.

As markets develop, companies have the need to adjust to changes in the market by making adjustments to their product and processes, which requires the modification of quality systems employed in the business. According to Beckford (2010), the traditional and industrial quality system models have been focused on control, conformance, and standardisation. However, quality is not only a matter of production and operation, but has an impact in many areas of the business, such as management and company culture, which makes it a topic, which requires constant assessment and improvement. Throughout time, different theories in quality management (QM) such as from Juran, Ishikawa, Crosby, Feigenbaum, and Deming have developed out of which the following theories have made a significant contribution in today's view of TQM and QFD.

Juran's (1974) Trilogy concept is regarded one of the first approaches to quality theory, and was based on the philosophy of managing business process quality through cross-functional quality improvement (Omachonu and Ross, 2004). By focusing on the people to create quality for the customer, Juran (1974) put emphasis on the planning process by targeting the responsibility of management to improve organisational issues and set clear goals. According to Subburaj (2005), quality in Juran's (1974) view was determined by its 'fitness for use'. Based on his philosophy, he found the Quality Trilogy, investigating each area for its 'fitness for use', consisting of:

- Quality Planning
- Quality Control
- Quality Improvement

(Juran, 1988)

Juran (1974) and De Feo (2012) believed that without changing according to the market demands, there would be continuous waste of resources within the business. Therefore, Juran's (1988) quality philosophy is largely based on management practices to improve the working efficiency of the company and effectiveness on the market by adjusting to market changes. The quality trilogy examines production planning and process execution by considering the end-

consumer through constantly improving the business by meeting customer demands. However, it was criticised as a highly simplified illustration which would not show the various steps that need to be included to design a new product (MSI, 2011). Furthermore, Juran's (1988) trilogy is dominantly a supply-led process, and lacks the inclusion of customer desires. While it is transferable to product development, the quality-led process for Juran's (1988) trilogy focuses mainly on the business procedure in order to improve the quality through a structured system in the company. Nonetheless, it has made a significant contribution to the definition of TQM from a business-wide approach for improving quality in the final product, and therefore needs to be acknowledged.

Similarly, Ishikawa (1976) was investigating theories of quality management within the business environment in Japan, which have significantly influenced TQM from a management perspective. Similar to Juran (1974), the roots of Ishikawa's (1976) philosophy originate from a 'Company-Wide Quality' approach, which does not only contribute to the product quality assurance, but to the success of the whole business. In agreement with Juran's (1974) theory, Ishikawa (1976) believed in the involvement of everyone in the business to build quality, which is illustrated by Flood (1993) as vertical and horizontal co-operation. Therefore, one of his contributions to ensure a quality system within a business was the formation of Quality Circles, where employees from the same area of a business would discuss and solve work-related problems (Summers, 2010). However, the communication within quality circles is only effective when the management team is trained on total quality management procedures (Economist, 2009). As a result, Quality Circles were seen to become a hunt for people to blame for the problems (Economist, 2009). The best known quality principle by Ishikawa (1976) became known as the 'Fishbone Diagram' or 'Cause and Effect Diagram', which showed the potential relationship between problems and causes of each problem respectively. By doing so, it was possible to accurately analyse and find solutions to the problems.

Philip Crosby (1979) on the other hand who is considered one of the founding fathers of quality management believed that the cost of failures in product development had a high influence on the efficiency as well as quality outcome of

the product, such as lost time, money resources and company image (MindTools, 2013). His philosophy 'Zero Defects' focuses on the company performance through constant monitoring and adjustment of the product input in order to 'get it right the first time' (Gilbert, 1992). Having no faults in the end product forms Crosby's (1979) philosophy, which implies no cost for adjustment to improve the quality. His definition of quality assurance is based on customer perceptions, by focusing on the quantity as quality standard measurement 'zero defects'. Therefore, quality standards are achieved when the product can meet customer requirements and expectations. While Crosby's Zero Defects has been found to be the first customer-focused approach to quality improvement, Zero Defects was often criticised as being solely a company mind set. It does not provide a clearly defined system, and therefore does not follow any method of steps to be effective (Mindtools, 2013). Zero Defects does not imply to have a faultless product, but rather is a philosophy that works on the attitude of constantly working on potential flaws in the system. Nonetheless, the continuous application of Zero Defects is highly time consuming due to the complex supply as well as market condition today, and therefore should be seen as a continuous change of perspective rather than an actual process in the product development.

Similar to Juran (1974) and Ishikawa (1976), in Feigenbaum's (1983) definition of 'Total Quality Control' approach, everyone who is affected by the company's actions and product should be involved in the development process. The idea was to continuously provide and improve quality through a businesswide approach (Ishikawa, 1985). Feigenbaum's (1983) fundamental principle was based on his early idea of 'total quality control', which has become one of the industrial ideas, later known as TQM (Feigenbaum, 1991). Feigenbaum (1983) argued that quality needed to be accomplished in all sections of a business from production to delivery and after services (Ogunpitan, 2009). Therefore, he focused on the process of the business to create quality while focusing on the people. Similar to Juran (1974) and Ishikawa (1976), Feigenbaum (1983) was focused on the people of the business, however, while customers were considered, it lacked the customer-centered approach, which Crosby (1979) highlighted in his theory. Flood (1993) summarised Feigenbaum's (1983) philosophy into four steps for management practices:

- Set quality standards;
- Appraise conformance to standards;
- Act when standards are not met;
- Plan to make improvements.

The idea behind these steps is the establishment of a 'Total Quality System', which Rumane (2011:26) defines as,

> *"The agreed companywide and plant wide operating work structure, documented in effective, integrated technical and managerial procedures, for guiding the co-ordinated actions of the people, the machines and the information of the company and plant in the best and most practical ways to assure customer quality satisfaction and economical costs of quality."*

In contrast to previous quality theories, Deming's (1986) definition of quality was to ensure the continuous improvement, by setting standards to minimise variations in the desired output (Beckford, 2010). He pointed out that long-term leadership and company focus are the priority. Therefore, he incorporated the 'company-wide approach' of previous philosophers, but determined that quality is a result of aligning the company product to the highest standard available in the market. By adopting early theories of quality management, he was the first to incorporate a benchmarking approach for the setting of quality standards. Deming (1986) argued that not only current profitable numbers determine the success of the business, but also good business practices, such as horizontal and vertical communication between departments and individual staff members that lead to future benefits. He believed that the assurance of quality for the end-consumer should be implemented in the product as well as in each step of the process (Mândru et al., 2011). He based the lack of quality in the management system rather than on the effectiveness and efficiency of employees (Mândru et al., 2011). Therefore, he designed 'fourteen principles for transformation' to ensure that a suitable company culture was put in place before implementing a quality management process. It starts with defining a clear purpose of the product and service before clarifying the understanding of responsibilities on the management level to educate other employees (Hawkes and Adams, 1994). Although Deming (1986) was lead by the belief of quality being

based on consumer needs, his approach is widely focused on the people and company culture as the determinant of quality (Deming, 2000). While quality management in his view started in the product development stage, his philosophy was largely based on the procedure of the business without incorporating the customer needs, and therefore not suitable for the purpose of this study.

All of the above theorists are believed to feed into the definition of TQM, although some do not mention the term in their works. However, a trend in the shift of focus from a process to a customer-driven approach could be determined within early quality management theories. While early philosphers were largely focused on the internal business side, a clear shift to external factors, such as customer involvement and competitive benchmarking could be observed in later theories of quality management. Although this has made the concept of TQM far more complex, it is crucial to consider all factors that affect and determine the quality of a product and business as a whole. As a result, businesses have focused on various areas when implementing aspects of TQM. Deming (1986) and Juran (1974) argued that TQM should not be considered a separate system, but rather be seen as the outcome of various practices implemented into the production and corporate strategy (Hellsten and Klefsjö, 2000). While definitions changed according to evolving customer needs and requirements, the key principle to embed customers and quality into the product development process is still regarded the key to TQM (Jha and Kumar, 2010). Overall, all early quality theorists believed in a system of top management support and considering customer relationships (Martínez-Lorente et al., 1998). While Deming (1986) and Crosby (1979) are more focused on the production process, the views of both support a different approach, as Crosby (1979) builds on the foundation of 'zero defects' through the commitment of employees during the production process. Deming (1986) on the other hand criticises this urge of employees to achieve zero defects. Ishikawa's (1976) approach on the contrary is the most employee-focused of all, stating that quality management needs to be guided by top management before it can be realised by other employees (Martínez-Lorente et al., 1998). Furthermore, Juran (1974), Ishikawa (1976) and Feigenbaum (1983) agree that regular inspections are required in order to increase the assurance of a standardised product and prevent variations in the output. In the literature searches it can be

determined that although quality management was considered much earlier, the term and importance of TQM has started to make an impact since the 1980s, at which an increasing amount of studies have been conducted globally (Martínez-Lorente, 1998). However, it was stated that the implementation of TQM in early times failed due to the lack of incorporating various tools used in TQM rather than the lack of establishing a 'total quality system' culture into the business (Zink, 2007).

While a 'total quality system' has been regarded as key principle of TQM, this study focuses on the development of a quality product. Therefore, the focus should be narrowed from a company-wide perspective to quality assurance in the production stage. A more suitable definition of quality for product development was formulated by IBM stating,

> *"Quality is the degree in which customer requirements are met. We speak of a quality product or quality service when both supplier and customer agree on requirements and these requirements are met".*

(Van Weele, 2005:192)

The idea of IBM's definition lies in the identification of customer requirements in order to align supplier requirements for the creation of a quality product. According to Ulrich and Eppinger (2000), quality can be implemented in various parts of the business, such as in production or process, as discussed by early quality theories. However, they argued that a customer-focused approach has been the most favourable to ensure a successful product. The key lies within the identification of customer requirements and creating a product that meets the customer needs at a low price (Ulrich and Eppinger, 2000). While TQM is a total business approach including product, business culture and strategic business management, QFD focuses on the product development side and has provided the foundation for this study. As the end-user for mobile AR tourism applications will mainly focus on tourists, a customer-driven approach as in QFD was regarded the most suitable to align with design elements that will be employed in the final application. In order to understand the position and application of QFD, the following will first provide a discussion of TQM as a result of early concepts of quality.

2.3 Total Quality Management (TQM)

According to Vector Study (2012), quality is the determining factor that leads to success and business growth. In Oakland's (1988) definition of quality, he put high emphasis on this issue as determinant for organisational success and argued that quality needed to be managed rather than controlled. It is crucial that the first priority is to continuously pursue the highest quality and adjustment to the changing business environment to succeed on a long-term basis. This principle was emphasised by Deming (1986) stating that inspections through random sampling should be avoided, and furthermore by Crosby (1979) who argued that control is unnecessary if 'zero defects' are established in the production process. Oakland based his definition on the sole idea that the importance of quality was to meet the needs of customers (Oakland, 1993). He therefore emphasised that the criteria of quality are set by the customer and not by the supplier, which refers back to the principle of Total Quality Management (TQM). Hellsten (1997) summarised the key values that were shared by all early influencers of TQM,

- Focus on customers
- Management commitment
- Everybody's commitment
- Focus on processes
- Continuous improvements
- Fact-based decisions

Hellsten (1997)

Oakland (1993) agreed with Ishikawa's (1976) belief that quality starts at a management level and can only be achieved if it is processed properly throughout the organisation. While he invented a ten-point process for senior management in order to ensure the implementation of quality, he emphasised on certain developments during the pursuit of quality. In comparison to Quality Circles, which are exclusively business internal, TQM incorporates the requirements of

customers into the quality creation process while aligning the business processes accordingly.

The three components of TQM, 'Total', 'Quality' and 'Management', are expressed by Besterfield et al. (2003) as the art of managing the whole process in order to strive for excellence. The closest definition has been found by a group in the Total Quality Forum of 1992, which defined TQM as,

> *"...a people-focused management system that aims at continual increase in customer satisfaction at continually lower real cost. TQ is a total system approach (not a separate area or program), and an integral part of high-level strategy. It works horizontally across functions and departments, involving all employees, top to bottom, and extends backwards and forwards to include the supply chain and the customer chain..."*

A total system approach implies that it is not simply a concept, but rather a culture and style that is incorporated into the business (Bounds et al., 1994). Although it has been given various names according to the area and industry of implementation, such as 'Market-Driven Quality' by IBM, it refers to a customer-focused approach, which forms the main idea. Comparing Besterfield's (2009) TQM concepts to early ideas of TQM, it can be seen that the core values remained the same, and were only worded differently.

1. A committed and involved management to provide long-term top-to-bottom organisational support.
2. An unwavering focus on the customer, both internally and externally.
3. Effective involvement and utilisation of the entire work force.
4. Continuous improvement of the business and production processes.
5. Treating suppliers as partners.
6. Establishing performance measures for the processes.

(Besterfield, 2009)

TQM emphasises three key principles, customer satisfaction, continuous improvement and involvement of all employees in the organisation. The aim of TQM is to provide a quality product tailored to customer-requirements and

demands, while increasing efficiency by lowering production cost and preventing potential errors (Harnesk and Abrahamsson, 2007). Beheshti and Lollar (2003) furthermore argue that TQM has evolved to consider process design for production and service, relationship with customers and suppliers, benchmarking, and statistical tools in order to build a complete system. Table 2.1 shows the list of factors crucial for TQM regarded by the early quality management theorists.

Table 2.1: List of crucial factors for TQM considered by early influencers

	Juran (1974)	Ishikawa (1976)	Crosby (1979)	Feigenbaum (1983)	Deming (1986)
Top management commitment	X	X	X	X	X
Strategic quality management	X		X	X	X
Process quality management	X		X	X	X
Design quality management	X	X	X		X
Education and training	X	X	X	X	X
Supplier quality management	X	X	X		X
Customer satisfaction	X		X		X
Employee empowerment and involvement	X		X	X	
Business results	X	X	X		X
Culture			X		

Source: author (2015)

TQM is set to improve customer service, increase the quality of products and services and engage people in their workplace. However, Hellsten and Klefsjö (2000) argue that a successful implementation of TQM highly depends on the values of the organisation, which determine the area of focus and the implemented technique. Therefore, it was not surprising that adopters of TQM were often customising the tool in order to improve its efficiency and relevancy for the business particularly in the manufacturing industry, where TQM was widely studied and implemented selecting various tools to achieve goals. While businesses impement TQM in various practices, the purpose of this study is to provide a guideline for the development of mobile AR tourism applications in the urban heritage context. Therefore, it was found that an overall business strategy focus was less relevant, but that this study rather requires more investigation of

product development-related practices of TQM. A number of product development techniques and tools have been established including national and international Award-based systems, the Malcom Baldrige National Quality Improvement Act (MBNQA), ISO 9000 standards and Quality Function Deployment (QFD). Figure 2.1 outlines the early quality management theories that have influenced TQM, and the tools that have developed in TQM to improve quality in the business and product. The following will discuss each tool and their purpose in the theory of TQM.

Figure 2.1: Theories that influenced TQM and tools developed in TQM

TQM Tools
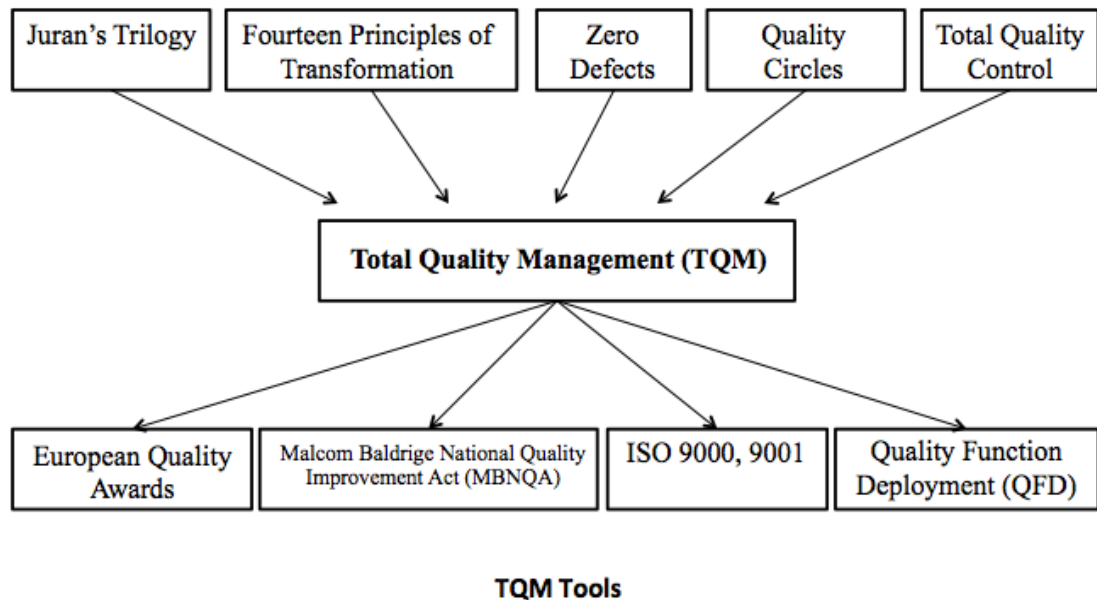
Source: author (2016)

2.3.1 European Quality Award

The European Quality Award is introduced in this chapter as one of the regional awards that were established for businesses in and around Europe in alignment with the context of this study. Regional and national quality awards were introduced and used as guidelines for many businesses to establish an acknowledged standard of quality products. However, one of the difficulties of such guidelines was found in the limited definition of quality as a tool rather than a concept. The European Quality Award was founded in 1989 by 14 leading

European organisations including Robert Bosch GmbH, KLM Royal Dutch Airlines, and Nestlé AG. The European Quality Award was later renowned as the European Foundation for Quality Management (EFQM) Excellence Award that was rooted in the Model of Excellence (EFQM, 2016). The fundamental concepts of EFQM were built around,

- Achieving balanced results
- Adding value for customers
- Leading with vision, inspiration and integrity
- Managing by processes
- Succeeding through people
- Nurturing creativity and innovation
- Building partnerships
- Taking responsibility for a sustainable future

(Lai, 2012)

The EFQM was designed to assist and stimulate particularly higher management to incorporate the principles of organisational excellence. It focuses on the business management and structure as a whole, instead of the systematic creation of quality products. Being supported by the European Commission in accordance to the European Quality Promotion Policy (EFQM, 2016), it aimed to improve the competitiveness of the European industry towards developed countries such as Japan and the USA. While internationally recognised quality awards such as the EFQM can increase the business performance as a means of motivation and benchmarking, it lacks the theoretical concept to be studied from an academical perspective. It is therefore rather regarded as recognition for companies that have implemented TQM in their business strategy and are striving to be a rolemodel in the industry. While the EFQM was acknowledged as a TQM tool that is used to guide businesses, it was not considered further since it does not align with the study objective to provide a guideline to develop a quality product.

2.3.2 Malcom Baldrige National Quality Improvement Act (MBNQA)

The Malcom Baldrige National Quality Improvement Act (MBNQA) was founded in 1987 and is administered by the National Institute of Standards and Technology (NIST). It aims to identify and recognise role-model businesses and to establish criteria for evaluating business practices in order to identify specific areas for improvement (Heaphy and Gruska, 1993). The core values were established as,

- Visionary leadership
- Customer-driven excellence
- Organisational and personal learning
- Valuing workforce members and partners
- Agility
- Focus on the future
- Managing for innovation
- Management by fact
- Social responsibility
- Focus on results and creating value
- Systems perspective

(Heaphy and Gruska, 1993)

Through incorporating the core values into the business, it is crucial to embed them into the business system in order to improve the overall performance. The criteria therefore establish a framework that encourages company wide quality practices that is transferable to any organisation. By improving the performance of the business, Evan and Lindsay (1999) argued that the final goal was to achieve customer satisfaction. While the MBNQA is largely used for self-assessment to improve performance management and business processes, evidence suggested that businesses that implemented the MBNQA resulted in higher average productivity, better employee relations and greater customer satisfaction (NIST, 2002). While many countries established a similar awards system, such as the European Quality Award, the Canadian Awards for Business Excellence, the

Australian Quality Awards and the New Zealand Business Excellence Award, all of them were modeled according to the Baldrige Award. However, due to the context of this study, only the European Quality Award (section 2.3.1) was introduced in this chapter. Similar to the European Quality Award, the MBNQA sets guidelines for businesses in order to improve quality businesswide. However, in contrast to the European Quality Award, the MBNQA is a self-assessment of business procedures. While it is regarded as one of the key tools in TQM, it has a strong focus on the overall business performance rather than on product development. Similar to other tools within TQM, both award systems are considering customer satisfaction as one of the core criteria for successful business performance. Nonetheless, although product development is considered in both award systems, it does not provide a theoretical concept of quality assurance in the development stage. Therefore, the award systems were not further pursued for the objective of this study. Compared to the ISO 9000 and 9001, the focus of award systems lies in quality awareness and achievement for implementing successful strategies. The main criteria are based on results and continuous improvement of all business practices. The ISO 9000 and 9001 on the other hand is based on four internationally set standards which businesses can use as guidelines in order to establish an efficient quality system. As the ISO standards focus on a set of specific requirements, they were considered to be more precise compared to the criteria for the Baldrige Award.

2.3.3 ISO 9000, 9001

The International Standard Organisation (ISO) was formed by the United Nations in 1947 in order to set a global standard for products across different industries. The ISO 9000 was set in 1987, which was later renamed to ISO 9001 in order to combine prior set standards and reduce them to one set of guidelines for quality disregarding the industry or demographics of the business (Hill et al., 2002). According to the ISO 9000, the definition of achieving quality is based on the degree to which a set of inherent characteristics fulfils requirements (Besterfield, 2009). The international organisation of standardisation categorised the principles of quality management into eight areas,

- Customer focus

- Leadership

- Involvement of people

- Process approach

- Systems approach to management

- Continual improvement

- Factual approach to decision-making

- Mutually beneficial supplier relationship

(ISO 9000:2000, 2002)

As an organisational approach to quality assurance, it is crucial to understand customer needs in order to meet and exceed customer expectations to guarantee satisfaction. Compared to the ISO 9000, the ISO 9001 focuses largely on customer satisfaction, continual improvement and efficiency. Therefore, it concentrates on the features that are directly linked to the customer, ensuring that all products and services offered by the business align with the customer's requirements (Dick et al., 2002). In alignment with the principle of TQM, successful implementation of the system was believed to depend on the commitment of top management and efforts to establish a common direction for the organisation. Therefore, the involvement of all people and levels are necessary to achieve the organisational objectives. The performance of the organisation as a whole stands in the centre of objectives and should continuously be monitored. At the same time, the organisation as well as supplier's performance should improve in order to create a beneficial relationship for both. Overall, the ISO 9000s regard quality as attributes or service that would make a certain product attractive to customers and satisfy their expectations.

Compared to the EFQM and MBNQA it was found that principles of the ISO 9001 were evident in both award systems while in contrast, ISO was missing indications on innovation and results. As a result, MBNQA is regarded as a 'systems perspective', whereas EFQM focuses on management of processes. It needs to be recognised that quality award systems are highly focused on the business

performance, and therefore lack the examination of customer requirements and understanding of the customers' perpective. However, while popularity and use of ISO 9000 and 9001 standards were growing among businesses, the adoption in the tourism industry has been limited (Augustyn and Pheby, 2000). Since the ISO 9000 series is not widely promoted as a performance improvement tool, it is argued that lack of awareness has largely been the cause of its limited adoption. On the other hand, ISO supporters emphasise the importance of ISO standards in order to achieve business excellence. Nonetheless, overall knowledge of ISO standards in the tourism industry has been limited and generally believed not being suitable for the tourism industry (Augustyn and Pheby, 2000). While the ISO 9001 focuses on meeting customer requirements, it is a business practice approach, and therefore lacks the employment for product design. As this study aims to develop a model for mobile AR tourism applications in the urban heritage tourism context, ISO standards were therefore not further investigated.

2.4 Quality Function Deployment (QFD)

As a common challenge lies in involving the customer into the product design process, QFD has been identified as a technique within TQM that focuses largely on the customer. Therefore, the QFD method was considered to be the most suitable concept for the purpose of this research and the desired outcome. While customer requirements can be identified through the 'Voice of Customer', such indications were argued to be largely vague and needed to be translated into corresponding technical criteria in order to be implemented in the design of the product (Decision Lens, 2010). Whereas most quality approaches are based on eliminating errors in the production and meeting customer requirements, the QFD method encourages the identification of customer requirements to achieve customer satisfaction. Kano (1984) established a model to identify different types of customer requirements through the voice of customer, which will be covered in section 2.5.1.

Since the late 1960s, businesses have experienced the need to adjust their business strategy to market changes in order to stay competitive in the global market (Tidd

and Bessant, 2011). Markets have changed from businesses gaining a competitive advantage through 'economies of scale' to produce large quantities with less cost to 'economies of scope', where products best meet the customer requirements and demands (Decision Lens, 2010). Therefore, various concepts have been developed to increase the efficiency of the manufacturing process. One of the most significant and widely used techniques that has been identified is Quality Function Deployment (QFD), which is a structural approach to include customer requirements in the product development phase in order to meet and exceed customer satisfaction of new products.

Huber and Mazur (2002) argue that quality has largely been seeked in the improvement of existing processes and products by identifying errors and misalignments of the existing product and business to market demands. This businesswide approach has been evident in TQM and many of the tools used within the TQM theory, such as the award systems as well as ISO 9000 series. However, it was pointed out that such tools were based on industry-based benchmarking activities, and therefore do not fulfil the criteria of this study to identify new requirements. Since this study is based on developing a mobile AR application for urban heritage tourism, alternative comparable applications are not yet existent, making benchmarking irrelevant. QFD can identify tourist requirements through directly communicating with tourists to understand their needs before the product is developed. Lim and Tang (2000) further argue that TQM is generally focused on the process and product development inside an organisation, whereas QFD focuses on the outside of the organisation, including customer expectations and requirements as well as targets and improvements. Although QFD is based on the theory of TQM to implement quality through all stages in the product life cycle, it focuses particularly on the design aspect of the product (Ramaswamy, 1996). Since QFD has not yet been implemented for the development of mobile AR tourism applications in the context of urban heritage tourism, a gap in the theory was identified. QFD was regarded as the most suitable tool for the purpose of this study, as the research aims to identify tourist requirements for mobile AR tourism applications in urban heritage tourism to design and propose a hierarchy of technical elements that should be considered in a mobile AR tourism application.

2.4.1 QFD Development

The history of QFD dates back to Mizuno and Akao (1978), who introduced QFD in the early 1970s in order to improve the design of Mitsubishi Heavy Industries Ltd's oil tanks in Kobe, Japan, utilising a quality chart which forms a significant part of QFD. The basic idea was to improve the production process in the manufacturing industry and develop products faster, while lowering the cost compared to competitors (Pulli et al., 2007). According to Akao and Mazur (2003), the following two issues were the determinants of developing QFD. On the one hand, people started to realise the importance to design quality into the product. However, standardised guidelines were still limited. On the other hand, although companies were already using Quality Control Charts, they were used towards the end of the production stage, when the product had already been manufactured. Therefore, Akao (1990:1) criticised the following,

"By the time design quality is determined, there should already exist critical quality assurance (QA) points that are needed to ensure certain qualities. Why, then, could we not note these critical points on the QC process chart as predetermined control points or check points for production activity, prior to production start-up?"

Ever since the introduction of QFD into the US, it has caught the interest of many industry practitioners through a variety of industries as well as academics, who have analysed and published books about its benefits ever since (Pulli et al., 2007). After Toyota was able to reduce its pre-production cost by 60% and shorten the time of development by one-third from 1977 to 1984, the method was implemented and adjusted by major US companies, such as Ford Motor Company, AT&T and IBM (Hauser and Clausing, 1988). In 1994, the QFD Institute in the United States was founded to provide a platform for all QFD activities where theorists and practitioners could gather to exchange and improve methods to implement into their businesses (Akao and Mazur, 2003). In 1995, Motorola announced QFD the only research method that showed significant improvements in the production process resulting in higher cost efficiency (Astorga, 2008). Similar results were noted in other companies that implemented QFD into their business strategy, such as Toyota, which was able to reduce their production cost by 61% over seven years, and Host Marriott, which increased Bagel sales by 240% in 120 days (Astorga, 2008). QFD has spread from Japan to the USA and Europe in the last three decades and has been on the verge of being adopted in India and China to improve their global competitiveness (Abu-Assab, 2011). Still today, QFD is highly researched and developed in various industries and contexts, and can be followed through annual QFD Symposiums all over the world (Abu-Assab, 2011). This study will provide the employment of QFD into the mobile application development in the tourism context and extend the knowledge of QFD.

2.4.2 QFD Benefits

Academics and industry practitioners have mentioned many benefits after developing their product using QFD. Apart from its original benefit to reduce production time and cost, it was found to encourage teamwork within the organisation, as all departments from production to marketing need to interpret the voice of the customer properly in order to prevent any misalignment. Sullivan (1986) has summarised the benefits into key categories such as higher customer satisfaction through design improvement, shorter time consumption due to early changes in the development process and therefore, early detection of errors and bugs, higher commitment of the development teams, communication improvement through stronger links among designers and manufacturers, less product components, and better work atmosphere through horizontal communication supported by documentation procedures through QFD. Furthermore, Lockamy and Khurana (1995) pointed out the guarantee of developing a high quality product, as it goes through the stage of competitive benchmarking. QFD therefore does not only look at customer responses, but also at past competitive information of similar products and customer reactions to such (Akao and Mazur, 2003). Although Clausing (1994) identified some cost and implementation issues with the employment of QFD into the development process, it is generally believed that QFD provides a technique to increase the overall business performance (Herrmann et al., 2006). Being proactive to eliminate conflicts in the design process prior to production, it prevents the need to reorganise and change the company structure, compared to other TQM methods that are mainly focused on error correction as a reactive method (Akao and Mazur, 2003). This includes not only the internal business structure, but also greater market share and greater profit (Bayraktaroglu and Özgen, 2008). The crucial benefit of using QFD from the theory of TQM compared to previously discussed theories is the customer-oriented product development focus in the design stage. In its essence is the House of Quality (HOQ), the main matrix in QFD (Hauser and Clausing, 1988), which is further discussed in detail in section 2.6. This HOQ is being utilised all across the world in a number of production as well as service industries as efficient solution to meet and exceed continuously changing customer expectations (Akao and Mazur,

2003). To generate the HOQ, various ways have been found to identify and prioritise customer requirements during the collection of the voice of customer (VOC). The following will provide an overview of the main approaches for the identification and prioritisation of customer requirements.

2.5 Identification and Prioritisation of Customer Requirements

Quality management systems have been discussed in order to provide an overview and justification for the employment of QFD as theoretical framework of this research. The main benefit of QFD was discussed as the identification and prioritisation of quality and technological requirements that ensure customer satisfaction (Akao and Mazur, 2003). Therefore, the QFD model is only as accurate as the identified input variables, and it is vital to gather the right data in order to guarantee a quality product outcome. A number of supporting techniques have been developed over time in order to facilitate the identification of criteria in specific contexts. In the area of system development, the prioritisation of user and technical requirements is seen to be a necessary step before moving into the actual product development process (Moisiadis, 2002). Due to products undergoing a much shorter development process than before, prioritising requirements as early as possible reduces potential product modifications in the later stage resulting in saving valuable resources, such as time and money (Firesmith, 2004). However, it is a time-consuming and difficult task to decide which requirements in a product are the most significant and which can be subsidised due to time and budget limitations (Karlsson and Ryan, 1997). According to Moisiadis (2002), prioritising requirements establishes a hierarchy among identified requirements that take various stakeholder views into account. Several methods have been established to identify and prioritise customer requirements including the Kano Model (Kano, 1984), Analytic Hierarchy Process (AHP) (Saaty, 1980), Karlsson's Cost-Value approach (Karlsson and Ryan, 1997), Wiegers Prioritisation Matrix (Wiegers, 1999), and a wide array of ad hoc practices that have been implemented in the industry. The following will discuss the most common methods to identify

customer requirements for the implementation into the QFD model before discussing the HOQ.

2.5.1 The Kano Model

The Kano Model was invented by the Japanese TQM consultant Kano (1984) and provides a categorisation model of customer satisfaction indicators that result from product features (Chen and Chuang, 2008). Therefore, the model categorises each feature into three key areas, Dissatisfiers, Satisfiers and Delighters. The importance of identifying such features was realised by recognising the allocation of limited resources.

Dissatisfiers are product characteristics that the customer takes for granted. As a result, the absence of such features leads to dissatisfaction in the customer, as it does not meet the standard (Mikulic and Prebežac, 2011). Dissatisfiers are generally difficult to identify out of the VOC, as customers are expecting such features without having to mention them separately (Vargo et al., 2007). According to Mikulic and Prebežac (2011) the only way of identifying such features is through customer complaints that help the business to realise the existence of Dissatisfiers.

Sometimes called "desired quality", Satisfiers are regarded as features that the customer would like to have included in the product (Mikulic and Prebežac, 2011). Those are typically directly identified through the VOC, as they define features that are mentioned by customers to raise their level of satisfaction (Vargo et al., 2007). In the process of competitive benchmarking, Satisfiers typically set the new standard, as they are fairly easy to measure in a competitive analysis (Nilsson-Witell and Fundin, 2005).

Delighters (Exciting Qualities) refer to a product feature category that defines elements that positively surprise the customer when using the product (Burns et al., 2000). Those are features that positively distinguish the product from the competition (Evans and Burns, 2007). Therefore, Kumar et al. (2010) refer to them

as 'exciting' or 'unexpected' quality. Sometimes, such features are referred to as 'hidden needs', as they cannot be identified by the customer, since they do not realise the necessity of them (Matzler and Hinterhuber, 1998).

There are two aspects that need to be considered. First, features for customer satisfaction need to be allocated to different categories, as they do not only differ in the degree of importance to the customer, but also have various effects on the level of satisfaction (see Dissatisfiers and Delighters) (Chen and Chuang, 2008). Furthermore, it is insufficient to only respond to customer complaints, as such mainly refer to Dissatisfiers and do not add to increasing customer satisfaction. Instead, customer needs must be identified proactively through the VOC and catered for in a new and creative way that meets (Satisfiers) and exceeds (Delighters) customer expectations (Lai et al., 2004). In order to properly categorise product features in the Kano model, it needs to be understood which customer need they originate from and how the customer reacts in each category (Chen and Chuang, 2008). Providing more features that the customer is familiar with will increase customer satisfaction and therefore, be categorised as Satisfiers. On the other hand, features that can increase customer satisfaction without the customer's prior knowledge of it are referred to as Exciting Qualities or Delighters and enhance the customer experience by providing new benefits (Zultner and Mazur, 2006). In the case of Desired Features (Satisfiers) being raised high enough, it is also possible to shift them into Delighters, as the new provided level of product feature results in the possibility of new benefits. Therefore, Lai et al. (2004) recommend identifying customer benefits first and then sorting them into respective categories.

The VOC is mostly gathered through interviews, as it is recommended to go to the 'gemba', a process to study customer requirements on-site in order to understand what the customer wants to do and provide meaningful solutions to their problems. This method assists in identifying new benefits that would excite the customer. For many years, researchers and industry professionals have used the Kano model to categorise customer requirements (Sauerwein et al., 1996; Shahin, 2004; Tontini, 2007; Chen and Chuang, 2008) and have implemented it into the QFD process to better understand and analyse requirements.

2.5.2 Analytic Hierarchy Process (AHP)

Although the Analytic Hierarchy Process (AHP) approach was developed in the 1970s, it was not until early 2000 that AHP was attracting more interest and was used in various areas, starting in countries such as Taiwan, Turkey and the USA (Sipahi and Timor, 2010). It has mainly been used in the strategic allocation of resources, evaluation of alternatives as well as in the process of new technology development (Shahin and Mahbod, 2007). Various industries have applied this method to identify and prioritise requirements to form the input variables in the product design process (Moisiadis, 2002).

The early QFD process to identify important requirements was based on a simple mathematical method. However, developers soon realised that the potential of QFD did not solely rely on prioritising customer needs, but could be combined with identifying a hierarchy among design elements for planning and production processes (Hepler and Mazur, 2007). These outputs were all interconnected and provided a new level of understanding of the business and development process. In order to rate criteria, different methods to signify their importance have been developed.

The Absolute Importance evaluates criteria on an interval scale. The typical scale was identified as ranging from 1 (not important) to 5 (very important), where each feature could be given an importance rating. The Ordinal Importance on the other hand gave respondents the freedom to allocate points to each criterion ranging from 0 to 100 to indicate which item was more important than another (Bayraktaroglu and Özgen, 2008). AHP was created to assist in the understanding of the hierarchy process by participants, providing a stable mathematical background (Hepler and Mazur, 2007). The main steps within the AHP process has been summarised by Partovi (2001) as,

1. The design of the hierarchy;
2. The prioritisation procedure; and

3. The calculation of the results.

The main idea of AHP was the allocation of limited resources. However, developers soon realised that it had much greater potential by transforming subjective judgments into objective measures (Sipahi and Timor, 2010). Manufacturing was identified as the area where AHP is mostly used, as supplier selection, system selection and evaluation are problems mostly encountered in the manufacturing industry. However, in order to utilise AHP, it requires a profound knowledge of customers in order for them to interpret requirements the same way. While AHP has been accepted in the literature as valid method to prioritise requirements, critics of the method have pointed out that AHP uses a pre-determined pairwise comparison of two requirements (Whitaker, 2007). Since the outcome is pre-generated, it does not allow tourists to make decisions on the prioritisation of requirements independent from one another. Therefore, the use of AHP was not considered suitable for the purpose of this study.

2.5.3 Karlsson's Cost-Value Approach

The idea of Karlsson's Cost-Value approach originated from providing guidelines to management and decision makers to get an indication of requirements and their associated cost for successful implementation (Karlsson et al., 1998). By linking each requirement to its additionally creating cost for implementation, decision makers can get an insight of the potential value of each requirement and its contribution to customer satisfaction (Karlsson et al., 2006). Karlsson and Ryan (1997) argued that this process must be simple and fast on the one hand, on the other hand provide enough valuable results to make it worthwhile in order to be usable in the industry. Especially for software development, the timespan of development and production is shorter than ever before. Therefore, the cost-value approach is designed to include a suboptimal view based on stakeholder satisfaction. The method has its origin in the Analytic Hierarchy Process (AHP) for the quantification of value and cost and is often combined with the pairwise comparison of multiple requirements from AHP (Karlsson, et al., 2006). The cost-value approach is usually carried out in five steps,

1. Review of complete and clear indication of candidate requirements
2. Pair-wide comparison through AHP to assess the relative value of each requirement
3. Estimation of relative cost involved for each requirement
4. Calculation and display of the relative value and cost of each requirement
5. Mapping and analysis of the cost-value diagram involving various stakeholders

(Karlsson et al., 2006)

As the results of the cost-value diagram are generally displayed in an ordinal scale form, they are limited in information richness compared to ratio scales as outcome of AHP (Karlsson et al., 2006). It is therefore mostly used to provide a quick and simple insight into the prioritisation of requirements and as stepping stone for a more in-depth analysis using other methods, such as AHP.

2.5.4 Wiegers Prioritisation Matrix

The Wiegers approach evolved from the recognition for collaboration between customers and developers to prioritise requirements based on limited resources (Wiegers, 2003). While developers do not necessarily know which requirements are valued the most by customers, customers are often not aware of the involved cost and resources that are involved to provide certain requirements, which potentially make a requirement not valuable and beneficial enough to be included in the final product (Wiegers, 1999). In practice, it is often difficult to identify requirements that can be neglected in the developing process, as the common problem is that customers often find all requirements equally important, leaving the developers with the same prospect as before (Azar et al., 2007). Wiegers Prioritisation Matrix is based on a spreadsheet model, which distributes a set of estimated continuous priorities as opposed to categorising requirements into priority classes (Wiegers, 2003). Each requirement is measured according to the value it provides compared to the cost of implementing the feature, such as in the cost-value approach. However, Wiegers (1999) points out that this method should

not be used alone, but combined with other methods, such as QFD or AHP due to its limited incorporation of other variables. Wiegers (1999) suggests using this method for requirements that are negotiable and not top priority, and can be determined without the thorough process of QFD, TQM or AHP to save time. Being based on weighted assessments of perceived value of customers, relative penalty, anticipated cost and technical risks, it was argued that Wiegers prioritisation method is less rigorous than other alternatives, such as AHP (Karlsson and Ryan, 1997; Wiegers, 2003). While AHP has been identified as a method for vigorous prioritisation of requirements in the area of software development (Liebowitz, 2005; Vaidya and Kumar, 2006; Ho, 2008), the nature of this study is highly exploratory, and therefore requires the in-depth investigation of 'customer attributes' before it can be meaningfully prioritised. In order to employ AHP meaningfully, it is implied that two requirements are independent and comparable with one another (Saaty, 1995), while being distinguishable as 'can' and 'must' criteria (Crostack et al., 2007). Since tourist requirements in this study were newly explored for the research context, and the majority of tourists participating in this study did not have prior experience with AR applications, it was concluded that utilising AHP should be regarded as future recommendation to confirm the outcomes of this study. This study will be based on the traditional prioritisation approach in QFD evaluating importance ratings to determine the absolute hierarchy of tourist requirements, which is considered a valid method.

2.6 The House of Quality (HOQ)

The most utilised tool of QFD has been identified in the literature as the 'House of Quality (HOQ)' which is the main matrix for using QFD (Pulli et al., 2007). It is generally used to identify and prioritise demanded quality items based on customer requirements, competitive performance and vision of the company. As a result, the designer is able to develop a product designed to achieve high customer satisfaction after considering all information input (Zheng and Pulli, 2005). As this study focuses on the main matrix of QFD, the following will discuss the HOQ in detail providing an understanding of the main tool utilised to achieve the main objective of the study. While the original structure (Akao, 1990) was used,

individual parts of the HOQ were renamed to be consistent with the terms used in the study.

Figure 2.2: The Components of the House of Quality (HOQ)

Correlation Matrix
E

Technical Characteristics
C

Customer Importance Ratings (Relative Weight, Weight/ Importance)

Customer Requirements

A

Relationship Matrix

D

Planning Matrix

B

Target Values

F
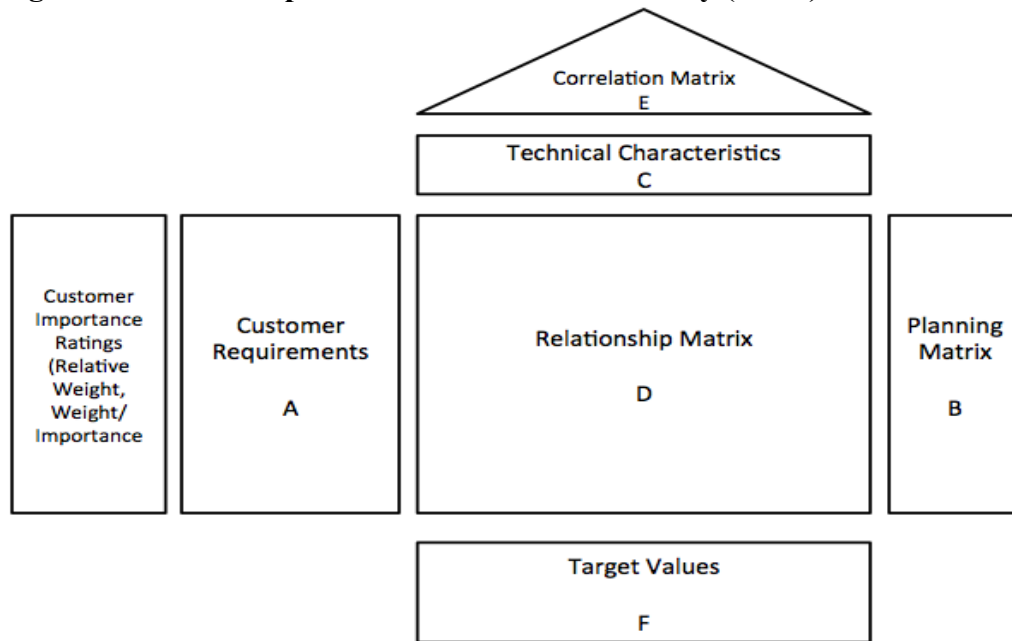
Source: Akao (1990)

The individual sections of the HOQ are shown in Figure 2.2 and are labeled with the letters A to F. While each section indicates various areas in the product development stage, it has been structured with letters to follow the logical input of data into the matrix. Customer requirements describing wants and needs (quality requirements) labeled with 'A' are located in the left part of the 'house' and are commonly acquired through qualitative research (Chan and Mazur, 2010). The Planning Matrix (B) generally includes three types of information. The main information are the quantitative market data, indicating current businesses and products similar to the desired output, and the satisfaction level of current offerings (Tan and Shen, 2000). Additionally, strategic goals for the developing product and a ranking of customer wants and needs are listed within this matrix. The development criteria (technical characteristics) that are formulated in technical terms are placed on the top of the matrix (C) (Hauser and Clausing, 1988). According to Cohen (1995), these are commonly generated after investigating the customer attributes. The middle part labeled with the letter 'D' presents the

relationship matrix between customer requirements and technical characteristics and is commonly indicated using a numbering scale 0-1-3-5 or 0-1-3-9. 0 signifies no relationship at all, 1 refers to a weak relationship, 3 a medium relationship and 5/9 a strong relationship to each other (Pulli et al., 2007). The roof of the 'house' (E – Correlation Matrix) is a half square matrix, which is split along the 45 degrees angle. While giving the model its name 'House of Quality' it evaluates interrelationships between technical characteristics that have been identified by developers and designers. While Target Values (F) at the bottom include three types of information, the prioritisation of technical design elements is the main purpose (Cohen, 1995). Furthermore, it can provide information about the technical performance of competitors. In the following, each individual part in the HOQ (A to F) will be discussed.

2.6.1 Customer Requirements (A)

The Customer Attributes matrix, or often called 'customer requirements' is generally the first matrix that is constructed in the HOQ (Chan and Mazur, 2010). According to Chan and Mazur (2010), the input is usually acquired through interviews, questionnaires and 'gemba', a term used to describe on-site visits in order to evaluate actual performance necessities to collect the VOC. It is important to give the customer freedom to comment on his needs and wants as well as possible complaints and suggestions. To do so, open-ended questions are recommended that give the customer the opportunity to fully define values or pinpoint problems that prevent them from achieving their goal (Mazur, 2008). However, it is suggested that the customer is identified prior to the process, as the provided criteria will only represent the requirements of the selected target audience (Hamilton and Selen, 2004). The gathered data is analysed, by structuring them into main categories before inputting them into the Customer Requirements Matrix in the HOQ. While using the Kano Model to analyse customer requirements is considered helpful, it is difficult to implement it for new product developments that include features that customers are generally unfamiliar with. Since this study is based on newly identifying tourist requirements, categorising requirements into Dissatisfiers, Satisfiers and Delighters has been

found challenging. However, in order to get a thorough understanding of customer requirements, it is crucial to not only investigate satisfiers, but also dissatisfiers as suggested by Kano (1984). Although customer requirements are generally product related, it was argued whether or not it is more helpful to get product unrelated indications of customer needs and desired benefits in order to identify gaps of current products. Furthermore, by identifying needs that are not directly related to product features, it is possible to get an insight into potential problems a new product is able to solve. As customer needs are not always specific enough to define a specific solution, attempts should be made to specify the benefit with additional questions while gathering the VOC.

2.6.2 Planning Matrix (B)

The Planning Matrix (also called pre-planning matrix) is traditionally located on the right side of the HOQ. This matrix represents the goals that are generated after evaluating the customer requirements in order to determine specific measures to satisfy customers' wants and needs (Bayraktaroglu and Özgen, 2008). Whereas the Customer Attributes matrix has a purely qualitative background, the Planning Matrix is typically based on quantitative data. It compares the current performance of existing products in the market and develops a strategy in order to achieve short-term as well as long-term customer satisfaction (Tan and Shen, 2000).

The reason to create the Planning Matrix at the second stage is its direct connection to the Customer Attributes matrix, as it prioritises the information that supports the analysis of customer requirements for the creation of the remaining matrices (Lee et al., 2008). Furthermore, it provides a direct comparison of current products in the market including problems that current products failed to solve and desires that have not been met. Another alternative is to generate the Technical Characteristics (C) as the second stage followed by the Relationship Matrix (D) in order to get a better understanding of requirements that enable a more specific setting of goals when generating the Planning Matrix. The Planning Matrix is typically subdivided into various columns (categories) that need to be taken into consideration separately. The columns are divided into, importance to customer,

customer satisfaction performance, competitive satisfaction performance, goal, improvement ratio, sales point, raw weight and normalised raw weight (Cohen, 1995). However, since designing the main part of the Planning Matrix implies that an alternative product already exists in the market, it was disregarded for the purpose of this study. As the aim of this study is to create a QFD model for the development of mobile AR tourism applications in the urban heritage tourism context, applications in this context are still non-existent. Therefore, this study has moved directly to the generation of technical characteristics (C) in order to develop the relationship matrix. The customer importance rating was moved from the planning matrix next to the customer attributes as seen in figure 2.2.

2.6.3 Customer Importance Rating

The importance to customer column indicates how important each requirement is for the customer (Chan et al., 1999). Therefore, it is subdivided into two parts, Relative Weight and Weight/Importance (Bayraktaroglu and Özgen, 2008). The Relative Weight indicates the individual weight of importance on the given criteria. Therefore, the customer is usually asked to rate them on a numeric scale basis, from 1 indicating 'not important at all' to 5 'very important' (Ermer and Kniper, 1998). In order to establish the importance rating, Chan and Mazur (2010) suggest using questionnaires. While importance ratings could have been identified in the process of gathering the VOC, using quantitative questionnaires with a larger sample size was found to provide a more accurate picture of importance ratings, as they can be subjective to the customer's knowledge and background. The Weight/Importance is presented as a percentage out of 100.

2.6.4 Technical Characteristics (C)

The Technical Characteristics provide product requirements, features and capabilities that originate from the VOC and are translated into the 'Voice of Developer' (Mazur, 2003). This matrix is often referred to as Technical Characteristics or Technical Design Elements and is placed on top of the

Relationship Matrix (Mazur, 2003). A common way to define characteristics is by naming the Customer Needs "Whats" and developer requirements "Hows" (Hamilton and Selen, 2004). However, there are various languages that can be used for defining Technical Design Elements. According to Cohen (1995), the most widely used language is 'Top-Level Performance Measurements (TLPM)'. In the process of defining Technical Characteristics, Mazur (2003) suggests to formulate clear descriptions that include examples that fall into that category to be clearly understood by all members of the development team. This is particularly difficult for teams with various backgrounds, as each member will have a different level of technical knowledge and interpretation of customer requirements. Another challenge can be the lack of technical knowledge in the team, which requires the outsourcing of technical information. In such cases, intensive communication is required to interpret customer requirements to assure the proper translation into technical characteristics. By regarding them independently from the actual product development process, they can represent ideal criteria to outperform the competition, as they are not bound to certain solutions.

2.6.5 Correlation Matrix (E)

The Correlation matrix is placed in the roof the HOQ and presents interrelationships among technical design elements (Chen et al., 2005). A similar principle is used for mapping interrelationships in the Relationship Matrix (D). By putting each element in comparison to one another, strong-positive, moderate-positive, none, moderate-negative or strong-negative impacts on each other are identified (Bevilacqua et al., 2006). It also gives an indication of which design element modification will have a greater impact on the overall outcome by affecting other elements. However, in order to identify the inter-relationships among technical requirements, it is necessary to understand the technical aspects of the product development. For the purpose of this study, it is therefore required to have an understanding of mobile application development and how AR influences functions in the application as well as its impacts on the processing power of current mobile devices. Without knowledge of technical aspects, it was found to be challenging to make correct judgements on the relationship in the

correlation matrix. Therefore, mobile application developers were consulted which will be further discussed in section 5.10.

2.6.6 Relationship Matrix (D)

This Matrix shows the correlation between Customer Requirements and Technical Characteristics. Shen et al. (2000) refer to 'impacts' in each cell showing the relationship of one Customer Requirement to one Technical Design Element. In general, the link between the two elements is positive suggesting an improvement of the technical requirement leading to higher customer satisfaction. However, very often they have a different strength of impacts (Shen et al., 2000). Therefore, Miguel (2005) distinguishes between four linkage degrees; not linked, possibly linked, moderately linked and strongly linked. The degree indicates how much the two elements are affecting each other. 'Not linked' refers to no impact on customer satisfaction when changing the technical requirement, while strongly linked refers to a small change in a technical requirement having a big impact on customer satisfaction. In order to visualise this relationship, symbols or numbers ('Θ' = 9, 'O' = 3, '$\blacktriangle$' = 1, 'none' = 0) have evolved as the norm (Cohen, 1995). Technical design elements are typically formulated after identifying Customer Needs and after finding one or more solutions to each Need (Akao and Mazur, 2003). Therefore, it logically results in many one-to-one relationships. However, after identifying all technical design elements, each one of them needs to be put in contrast to every Customer Need in order to detect all possible impacts (Benner et al., 2003). Typically, this results in unexpected strong and weak relationships and helps the developer understand correlations of Technical Requirements and Customer Requirements that would not have been identified. Therefore, this process gives certain technical design elements a different degree of importance. After looking at the relationships to one another, the Relationship Matrix provides information to prioritise Technical Characteristics, which outlines every technical characteristic's relative contribution to the overall customer satisfaction (Akao and Mazur, 2003). The priority is calculated by multiplying the impact value ('Θ' = 9, 'O' = 3, '$\blacktriangle$' = 1, 'none' = 0) with the Relative Weight value calculated in the 'Customer Importance'. Afterwards, all results of one Technical Characteristic

(each column) are added together to calculate the 'total priority' of each requirement (Raharjo et al., 2006). The larger the total contribution of one design element, the more important it will be for the final product.

2.6.7 Target Values (F)

The outcome of the HOQ is presented in the Target Values. The prioritisation of Technical Characteristics provides a clear indication of the design element with the highest contribution value. These are generally the ones that should be taken into consideration and be focused on the most (González et al., 2004). In order to calculate target values, typically the technical performance, competitive benchmarks and priorities need to be taken into consideration. Therefore, the total priority of each Technical Characteristic is calculated by multiplying each importance indicator ('Θ' = 9, 'O' = 3, '▲' = 1, 'none' = 0) in the Relationship Matrix with the relative weight of each customer requirement in the 'Customer Importance', and taking the sum of all values in each column. After considering the technical design elements with the highest priority, it needs to be determined how the product is currently performing compared to the competitive standard. It can then be decided whether or not the product should meet or exceed the standard to achieve higher customer satisfaction. By putting the current product, the top product in the market (through competitive benchmarking) and target on a graph, it can be visualised where the current product is performing compared to the competitive best, and where the target should be aimed at (Goetsch and Davis, 2010).

2.7 QFD in the Tourism Industry

While QFD originated in the manufacturing industry, as the number of early studies confirm (Rodriguez-Soria, 1989; Burrows, 1991; Hjort et al., 1992; Kealin and Klein, 1992; Ansari and Modarress, 1994; Cadogan et al., 1994; Hales, 1994; Scheurell, 1994; Anthony and Dirik, 1995; Rahman, 1995; Tottie and Lager, 1995; Zairi and Youssef, 1995; Bergquist and Abeyse- kera, 1996; Gustafsson, 1996; Tsuda, 1997; Bode and Fung, 1998; Kaulio, 1998; Matzler and Hinterhuber, 1998;

Crow, 1999; Zhang et al., 1999; Govindaraju and Mital, 2000), QFD has increasingly and successfully been implemented into the service sector (Curry and Herbert, 1998; Harvey, 1998; Jeong and Oh, 1998; Curry, 1999; Barnes and Vidgen, 2001; Chin et al., 2003) and other areas, such as aerospace (Kojima et al., 2007; Pica et al., 2008), public transportation (Hopwood II and Mazur, 2007), education (Chen and Chen, 2002; Prusak, 2007; Durán, 2007), telecommunications (Xiong and Xia, 2007), health care (Helper and Mazur, 2008), and construction (Gargione, 1999; Cariaga et al., 2007), confirming its transferability into different industries including tourism, for which QFD has been largely employed in particular for the hotel sector (Stuart and Stephen, 1996; Dube et al., 1999; Pawitra and Tan, 2003; Zheng and Pulli, 2005; Simons and Bouwman, 2006; An et al., 2008; Das and Mukherjee, 2008; Paryani et al., 2010; Chang and Chen, 2011; Crick and Spencer, 2011). Therefore, Chan and Wu (2002) argue due to the wide array of studies implementing the QFD method in various fields, the transferability of QFD has not yet reached its limits.

A number of studies have been conducted implementing QFD in the hotel and tourism industry. Stuart and Tax (1996) examined QFD for the strategic planning process of hotel activities in order to investigate whether problems within a hotel operation can be avoided before they occur. The study reveals that customer requirements can be directly related to individual steps in the service environment and can be met by incorporating suitable technological solutions. A similar study was conducted by Dube et al. (1999), investigating how QFD can enhance service transactions for a variety of businesses in the tourism industry. The study illustrates that service, as intangible product is very different from physical manufactured goods, and is dependent on personal contact and the customer's time for consuming the experience. However, Dube et al. (1999) argue that despite those differences, QFD can be applied to the service industry and benefit the customer experience by improving the service quality and design. A similar outcome was revealed in the study conducted by Pawitra and Tan (2003), which contribute to the understanding of customer satisfaction indicators in order to develop an innovative product around service delivery based on customer requirements. While QFD has been studied to some extend in the AR context as well, particularly for mobile learning methods (Baber et al., 2004) and for the

investigation of AR user interfaces in the immediate environment (Antoniac et al., 2002, Pulli and Antoniac, 2002, Pulli et al., 2003, Metso et al., 2009), the implementation of QFD in the urban heritage context for mobile AR tourism applications has not yet been examined and presents a knowledge gap.

2.8 User Requirements in the Mobile Computing Context

Whereas different fields slightly modified the basic QFD model to adjust it to their context, it is particularly significant for this research how QFD has been employed so far in the field of new technology development, especially in the mobile computing context. This area was chosen as being closest to the development of technology in the context of mobile AR applications due to the lack of literature in this particular field. The International Organisation for Standardisation (ISO) has defined quality in technology as the ability of a product or service to fulfil its intended functions, which is achieved through features and characteristics (Tan et al., 1998). However, it has been found that the prevention of errors is not enough in order to get a competitive advantage. According to Ordoobadi (2012), many industry practitioners agree that it is vital for a business to offer the newest type of technology in order to work efficiently and stay competitive in the market. Therefore, it is important to invest into the right technology out of the massive selection that is offered. Most US executives have come to the conclusion that the right implementation of new technology leads to higher productivity and competitive advantage. In order to support the decision-making, QFD, has been found to provide a supportive technique.

User requirements were identified from previous studies in the software and mobile computing context to test their validity for current mobile applications and identify newly emerging requirements. Since not all requirements are relevant for the purpose of this study, key themes were identified from the literature. A reoccurring theme in software as well as mobile computing was 'simplicity' and 'design of the user interface' (Buellingen and Woerter, 2004; Leem et al., 2004; Wu and Wang, 2005; Zheng and Pulli, 2005; Ngai and Gunasekaran, 2007; Pulli et al., 2007; Turner et al., 2007; Wang and Liao, 2007; Gafni, 2008; Dantas et al.,

2009; Karahasanović et al., 2009; Kenteris et al., 2009; Gebauer et al., 2010) to be clearly understandable with a prompt accessibility to required information. It was pointed out that information required 'sufficiency' for the purpose of the application and 'relevancy' for the user (Wang and Liao, 2007; Gafni, 2008; Kenteris et al., 2009; Delagi, 2010; Herskovic et al., 2011; Dinh et al., 2013). However, the difficulty with an increasing amount of information was seen to be the decreasing 'speed' of the application as well as reaction and loading times (Buellingen and Woerter, 2004; Pulli et al., 2007; Wang and Liao, 2007; Gafni, 2008; Kenteris et al., 2009; Delagi, 2010; Gebauer et al., 2010; Dinh et al., 2013). The 'size' of the application was suggested to be limited to facilitate the installation process. It was pointed out that 'safety' and 'security' issues were not to be ignored and 'privacy' should always be considered a priority (Buellingen and Woerter, 2004; Derek, 2004; Zheng and Pulli, 2005; Lee et al., 2007; Gafni, 2008; Dantas et al., 2009; Karahasanović et al., 2009; Delagi, 2010; Herskovic et al., 2011; Dinh et al., 2013). 'Access' to the application was another key requirement with regards to time, location, soft- and hardware. The application should be accessible at any time, anywhere and be designed to run on various platforms (Buellingen and Woerter, 2004; Durscha et al., 2004; Zheng and Pulli, 2005; Lee et al., 2007; Wang and Liao, 2007; Kenteris et al., 2009; Delagi, 2010; Gebauer et al., 2010; Herskovic et al., 2011; Dinh et al., 2013). Although 'social functions' were among the newer emerged requirements in the literature, it was obvious that social networks and reviews were gaining importance as more people exposed themselves to social networking platforms such as Facebook and Twitter (Zheng and Pulli, 2005; An et al., 2008; Karahasanović et al., 2009; Herskovic et al., 2011). Furthermore, a trend was seen towards 'personalised' interfaces and service as peoples' expectations of personalised marketing messages and services was increasing (Buellingen and Woerter, 2004; Durscha et al., 2004; Zheng and Pulli, 2005; Swallows et al., 2007; Wang and Liao, 2007; An et al., 2008; Gafni, 2008; Karahasanović et al., 2009; Kenteris et al., 2009; Herskovic et al., 2011). As people were in more time-pressure than ever before, another key theme was identified as 'efficient' and time-saving (Zheng and Pulli, 2005; Pulli et al., 2007; An et al., 2008; Delagi, 2010; Gebauer et al., 2010; Herskovic et al., 2011; Dinh et al., 2013). Delagi (2010) suggested mobile technology to be more seamless, but always on standby in order to provide an efficient user experience. Previous literature further

argued that mobile softwares would need to provide the user with enough convenience in order to attract utilisation. 'Ease of use' was a reoccuring key theme that would enable the user to utilise the mobile application without having to go through a learning process (Buellingen and Woerter, 2004; Wu and Wang, 2005; Lee et al., 2007; Pulli et al., 2007; Wang and Liao, 2007; Gafni, 2008; Dantas et al., 2009; Karahasanović et al., 2009; Kenteris et al., 2009; Gebauer et al., 2010; Herskovic et al., 2011). The challenge of 'battery capacity' was repeatedly argued to hold back high-end technological developments and was a key issue for many mobile applications. Kenteris et al. (2009) and Delagi (2010) pointed out that mobile applications consuming much of the device's processing power, such as AR features, would therefore require being power efficient. It was noted that current mobile devices were expected to be increasingly 'context-aware', particularly for augmenting the immediate environment (Dantas et al., 2009; Karahasanović et al., 2009; Delagi, 2010; Gebauer et al., 2010; Herskovic et al., 2011; Dinh et al., 2013). While the 'usefulness' and 'added value' of a mobile application is not considered a technical requirement, it was largely argued in the literature that the user needed to understand its value to be meaningful (Buellingen and Woerter, 2004; Leem et al., 2004; Wu and Wang, 2005; Lin and Wang, 2006; Turner et al., 2007; Wang and Liao, 2007; Dantas et al., 2009; Karahasanović et al., 2009; Dinh et al., 2013). Karahasanović et al., 2009 and Delagi (2010) on the other hand pointed out that content co-creation by peers was increasingly gaining importance in modern applications for entertainment and social functions. In addition, as the amount of mobile applications was rapidly increasing, it was argued that the 'price' of the application as well as in-app purchases should be aligned with its added value (Leem et al., 2004; Wu and Wang, 2005; Lin and Wang, 2006; Wang and Liao, 2007). Finally, it was regarded key that the mobile application was 'reliable' in its performance to ensure a positive user experience (Derek, 2004; Durscha et al., 2004; Wu and Wang, 2005; Lee et al., 2007; Wang and Liao, 2007; Dantas et al., 2009; Kenteris et al., 2009; Herskovic et al., 2011; Dinh et al., 2013). Table 2.2 shows the identified user requirements in the mobile computing context.

Table 2.2: User Requirements in the Mobile Computing Context

Requirement	Authors
Simplicity of user interface	Buellingen and Woerter, 2004; Leem et al., 2004; Wu and Wang, 2005; Zheng and Pulli, 2005; Ngai and Gunasekaran, 2007; Pulli et al., 2007; Turner et al., 2007; Wang and Liao, 2007; Gafni, 2008; Dantas et al., 2009; Karahasanović et al., 2009; Kenteris et al., 2009; Gebauer et al., 2010
Relevant and updated information on surrounding	Wang and Liao, 2007; Gafni, 2008; Kenteris et al., 2009; Delagi, 2010; Herskovic et al., 2011; Dinh et al., 2013
Speed, High performance processing	Buellingen and Woerter, 2004; Pulli et al., 2007; Wang and Liao, 2007; Gafni, 2008; Kenteris et al., 2009; Delagi, 2010; Gebauer et al., 2010; Dinh et al., 2013
Safety and security (Privacy)	Buellingen and Woerter, 2004; Derek, 2004; Zheng and Pulli, 2005; Lee et al., 2007; Gafni, 2008; Dantas et al., 2009; Karahasanović et al., 2009; Delagi, 2010; Herskovic et al., 2011; Dinh et al., 2013
Accessibility	Buellingen and Woerter, 2004; Durscha et al., 2004; Zheng and Pulli, 2005; Lee et al., 2007; Wang and Liao, 2007; Kenteris et al., 2009; Delagi, 2010; Gebauer et al., 2010; Herskovic et al., 2011; Dinh et al., 2013
Social functions	Zheng and Pulli, 2005; An et al., 2008; Karahasanović et al., 2009; Herskovic et al., 2011
Personalisation	Buellingen and Woerter, 2004; Durscha et al., 2004; Zheng and Pulli, 2005; Swallows et al., 2007; Wang and Liao, 2007; An et al., 2008; Gafni, 2008; Karahasanović et al., 2009; Kenteris et al., 2009; Herskovic et al., 2011
Efficient and time saving	Zheng and Pulli, 2005; Pulli et al., 2007; An et al., 2008; Delagi, 2010; Gebauer et al., 2010; Herskovic et al., 2011; Dinh et al., 2013
Ease of use	Buellingen and Woerter, 2004; Wu and Wang, 2005; Lee et al., 2007; Pulli et al., 2007; Wang and Liao, 2007; Gafni, 2008; Dantas et al., 2009; Karahasanović et al., 2009; Kenteris et al., 2009; Gebauer et al., 2010; Herskovic et al., 2011
Power efficiency	Kenteris et al., 2009; Delagi, 2010
User context awareness	Dantas et al., 2009; Karahasanović et al., 2009; Delagi, 2010; Gebauer et al., 2010; Herskovic et al., 2011; Dinh et al., 2013
Usefulness, Added value	Buellingen and Woerter, 2004; Leem et al., 2004; Wu and Wang, 2005; Lin and Wang, 2006; Turner et al., 2007; Wang

	and Liao, 2007; Dantas et al., 2009; Karahasanović et al., 2009; Dinh et al., 2013
Content co-creation	Karahasanović et al., 2009; Delagi, 2010
Entertainment	Karahasanović et al., 2009
Price of the application	Leem et al., 2004; Wu and Wang, 2005; Lin and Wang, 2006; Wang and Liao, 2007
In-app payment	Chou et al., 2004; Lin and Wang, 2006; Ondrus and Pigneur, 2006; Wang and Liao, 2007; Dantas et al., 2009;
Reliability of performance	Derek, 2004; Durscha et al., 2004; Wu and Wang, 2005; Lee et al., 2007; Wang and Liao, 2007; Dantas et al., 2009; Kenteris et al., 2009; Herskovic et al., 2011; Dinh et al., 2013

Source: author (2015)

While table 2.2 summaries the user requirements identified in the mobile computing context, it can be seen that the majority of requirements can be anticipated to be applicable for mobile AR applications in tourism. It was pointed out that 'relevant and updated information on surrounding', as well as 'user context awareness' are regarded essential in mobile computing. Particularly as mobile devices are becoming more sophisticated and functional, for instance using incorporated GPS sensors, such requirements are believed to make a crucial impact on mobile AR tourism applications. Furthermore, as tourists are considered to be the main user of the application, it can be expected that requirements such as 'accessibility' and 'efficient, time saving' are among critical factors that would impact on the tourists' decision to use the application. As tourists are believed to move between places, it is crucial to make mobile AR tourism applications accessible at any place and time to increase its usefulness. While other requirements such as 'usefulness, added value', 'reliability of performance', and 'ease of use' are considered significant, they are believed to be relevant in any mobile application and not treated with higher relevance in the tourism industry. On the other hand, requirements such as 'content co-creation', 'entertainment' and 'in-app payment' seem to be more specific to the individual application, and should be investigated further. Nonetheless, the critical review of customer requirements in the mobile computing context has provided a general overview of requirements that should be considered in any mobile application, since tourist requirements for mobile AR tourism applications in the urban heritage context

have not yet been investigated. They will serve as a guideline for the identification of tourist requirements through the primary research in this study.

2.9 Summary

This chapter reviewed the theoretical framework of the study by discussing early quality theories and the development of TQM and QFD. It was concluded that early philosophers of quality such as Juran, Ishikawa, Feigenbaum, Crosby and Deming influenced the TQM theory. By discussing TQM tools, including quality award systems and ISO 9000, 9001 standards, TQM and QFD have been selected as the theoretical guideline through the study to achieve the study objectives. It was shown that although quality systems have been implemented since the early 20th century, they need to be consistently monitored and adjusted to current economic as well as technological standards. QFD was identified as one of the quality tools in TQM that explicitly incorporates customer requirements in the product development phase and has therefore been implemented in many manufacturing industries for new product development. However, it was pointed out that although QFD provides valuable information and increases the chance of a successful customer-driven product development, it generally requires a large amount of time and is therefore argued to be unsuitable for industry purposes, as development and product adjustment is a time-limited procedure. The mentioned theories have been covered chronologically in order to facilitate the process leading to the QFD model and the development of the House of Quality (HOQ), the most common tool of QFD. Although QFD has originated in the manufacturing industry, critical review of the literature showed that it was previously successfully implemented in other industries, including the service sector. Therefore, this study will implement QFD in the tourism context for the development of mobile AR tourism applications in urban heritage tourism. The chapter was concluded with the identification of user requirements in the mobile computing context and determined that many of them could be applied to mobile AR tourism applications, and therefore were expected to be relevant for this study. Nonetheless, QFD has not yet been employed in the urban heritage tourism context and presents a knowledge gap.

Augmented Reality (AR) has been identified to represent a potential technology that is highly beneficial for the tourism industry due to its ability to portrait information in the immediate surrounding. As many destinations face the challenge of staying competitive in the global market, the investment in new technology is crucial, especially for urban heritage areas. Since heritage spaces are limited in the possibility to post signs and banners in the environment, AR provides a potential tool due to utilising a virtual overlay of information. After reviewing the literature of TQM and QFD, Augmented Reality (AR), specifically in the tourism industry and urban heritage tourism, will be investigated. This research aims to bridge the knowledge gap by providing a QFD model in the context of tourism to develop AR tourism applications in the urban heritage context. The following chapter will provide a literature review on AR, its application in the tourism industry as well as recent studies of AR in the urban heritage tourism context.

CHAPTER 3 – AUGMENTED REALITY

3.1 Introduction

Chapter 3 will introduce Augmented Reality (AR) and discuss its development, areas of utilisation as well as current implementation cases in the tourism industry. The aim of this chapter is to get an understanding of the technology, its potential benefits as well as current challenges that are potentially affecting the tourism industry. After reviewing various methods of utilising AR to date, the implementation of AR functions through mobile devices will be discussed, as this research aims to provide a model for the development of mobile AR applications. This chapter will further evaluate the implementation of AR in various industries where it was introduced for commercial use and provide the development from AR for industrial use to AR for public use. Finally, it provides a detailed discussion for its current employment in the tourism context with particular focus on urban heritage tourism.

3.2 Definition of Augmented Reality (AR)

As information technology has been increasingly implemented across many industries, the search and access of information has shown a shift from presentation to user interaction and from collective to individually shaped information search (Thomsen, 2002). One of the most promising areas of digital media that opened an additional area of interaction between users and applications is 'Augmented Reality' (AR), which has increasingly become an area of development in many industries since early 2000 (Nicas, 2016). Regarded as a revolutionary kind of media-user interaction, it quickly became attractive for many industries, including the gaming, education, health, retail, as well as the tourism industry.

As AR has been researched, many attempts have been made to give a proper definition (Bimber et al., 2005). However, while it is not a new technology, it is

still considered to be in its infant stage, and has not yet been fully developed, which has lead to a constant modification to define AR properly depending on the implementation method and area (Van Krevelen and Poelman, 2010). However, a universally accepted definition has been formulated by Stone et al. (2009), as a means to provide functionalities to supplement or enhance the real environment. Therefore, it should include the following specifications:

- Create a conjunction between virtual and the real environment
- Be able to utilise and interact with in real time
- Register and align virtual as well as real objects connected to each other

(Azuma, 2004)

A more recent definition has been formulated as the integration of digital information with live video on the user's environment in real time (Rouse, 2015). While the definition has become more specific according to technological advancements, the core has remained as an enhancement of the real environment by computer-generated content, which is up to date mostly supplemented with graphical content (Kalawsky et al., 2000). Azuma (2004) furthermore classified early AR devices into three subparts, which have remained relevant for current devices alike. Each system should include a scene generator, a display device and a tracking-sensing device in order to successfully harmonise with the real environment.

Although the concept of AR is closely related to Virtual Reality (VR), its main difference was defined by the interaction with virtual information and objects in a real-time setting (Höllerer and Feiner, 2004). The user can experience the real environment in an enhanced way mainly through a visual sense, but also through auditorial enrichments. In the development of 'Mixed Reality', which AR is a part of, many other terms have been given to this technological concept including 'ubiquitous computing', 'augmented reality', 'wearable computing', and 'tangible computing', which are all based on the perception of combining virtual information with the real-world environment (Bolter et al., 2006). Utilising such 'Mixed Reality' applications, it gave users a new way of understanding of interacting with the physical environment (Dourish, 2006). The 21st century is

regarded as one of communication and information exchange, requiring people to exchange information faster and more efficiently than ever before. With the help of mobile devices, it has enabled people to use technology for everyday life purposes, making it part of culture and lifestyle (Fritz et al., 2005).

Sutherland (1965) came up with the concept of the 'Ultimate Display', which should provide the user with additional relevant information for specific jobs. Other display enhancements have been studied for a variety of industries (Zhou et al., 2008). The Head-Up Display (HUD) for aircraft assembly and navigation purposes has been found to be one of the most dominating and earliest implementations of AR (Kalawsky et al., 2000), which enhances the real world with a graphical information overlay, such as navigation routes in the sky for orientation assistance. However, real world enhancements have been argued to not only be possible with visual supplements, but also using auditory enrichments to provide 3D sounds to the setting for the improvement of spatial awareness (Vincenzi et al., 2003). There is a need to continuously develop interaction equipment as peoples' expectations are constantly rising. Although AR was initially regarded and utilised for a number of restricted industries, it has been introduced and utilised in public especially for industries such as gaming and tourism (Fritz et al., 2005). By using AR, users are expected to process larger amounts of information in a shorter period of time in order to help in the decision making process (Stone et al., 2009). Therefore, Ahmad et al. (2005) concluded that AR systems should be designed to be light and mobile, enabling anyone to use it for everyday purposes, such as in private mobile devices. The information could be displayed on the device itself and provide the user with additional visual as well as auditory content based on the surrounding of the user. Google was believed to provide the first device of an AR capable wearable display for public use with their Project Glass concept. It was expected to be launched in 2014, but was withdrawn before the launch (Rivington, 2013). Although, it was argued that Glass does not yet provide AR overlays, it was considered to be the first form of wearable computing that had the potential of being widely adopted (Gorman, 2013). AR systems should be widely available so that it is usable indoors as well as outdoors in any set of environment without location based limitations. However, there are still challenges to overcome in order to reach that stage of development. Further

requirements and challenges will be discussed in section 3.5, investigating the current state of AR development.

Researchers have identified AR as a promising type of technology for public use, which connects the user's spatial dimension with information to enhance the overall user experience (Pang et al., 2006). Furthermore, users were thought to be able to share and exchange location based information, which makes it especially attractive for the tourism industry (Thomsen, 2002). Today's mobile applications are plentiful that many applications that enhance tourism products exist already, making tourism applications the 7th most downloaded type of mobile apps (Klubnikin, 2016). The flexibility to access required information anytime and anywhere opens up new possibilities for the users' immediate surrounding. Höllerer and Feiner (2004) expect the development of mobile AR to become accessible anywhere in the world without the restrictions of place and time, which would enable people to access desired information and integrate it in the real environment. Although AR has been increasingly studied since early 2000, the technology has yet to overcome challenges, as it has not yet been implemented seamlessly into current mobile applications. Nonetheless, it is continuously researched and enhanced, and academics expect it to be able to utilise for everyday purposes in the near future.

3.3 Augmented Reality (AR) vs. Virtual Reality (VR)

In the development of Mixed Reality, a second subclass has been identified as 'Virtual Reality' (VR), which is completely based on a virtual environment, and is not part of the real world in contrast to AR (Pang et al., 2006). Milgram and Kishino (1994) designed a 'Virtuality Continuum' model, which shows to what degree the virtual world interacts with the real world. The scale ranges from complete reality to complete virtuality, in which many forms of mixed reality are evident (Kalawsky et al., 2000). Based on this model, AR lies much closer to the real world, which refers to a higher level of implementation into the real world context (Chapman et al., 2009). It mixes computer-generated content with the real environment, and provides a reality-based enhancement (Carmigniani et al., 2011;

Rouse, 2015). According to Bolter et al. (2006), AR enhances the user's physical and social space, which is not given in a VR, where the user's world is completely replaced with a computerised environment.

The degree to define 'virtuality' and 'reality' is based on how much computer-based content is available in contrast to the real environment and how it interacts with the user's immediate surrounding (Milgram and Colquhoun Jr., 1999). The main focus of AR for applications should therefore be the harmonised provision of information to the user, which is related and properly implemented into the context of the real world (Kalawsky et al., 2000). Ideally, the user should get the feeling that virtual and real objects coexist in the same place. However, AR has long been at a stage that lacks the technological standard to further improve compared to possibilities in VR (Fritz et al., 2005). In contrast, creating a virtual environment aims to completely transfer the user into a different dimension. The idea is to bring the user to a completely computer-generated environment and give him the feeling as if it was real. This is achieved by closely resembling the virtual world to the real environment with the use of 3D content (Maad et al., 2007). Investigating the enhancement of virtual realities through multisensory augmentations, such as olfactory, auditory, and even mechano-receptive, it was found that the challenges of VR could potentially be overcome sooner compared to barriers that restrict the seamless interaction with AR (Van Krevelen and Poelman, 2010). The simulation in VR reacts to the user's movements and actions, giving the user the feeling of being there (Thomsen, 2002). However, as there is no clear relationship between the user and the real world in a VR setting, the popularity of AR increased due to the potential use cases of AR technology (Fritz, et al., 2005). AR has proven to provide more opportunities, as the user is not limited to the virtual environment, but can freely move in the real world. Being able to view multiple virtual windows at the same time, it would provide freedom to the user to organise and put preferences on various kinds of information simultaneously. Another possibility of utilising AR was argued in the option to manually customise required information to one's needs through context-awareness, enhancing the environment with personalised information (Oh and Woo, 2009). Such customisations could include the presentation of information or the control of virtual windows. Another major benefit that was identified in early

studies is the ability to view virtual information in a 3D setting without being limited on a screen (Billinghurst et al., 2005). This option enhances the user's spatial awareness without having to utilise additional technology to support 3D vision. However, visual enhancement is not only limited to the presentation of 3D content, but was further argued to potentially enhance the user's sight by providing a view, which would be invisible or blocked in the real environment (Avery et al., 2009), such as looking past buildings and obstacles. Another possibility, which is already mostly utilised in current aircrafts and is being implemented in the automobile industry, is the display enhancement with additional information, such as flight level, temperature, speed and navigation (Regenbrecht et al., 2005). Overall, AR does not imply to be an improvement of VR, but is rather considered to be a different field of study category under the umbrella of Mixed Reality (Pan et al., 2006).

3.4 Development of AR and Current Stage

Even though the term 'Augmented Reality' was first defined in 1990 by Boeing researcher Tom Caudell (Cassella, 2009), the first 3D display enhancing the real environment was designed by Sutherland (1968), as the first head-worn display enhancing the environment with graphical information. Hereafter, many studies in the mobile and commercial field were conducted in order to enhance the interaction of computer-generated graphical information in the real environment (Azuma et al., 2001). By 1970, tracking devices were implemented into the AR content, which provided the foundation for the VR concept. Although the US Air Force was already conducting research on heads-up displays for fighter jets (Furness, 1986), Boeing's studies of display overlays provided the first definition of AR. The idea of AR, which originated from the study by Caudell and Mizell (1992) to support aircraft assembly for construction workers, was soon considered to have the potential for a much wider area (Azuma, 2004). Nonetheless, AR systems could not be implemented into modern technology until the mid-1990s, when mobile devices became powerful enough to serve as AR platforms.

Up to date, there have been many studies conducted with regards to AR implementation in a number of fields. However, most studies were concerned with technological issues and implementation challenges. Although there has been prior research regarding the impact of AR on performance, such as testing the user-experience based on AR enhancements, it was focused mainly on the visual improvements and did not consider multisensory types of AR enhancement (Swan and Gabbard, 2005). Stone et al. (2009) stated that AR interfaces should be able to augment more than just graphical overlays, and use more enhancements including visual, auditory and touch senses. They concluded that not only visual enhancements via Head-Mounted Displays could enhance users' performance, but also other modalities, such as auditory to improve accuracy, and decrease information processing time. While studies in AR continue to increase, AR in the industry has accelerated through investments of major businesses such as Microsoft Hololens and Google Glass in recent years, as well as the increase of tech start-ups expanding the technology to create new markets and frontiers (Nield, 2015). According to Sullivan (2015), a total of USD 3.15 billion has been raised by such start-ups in equity financing just within a year. The trend of AR and VR has triggered many big players in the industry to venture into new areas to make it accessible for the public (Sullivan, 2015). Similarly, the film industry has tapped into the market with Michael Bay, the producer of major motion pictures such as Transformers, as well as other producers experimenting with AR comics to be released in the near future (Kamen, 2015).

3.5 Challenges and Requirements of AR

There have been many challenges and requirements when using AR technology that need to be overcome (Carmigniani et al., 2011). While early studies in AR have focused mainly on the interaction between the real and virtual environment, McGrurity and Tuceryan (1999) state that most difficulties refer back to registration errors that originate from a media-user interaction. Yovcheva et al. (2012) further stated that visual issues still existed that would simply overload the display with information and be counter-productive as the view becomes unclear. They suggested the user to be able to display only one content at a time in order to

avoid this problem seen in applications, such as Junaio, Augmented Reality UK and Localscope. Julier et al. (2002) on the other hand proposed a distance-based solution to this problem, which would only present information in the immediate surrounding, however, this conflicts with content that is not distance-related. Another challenge was identified in the perception and user acceptance (Olsson and Salo, 2011). As AR is still considered an underutilised technology, it has not yet been successfully employed by many businesses with limited use in public. Therefore, Maad et al. (2007) argued that AR needed to be easily accessible as well as controllable in order to benefit the consumer and accelerate adoption. However, one of the challenges was acknowledged that various people interpret, access and process information differently, and therefore required a system that is able to adjust to individual preferences (Yeh and Wickens, 2000). Additionally, Höllerer and Feiner (2004) highlighted registration and tracking difficulties while screening information in real-time that is able to immediately adjust to the user's movement. This issue has remained a challenge despite recent technological advancements (Nicas, 2016). As the world moves towards mobile information access, designing devices for convenience with an increased power source for AR functions are only some of the challenges that need to be overcome. Manufacturers have been constantly working to develop miniature displays that are richer in technology (Carmigniani et al., 2011). However, the challenge with AR devices remained in using higher processing power to enhance the user experience (Nicas, 2016). To utilise AR applications in outdoor environments, additional challenges were identified, such as different lighting and temperature conditions through direct sunlight, night, snow, and rainfall (Höllerer and Feiner, 2004). However, the correct registration of the user's immediate environment remained one of the most significant issues (Liarokapis et al., 2006). Nicas (2016) argued that this persisted to be a challenge, as current AR devices were still not sensible enough in their registration process to logically overlay computer-generated content. As AR systems need to interact accurately with the user's immediate surrounding, it is necessary that the environment is able to create a tracking surface to enable data to be accessed and implemented into it. However, this challenge needs to be overcome first in order to commercialise AR systems and spread its use. This issue was attempted to be overcome by methods, such as saving a picture of the environmental setting in the device, which it could interact with, or by creating

visual markers to map the environment (Höllerer and Feiner, 2004). Nonetheless, tracking in the unprepared environment is still being researched. Furthermore, Höllerer and Feiner (2004) stated that access to wireless networks was needed especially for mobile use in order to access information while being on the move. While many urban destinations including Dublin are offering free Wi-Fi networks, it needs to be stable enough to be used for AR applications. The device then should be able to properly store large amounts of data or have immediate access in order to interact with the immediate surrounding. An alternative method was identified using cloud computing, which enables to store large data sizes in virtual space to be accessible anywhere with an Internet connection (Luo, 2009). Although major challenges are expected be overcome in the near future, AR technology still needs to be stabilised and designed purposefully before being implemented and adapted for everyday life purposes (Yu et al., 2010). Nonetheless, investors remain positive regarding the impact of AR, which could be seen in 2015 with a total number of 114 investments creating a sum of USD 1.3 billion (Nicas, 2016).

3.6 Benefits of AR

It has been found that AR provides many benefits for various industries due to its mixed environment or computer enhancement of real world setting (Reinhart and Patron, 2003; Regenbrecht et al., 2005; Shin and Dunston, 2008). While millions of users will be able to experience VR in the near future, Nicas (2016) argued that AR requires more time to overcome current challenges. However, AR benefits are expected to yield higher returns compared to VR due to the nature of interacting with the real environment. While a lot of hype has spread around the consumer market in recent years, Rossi (2016) believes that AR will impact mainly on enterprises in the coming years, particularly as wearable technology will provide more possibilities.

3.6.1 Economic Benefits

While AR has become an increasingly discussed topic in recent technological advancements, excitement has particularly increased with major companies in the digital market, such as Google, Facebook and Microsoft making big investments in this area. Although it is surprising how little AR has been used so far to generate revenue (News 3.0, 2013), Facebook has recently purchased Oculus for USD 2 billion followed by Google's USD 542 million investment in Magic Leap and Microsoft's HoloLens (Merel, 2015). Although the numbers are still not sufficient to be analysed meaningfully, AR and VR show high potential in many areas and is regarded to create significant economic as well as non-economic benefits for businesses and stakeholders in various industry sectors. While AR is still seen by many businesses as gimmick and has been used for promotional purposes only, Digi-Capital forecasts the revenues generated from AR/VR technology to reach USD 150 billion by 2020, with AR generating around USD 120 billion and VR the remaining USD 30 billion (Digi-Capital, 2015). The division is not surprising considering that VR was originally developed for the 3D and gaming market as a 'sit-down' experience due to the safety issues arising while moving with a fully closed headset. AR on the other hand is expected to ride the wave of the current smartphone and mobile device market, which has an enormous market range and therefore provides significantly more potential use cases for implementation. It is believed that AR will not only serve to grab peoples' attention in the future, but as a mainstream technological tool that will alter the way people interact with technology and their surrounding (Business Wire, 2013). Clark (2015) forecasts a similar trend suggesting that the AR/VR hardware market will reach USD 4 billion by 2018. Ahonen (2012) furthermore predicted users to adopt AR naturally with the increasing market penetration of smartphones and expects AR users to exceed 1 billion by 2020. CCS Insight (2015) released a report stating that 2.5 million devices will be sold this year that are capable of running AR applications. The number is expected to increase to 24 million devices that are AR/VR ready being sold by 2018, which would make AR and VR a mainstream technology. While early forecasts were argued to be too optimistic, Clark (2015) claims that with the involvement of major companies such as Google and Samsung, AR and VR technology would be at a tipping point to be accepted and used by the public. Currently, developers spend significant parts of their budgets on AR technology. Ingram (2013) argues that about USD 670 million is currently spent on the

development and research of AR and is expected to increase to USD 2.5 billion within the next five years. Investments in AR are increasing in many industry sectors, as more people see the potential that this technology has to offer. With a connection to a cloud based database it could potentially be able to grant access to information immediately and anywhere in the world. While AR has mainly been used for promotional activities to enhance brand image and social capital, businesses that have implemented AR are now seeking to further develop the technology and encourage customers to a purchase decision targeting economic benefits (News 3.0, 2013). Although Google Glass was not successfully launched, businesses have realised the potential benefits that AR can provide. In the meantime, Google is heavily investing into its own VR headset, Google Cardboard, by partnering with Magic Leap to create AR and VR experiences (Conditt, 2016). While Google is putting more resources into researching and developing AR and VR systems, it has recently announced the collaboration with Lenovo to create an AR technology called Project Tango, which enables developers to scan the immediate surrounding and overlay 3D objects to create applications, such as AR games (Takahashi, 2016). Therefore, Clark (2015) argues that those who will embrace AR in the next two years will gain a major competitive advantage.

3.6.2 Socio-cultural Benefits

While the potential economic impacts of AR start to be evident, the opinion of non-economic impacts varies. In general, as AR applications enhance the real environment they are believed to provide the user with more information and enhance the life and experience of people (Oldershaw, 2012). As the augmented overlay communicates visually as well as auditory with the real environment, it gives the user a chance to interact with or process any kind of given information immediately (Pan et al., 2006). By interacting with AR systems, the user is expected to be able to focus on priorities, while not being distracted by other factors in the immediate environment. Such applications come particularly handy for industries, which require people to process a lot of information while being able to freely utilise their hands for other operations (Tang et al., 2003). Previous

research in the manufacturing and assembly industry has found that people using AR applications were less likely to do errors during operation and could better recall information that needed to be processed (Tang et al., 2003). Vincenzi et al. (2003) supported this point arguing that the use of AR platforms could be taught to users, as it relies on cognitive psychology, and would boost productivity and efficiency once properly implemented. Henceforth, it would require less effort to complete a given task, as the application would automatically provide any necessary information. Furthermore, the frequency of switching the user's attention are greatly reduced, as all required information could be screened as an overlay to the user's convenience. Milham et al. (2001) argued that the environment of AR is already embedded by the real world and did not require to be separately designed. This implies that such technology could be easily implemented into society for everyone to utilise. Additionally, by providing information according to the physical world, AR could improve users' spatial cognition, especially for new and complex environments, which closely relate to navigation technology (Wang and Dunston, 2004). Applications in this regard have been developed and studied in AR games, such as 'String' that uses AR to put the gamer in a real life setting intending to enhance the gaming experience (String Labs Ltd, 2012). An application in tourism includes Wikitude, which overlays AR information into the tourist's immediate surrounding, and provides navigation assistance to aid tourists's way finding (Wikitude, 2012). Such applications are expected to continue being developed and improved. A specific example of AR impact in society was outlined by Ioannidis et al. (2014) arguing that museums today face the challenge of competing against other entertainment industries, which has a financial as well as an educational and cultural impact on society. In order to make stories in museums more attractive, an EU-funded project has been tested in the Acropolis museum in Athens, Greece, which involves the visitor in an interactive story by using AR on tablet devices (Ioannidis et al., 2014). Through employment of AR devices it aims to bring museum visits back to life by educating visitors interactively. Nessi (2014) on the other hand believes that AR has already started to make an impact on the way people see their surrounding. Since it has been introduced in various industries, including gaming, education, medicine and marketing, it is believed that AR will mainly provide instant information on the things people see and interact with on a daily basis (Nessi,

2014). As technology advances, Havens (2013) further argues that the use of AR with wearable computing will change the way humans behave. With the help of wearable computing, both hands would be available to complete tasks while checking E-Mails, or other forms of interacting with the technology. Furthermore, using AR to access information instantly would enable users to personalise information according to their preference. Wang and Dunston (2004) argued that most of the time spent on operation was typically used for processing given information and understanding a task, rather than utilising the time for the actual job itself. Therefore, they stated that the use of AR would benefit task performance, as it provides the user with necessary information, improving the process which could ultimately result in increased productivity. While Havens (2013) highlights that information accessibility has been important for many years particularly after the development of the Internet, the effective processing of information has been limited. Using AR would therefore assist in the processing of existing information to screen only what is relevant and of interest to the user.

While AR is believed to provide many benefits, others fear the security impact that AR applications as well as AR enabled hardware will cause (Gorgone, 2013). Particularly personalised information and the invasion of others' personal space are issues that are concerning and developers need to address before releasing devices, such as the Google Glass wearable hardware (Pomfret, 2012). Google's Glass project is based on capturing and sharing the world through someone else's eyes (Tab Worldmedia, 2012), which will be pushed by the interest for social media and social acceptance of AR technology. According to Gorgone (2013), smartphones were one of the first devices to trigger concerns for privacy which has become an issue for coming technological developments.

3.7 AR Systems

As the development and implementation of AR systems became more feasible, researchers have attempted to develop practical solutions according to the context of implementation (Haller et al., 2007). With respect to current technological developments, AR systems were divided into 'wearable AR' and 'mobile AR'. It

was found that both systems are practical in their own way and would be utilised for different settings (Tang et al., 2003). However, as wearable computing has not yet been widely implemented into the consumer market (Rossi, 2016), mobile AR will be the focus of this study.

3.7.1 Wearable AR

In the development of AR and VR, the use of wearable computing as the next phase of AR devices has been increasingly discussed in industry and academia. According to the study investigating pilot reactions by Wang and Dunston (2004), it was found that head-mounted displays (HMDs) reduced the necessity of reorientation and lead to shorter task completion times. Therefore, it was found that more simple tasks could be accomplished without facing great challenges. However, Yeh and Wickens (2000) stated that due to the overlapping view of information in direct eye sight, it could also disturb from the real environment. This criticism was also highlighted by Chapman et al. (2009), arguing that head-mounted displays are not ready to be effectively utilised. Chapman et al. (2009) envisioned wearable displays that could be used for everyday life in form of a pair of glasses with a stable display to match any outdoor condition. By investigating early developments of HMD, two types were identified, 'video-see-through' and 'optical-see-through' displays (Bonsor, 2001). Video-see-through displays completely block out the user's external sight and therefore, he is exposed to video cameras attached to the goggles, which screens the environment in real-time. Being investigated over time, these types of displays became known as VR headsets, such as Facebook's Oculus Rift, and Samsung Gear VR headset, also powered by Oculus Rift (Lamkin, 2016). Optical-see-through displays on the other hand are embedded with reflective mirrors, which enable the user to see the real world directly. However, as augmented images could not be overlayed properly onto the real-world setting (Chapman et al., 2009), Microsoft's Hololens provided a promising alternative of a hybrid method between VR and AR (Lamkin, 2016). The past hype of Google's project glass is the most imminent example of HMDs entering the consumer market apart from early developments to implement AR into contact lenses (Rivington, 2013). However, the first attempt to bring Google

Glass into the mass market has proven to be unsuccessful, as consumers were not able to see the intended benefit and use cases of the wearable device (Altman, 2015). Furthermore, Google was facing highly debated privacy disputes even before the launch of the product. Nonetheless, researchers are investigating whether wearable glasses could overcome privacy concerns despite its criticism by encrypting messages and content only visible to the eye of the recipient (Andrabi et al., 2015). While having a wearable device that could operate through voice command or in form of a smart watch, such as Apple's iWatch would have been successful in the past, it was argued that today's consumers expect more than just a slick device. Altman (2015) therefore claims that it is crucial for consumers to understand which problem the new device will be able to solve and how it can provide a clear benefit to their life. Reynolds (2015) supports this view and further argues that a clear marketing message is required while making the new product easily accessible to the market. Although it was criticised that Google's glass did not yet have the capabilities of providing efficient AR overlays (Gorman, 2013), it was considered the first step of moving from smartphone technology and hand-held display systems to wearable computing apart from a number of smart watches that were launched in 2013 by Pebble, Samsung and Sony (Plafke, 2013). Google recently announced a new direction on wearables by completely neglecting a device, but rather incorporating smart technology in familiar materials such as fabric and furniture including gesture recognition, which allows the user to activate certain objects with a simple motion (Mittica, 2015). Furthermore, it can be seen that wearable technology is becoming more than simply a gimmick, as the Pentagon recently announced to team up with Apple and Boeing to develop wearable technology for federal defence systems (Reuters, 2015).

The wearable computing market is still in its infant phase, and although promising devices are slowly emerging, it is arguable how long it will take until consumers will accept the technology and understand its benefits (Curtis, 2015; Haque, 2015). Tim Sweeny, developer of the Unreal game engine claimed that AR would replace the screen in the near future, as a mobile solution that can be overlaid in any environment (Orland, 2015). While VR seems to be the next big thing for many, Sweeny argued that AR would eventually surpass VR, as it provides far less limitations in terms of wearability, space and use cases (Orland, 2015).

Nonetheless, this study will investigate the development of mobile AR tourism applications for hand-held mobile devices, as wearable computing has not yet reached the potential to be used by a mass audience and therefore is not believed to be feasible at the time of this study.

3.7.2 Mobile AR

Using mobile AR on the other hand, enables the user to detect and focus on a target, which can be involved into the task, providing more freedom in involving the environment (Wagner and Schmalstieg, 2003). However, Yeh and Wickens (2000) argued that by involving a wider area, it could result into a decrease of productiveness, as the user is directed to a specific area. Furthermore, Wang and Dunston (2004) stated that hand-held mobile displays, such as smartphones, could result to be more inefficient due to the time loss to constantly shift the user's attention to the display and outside environment. Nonetheless, to date, hand-held displays are considered to be the most suitable device, as hand-held devices have already been developed sufficiently in terms of access and everyday use (Wagner and Schmalstieg, 2003). GPS systems and electronic compasses are furthermore already in most of mobile devices today. Therefore, just as smartphones have become an increasing part of everyday life, it is anticipated that more AR applications will be used in the near future.

3.7.2.1 Mobile Marker-based AR

Although mobile AR is still in an early stage of development, marker-based AR has been largely discussed as one of the most stable forms of AR systems (Wagner et al., 2005). Early marker-based sysyems were typically built on a 2-dimensional QR code (Quick Response Code), which would provide the user with additional information mostly in form of a website link by simply scanning it (Walsh, 2009). Such codes have become internationally recognised and standardised, which have supported the public awareness and popularity of QR codes globally (Liu et al., 2008). Being first developed in the car manufacturing industry in Japan to support

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the building process, it has quickly become popular in various other industries such as in tourism. It has been increasingly used for the promotion of destinations as well as private businesses, such as restaurants and pubs (Canadi, et al., 2010). In the Pitney Bowes Report (2012), people from Europe as well as the U.S. were interviewed regarding their awareness and use of QR codes, out of which 15% of the people were aware and already using QR-codes on a regular basis. This trend was recognised to increase with more demand by smartphones users in the United States (Pitney Bowes Report, 2012). Schadler and McCarthy (2012) argued that by 2016, the number of smartphone users would exceed one billion globally, which would significantly contribute to the use of new applications, such as QR codes and other AR applications. Placing the QR code anywhere in form of posters, or even into buildings, it serves as a bridge to close the gap between the physical and digital space being instantly connected to digital information (Pitney Bowes Report, 2012). However, recent developments have moved away from relying on QR codes as triggers for marker-based AR experiences. Instead, alternative recognising softwares are used to overlay computer-generated content onto the real environment. Limitless Computing Inc. announced the development of a cloud-based solution called 'SightSpace Pro', which is able to project designed 3D models in form of real-life buildings on the real environment (Graham, 2016). However, the fashion industry has made an alternative approach to marker-based AR through facial recognition softwares in which the user's facial features are tracked by the insight camera of the mobile device and make-up products can be directly augmented on the user's face on the camera (Jaekel, 2016).

3.7.2.2 Mobile GPS-based AR

The second system of AR has evolved in GPS-based AR, which works under the criterion that the mobile device includes a GPS function (Reitmayr and Schmalstieg, 2003). However, Walsh (2011) argued that this type of AR is not suited for indoor environments due to the limited GPS range, as opposed to its promising potential in outdoor environments, making it particularly interesting for tourism purposes. Nonetheless, it needs to be acknowledged that VR and marker-based AR have been developed and improved steadily up to date, whereas GPS-

based AR has been found to pose a higher challenge to overcome (Rohs, 2007). Due to its complexity, the impact of mobile GPS-based AR in the public space has been limited as Marimon, et al. (2010) pointed out. One of the biggest challenges was identified as the inaccuracy of GPS systems in mobile devices, being able to pinpoint locations only up to 20 metres accuracy (Reitmayr and Drummond, 2006). However, due to the promising opportunities that would benefit from accurate mobile GPS systems, alternative approaches have been sought to increase its accuracy with minimal increase of the cost (Brachmann, 2016). In the past it was considered extremely difficult to use mobile GPS systems for AR applications that require the exact coordinates to project the overlay accurately and provide enhanced experiences (Flintham et al., 2003). As a result, graphical enhancements were not aligned properly, making overlays float in mid-air rather than being fixed to a specific object, which has been challenging particularly for mobile AR games. Beer (2011) argued that one way of compromising was the use of multiple elements, such as a combination of GPS, magnetic compass and acceleration sensor. Alternative solutions have been studied, such as the use of ground-based sensors that would improve the GPS accuracy significantly. However, the cost of implementing such systems has slowed down development (Brachmann, 2016). In the meantime, alternative sensor technologies and their usability have been studied, such as iBeacons and the 'Aware' device which uses Bluetooth sensors in order to send information through smartphones to the user (Naziri, 2015). While it does not use GPS and therefore relies on a bluetooth beacon, it suggests a workable alternative for many use cases, such as shopping malls or for locating objects. Nextome has recently patented a similar bluetooth technology that allows the mapping of indoor environments which are difficult to reach through GPS signals, using bluetooth transmitters (Mastrolonardo, 2016). GPS-based AR's biggest market to date was identified as the automotive industry, where cars are equipped with windshields that are able to overlay navigation information based on GPS coordinates directly on the windshield (Ponomarev, 2015). However, Limer (2015) suggested that an improvement in the mobile antenna could increase GPS accuracy by a degree, which would allow the meaningful implementation of overlays. Henrysson and Ollila (2004) similarly argued that GPS-based AR was expected to prosper once the main difficulties were overcome (Henrysson and Ollila, 2004). Such technologies are expected to provide a platform to develop

tourist AR applications using mobile GPS functions and enhance the overall tourist experience (Burigat and Chittaro, 2005).

3.8 AR Implemented Industries

AR has been discussed to have the potential to be successfully implemented in many industries, which convinced academics to increasingly investigate this area over the last decade (Bimber et al., 2005). While studies in AR originated from industrial purposes, such as manufacturing and construction, today's use cases of AR for the consumer market are increasing rapidly. This section will investigate early use cases of AR in the industry, followed by the current employment of AR for public use.

One of the earliest implementations of AR was the assembly industry for Boeing by utilising AR technology to support the building procedure of aircrafts especially for cable arrangements (Barfield et al., 2001). However, it has also been used for a similar purpose in the car manufacturing industry (Reiners et al., 1998). Ruffner and Fulbrook (2007) further discussed the implementation in watchtower controls for the airplane industry, where via near-eye displays, additional information could be screened for better navigating the approaching aircrafts at night. It was found that most companies implemented this technology to create prototypes particularly for modern machinery assembly, as in the research project 'AVIRKA', but also the WebShaman Digiloop system by Halttunen and Tuikka (2000), the Fata Morgana system by Klinker et al. (2002), and Spacedesign system by Fiorentino et al. (2002). Another area to implement AR technology is for military purposes (Wagner and Schmalstieg, 2003). As one could augment the real environment with visual and auditory enhancements, it was seen highly valuable for training purposes, being able to reconstruct real situations without having to educate people in training rooms using only verbal examples (Hughes et al., 2005). 'Battlefield Augmented Reality System' (BARS) is just one of many utilised military systems that have developed since AR was first introduced to increase the effectiveness of training methods (Juhnke et al., 2010). According to Hamilton and Holmquist (2005), the range of impact was getting wider with the development of technology

and modern weaponry, which made it harder to train people in real environments. Therefore, Hamilton and Holmquist (2005) claimed that with the use of AR systems, it would be possible to simulate the destructive power and reconstruct real life situations, giving training sessions a much higher purpose. Additionally, Stone et al. (2008) discussed the utilisation of AR technology in the military for landmine detection and disposal, as their study proved that locating and disposing of such hazards could be highly improved through AR. Maad et al. (2007) on the other hand presented a CYBERII application in the finance industry, where the market and dealer are 3D animated, giving traders an enhanced setting to operate in. AR has also been studied extensively in the medical industry. Carson (2015) discussed the use in medical education, utilising AR to simulate body organs and body anatomy for surgery purposes. Another possibility in the surgical area is the assistance of the doctor with additional information on the patient, such as for the support of daily routines, being able to see information on the patients' status while doing regular check-ups in the hospital. The public use of AR was largely initiated by the gaming industry as one of the few areas where AR has already been utilised and publicised to a certain extend (Geiger et al., 2007; Bernardes et al., 2008). GPS-based games, such as 'Foursquare' (Ebling and Cáceres, 2010) and early AR games such as 'ARQuake' are just two of the increasing number of AR games on the market (Piekarski and Thomas, 2002). Another AR game is 'Frequency 1550', which was developed in 2005, and enhances the physical environment to create a different perception of the surrounding while letting players interact with and become part of the game (e Silva and Delacruz, 2006). This type was referred to as 'Hybrid Reality Gaming' (HRG), and was defined as a mobile-based technology, enabling multiplayer options in different surroundings and exchange of information among players while being played outdoors (e Silva and Delacruz, 2006). With regards to recent advances in the gaming industry, the recently launched mobile AR game 'Pokémon Go', designed by Niantic allows the user to collect Pokémons in the real surrounding using their mobile device's GPS and camera to pinpoint the user's location and track Pokémon. Furthermore, AR allows the user to see and project them into the real environment, by using the camera on the mobile device (David, 2016). AR has already made an impact on the way people shop. Cases, such as 'TryLive' allow the user to try on virtual glasses and test the look online through a website without having to physically be in a shop

(Total Immersion, 2013). Another example includes the 3D modelling of furniture in the own apartment through AR overlay to get a first glimpse of how a particular piece of furniture would fit into the room (Black, 2013). Klubnikin (2015) argued that AR was able to impact on the shopping experience in various ways. From virtual shops only accessible on AR applications, such as 'Yihaodian', to characters moving across the screen to navigate visitors through venues, mobile AR applications are expected to make an impact on the customer experience. Lego X introduced a marketing campaign back in 2010 in order to show the potential buyer what the Lego model would look like once completed, using an AR monitor to point at the Lego box (Klubnikin, 2015). On the other hand, Coxworth (2015) discussed a wearable AR device for cycling. Due to safety concerns for using smartphones while riding a bicycle, 'Insenth', a Chinese tech manufacturer has developed 'Senth IN1', a set of wearable AR glasses that enables the wearer to access the music library, take photos and navigate without using their hands or losing sight of the road (Coxworth, 2015).

AR will provide social benefits and alter habits of how people interact with and experience customer service. While information can be tailored to specific needs and preferences, the invasion of privacy and access of personal data was argued to be a challenge to overcome (Hyman, 2013). Another issue was noted in the amount of virtual spam and unauthorised advertising that AR could encourage for open source networks (Zacharias, 2010). However, as more people are exposed to AR and use the technology, the enhanced experience and benefits are expected to surmount such issues. This is particularly attractive for the tourism industry, as it can be used outdoors in any kind of setting once further developed.

3.9 AR in Tourism

After AR was first introduced in tourism in the late 1990s, it has been increasingly investigated in the tourism industry, as it was able to enhance the immediate surrounding in indoor as well as outdoor environments. However, while many studies have been conducted with regards to user interfaces and the overlay of information, AR has limited successful implementation cases in the tourism

industry. Although today's tourists are better informed than ever before, Pang et al. (2006) claimed that tourists in general had little knowledge of their immediate surrounding. The first AR prototype for tourism purposes was found by Feiner et al. (1997), who invented a graphical tour guide for Columbia university campus visitors. Works by Feiner et al. (1997), Suomela et al. (1992) and Thomas et al. (1998) were among the first to examine the benefits of AR in the tourism industry. Pang et al. (2006) stated that AR interfaces were widely considered for navigation and information access, which was first introduced by Rekimoto (1997) as the 'Navicam', and has triggered many studies ever since. Regarding the implementation of AR in the tourism industry, a few notable examples include the 'GUIDE' project by Davies et al. (2005), which provides tourists in Lancaster with location-based information, and the 'Nexus' project by Rothermel and Leonhardi (2001), which generates a world model to provide location based data. Such location-based systems, which can be used to access information in the immediate surrounding, would greatly benefit the tourism industry (Hariharan et al., 2005). The use of AR devices has long been argued to have the potential to create the next generation of computerised tourist guide (Pang et al., 2006). Höllerer and Feiner (2004) described a user-interface, which should not only be able to pinpoint the user's location, but also provide background information of the area that might be of interest. Such applications aimed to not only offer information like a travel book, but to present it in an overlaid manner in the immediate environment which the user would be able to interact with (Höllerer and Feiner, 2004). However, those applications are still being modified in order to improve their efficiency to make them functional. Pang et al. (2006) provided an example for an urban tourist guide application, which was based on the city of Vienna and is able to guide the user to certain locations via GPS navigation. It was designed to be multi-user friendly, allowing various users to share information, while supporting functions for social networking. Fritz et al. (2005) further argued that the tourism industry required constant investigation into new technology, preferably for mobile use, in order to continue attracting visitors, which is challenging for many tourism destinations globally. As of 2013, the majority of smartphones provide navigation on GPS-map based systems, which is able to pinpoint the user's exact location. Furthermore, Yovcheva et al. (2012) stated that mobile phones are able to access up to date

content, are flexibly to deliver text, image and video data and can provide additional information on their map-based systems.

With the increasing use of the Internet for tourism purposes, such as conducting research on a destination before travelling and making holiday arrangements, the tourism product has become more transparent, empowering tourists to access information on the destination prior to the actual trip. However, the possibility to interact with the destination using technology has been limited. With the introduction of mobile AR applications, Lu and Smith (2008) argued that tourists were able to interact with a tourism product prior to the trip as well as on site. Recently, more studies are being conducted to test tourists' reaction of mobile AR systems as well as wearable computing in the tourism context (Chung et al., 2015; Jung et al., 2015; Leue et al., 2015). While AR browsers in tourism have been investigated to some extend (Yovcheva et al., 2014), current studies focus on the enhancement of the tourist experience rather than usability issues as in early studies of AR in tourism. Other applications of AR have been tested in museums to serve as virtual tourist guide and enhance the way visitors see, experience and interact with exhibitions, enabling the visitor to interpret art pieces in various ways (Damala et al., 2008). Jung and Leue (2015) conducted a study of using Google Glass at Manchester Art Gallery to explore the reactions as well as potential use cases of wearable technology for indoor tourism products. In their study it was revealed that visitors in general had a good response and positive perception towards using wearable technology to access information. However, it was pointed out that Google Glass was not yet ready to be utilised flawlessly and therefore required further development in order to enhance the visitor experience. A similar outcome was evident in other studies suggesting that AR systems still needed improvement before it could be utilised meaningfully in the tourism environment (Lee et al., 2015; tom Dieck and Jung, 2015). Additionally, AR has long been praised for its potential to support educational purposes due to its nature of providing a dynamic experience and hands-on interaction (Horn, 2006). It was found that using technologies such as Google Glass in museums had a positive effect on the visitor's learning outcomes (Leue et al., 2015). Previous findings showed similar outcomes in the wearable market, suggesting wearable technologies to be ideal for assisting human learning (Brown, 2015). Especially

for visitor attractions that are linked to a heritage or religious site, regulations for maintaining the site often restrict the use of information boards and signs, which can alter or affect the heritage site negatively. Therefore, AR has been seen as potential solution to provide information to tourists without affecting the environment by utilising the virtual space. Through mobile applications, such as 'Paris, Then and Now' tourists are able to travel back in time and experience Paris 100 years ago for 2000 different areas (Hutchings, 2013). Such methods are increasingly popular due to the intangible product element in the tourism industry, which can be seen in the amount that has been developed in AR gaming (Herbst et al., 2008). In contrast, Qantas and Samsung have released their first VR trial experience for first class passengers on flights in Australia, which provides destination content to tourists prior to their arrival (Adhikari, 2015). However, challenges, such as experiences of nausea and limited immersion into the content remain to overcome before such experiences can be implemented commercially.

While AR has a number of potential use cases in the tourism industry, the implementation of QFD in urban heritage tourism to provide a model for the development of mobile AR tourism applications has not yet been investigated, and suggests a knowledge gap. Since the expectations of tourists are continuously increasing, it is crucial to understand tourist requirements in order to provide and shape the urban heritage tourism product in a meaningful way. As a technology that is able to bridge the physical and virtual space to enhance the tourist experience, AR has shown great potential to benefit the urban heritage tourism product in many ways (Poria et al., 2003) and to increase the competitiveness of the destination (Fritz et al., 2005). This research aims to bridge the knowledge gap of providing a QFD model in tourism to develop AR tourism applications in the urban heritage environment.

3.10 Summary

The aim of this chapter was to provide an overview of AR technology and investigate its current development in the mobile tourism context based on existing use cases. It was shown that many academics and practitioners have long regarded

AR as a promising technological tool for various fields especially in the tourism industry. It has a high potential in the consumer market, as mobile applications are continuing to improve and become more user-friendly, empowering the consumer to increasing access over a wide field of information. While early AR applications in tourism were mainly developed for GPS systems, it is expected to improve drastically as global tracking technologies and wireless computing become more sophisticated and the technology more efficient. In recent years, the number of studies implementing AR in the tourism industry has increased, investigating how to enhance the tourist experience, compared to prior feasibility studies focusing mainly on user interfaces of AR browsers. While AR is a part of Mixed Reality, it was found to have higher potential benefits in many areas compared to VR, which is based on a complete virtual environment. Examples of previous studies have shown that AR in tourism has many potential areas of implementation. Reproducing historical sites to enhance the tourist experience as well as providing additional information for first-time visitors about the immediate surrounding are considered two main areas of implementation. However, AR has to date very few successful implementations in the urban heritage tourism sector although findings have shown that AR has the potential to be meaningfully implemented in this context. While wearable technology is heavily invested into, it is crucial to understand AR as technology and the benefits it can provide in the tourism context before moving to the next hardware. Therefore, it is crucial to investigate tourist requirements in order to develop a model that incorporates tourists' interests and needs when visiting urban heritage destinations to close the knowledge gap. It is anticipated that the identification of requirements for the development of mobile AR tourism applications for hand-held mobile devices will be largely transferable to wearables as well, and therefore will not be irrelevant even after the mass adoption of wearable computing. The following chapter will investigate urban heritage tourism to set the study context. In particular, Dublin will be explored in detail to fully comprehend the context of the research.

CHAPTER 4 – URBAN HERITAGE TOURISM

4.1 Introduction

This chapter will discuss the context of the study. As the research has been conducted in the context of urban heritage tourism, the chapter will first outline the origins of urban heritage tourism, providing a definition of cultural tourism and 'heritage' before moving into urban heritage tourism as part of the heritage tourism umbrella. Finally, the chapter will justify the selection of Dublin to provide the context for an urban heritage tourism setting. Therefore, the chapter will provide a detailed picture of Dublin as tourist destination before discussing specific urban heritage sites in more detail that have been selected as research site for this study. These were selected according to the city's vision to revive its heritage.

4.2 Cultural Tourism

Tourism has been considered the world's largest industry for many years and is continuously growing (Mill and Morrison, 1985; Hall and Page, 2000; Ghosh et al., 2003; Page, 2014; Navickas and Malakauskaite, 2015). According to the UNWTO (2009), tourism ranked as the fourth largest industry for export worldwide after fuels, chemicals and automotive products. While many attempts have been made to define tourism, many studies were found to be rather subjective and therefore did not provide a meaningful explanation. For instance, Smith (2003) defined tourism as a leisure activity to visit a place away from home in order to experience change. However, tourism has become much more than a leisure activity, such as travel for business, health and educational purposes, or simply for visiting friends and family members (Hall and Page, 2000). From the definitions that attempted to explain tourism, Hall's (2000) definition was found to incorporate a range of elements that were highlighted by other authors, such as tourism involving a temporary travel activity to and from a destination, resulting in a variety of impacts on the visiting destination. Although not all purposes for

travel were discussed, Hall (2000) pointed out that the context of tourism was mostly in leisure, while business travel was continuously growing. As there are many forms of tourism, Richards (1996) stated that culture is one of the main origins of tourism, as it was implied that all facilities and services that are offered at a destination are a reflection of its image and environment. In contrast, McCarthy (1994) claimed that tourism development should strengthen cultural identity and heritage, considering the opposite effect of tourism on a destination's culture. Nonetheless, the way and reason for travel has increased significantly, as more opportunities in transport and infrastructure have provided increasing possibilities for people to travel. While travel was considered a luxury many years ago, it is now considered a very common activity.

Cultural tourism has been increasingly investigated for its potential to tackle seasonality in tourism destinations (Cuccia and Rizzo, 2011). According to statistics by Europa Nostra (2006), more than 50% of tourism in Europe was driven by cultural tourism services. Furthermore, the Italian Statistics Office (ISTAT) claimed that in 2005, cultural tourism was responsible for 33.5% of total tourist arrivals in Italy, scoring the highest mark in the overall ranking (Cuccia and Rizzo, 2011). Girard (2008) argued that cultural tourism had become more than just a market niche over the past decade as it has been often viewed as a separate sector in tourism. While it has been debated whether cultural tourism provides more advantages or disadvantages to a destination (Faulkenberry et al., 2000; Tosum, 2002), Cooper et al. (2008) concluded that cultural tourism could serve as a tool to revive local traditions with a positive effect on society as a whole.

4.2.1 Definition of Cultural Tourism

Cultural tourism has been defined in various ways depending on the perspective of stakeholders. The International Council of Monuments and Sites (ICOMOS), categorised the definitions largely into four areas, 'tourism-derived', 'motivational', 'experiential', and 'operational'. McKercher and Cross (2002) supported tourism-derived definitions of cultural tourism due to the relation to the tourist market. In their view, it involves developing and maintaining cultural sites

for tourists to build a connection between people and the cultural heritage of the destination. However, the tourism-derived definition implies that the tourist is generally interested in a destination's culture and cultural events. As this definition is quite broad, Smith (2003) argued that it required sub categories, such as heritage tourism, arts tourism and ethnic tourism in order to get a clearer picture of cultural tourism as a whole. The 'motivational' definition of cultural tourism focuses on the people rather than the destination. It is based on Gnoth (1997) arguing that people are motivated or 'pushed' by their own desires to pursue a specific activity of experience, while at the same time being 'pulled' by a particular offer of a destination or attraction. Similarly, Lord (1999) defined cultural tourism as visits by tourists outside of the host community or region who are motivated by their own interest in a particular field. However, regardless of the motivation, tourists are involved in the culture of the visiting destination and therefore the 'push' and 'pull' factors are always inclusive. As an additional definition of cultural tourism, ICOMOS discussed the experiential and operational perspective. The experiential view is closely related to the motivational perspective, as tourists seek to consume culture in form of experiences through interacting with customs, traditions and heritage of a destination (McKercher and Cross, 2002). The operational definition on the other hand regards cultural tourism as a form of 'activity' that tourists conduct, such as visiting museums and historical buildings and attending performances and festivals to experience culture. This implies that tourists actively participate in the experience, rather than just passively 'visiting' the destination. As this study is based in the context of urban heritage tourism, it is crucial to review the meaning and development of heritage tourism before discussing the urban heritage environment. Therefore, the following sections will aim to provide an overview of heritage and heritage tourism from an academic point of view by investigating the definition and development of heritage tourism.

4.3 Heritage

To clearly understand the context of urban heritage tourism, it is crucial to investigate the meaning of 'heritage' as a tourism product. The Center for Heritage and Society in the University of Massachusetts Amherst (2013) defined heritage

as all kinds of inherited traditions, monuments, objects, and culture. However, while 'culture' is more focused on the actual attributes, 'heritage' further relates to the meanings and activities that people, especially tourists interpret in them (UMassAmherst, 2013). Timothy and Boyd (2003) on the other hand classify heritage into tangible immovable resources, such as buildings and natural areas, tangible movable resources such as objects, and intangibles such as values, customs, lifestyles and cultural events. Others categorised heritage into natural heritage, such as natural parks, living cultural heritage, such as food and customs, built heritage, such as historic cities and castles, industrial heritage, as in coal mines and textiles, personal heritage, such as cemeteries and religious sites and dark heritage, like places of death and pain. However, no matter how heritage is categorised, Timothy (2011) pointed out that people need to have a common understanding of 'heritage' to prevent any misuse for political or economic reasons.

Hall and Zeppel (1990) highlighted the difference between culture and heritage. As heritage is commonly associated with history, De Groot (2008) clarified that history refers to knowledge creation of the past, while heritage is a means of consuming the knowledge. In this definition, it is important to recognise that heritage cannot simply be regarded as 'the past', but is the consumption and experience of the past in modern society, which makes it attractive for the tourism industry. Nonetheless, Timothy and Boyd (2003) argued that heritage can only exist in its original surrounding. Therefore, the definition of heritage highly depends on the context in which it is regarded. Although heritage is very often seeked in historical monuments and understood as origin of one's cultural background, the Center for Heritage and Society (2013) argued that heritage includes finding the meaning in both, tangible objects, such as historical and archaeological sites, as well as intangible aspects, such as dances, traditions, language and food. However, since heritage largely depends on the subjective interpretation of areas, it often varies what people consider to be part of heritage. SOHA (2013) argued that heritage has family attributes and is commonly passed down in form of traditions and practices. Similarly, Smith (2006) claimed that heritage originates from values and traditions in the present day rather than the past, as people need to engage with and communicate heritage in order to create a

meaning. This view is further supported by Harrison (2009), claiming that heritage is often not so much related to the past, but rather the future, in the way people interpret heritage and conceptualise the meaning. However, this view implies that heritage is not dependent on physical historic places, disagreeing with views by Timothy and Boyd (2003). In contrast, it highlights the current inter-social processes and activities at and around a destination's culture. Maeer et al. (2012) argued that heritage has a much higher value and cannot be compared to an equivalent commercial form. However, in order to understand the true value of heritage to a specific group or person, it is important to recognise the relationship of the individual with the heritage site. Poria et al. (2003) emphasised this point stating that heritage is a result from the relationship of the supply and demand side.

Tourism has been found to create a platform of interpretation of heritage sites by creating experiences. Using technology, it is possible to communicate the heritage meaning accurately, but also to re-interpret heritage and create new experiences. Therefore, tangible and intangible heritage in forms of historical sites as well as traditions is constantly changing depending on the imaginations of the past and the vision of the future (Harrison, 2009). Obschoor and Tang (2011) on the other hand outline the challenges of the world heritage city Lijiang in China, which due to urban development faces difficulties to sustain its world heritage site. Therefore, Obschoor and Tang (2011) recommend the employment of digital technology to reduce energy footprint and assist the sustainable development of the world heritage site. In this regard, Li (2003) debated whether or not heritage tourism is beneficial or unsustainable, as heritage focuses on preserving the past, while tourism fosters dynamic change and variety. To understand the concept of heritage tourism, the following will discuss the development of heritage tourism leading to urban heritage tourism as the context of the study.

4.4 Heritage Tourism

4.4.1 Definition of Heritage Tourism

Academics and industry practitioners have employed a number of definitions of heritage tourism depending largely on historic aspects of a tourist attraction (Timothy, 2011). Although Timothy (2011) argues that most people have a common understanding of heritage tourism, a more specific definition is highly context dependent. Li et al. (2008) claim that heritage tourism needs to take socio-psychological issues into consideration, and therefore cannot disregard tourist motivations and behavioural intentions. In general, heritage tourism suggests a tourism activity that lets the tourist experience and learn about a destination's culture (Li, 2003). Orbasli (2000) further adds that the motivation to visit heritage attractions lie in the product offered to the tourist. On the other hand, heritage sites should also appeal to the local community by being sustainable to enhance the heritage of the community that can make an impact on people's visit as well as to the citizen of the destination. In order to understand the development of heritage cities, it is important to consider the meaning behind heritage tourism. Heritage Tourism was further defined by the WTO (2001) as being connected to forms of natural and human heritage, such as arts and traditions in another region or country. This implies that heritage is highly connected to the values and intentions of the society that determine which aspects of the past are considered worth keeping, as values of society change over time. Therefore, the value of heritage needs to be considered to understand the motivation behind heritage tourism. The value of heritage has been defined as 'world', 'regional' and 'personal' value. World heritage, which is often referred to, as 'heritage tourism' is considered neutral, while regional and personal heritage is defined by the emotional value attached to it by a distinct group (Fowler, 1989). According to Li (2003), heritage tourism caters to the experiential consumption of the destination, which is formed by historical and archaeological sites, buildings and other facilities that have a cultural meaning to the community. In the study of Poria et al. (2003) on the other hand, it was argued that heritage and the impact of heritage sites highly depend on the motivations and perceptions of tourists and the image of their own heritage which forms their behavioural intentions. Therefore, it naturally results into heritage sites having different values for tourists and inhabitants as a result of each individual's perception. While cultural tourism, heritage tourism and cultural heritage tourism are often used interchangeably in practice, review of the literature showed that they have different academic definitions. It was concluded that

cultural tourism is based on experiential tourism through performed and visual arts and festivals, whereas heritage tourism seeks experiential tourism by becoming part of the natural or historical place.

4.4.2 Development of Heritage Tourism

Heritage tourism has existed as one of the first forms of tourism and is not regarded a new concept which developed individually (Prentice, 1994). In early movements of heritage tourism, people such as traders and adventurers used to travel on 'Grand Tours of Europe' and other parts of the world and move between ancient cities to visit cathedrals and other establishments to explore other cultures (Marsh, 1989). One of the first forms of heritage tourism was known as 'The Grand Tour', which was forming a route through Europe and served as educational and cultural experience for mainly upper-class people (Towner, 1996). As the length of travel varied significantly, so did the origin of people that participated.

In recent years, heritage tourism has become of high economic importance for many destinations as well as a form to create awareness and shape the brand of the destination, such as in the case of Dublin. Higher educations as well as the impact of globalisation and technological development are argued to have affected heritage tourism to show substantial growth all over the world (Bowitz and Ibenholt, 2009). This growth has further been supported by the rising importance of culture and art. However, it has also been noted that not only tourists' needs, but also the interests of locals and citizen need to be taken into account, as they influence the degree and way of heritage site development (Uriely et al., 2002). According to Swarbrooke (1994) the growth of heritage has been influenced by supplier as well as demand interests, as shown in Figure 4.1.

Figure 4.1: Factors behind the Growth of Heritage Tourism
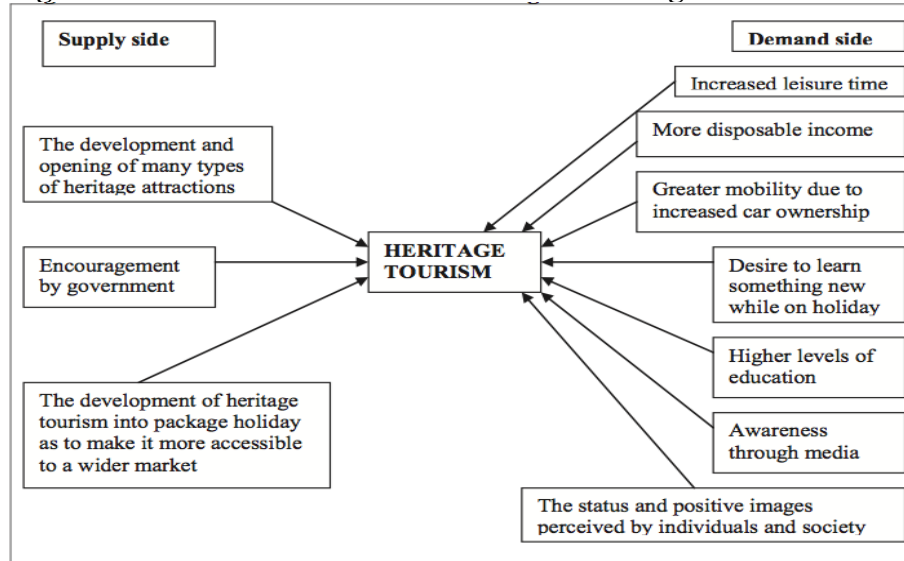
Source: Swarbrooke (1994)

It is often unclear whether cultural tourism and heritage tourism share the same meaning due to their overlapping concepts. Such confusion often arises by analysing cultural aspects and heritage contexts while investigating tourists traveling for culture and heritage (STCRC, 2008). The National Trust for Historic Preservation (2011) argues that heritage tourism is "place"-based refering to a destination specific context and includes the landscape, architecture and people that have their origin and traditions in that particular area. Although cultural tourism refers to the same content, such as traditions, people and their stories while also embracing tangible culture, such as monuments, the place of experiencing cultural tourism is flexible and not bound (STCRC, 2008). Preserving a historic area is referred to as heritage, while the preservation of paintings and sculptures is generally categorised as cultural tourism, since they can be transported and enjoyed in various museums or art galleries. The National Trust for Historic Preservation (2011) argues that therefore, urban areas are more often referring to cultural tourism, since financing such collection is more likely compared to rural destinations. However, heritage and culture need to be defined specifically, as historical events, such as revolutions are bound to certain buildings or places and should therefore be categorised as heritage sites.

Bowitz and Ibenholt (2009) argue that heritage and cultural tourism are becoming increasingly important and a major part of travel decisions globally. In many

countries, such as the UK and parts of the USA, heritage tourism has become the main source of attracting foreign tourists (Timothy and Boyd, 2003). Since early studies of heritage-based tourism, an issue has remained in the definition of 'heritage' to determine what attractions should be considered 'heritage sites' and how they should be maintained (Swarbrooke, 1994). Middleton (1997) argued that one of the challenges was the oversupply of heritage attractions, as people tried to preserve everything from the past with personal value, naming it 'heritage'. Therefore, it needs to be acknowledged that today's heritage has gone through various filters and has been passed down through generations and levels of society before it has been recognised as a valuable part of the past. In the process, the development of societal views as well as modern information technology have made a big contribution towards the tourist behaviour and their experience with heritage sites and destinations.

4.4.3 Model of Heritage Tourism

In order to support the understanding of heritage tourism, Timothy and Boyd (2003) proposed a heritage tourism model to explain and visualise the various categories of heritage tourism. As suggested by Timothy and Boyd (2003), heritage consists of two types of environments, 'phenomenal' and 'behavioural'. The phenomenal environment describes tangible heritage objects and sites and includes natural sites as well as cultural and built heritage enhancing the physical environment. The behavioural environment describes the experience with social and cultural aspects formed through human interaction. Such can include ceremonies as well as customs that have been passed down for generations. Timothy and Boyd (2003) argued that heritage in the phenomenal environment has existed as part of the physical world and only becomes part of the behavioural environment the moment it is perceived valuable by society. However, at this point it is crucial to differentiate between heritage as perceived by the host community, and perceived by tourists visiting and experiencing the destination and its culture. The provided model (Figure 4.2) shows that the heritage tourism experience is formed after two stages of filters. The physical heritage is first filtered through the cultural and societal filter evaluating its meaning and value, and in the second stage

filtered to determine whether the heritage site is beneficial for the local economy after considering its behavioural value for the community. However, it needs to be taken into consideration that the heritage tourism experience for tourists is often built separately. While phenomenal heritage often results in tourist sites and museums being experienced on a generic level, behavioural heritage requires the involvement of the tourist with the host community forming a different level of experience. In addition, the benefit of heritage sites for the community is determined through an economic filter shaping the heritage site to support the destination economically. This ultimately influences the heritage tourism experience, which is also affected by other factors, such as the overall supply and demand, conservation criteria, authenticity of the attraction and destination, impact management, interpretation by tourists and policies and regulations.

Figure 4.2: A Model of Heritage and Heritage Tourism
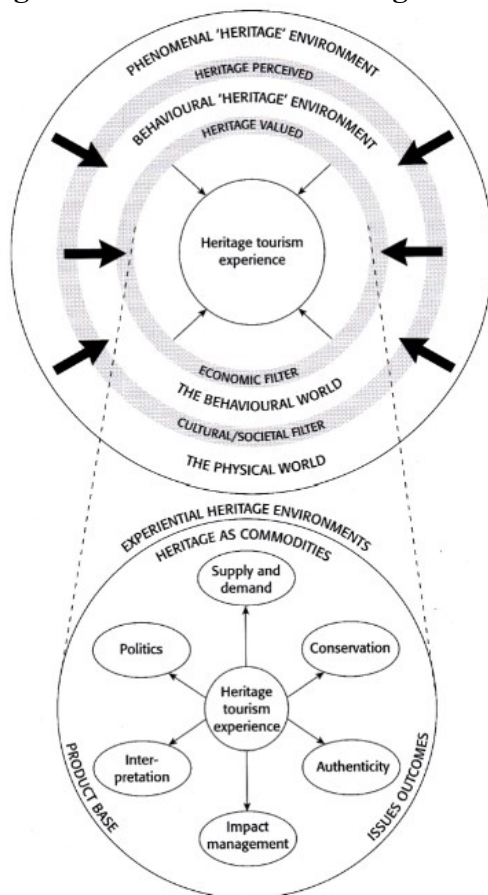
Source: Timothy and Boyd (2003)

In order to clarify the different types within heritage tourism, Timothy and Boyd (2003) further proposed a model (Figure 4.3) to analyse the heritage spectrum. The

landscape of heritage is defined from natural and rural, as part of ecotourism, to cultural and urban heritage tourism. It can be seen that the spectrum of heritage tourism involves various landscapes within the types of ecotourism, heritage tourism and urban tourism. However, the overlapping concept suggests that various characteristics can exist in different types of tourism, such as cultural and urban landscapes. Therefore, heritage tourism cannot simply be divided into clear categories, but should rather be regarded as a mixed concept, where individual heritage landscapes, such as natural, rural, cultural, and urban heritage are more dominant. This leads to the critical review of the context for this study. In the following section, the concept of urban heritage as part of cultural and urban tourism will be discussed in detail, leading to Dublin as the context of an urban heritage tourism destination.

Figure 4.3: The Heritage Spectrum: An overlapping Concept
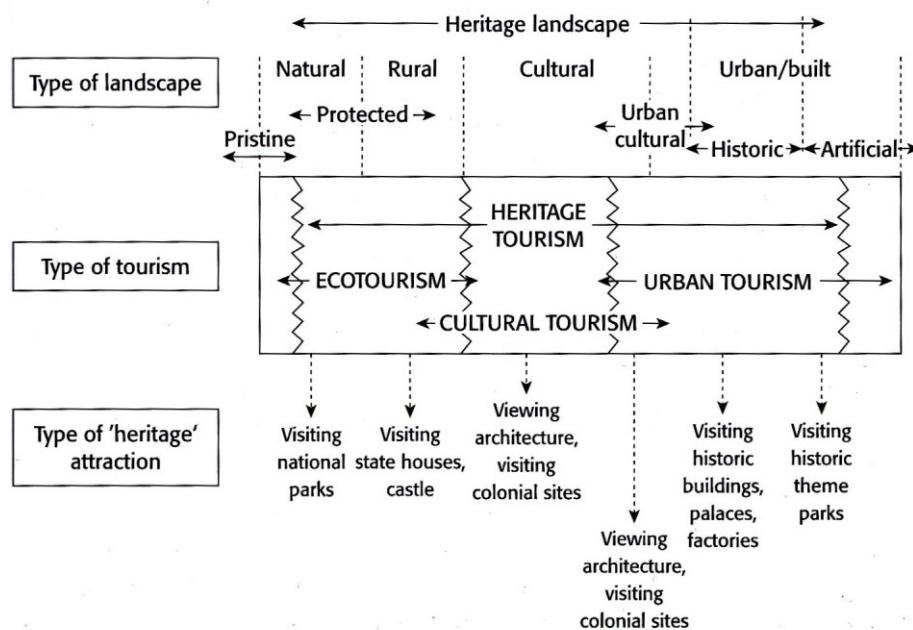
Source: Timothy and Boyd (2003)

4.5 Urban Heritage Tourism

Early studies in urban tourism were initiated by Ashworth (1989), in which it was highlighted that definitions in urban tourism were inconsistent. A number of studies have been published since, defining 'urban' as the opposite of 'natural',

where urban areas are typically shaped by humans, and natural environments in the absence of human interference (McIntyre et al., 2000). Others defined urban environments according to population density characterised by an accompanying infrastructure and array of lifestyles (Fainstein, 1994). Ashworth and Page (2011) argued that the major difficulty that was pointed out in the literature has been the provision of a clear definition of urban tourism in general that is able to account for the complex phenomenon of urban tourism due to its diversity. Building on the definition of urban environments, Fainstein and Gladstone (1997) have divided urban tourism into a political economy approach and a cultural approach. While the political economy approach "assesses the contribution of tourism to urban and regional economies" (Fainstein and Gladstone, 1997:120), the cultural approach deals with the impact on the traveller and the question of interpretation of cultural sites" (Fainstein and Gladstone, 1997:121). Pearce (2001) further defined urban tourism from a supplier's perspective examining economical and business developments in city, district and individual sites. However, this study will build on the cultural perspective and draw on the definition of urban heritage tourism. Based on the literature, it was concluded that urban environments are identified as areas where historic and cultural values are linked with collective identities, as communities and tourists shape and reshape the physical form of the surrounding.

Bandarin and Van Oers (2014) argue that cultural heritage and urban heritage cannot be seen as separate entities, but are rather a continuously developing form of heritage. Urban culture is seen as the cultural and social practices, behaviours and assets of the urban environment. Furthermore, it is the result of connecting cultural and natural values in the urban setting, such as the built environment, as well as social, cultural and economical practices and values (Bandarin and Van Oers, 2014). As discussed in section 4.3, heritage has received increasing attention as a driver for economic growth (Vaz et al., 2012). Therefore, there is a need to investigate the question of preservation and sustainable development in order to sustainably develop heritage to continuously drive economic growth in urban destinations. As culture plays a significant role in urban environments, both economically and non-economically, the preservation and promotion of cultural heritage in urban destinations provides many opportunities, such as creating jobs

and promoting cultural diversity, which have been recognised by a number of destinations (Anexo, 2015).

Urban heritage destinations such as Dublin and Venice are considered to be the attraction themselves compared to other destinations that prosper through the impact of specific tourist attractions. Therefore, the impact on the destination is often of socio-economic nature, reflecting the conflict between tourism and social and economic concerns. Van der Borg et al. (1996) investigated visitor to resident ratios in order to measure the impact of tourism in urban heritage destinations around Europe. It could be seen that the pressure on the historical centre of Venice with a visitor to resident ratio of 89.4 was much higher compared to Amsterdam with an index of 5.9. However, the numbers are to be interpreted with care, as they do not only represent the amount of tourists in the destination, but are also affected by the number of residents and the resulting economic and residential stability in the city. Nonetheless, such indices highlight the relative importance of tourism in urban heritage destinations and can be used to identify potential challenges in the destination, such as seasonality and tourism supply issues. However, it is evident that the number of tourists interested in urban heritage destinations is steadily growing, affecting the living standard of residents as well as the tourist experience. Therefore, Aas et al. (2005) argued that it is vital to properly employ tourism management policies in urban heritage destinations. In the case of the Turkish cultural heritage site Izmir, site management involves a cooperative approach between the public and private sectors to attract tourists. However, the inflow of tourists needs to be efficiently managed through infrastructural development and coordination to sustain the heritage sites (Günlü et al., 2009). The Australian Heritage Commission for instance provides guidelines for the successful management of heritage sites in Australia, such as understanding the significance of the heritage site, forming partnerships between private and public sectors, creating a quality visitor experience, developing indigenous tourism, and planning sustainable businesses (Australian Heritage Commission, 2001). Such measures should be taken into consideration to align the needs of tourists with the local community in the urban heritage destination. In order to understand the impact of tourism in urban heritage destinations, the following section will provide a definition of urban heritage tourism.

4.5.1 Definition of Urban Heritage Tourism

Urban heritage tourism has been seen as a complex phenomenon that lacks a clear definition due to its diverse and vague interpretations (Edwards et al., 2008). Therefore, urban heritage tourism has been defined from various perspectives in the literature. One of the earliest and widely accepted definitions of heritage tourism in the urban environment has been provided from a descriptive perspective. Urban heritage tourism was defined on basis of material components originating in culture and heritage in urban environments, such as attractions, art, relics, as well as intangible products such as traditions and languages (Millar 1989; Law 1992; Nuryanti 1996; Garrod and Fyall 2001). However, Law (1992) expanded this view by categorising urban heritage tourism into primary elements, as core products to attract people, and secondary elements, which were seen as supporting products to enhance attractions. An alternative definition, which was widely acknowledged in the literature has been formulated from an experience-based perspective through consumption of heritage resources (Dahles 1998; Moscardo 2001). This perspective is formed in the tourist's interaction and experience with heritage attractions, which determines the value and meaning of urban heritage sites. Poria et al. (2001) supported this view claiming that heritage tourism in its essence was based on perceptions and one's interpersonal relation to the heritage site. While it is debated which definition is more widely applicable, others have highlighted the relevance of both views (Richards, 1996) and acknowledged the importance of a product-based approach to define urban heritage sites. However, Richards (1996) also acknowledged that an experience approach is necessary in order to attach a motive or meaning to urban heritage tourism activity. Apostolakis (2003) similarly combined both views and proved that they were equally crucial for the definition of heritage tourism in general. However, he acknowledged that the change of focus from product to consumer orientation would provide implications particularly for tourism businesses. One of the latest definitions of urban heritage tourism focused on the values that have been developed, interpreted and conveyed through generations by accumulating traditions and experiences into the tourism product of urban environments (Anexo,

2015). After reviewing the literature, it was concluded that urban heritage tourism is regarded as the tourist's interaction with and interpretation of heritage sites in the urban environment.

4.5.2 Development of Urban Heritage Tourism

Since 2010, the UN General Assembly has acknowledged culture as factor for the sustainable development in urban environments, making a significant contribution towards strategic urban planning and sustainable urban heritage development for tourism. As the number of World Heritage cities increased, it has become more important to explore ways to conserve urban heritage sites in alignment with sustainable tourism development through innovative practices and management. Many theories and themes exist regarding why urban heritage tourism has started to develop. The global economic influence has been pointed out as one of the major reasons of tourism development in cities (Nasser, 2003). While economic impact is a common determinant for destination growth, local communities in cities face the challenge of staying competitive in the destination, which is increasingly dominated by international organisations. Although international investments encourage competitiveness and development of the destination, Gibson et al. (2005) acknowledge the challenges for local communities particularly to embrace the sustainability of the destination's local heritage. Law (1993) identified four factors that affected the development process from the 19th century, decline of the manufacturing industry, creation of a new economy to tackle unemployment, the perception of tourism and potential industry, and the potential effect of tourism towards revitalisation and regeneration of areas. It was repeatedly mentioned in the literature that the development of tourism sites is cyclic. Therefore, urban heritage destinations also undergo a lifecycle through the dynamics of tourism (McElroy, 2006; Kuo and Chen, 2009). As tourists visiting the place start to increase, investments are made into infrastructure, services and advertisement (Russo, 2002). While the economy starts to flourish, the city experiences the take-off stage in its lifecycle until the maturity stage is reached. A Common issue remains that international corporations dominate such destinations while local services continuously decline. Russo (2002) argues that the

interpretation of such a lifecycle implies that the problem needs to be tackled at the tourism expansion stage. Therefore, destination managers should put proper policies and regulations in place to ensure the sustainable development of urban heritage destinations and aid the local community. However, apart from the influence of international corporations, urban heritage destinations face a number of challenges that still need to be overcome.

4.5.3 Challenges of Urban Heritage Destinations

Urban heritage tourism development has been largely influenced by means and methods to maintain and sustainably develop heritage sites in and around the urban area. However, the situation of traditional monuments and buildings representing historical events varies significantly. While some buildings have been reconstructed to serve a different function and are well maintained, others have completely lost their purpose and have been left in poor condition. Pendlebury et al. (2009) argue that even today, many urban heritage sites particularly in developing countries are not maintained properly and are constantly declining either actively through tearing down and establishing new buildings or by passively not putting any effort into maintenance. Such is the case of Istanbul that was on the verge of losing its UNESCO World Heritage title in 2010 due to poor maintenance of its historical architecture (Head, 2010). The areas that benefit from conservation on the other hand are mostly related to economic purposes attracting visitors. If this trend continues, it is expected to result into many destinations losing their origin and heritage. Gospodini (2004) discusses the implications of urban heritage destinations in Europe that face the challenge that the tourist trend is shifting from sand and sun tourism to a cultural approach to travel, which is a high-selling point for many European destinations. Therefore, Gospodini (2004) argues that cities that are especially attractive tourist spots need considerable management in order to deal with the pressure on its capacity that is associated with high visitor numbers. On the other hand, it is important that other parts of the city are maintained effectively to sustain urban heritage sites. Tweed and Sutherland (2007) point out an additional concern in their study of European heritage cities as the amount of pollution that is brought in with the increasing

number of tourists, although the economic benefit of urban tourism was equally realised.

Another common issue in urban heritage destinations is the movement of tourists into neighbouring areas, while only travelling to the city for specific attractions (Nasser, 2003). As tourists are faced with increasing prices in developed destinations, they start to escape to other areas in close proximity of the city. This enables them to spend less money during their travels, while the destination lacks funding to maintain tourist attractions, such as heritage sites. As a result, external funding is required, which eliminates the destination's ability of self-support damaging the city's economy. Nasser (2003) points out that urban heritage in particular receive limited attention with regards to conservation and sustainability, despite its high contribution towards benefitting the destination and its economy. This phenomenon has long been an issue and was discussed in the study of van der Borg et al. (1996) examining major European city tourism destinations out of which none had a specific tourism development strategy. The potential movement of tourists needs to be considered for the development of urban heritage destinations. This is not only crucial for the city itself, but including neighboring areas in close proximity to benefit the destination as a whole. In contrast, the local community adds a further challenge in the urbanisation process, which started in the 1970s establishing new housing opportunities in and around the city and resulting in many parts of the destination being 'modernised'. On the other hand many older and traditional parts of the city are torn down as the social and economic value of such areas decreases. As a result, traditional areas are declining despite their often unrealised importance of giving meaning and character to traditions and its society. Furthermore, Hjalager (2007) outlines the impact of globalisation on tourism, as tourism products in destinations are at risk of becoming standardised experiences through the influence of a 'global culture'. In contrast, it has been repeatedly mentioned in the literature that tourists do not look for the experience in 'clone cities'. Therefore, each destination is in need to establish their individual brand according to their culture and background (Govers et al., 2007; Konecnik and Go, 2007; Lin et al., 2011). The 'local approach' to tourism urbanisation has emerged as a result, which focuses on the uniqueness of the destination without taking into consideration international influences.

Arguably, studies in this area are tailored specifically to the individual destination and make it difficult to conceptualise processes that are transferable to other areas. Although people gradually start to realise the potential of such areas, it is still unclear how to develop and maintain those parts of the city beneficially (Ruiz Ballesteros and Hernández Ramírez, 2007). One solution that has proven to have a positive impact on the sustainable development of urban heritage destinations is the use of Information and Communication Technology (ICT) and will be discussed in the following section.

4.5.4 ICT in Urban Heritage Tourism

De Noronha Vaz et al. (2012) argued that there is a risk of urban heritage tourism development becoming unsustainable in the future. One area that has significantly contributed towards sustainable tourism and the tourism economy is the implementation of modern Information and Communication Technology (ICT). Shanker (2008) argues that ICT has mainly contributed through the accessibility and sharing of information between various sectors to communicate through channels using the Internet and mobile services. It has been widely used in the extend and reach of marketing activities affecting the tourism experience due to its limited geographical boundaries. According to Collins et al. (2004), particularly small heritage sites often lack sufficient technical as well as economical resources to be developed sustainably. While heritage tourism management aims to conserve heritage sites in a meaningful manner, Hasse and Milne (2005) argue that communities are often excluded in the determining process and the handling of issues related to their heritage. Therefore, Gretzel et al. (2009) discuss the implementation of ICTs for the community and its heritage development, while Paskaleva and Azorin (2010) support the argument of destinations requiring to be represented in the increasing digital environment in order to stay competitive in the global market. Shanker (2008) further outlines challenges and effects of ICT for the economic and social development being highly dependent on the ability to create and share information globally, while enabling access to information. Mitsche et al. (2008) on the other hand discuss the use of ICT for interpretation and marketing purposes of heritage sites that is communicated on cultural

attraction and destination websites and outline potential effects it has on visitor interpretations. While such information assists tourists to acquire knowledge regarding the heritage site and destination, it needs to be aligned with the desired tourist experience at the time of visit. Rubegni et al. (2010) introduce an Instant MultiMedia (IMM) approach for exhibitions to provide a communication tool for instant information access and increased satisfaction, understanding of context, knowledge and interest generation. By providing new tools and digital communication channels, ICT in tourism has proven to have significant effects on consumer behaviour (Shanker, 2008). In the constantly growing digital world, it is therefore crucial for particularly urban heritage destinations to explore the opportunities of e-services to be able to share their local culture and heritage and stay competitive.

4.6 Urban Heritage Tourism in Dublin

While a number of urban heritage destinations were considered as research site, Dublin was selected as the study site to achieve the anticipated objectives. In the time the research was conducted, Dublin was initiating a plan to revive its urban heritage to include in their branding strategy as part of their Smart City initiative. Although Dublin realised the potential of their urban heritage for their strategic planning in the 1990s, it has just recently launched a plan to become the 'City of Innovation' and raise their brand of 'Digital Dublin'. The Dublin Innovation Declaration was founded in an effort to promote European change through technological development and create a wealthier Europe (European Commission, 2013). In Dublin's initiative, the aim was to implement cutting edge technology into their urban heritage tourism product. Naming itself a 'test-bed of innovation', Dublin was regarded as ideal destination to select as research site and to develop a mobile AR tourism application for the enhancement of their urban heritage tourism product in order to support their brand image.

Tourism in Ireland has been working on a similar branding strategy for decades building on its natural surrounding, people and culture (Byrne and Skinner, 2007). However, it appears that Dublin has approached a slightly different approach of

branding the city as tourist destination. According to Dublin Tourism (2003), Dublin has been a distinguished brand as a vibrant city to attract business as well as leisure travellers. McManus (2001) points out that in the past, travellers used to stay in Dublin only as a 'pit stop' in order to reach other places, such as natural landscapes. However, due to the differentiating image of the city, the tendency of overnight stays of incoming tourists increased.

Table 4.1: Main International Markets visiting parts of Ireland

Numbers (000s) Revenue (Cm)	Britain	Mainland Europe	North America	Other Areas	Overseas Tourists	Northern Ireland	Domestic Trips	Total
Dublin	1,328	1,567	663	247	3,805	311	1,683	5,799
	256.0	504.9	220.6	143.7	1,125.2	76.1	314.6	1,515.9
East & Midlands	372	233	104	51	760	185	1,183	2,128
	117.2	81.9	32.7	21.3	253.1	38.0	198.5	489.6
South-East	238	269	174	39	720	73	1,293	2,086
	65.6	61.3	34.6	10.0	171.5	19.6	271.3	462.4
South-West	553	585	405	135	1,678	70	1,906	3,654
	201.2	183.3	144.9	66.5	595.9	19.6	442.7	1,058.2
Shannon	282	279	252	46	859	32	887	1,778
	80.7	71.5	96.5	8.1	256.8	8.1	169.1	434.0
West	249	528	320	83	1,180	103	1,303	2,586
	83.4	189.1	133.8	17.3	423.6	27.7	290.8	742.1
North-West	209	173	94	29	505	530	739	1,774
	69.7	42.3	27.4	5.3	144.7	80.7	135.2	3,60.6

Source: Central Statistics Office (CSO) (2013)

In table (4.1) it can be seen that the majority of overseas tourists were visiting Dublin as compared to the rest of the country in 2013, whereas many domestic tourists chose to visit the South-West of Ireland as a holiday destination. A similar trend was notable in the accommodation sector across Ireland (Figure 4.4), which showed positive growth in accommodations around Ireland in 2015 as compared to numbers in 2014. The graph refers to the number of businesses responding to have performed better in 2014. In Dublin, 99% of businesses in the accommodation sector responded to have performed better in 2014.

Figure 4.4: Performance by region for the paid serviced accommodation (PSA)
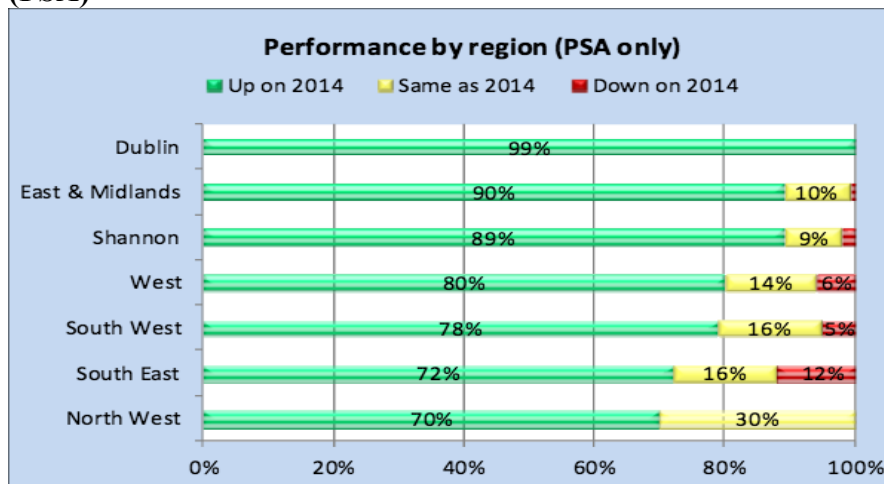
Source: Failte Ireland (2015)

Dublin has become increasingly attractive for a variety of tourists, as its image of being a lively city at night while having a long history and rich culture is spreading globally. Dublin as tourist destination has long been promising as stated by Lennon and Seaton (1998) whose study found that tourism growth in Dublin was much faster than other major cities in Europe. Lennon and Seaton (1998) argued that Dublin's key advantages lied in history and culture in connection with its largely young and modern city image. Nonetheless, Karmowska (1996) as well as Morgan et al. (2002) have noted that Dublin has a strong heritage, which has not yet been exploited due to its overall marketing and branding strategy that has been consistent many years. Byrne and Skinner's study (2007) showed that the perception of Ireland was based on its natural landscapes, while Dublin was seen as a vibrant and entertaining city. Nevertheless, literature pointed out the importance of Dublin's heritage sites as a selling point for domestic and international tourists in alignment with Dublin's recent initiative to promote its rich heritage.

Due to the socio-economical impacts of heritage in Ireland as well as outside investments in the destination to boost the national economy, Brett (1997) stated that the future of tourism in Ireland would eventually develop in the heritage sector. While Dublin was the designated 'European Capital of Culture' in 1991 to support the European cultural cooperation among its members, Lincoln (1997) argued that

it has since provided the city authorities with a challenge as well as opportunity to develop its urban heritage areas and improve the image and brand of the city. However, in 2015 the city of Mons was nominated to become the next 'European Capital of Culture' with the vision to highlight the economic effects of culture and technology (PTI, 2014). With their slogan 'where technology meets culture', it attempts to attract digital businesses such as Google, IBM and Microsoft into establishing a digital valley similar to Dublin. While Mons focuses on the development of mobility throughout the city to accommodate future events, Dublin's initiative emphasises on the revival of its urban heritage. Although Dublin has developed into a metropolis, it has long suffered from insufficient branding in the global market due to inadequate political expression (Lincoln, 1997). After discovering its heritage potential in the urban area, it has commenced to focus and develop the city's tourism product largely in the urban heritage context. However, Dublin was struggling to become a cultural city alongside Venice and Amsterdam due to the disregard of the local government to support and maintain heritage sites (Lincoln, 1997). During that time, Dublin was facing a lot of criticism due to outside views of Dublin having neglected various parts of their heritage (Cruickshank, 1990). However, after realising its heritage potential, the Dublin tourism board has focused on three strengths to develop Dublin as tourism destination; leisure activities, the Irish tradition and culture, and its cultural heritage. However, it is required to package the heritage tourism product appropriately to attract the target audience. In order to raise international tourist numbers in Dublin, 40 per cent of the European Regional Development Fund in 1989-1993 was allocated to Irish heritage and culture (Ventures Consultancy Ltd., 1990). Therefore, this study will add to the original plan of supporting Dublin's brand image started in 1990 to enhance its urban heritage tourism product and its strategic brand establishment that started in 2013 to become the 'City of Innovation' through the 'Digital Dublin' brand by bringing together urban heritage tourism with cutting edge technology.

4.6.1 AR for Dublin's Urban Heritage

For the purpose of this research, Dublin's Independence from the British Empire was selected after careful consultation with the Dublin City Council to align the research with their current projects in the urban heritage sector and facilitate the selection process of heritage sites to conduct the study. The Independence Trail was identified as one of the heritage trails in Dublin that marks significant landmarks from the Rising on Easter Monday of 1916, the day Ireland declared its independence from the British Empire. Although many landmarks are significant to the event of that era, most of them were destroyed during the revolution. However, the General Post Office (GPO) on O'Connell Street is considered one of the most significant landmarks that remained. As Ireland's declaration of Independence was presented on the steps in front of the GPO, the GPO and O'Connell Street were chosen to conduct the study. Selecting the GPO as the research site facilitated the research in two ways. On the one hand, the GPO is located in the centre of O'Connell Street, which was marked the most influential area during the Irish Independence. On the other hand, the researcher had the possibility to develop an application demonstrator for the study for outdoor and indoor environments incorporating meaningful content. Due to the location, it was possible to include other landmarks on O'Connell Street that were closely related to the Irish Independence. Furthermore, the stamp museum inside of the GPO provided an exceptional indoor environment to test the usability of the developed demonstrator application to collect more accurate and meaningful data.

According to Li (2003), the main challenge of heritage tourism lies in the meaningful interpretation of the past and culture in the present time. Using technology to reconstruct historical sites, the interpretation of the past needs to be composed in order to satisfy the consumption of the present tourist. While heritage is associated with the conservation and passing on of traditions and cultural values to the next generation, the nature of tourism is increasingly dynamic. Although many studies have been conducted to examine the relationship between heritage and tourism, the majority of researchers have focused on the link between the cultural aspect of heritage and its consumption by tourists (McKercher et al., 2002; Waterton and Watson, 2010). Jansson (2007) argues that the post-modern tourist

increasingly experiences the tourist attraction and destinations around the world through a filter of media channels which results in forming a series of images to generate the picture of the destination. However, the forms of media and its possibilities have increased exponentially through the increasing use and development of the Internet starting around 1995. Modern technology features, such as VR and AR, indicate this phenomenon which increasingly interlinks reality with the virtual world. Particularly for urban heritage sites, it is often difficult to provide physical information within and around a heritage site without disturbing or destroying the heritage image. Since AR is able to overlay the physical environment using the virtual space, it has long been regarded as a potential method to provide easily accessible information for visitors (Noh et al., 2009; Choubassi et al., 2010; Marimon et al., 2010). Although research and development of mobile AR in tourism has since advanced significantly, functioning employment of AR for commercial uses are just starting to emerge and are often criticised to provide limited benefits to the user. Therefore, this study aims to provide a model for the development of mobile AR tourism applications in the urban heritage tourism context. While the hardware is expected to eventually develop from smartphones or tablets to wearable computing in the future, the content and features of AR are anticipated to remain largely relevant. Using QFD, this study will provide a guideline of prioritised requirements for the implementation of mobile AR tourism applications in the urban heritage tourism context. Therefore, tourist requirements that are sought in mobile AR applications for urban heritage tourism will be identified and translated into technical design elements.

4.7 Summary

This chapter has provided a general overview of cultural and heritage tourism, as well as their development and definitions, leading to urban heritage tourism as the context of this study. It has been found that cultural tourism is based on experiential tourism through performed and visual arts and festivals, whereas heritage tourism seeks experiential tourism by becoming part of the natural or historical place. Heritage tourism has not only become of high importance for

many countries economically, but also as a form to create awareness and shape the brand of the destination, such as in the case of Dublin. While heritage tourism has been heavily investigated to tackle seasonality in tourism destinations, there is a risk to the sustainable development of heritage tourism destinations. Therefore, urban heritage tourism development has been largely influenced by methods to maintain and sustainably develop heritage sites in and around the urban area. Technology has been widely used in tourism to assist in the interpretation of cultural attractions and information accessibility.

Dublin was selected as the context for this research. The Irish Independence Trail was chosen as the theme after consultation with the Dublin City Council in order to align the study with their current urban heritage projects. While technology is seen to be increasingly significant for further economic development of European cities, successful implementation of AR in heritage destinations has been gaining more attention in recent years. Since AR is able to overlay the physical environment using the virtual space, it was identified as potential method to provide information for visitors without disturbing the actual heritage site. This study aims to generate a model for the development of mobile AR tourism applications in the urban heritage tourism context. Using QFD to prioritise tourist requirements, this study will provide a guideline of technical design elements for the development of mobile AR tourism applications in the urban heritage tourism context. The following chapter will therefore lead into the methodology of the study, providing a detailed outline of the primary research and the research philosophy that were employed in order to achieve the study objective.

CHAPTER 5 – METHODOLOGY

5.1 Introduction

The aim of this chapter is to discuss and justify the research methodology that was implemented in the study in order to reach the overall research aim. This study aimed to develop a QFD model for the development of mobile AR tourism applications in the urban heritage context. Therefore, it will first review the research aims guiding this study and further provide a discussion of research philosophies and approaches implemented in the study. By discussing the research strategy and design, it will follow with a detailed explanation and justification of the adopted primary research. The primary research was divided into three research phases, 1) semi-structured interviews with tourists and industry professionals, 2) Focus Groups conducted as post-experience study and 3) quantitative research with tourists in Dublin. All three phrases will be individually discussed with regards to purpose, population, sample, data collection and data analysis. Additionally, time horizon, validity and reliability, ethical issues as well as limitations for the chosen methodology are discussed.

5.2 Review of Research Aims

While the rationale of research aims have been explained in Chapter 1 (section 1.3) and will be discussed in Chapter 10 (section 10.2), this section is designed to present the implementation of the selected research methods to achieve the aims of the study. Although QFD has been employed in tourism and hospitality (Stuart and Stephen, 1996; Dube et al., 1999; Pawitra and Tan, 2003; Zheng and Pulli, 2005; Simons and Bouwman, 2006; An et al., 2008; Das and Mukherjee, 2008; Paryani et al., 2010; Chang and Chen, 2011; Crick and Spencer, 2011), it has not yet been implemented in the urban heritage tourism context, leaving the impact unknown up to date. Therefore, this research aims to eliminate the gap of generating a QFD model based on tourist requirements to develop and implement mobile AR technology in the context of urban heritage tourism. The most utilised

sources for this study were books as well as journal articles to provide a general knowledge of academic research within the context of this study. The researcher therefore used sources provided by Manchester Metropolitan University and accessible electronic database sources made available through the university. Additionally, Google Scholar and Google were used as search engines for academic articles and business insights providing the latest trends in the area of mobile AR particularly in tourism, using keywords such as 'Augmented Reality Tourism', 'AR Tourism', 'Tourism Technology', 'Tourism Mixed Reality'.

By investigating tourist, developer and industry expert requirements for mobile AR tourism applications it aims to generate a hierarchy of requirements to be considered for the development based on the HOQ. This section outlines the individual aims of the study as well as the methods that were employed in order to achieve each individual aim. The overall research incorporates five aims, which will be reached through the adopted methodology.

1. *To critically review existing theories in quality management.*

The first aim was achieved by investigating existing literature in the area of quality management in Chapter 2. Aim 1 was designed to develop a thorough understanding of the underlying theory and models of quality in management as well as product development, as it was regarded essential to understand the fundamental concepts around quality design for the development of products overall. Therefore, secondary sources such as books, journal articles and Internet sources were utilised to acquire an understanding of early quality theories, their development, validity and limitations before thoroughly reviewing QFD as the theoretical framework for this study.

2. *To critically explore Augmented Reality (AR) applications in urban heritage tourism.*

The second aim was achieved in Chapters 3 and 4. To achieve aim 2, secondary sources were critically reviewed. Journal articles were among the mostly used secondary sources to examine the current employment of technology in urban heritage tourism as well as case studies of AR employment based on its current

technological standards. However, as journal articles often require a longer time to be published, it was regarded crucial for technological studies to include sources representing currently trending issues. Internet sources such as online news articles, technology blogs and AR conferences, as well as industry reports from mobile AR pioneering companies such as Wikitude, Vuforia, and Metaio were used for the investigation of latest trends in mobile AR in tourism and other consumer markets. In order to keep up to date with the most recent developments in AR and tourism technology, Twitter was furthermore used to follow trends and news. Attention was given to recent developments and implementations as well as updates on new technologies that were still being worked on in order to have a wide ranging picture of recent use cases for mobile AR that could potentially have an impact on urban heritage tourism.

3. *To analyse tourists' requirements for AR applications in urban heritage tourism.*

Aim 3 was achieved by conducting qualitative research in form of semi-structured interviews with international tourists in Dublin. In the initial research stage, interviews were considered the most suitable research instrument, as the study aimed to newly identify tourist requirements to develop a mobile AR tourism application demonstrator for the next research stage. The interview questions were designed after investigating the literature for prior identified user requirements in the mobile computing context to contrast tourist requirements with previously identified requirements. As a result, previously identified requirements could be confirmed, and newly emerged requirements identified through the tourist interviews and a post-experience study in the second research phase.

4. *To investigate key design requirements considered by AR application developers and industry experts when developing AR applications in urban heritage tourism.*

Aim 4 was achieved by conducting in-depth interviews with industry experts in Dublin as well as AR application developers. The aim of these interviews was the identification of design elements that are valued by AR application developers and industry experts in comparison to tourist requirements. The AR application

developers were further consulted for the achievement of Aim 5 to interpret interview outcomes and translate identified tourist requirements into respective technical characteristics for further prioritisation in the HOQ. For the purpose of the study, a combined research approach was employed using an inductive approach to investigate tourist (Aim 3) and developer requirements (Aim 4) and further reduce and prioritise the requirements for the implementation into the QFD model through a deductive research approach.

5. *To develop a QFD model to implement mobile AR applications into the context of urban heritage tourism.*

The final aim was the design of a QFD model for the development of mobile AR applications in urban heritage tourism. In order to achieve aim 5, quantitative research in form of questionnaires were conducted, which was designed to prioritise and validate the identified tourist requirements. Confirmatory factor analysis (CFA) was employed for the reduction of tourist requirements to 18 items to be incorporated in the QFD model. Mobile application developers that participated in previous interviews (EP4, EP6) as well as an additional expert from the IT department within the Manchester Metropolitan University were consulted to interpret tourist requirements and translate them into technical characteristics for the HOQ. Through the translation of tourist requirements into technical design elements, the two sides of the QFD model, user requirements and technical characteristics were gathered to generate the HOQ and conclude the study. The following will provide an overview of the research approach and a detailed outline of the methodology to reach the objective of this study.

5.3 Research Philosophy

Research philosophies are necessary to discuss prior to conducting research, as it provides the perspective for the study and determines how knowledge is created (Johnson and Christensen, 2012). Similarly, Easterby-Smith et al. (2002) argue that it is crucial to explore the research philosophy in relation to the methodology used for a study. Understanding the research philosophy can clarify the research

strategy employed in a study, from the data collection method to its interpretation and answering the research question. Furthermore, Easterby-Smith et al. (2012) conclude that investigating the research philosophy prior to conducting research will assist the researcher to evaluate potential research methods and provide a clearer picture of which method will be the most suitable to answer the research question. In order to employ a suitable research design to achieve the research aims, a background of the underpinning research philosophy should be evident, which supports how the study is viewed and influences the research design that was implemented in the study. The main philosophies that developed over time have been identified as Positivism, Realism, Interpretivism and Pragmatism. While Positivism is more implied in quantitative research methods, Interpretivism and Realism are often considered philosophies closely related to qualitative research methods (Saunders et al., 2009).

Positivism aims to form hypotheses at the beginning of the research before any data is collected. A hypothesis is commonly defined after investigating the literature and other secondary sources that build an opinion about a specific topic. Such hypotheses are tested in the process of the research and add to the current understanding by expanding the research area with the contribution of the study (Creswell, 2007). Therefore, it is necessary to explore hypothesis by taking large samples, enabling it to test the reliability of the assumption and test the stated hypothesis. According to Tashakkori and Teddlie (1998), the research design within the positivistic approach is therefore commonly of quantitative nature, using surveys and questionnaires. Straub et al. (2004) argue that research in the area of information technology has been largely dominated by positivism. However, it needs to be acknowledged that studies in this area are typically conducted to test established systems in alternative scenarios, which is not the purpose of this study. As this research aims to design of a QFD model for the development of mobile AR tourism applications, it was regarded necessary to investigate tourist, developer and industry expert requirements to establish a fundamental understanding of requirements in mobile AR applications for tourism purposes before being able to determine a hierarchy of needs for the development of a QFD model.

In comparison to Positivism, Realism is often used in relation to qualitative research designs. In contrast to Idealism, which signifies the picture of the perfect world, Realism is based on truth and reality, as it is perceived by human senses. Therefore, theories and social research can be designed on the basis of how this reality is perceived. Saunders et al. (2009) distinguish between 'direct' realism and 'critical' realism. While direct realism relates to the accurate world picture as we see it, critical realism, which has its origins in the scientific research, argues that experiences are merely sensations in the real world, but do not necessarily relate to the actual world picture. According to critical realism, there are two steps involved when experiencing the world. First is the object itself, while the second step involves the mental processing after the object is picked up by one's senses. Direct realism on the other hand claims that the first step alone is a sufficient reflection of reality (Saunders et al., 2009). Johnson and Christensen (2012) argue that Realism is typically based on the objective reality influencing people's interpretation and reaction towards it. Uddin and Hamiduzzaman (2009) further add that social reality as a third area is formed as a result of individual social elements that are arranged into a social system.

Interpretivism on the other hand emphasises on the difference of people as individuals and the roles of each person in society. It is crucial that the researcher understands the difference between humans as social actors and therefore might result in a subjective research approach. According to Saunders et al. (2009), Interpretivism is based on phenomenology, which deals with the meanings of occurrences in the world. However, Goldkuhl (2012) points out that Interpretivism does not only relate to the researcher's point of view, but rather on the view of the individual research participant and how the person interprets his or her role within the environment. Therefore, Saunders et al. (2009) argue that it is necessary that the researcher keeps an empathetic position to accept various views of participants, which reflects the exploratory nature of this research. In the interpretivistic view, the world is too complex to be defined by theories and laws, such as is natural sciences, and therefore it is highly dependent on each individual situation. Although Interpretivism and Positivism both rely on critically investigating the research question, Interpretivism is influenced by the researcher's interpretation of the collected data as well as the participant's social and demographic situation

(Johnson and Christensen, 2012). Due to the characteristics of Interpretivism, it is a philosophy often used for qualitative research studies. As research instrument, unstructured interviews are often used within the interpretivistic research philosophy, as it provides complete freedom to the interviewee to talk about certain topics without limitations by structured interview questions (Saunders et al., 2009).

While Positivism, Realism and Interpretivism are representing one-sided perspectives to the research and research process, Pragmatism supports a more flexible approach by putting the focus on the research question. Therefore, answering the research question the best possible way is the aim of Pragmatism (Saunders et al., 2009). It can result in various methods being used to answer different questions within the research process. According to Hanson (2008), the philosophy of pragmatism does not rely on a particular research method, but aims to interrogate the research question finding the most suitable method to reflect reality. However, Feilzer (2010) argues that the nature of applied research studies that require fieldwork often does not result as a 'fit' in the desired outcome, but rather shows various views and opinions on the research question that were not considered before. Therefore, Teddlie and Tashakkori (2009) argue that pragmatism requires reconsideration and flexibility during the data collection process and often deals with uncertain outcomes and acknowledgements of findings as a relative, and not an absolute outcome. Furthermore, Hanson (2008) highlights that Pragmatism disregards the quantitative and qualitative division as it focuses on answering the research question with the best method possible. Morgan (2007) argues that pragmatism therefore offers a guide for a deductive as well as an inductive research approach as an integrated research methodology for social sciences. It acknowledges the value of knowledge that both, quantitative and qualitative methods produce in order to understand the meaning in today's social settings.

This study aims to identify tourist and industry expert requirements in order to develop a model for mobile AR tourism applications. In the time this study was designed and conducted, AR was largely unknown to the majority of tourists. Nonetheless, it was crucial to reflect the 'real' opinions of tourists in the

investigation of tourist requirements in order to develop a meaningful QFD model that reflects reality as closely as possible. Therefore, the focus of the study was put on answering the research question. Therefore, the pragmatic research philosophy was seen to be the most suitable perspective on this study. According to Johnson and Onwuegbuzi (2004), the pragmatic approach attempts to understand the meaning in words, statements and ideas that should be considered to make an assumption of the effect it will have for practical consequences. Due to the nature of the study investigating the implementation of technology in the urban heritage tourism context, it was considered important to recognise that the research outcomes might only be provisional. As many applied scientific studies, this research offers a practical solution through generating a QFD model that is able to provide a guideline for the development of mobile AR tourism applications. Pragmatism acknowledges these provisional truths as compared to other puristic views. It is therefore crucial to understand that studying technological factors will potentially change over time as new technologies are developed and the capabilities of hardware and software increase. However, it needs to be recognised that an interpretivistic view was used to guide the qualitative research process for the semi-structured interviews and focus groups. Interviews were conducted with international tourists as well as with mobile AR application developers and industry experts in Dublin. Therefore, it was crucial to recognise the position of each research participant and the resulting opinion and view of the interviewee. In this regard, mobile AR application developers were considered to have a more profound knowledge of application requirements, while tourists could provide direct information on desires and practicality issues with regards to mobile applications for tourism purposes. Industry Experts on the other hand were seen to be able to provide an in-depth perspective on the strategic goals of the destination in alignment with content and services that were offered to the tourists.

5.4 Research Approach

The research approach is largely based on the research philosophy and determines how the study will be designed. It is generally distinguished between a deductive and inductive research approach (Saunders et al., 2009). However, Johnson and

Christensen (2012) argue that mixed methods, combining the two approaches has evolved as a third, and widely accepted research approach.

The deductive approach determines a theory prior to the primary research and aims to test the validity of the statement. By investigating relationships among variables, it aims to identify explanations to the research question looking at occurrences as future predictors (Elo and Kyngäs, 2008). It is based on quantity and aims to examine a hypothesis, by collecting quantitative information in order to find evidence of the statement and be able to generalise the concept. This is usually achieved by conducting surveys and questionnaires, where a large sample of the population is chosen to collect data. Gill and Johnson (2002) point out that one advantage of using the deductive approach is the possibility to replicate the study in other areas with similar context. Therefore, it is largely used for the purpose of comparative studies across various segments or contexts. However, Saunders et al. (2009) point out that this research approach requires the investigation of large datasets in order to ensure the objectivity of the collected data and to generalise statistical regularities.

The inductive approach on the other hand focuses on the context and meaning of the conducted research by obtaining in-depth information to explore a specific topic or research question. Therefore, the focus lies in quality instead of quantity and is often achieved through qualitative data collection strategies such as interviews and focus groups to collect user-specific information in order to formulate a theory (Gill and Johnson, 2002). This research approach is often exploratory and is typically used in order to get a better understanding about a specific problem or research question. Being largely utilised in social sciences, the aim of the inductive method is often to gain a better understanding of human behaviour. Compared to the deductive approach, an inductive approach leaves room for new ideas and is not limited to the controlled choice of answers regarding a specific research problem. Therefore, Easterby-Smith et al. (2012) argue that inductive methods typically require a smaller sample size.

Mingers (2003) recommends a mixed method study, as it provides the opportunity to increase the validation and reliability of the study. This is supported by Saunders

et al. (2009) who claim that a combination of data collection techniques within a study increase the correct interpretation and validity of results. Therefore, a combined inductive and deductive approach was implemented in this study in order to facilitate the understanding and interpretation of primary data. The primary reason to employ a both approaches was the limited literature available with regards to mobile AR user requirements in the urban heritage context. While AR has been studied to a great extend in tourism as well as other industries, AR is still considered a new technology to be implemented in urban heritage tourism and has not yet been widely developed and employed in this area. As a result, literature as well as the public awareness of the technology was limited. Creswell (2007) suggests a combined approach particularly when literature on the topic is limited due to investigating new areas. Therefore, the primary research first employed an inductive approach of exploratory nature to establish an understanding of requirements and develop a mobile AR demonstrator application, and then a deductive research approach to prioritise and reduce the requirements to develop the QFD model.

5.5 Research Strategy

In order to determine the appropriate research design, it is crucial that the purpose of the research as well as the aims the study are identified beforehand. Although Robson (2002) argues that the research purpose is flexible and might change in the process of the study, a clear understanding should be evident in order to accurately define the research method. Saunders et al. (2009) distinguish between three research strategies; exploratory, descriptive and explanatory.

The exploratory study is generally seen to explore insight information and is therefore regarded valuable to find a solution to a specific problem, which lacks the explanation of origin or cause (Creswell, 2007). It is typically employed in areas that lack literature and prior research, such as studies in technological and business innovation (De Haes and Van Grembergen, 2009). Since the reaction or effect of a certain question is still unknown, exploratory studies are suited to establish an understanding of the underlying topic. Therefore, Saunders et al.

(2009) suggest three principal ways to conduct an exploratory study; the general literature search, in which existing literature and findings are identified concerning the research topic, interviews with experts in the field of study, based on qualitative data collection to get an insight of professionals in the field and focus group interviews, which should examine scenarios or research questions of the research topic in a controlled environment. According to De Haes and Van Grembergen (2009), the advantage of exploratory studies is the fact that they are very flexible and able to adapt to changes when applicable, due to the nature of new data and insight information that is added as more studies are conducted in a specific area. Saunders et al. (2009) agrees that as people get a deeper understanding of the subject, the topic is likely to change accordingly.

The descriptive study on the other hand aims to picture a specific profile of various research objects in all its detail rather than to uncover a new idea. According to Creswell (2007), it is often necessary to have a descriptive understanding of a research object before being able to conduct an explanatory or exploratory study as a step to understand the underlying topic. Saunders et al. (2009) note that descriptive studies are important to establish a base understanding before assessing a situation or anticipating specific outcomes. However, Saunders et al. (2009) further argue that descriptive studies are weak to the argument of defining a clear study purpose. Although the outcome of descriptive studies might be interesting, it is often criticised to lack a specific purpose for research. Therefore, an additional investigation after conducting a descriptive study is often necessary to draw conclusions and develop a meaningful result (Saunders et al., 2009).

Explanatory studies aim to establish relationships between variables that are considered in a research. While similar outcomes can be achieved using different strategies in qualitative research, explanatory studies focus on inter-relationships among variables as potential causes for a given outcome in contrast to exploratory studies (Creswell, 2007). While the setting is examined and explained, it does not give room for creating new ideas as exploratory research does. In explanatory research, data is collected and analysed using statistical tests in order to find explanations to phenomena (Saunders et al., 2009).

To reach the overall aim, the study drew on combining exploratory and explanatory research. Since the nature of this research was based on innovative technology, it was evident that literature in this matter was still limited. Therefore, an exploratory study was necessary in order to gain a better understanding of the current situation, such as technological standard and public awareness. By critically reviewing the literature, a foundation was acquired, which was supported by an initial qualitative research process in form of interviews and focus groups to explore the topic in theory as well as in practice. Furthermore, the study expanded into an explanatory research by investigating relationships of tourist and developer requirements and providing a quantitative priority system within the identified requirements for the QFD model.

5.6 Research Design

Qualitative research has often been criticised as being purely exploratory in nature resulting in findings not being reliable enough (Hair et al., 2007). In contrast, Maruyama (1998) argued that quantitative studies, while being supported with rigourous statistical analysis, would similarly not guarantee a more meaningful and accurate approach, but rather test the suitability of models and the reliability of an established hypothesis. Therefore, a mixed method approach should be considered to increase the reliability and validity of studies and enhance the research outcome (Mingers, 2003; Hair et al., 2007; Gray, 2009; Somekh and Lewin, 2011).

There have been debates about whether a mixed method approach is comparative to one-sided approaches (Alasuutari et al., 2008). According to Denscombe (2008), mixed method studies are used for research designs that incorporate a link between interview results and field experiments as well as analysis methods using factor analysis of Likert scale items. Tashakkori and Teddlie (1998) pointed out the conflict of paradigm wars within the social and behavioural sciences and the resulting pragmatistic view as acceptable third option in the conflict of paradigms. Johnson and Onwuegbuzi (2004) agreed claiming that a mixed method approach can be selected as an alternative and new approach of a research paradigm. A

mixed method research design is able to combine the strengths of both research methods to develop a more practical-oriented approach, as well as serve as a communication tool among researchers, as research is becoming more interdisciplinary and dynamic. It has been pointed out that mono-research methods, such as solely conducting qualitative research or quantitative research lack the vigorousness of providing meaningful and reliable data (Mingers, 2003; Hair et al., 2007; Somekh and Lewin, 2011). Gray (2009) added that a mixed method approach combining qualitative as well as quantitative research methods within the same study provides a process of development within the research and is therefore considered to enhance the overall research outcome. Saunders et al. (2009) in contrast state that each research method has its original purpose and therefore should not be seen as better or worse in comparison to another. Although the research method depends largely on the purpose of the research, Gray (2009) suggests commencing with qualitative research when using a mixed method approach, since the outcome of qualitative data is able to assist in the quantitative research design, particularly when identifying new variables.

Within mixed method research, Leech and Onwuegbuzie (2009) identify three measurements of mixed methods, the level of mixing (fully or partially mixed), time (research conducted concurrently or sequential) and emphasis (qualitative and quantitative research treated equally or more weight on one method). Leech and Onwuegbuzie (2009) argue that fully mixed methods are considered different to partially mixed methods. While fully mixed methods use qualitative and quantitative research methods within one and across many research stages, the partial mixed method has a clear division between stages. In the case of this study, qualitative research was conducted for Research Phase 1 and 2, and quantitative research for phases 3. Driscoll et al. (2007) further suggest a sequential mixed methods design where data collected in one research phase contributes to the data of the next phase. Driscoll et al. (2007) argue in this regard that sequential mixed methods are able to uncover emergent and unexpected themes during the analysis process. Although the study uses both qualitative and quantitative research methods, and is therefore considered a mixed method research, it follows in sequential order and therefore should be considered a partial and sequential mixed method study.

Research Phase 1 included the qualitative research in the form of semi-structured interviews with international tourists in Dublin as well as with industry experts and application developers. It aimed to establish an understanding of the current AR knowledge by tourists, as well as expert views, implementation criteria and challenges within AR application development. Therefore, it identified initial tourist as well as developer and industry expert requirements that were further analysed in the study. The interview findings were used to develop an AR demonstrator application that would allow the user to test a mobile AR tourism application based on the requirements from the interviews. The application was developed by a post-graduate student from the Dublin Institute of Technology in close liaison with the researcher and tested multiple times before moving to Research Phase 2 of the study. The second phase was conducted after the AR application demonstrators were developed by the post graduate student from the Dublin Institute of Technology, which provided sample functionalities of an AR tourism application derived from the interviews that was tested by participants before the post-experience research was conducted. The research for this phase was conducted through qualitative research in form of focus groups with young tourists from the UK as Research Phase 2. They were selected as one of the key market segments for potentially using AR tourism applications in collaboration with Manchester Metropolitan University and the Dublin Institute of Technology. The purpose was to confirm previously identified tourist requirements and to examine whether additional requirements were evident after experiencing the mobile AR application demonstrators. Research Phase 3 was conducted using the findings from the previous research phases to design questionnaires for the quantitative research. The purpose of this research phase was the prioritisation of tourist requirements followed by a reduction of requirements to identify the input content for generating the QFD model. Therefore, AR application developers were consulted for the translation of tourist requirements into technical design elements for the QFD model. This study was placed in the area of social sciences and investigates the requirements of tourists using mobile AR tourism applications in the area of urban heritage tourism. Figure 5.1 provides an overview summarising the research process.

Figure 5.1: The Research Process
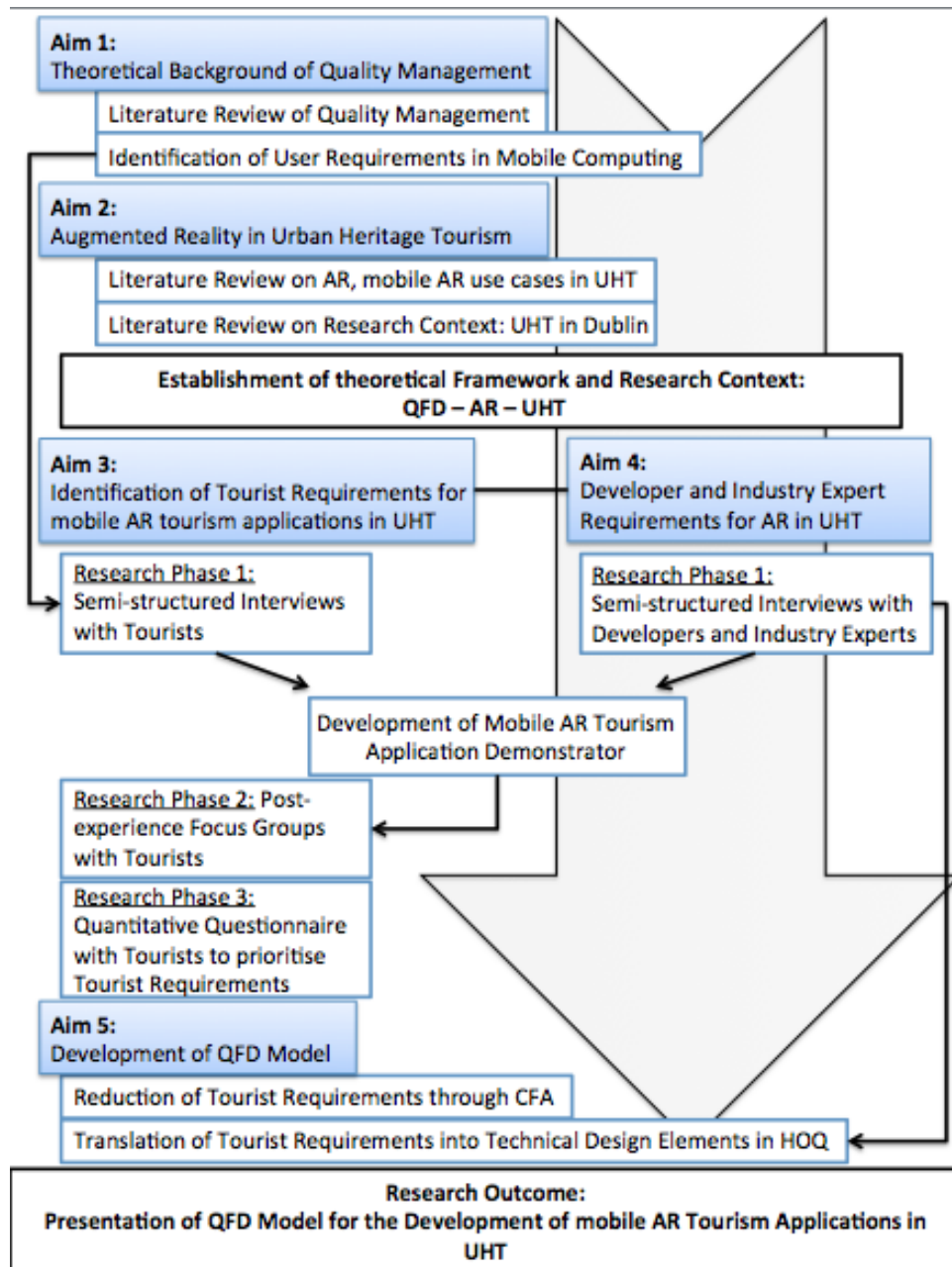
Source: author (2015)

5.7 Research Phase 1: Semi-Structured Interviews

Semi-structured interviews were conducted as the first phase of the primary research process. It aimed to establish a current understanding of tourists' knowledge of AR and to get an insight into the user behaviour of their mobile devices and applications in particular for tourism purposes. This research phase

provided an initial identification of tourist requirements for the further development of the study. Qualitative research techniques are often used to understand the research context and clarity in defining the research problem (Myers, 2009). Therefore, the following section will provide an in-depth explanation of the underlying research, including information regarding the population and sample size, the pilot interview and data collection.

5.7.1 Interviews with Tourists

Interviews with international tourists in Dublin were conducted as data collection technique for the first research phase. While Rowley (2012) argues that interviews require a smaller sample size compared to quantitative research techniques, Qu and Dumay (2011) state that interview outcomes cannot be generalised, due to the limited small sample not representing the whole population. However, according to Creswell (2007), qualitative data collection is aimed to explore new ideas and contexts rather than the testing of a hypothesis. Particularly for widely unexplored areas, qualitative studies are able to identify new concepts for further development. Therefore, tourist interviews were conducted in order to confirm the user requirements in the mobile computing context identified in the literature review and to investigate whether new requirements were evident in the selected research context. Additionally, an understanding of tourists' knowledge of AR and their mobile device behaviour was acquired.

Interviews are generally categorised into three forms, unstructured, semi-structured and fully structured interviews (Gill et al., 2008). According to Myers and Newman (2007), fully structured interviews are designed for a larger sample size and aim to generalise findings due to the nature of full guidance through the interview process and are therefore often used in positivistic approaches to test a hypothesis. However, it often limits the findings of new ideas and themes as part of the qualitative research aim. Myers and Newman (2007) therefore argue that semi-structured interviews are more suitable to gather new insights due to the limited guidance in the data collection process.

Semi-structured face-to-face interviews were conducted in this study in order to maintain the freedom to receive "unexpected and insightful information" (Hair et al., 2003:135). The interview questions were designed with reference to key research outcomes from the literature, providing the framework for the overall interview. However, while conducting the semi-structured interviews, the researcher maintained the freedom to adjust the interview questions depending on the provided responses to collect more in-depth information. A detailed process including pilot interviews and modification of interview questions will be discussed in the following sections (5.7.1.1, 5.7.1.2). Since the aim of the qualitative research was to identify new requirements in addition to the literature, it was crucial that the data collection process provided freedom for the interviewee to answer the questions according to their own ideas. All interviews were digitally recorded to support the interviewer to fully focus on the interview process and facilitate the transcribing process at a later stage and serve as reference for further analysis. The interview questions were developed according to the outcomes of the pilot interviews, and is further discussed in the following section (5.7.1.1). The final list of interview questions can be found in Appendix D.

5.7.1.1 Tourist Interview Design

A total of 18 questions were developed for the tourist interviews. The first questions (Q1 – Q3) were regarded as 'warm-up' questions to build rapport with the interview participant prior to moving to more specific questions (Gill et al., 2008). Additional follow-up questions were generated prior to the interview in case of insufficient data in the response. However, the interviewer took the liberty of asking any follow-up questions according to the flow of answers if considered relevant. Questions 20 and 21 were regarded as 'cool-down' questions suggesting any further comments and recommendations with regards to the AR application and its further implementation in tourism (Gill et al., 2008). While those questions were not specifically targeted at a topic, they provided the opportunity to collect any additional requirements that might not have been considered during the interview. The semi-structured interview questions are composed of four sections based on the previously identified criteria in the literature (Büyüközkan, 2009;

Karahasanović et al., 2009; Delagi, 2010; Gebauer et al., 2010; Herskovic et al., 2011; Dinh et al., 2013) and designed to focus on a variety of themes.

The first three questions (Q1 – Q3) focused on the current interaction with smartphones and tablets (Eastman and Iyer, 2004; Karahasanović et al., 2009; Pentikousis, 2010), and the behavioural pattern of tourists by examining the most commonly used applications. The questions are formulated to get an insight into the perceived benefits of mobile devices and their integration into tourists' everyday lives. The next questions (Q4 – Q5) were leading into the topic of AR, its awareness and past experience, as users were often found to lack technical knowledge with regards to information systems (Goncalves da Silva et al., 2009; Henfridsson and Lindgren, 2010). Furthermore, the perception of AR application examples was investigated to test the tourists' reaction and preference of computerised overlay. The main part of the interview (Q6 – Q13) was focused on identifying tourist requirements for mobile AR tourism applications by dividing the questions into function and content requirements in general and within a tourism application. This division confirmed previous user requirements in mobile computing from the literature as well as assisted in the identification of additional requirements in the mobile AR tourism context (Belimpasakis et al., 2010; Atherton et al., 2013). Questions 14 and 15 were included to explore the free Wi-Fi network in Dublin that was implemented in early 2013, however, they were asked as a favour for the Dublin City Council and were not considered in the data analysis process, as it was not part of the purpose of this study. Finally, the last part of the interview (Q16 – Q18) was designed in order to examine tourist motivations to use AR tourism applications aspired by user motivation studies (Boyd and Ellison, 2007; Brandtzæg and Heim, 2008) and identify key desires and benefits of mobile AR tourism applications to encourage repetitive use of the application (An et al., 2008).

5.7.1.2 Pilot Interview

Two pilot interviews in form of a personal face-to-face interview were conducted to assess the interview process and potential responses of interviewees and make

adjustments where it was considered necessary. According to Wimmer and Dominick (2013), this provides the opportunity to get a different view on responses and interview questions that might not have been considered while designing the questions. Due to the exploratory nature of Research Phase 1, the pilot interviews were conducted to assess the clarity of the interview questions as well as the range of freedom in the responses, while still remaining in the framework of the interview topic. The first two tourist interviews were therefore run with students from the Dublin Institute of Technology and used as pilot interviews to make necessary adjustments. The changes were listed in Table 5.1. The first interview took place on the February 22nd 2013 in a conference room of the Gresham Hotel in Dublin.

Table 5.1: Pilot Study

Question	Comments	Action taken
1	Satisfactory	None
2	Wording too technical	Used as follow up question to Q1
3	Wording too general	Divided into Q3 (Perceived Benefit) and Q4 (Reason for Adoption)
4	n/a	Wording adjusted, changed to Q5
5	Interviewees are unaware of "mobile AR" applications	Wording adjusted, moved to Q6
6	Question is too general	Question adjusted as follow up to Q5
7	Satisfactory	None
8	Follow up question needed for Q7	Follow up to Q7, previous Q8 moved to Q9
9	Question needs further elaboration	Wording adjusted, moved to Q10
10	Repetitive question	Question was removed
11	Satisfactory	None
12	Satisfactory	None
13	Question is repeated at later stage	Question was removed
14	Satisfactory	Moved to Q13
15	Question needs further elaboration	Details added, moved to Q14
16	Question provides examples of AR gamification	Wording adjusted, moved to Q15
17	Question needs further elaboration	Wording adjusted, moved to Q16
18	Question can be combined	Moved to Q16
19	Question can be combine	Moved to Q16
20	Satisfactory	Moved to Q17
21	Satisfactoy	Moved to Q18

Source: author (2015)

5.7.1.3 Tourist Interview Population, Sample Size and Data Collection

According to Saunders et al. (2009), it is crucial that the researcher identifies the target population from which a sample for the research is collected, since it is often not possible to conduct the research on the whole population due to practical issues. The population of the interviews was set as international tourists visiting Dublin. The main market segments of tourists in Dublin were identified based on the 2010 Annual Report of Failte Ireland, the Irish Tourism Authority and included international tourists from France, Germany, Spain, America and the UK.

Teddlie and Yu (2007) distinguish between probability and non-probability sampling. Probability sampling is determined by taking a known representative sample from the population, facilitating the acquisition of statistical characteristics from the total population, while non-probability sampling such as 'convenience sampling', 'snowball sampling' and 'purposive sampling' is not able to lead to statistical conclusions but are often used to explore new ideas (Teddlie and Yu, 2007). As tourists were selected through convenience sampling being recruited from the street, it was aimed to cover all main market segments mentioned in the 2010 Anntual Report of Failte Ireland. Furthermore, a wide variety of tourist profiles were aimed at in order to cover different market segments of tourists, from under 21 year olds to 50 and above years, as well as an equal amount of a male and female sample. DePaulo (2000) suggests 30 interviews as a starting point for a large population in order to be able to cover a majority of the most important customer expectations. While there is no agreed method on how many interviews are considered enough, Francis et al. (2010) recommends continuing the data collection process until data saturation is reached and no new insights are evident. Two interview sessions were conducted in February and April 2013 to collect a total of 26 tourist interviews and two pilot interviews. The table shows an overview of all interview participants. Since two pilot interviews were conducted, the actual 26 participants were labelled as TP3 – TP28 (Table 5.2).

Table 5.2: Interview Sample excluding Pilot Interviews (TP1, TP2)

Age group	Gender	Country of Origin	Initial	Duration of Interview
≤21	F	England	TP22	25 min. 44 sec.
≤21	F	France	TP15	29 min. 23 sec.
≤21	F	USA	TP20	16 min. 50 sec.
≤21	F	USA	TP4	25 min. 00 sec.
≤21	F	USA	TP5	33 min. 09 sec.
22-30	F	England	TP21	19 min. 37 sec.
22-30	F	Germany	TP13	21 min. 11 sec.
22-30	F	Germany	TP18	22 min. 50 sec.
22-30	F	Ireland	TP8	22 min. 25 sec.
22-30	F	Northern Ireland	TP10	24 min. 09 sec.
22-30	F	Northern Ireland	TP26	33 min. 27 sec.
22-30	F	Norway	TP28	23 min. 58 sec.
22-30	F	Spain	TP7	28 min. 32 sec.
22-30	F	Wales	TP17	28 min. 58 sec.
22-30	M	England	TP24	26 min. 08 sec.
22-30	M	France	TP9	22 min. 29 sec.
22-30	M	Germany	TP14	25 min. 02 sec.
22-30	M	Germany	TP19	23 min. 58 sec.
22-30	M	Ireland	TP11	59 min. 21 sec.
22-30	M	Ireland	TP3	17 min. 20 sec.
22-30	M	Norway	TP25	15 min. 32 sec.
22-30	M	Norway	TP27	25 min. 14 sec.
31-40	F	England	TP16	22 min. 56 sec.
31-40	F	Spain	TP6	18 min. 54 sec.
41-50	F	Northern Ireland	TP23	21 min. 24 sec.
41-50	M	France	TP12	48 min. 04 sec.

Source: author (2015)

The interviews were conducted in two stages. The first 15 interviews including the two pilot interviews were conducted between February 22nd and February 24th 2013 in a conference room of the Gresham Hotel in Dublin's O'Connell Street. The conference room was booked prior to the research and agreements were made with the Marketing Manager of the Gresham Hotel. The tourists were recruited on-site as well as on O'Connell Street in front of the Gresham Hotel. Further support was provided by Dublin City Bus Tours by creating awareness of the on-going research to its passengers during their tours. Although O'Connell Street is

considered one of the busiest main roads within the Dublin City Centre, it was found that tourists were often busy passing through the street and interviewee recruitment was challenging. Since the study aimed to develop a mobile AR tourism application for urban heritage tourism, it was decided that moving to a different urban heritage data collection site for the second part of the tourist interviews would not affect the final outcomes of the initial tourist interviews for Research Phase 1. The second part of interviews was conducted in the lobby of The Fleet Street Hotel, in the Temple Bar area, which is known as one of the main tourist areas in Dublin hosting many of the city's traditional Irish pubs and restaurants. Arrangements for the interviews were made beforehand, and a total of 13 additional interviews were conducted from April 11th to April 13th 2013. Once again, participants were gathered from the area around the hotel, and additional tourists were approached in the hotel lobby with prior consent of the hotel management. The interviews were all between 15.3 minutes (Interview 25) and 48.19 minutes (Interview 11), with an average length of 26 minutes. All interviewees signed a consent form prior to their participation, which can be found in Appendix A.

Before conducting the research, it was expected that interviewees would have little knowledge of AR or not be aware of AR due to the novelty of the technology in the consumer market. Therefore, three AR examples were prepared based on text overlay, image overlay, and video overlay. Aurasma was used to create the AR experiences without additional cost or involvement of application developers. Although the questions were originally categorised into two separate interview questions, for AR experienced and non-AR experienced interviewees, it was found that the majority of interviewees did not have prior knowledge of AR, while the ones with prior knowledge were very limited and therefore the interview questions were combined into one set of questions. As many participants had none to limited knowledge about AR, questions were mostly based on the expectations after experiencing the provided AR examples prior to the interview. Therefore, the initial tourist interviews in Research Phase 1 were regarded as 'pre-AR experience study'. A second qualitative research was conducted (5.8 Research Phase 2) after the development of AR demonstrators in Dublin as 'post-AR experience study'. A consent form and profile sheet was provided for all participants in order to clarify

any ethical issues for the conducted research, which can be found in Appendix A and B.

5.7.2 Interviews with Industry Professionals

Interviews with industry professionals were conducted to get an understanding of developer requirements and perceptions of current challenges of AR as well as future directions of AR particularly in tourism. The AWE conference 2013 in Santa Clara was visited as an event that gathers the majority of the top AR and platform developers from around the world, while interviews with industry experts in Dublin were conducted in Dublin itself. A similar interview structure was employed to interview AR application developers and industry experts in Dublin. The researcher made sure to include interviewees from various positions including CEOs, marketing directors and application developers to gain an understanding on developer and industry expert requirements in the field of AR and for the urban heritage tourism context in Dublin. The questions were semi-structured and designed in alignment with the structure of the tourist interviews. However, since industry professional interviewees were selected according to their individual profile, the focus was given to the identification of AR application requirements in tourism and excluded any questions that were aimed at identifying the participants' awareness of AR. As the interviews were conducted at different times and spaces, the interview destination was selected as a quiet space to the interviewees' convenience.

5.7.2.1 Industry Professionals Interview Design

While the interview structure was closely aligned to the structure of tourist interviews, mobile AR application developers were considered very knowledgable in technical aspects. Therefore, it was aimed to provide as much freedom as possible for interviewees to answer the questions. The first two questions (Q1 – Q2) were formulated in order to lead into the topic investigating the overall experience and contact with AR (Gill et al., 2008; Karahasanović et al., 2009; Pentikousis, 2010). The next two questions (Q3 – Q4) were designed in order to

identify developer requirements (Büyüközkan, 2009; Karahasanović et al., 2009; Dinh et al., 2013). By investigating the perceived challenges of mobile AR applications and expected AR development in the future (Delagi, 2010; Gebauer et al., 2010; Herskovic et al., 2011), the following six questions (Q5 – Q10) covered general perceptions of AR before moving to AR in the tourism context (Q11 – Q14). Three additional questions (Q15 – Q17) were prepared for the interviews with industry experts in Dublin. They related to the implementation of AR in Dublin to explore whether additional context specific requirements in urban heritage tourism were evident from experts in the study context. Therefore, a total of 14 questions were formulated for the developer interviews, with an additional three questions for industry experts in Dublin. The interview questions were first assessed for understanding by asking the first participant (EP1) from the AWE 2013 conference to read and confirm the interpretation of each question before conducting the interview. A formal pilot test to assess the time and potential responses was disregarded, as the questions were designed to leave as much freedom as possible for the interviewee to answer each question according to their full knowledge and experience. Therefore, a timeframe for the interview was not considered. All interview questions for the developer and industry expert interviews can be found in Appendix G. Depending on the flow of answers, additional follow-up questions emerged in individual interviews.

5.7.2.2 Industry Professionals Population, Sample Size and Data Collection

The population for the developer interviews were mobile application developers working with AR technology as well as business managers within AR companies. Industry experts included a regional hotel marketing director, a tourism development consultant and mobile application developer with expertise in the tourism field in Dublin. Interviewees were carefully selected through purposive sampling in order to get a variety of different perspectives within the AR industry to explore different views of the technology. Therefore, the developer interviews were conducted with leading AR application developers and business managers at the Augmented World Expo 2013 in Santa Clara. The main aim of developer

interviews was the identification of developer requirements and therefore mainly identified by AR application developers. Nonetheless, industry experts from Dublin were considered important to get a more context-driven view. For a homogenous group, such as experts in a given area, Guest et al. (2006) recommend using a minimum of six interviews to collect reliable qualitative data. However, Saunders et al. (2009) advise to continue the interview process until data saturation is reached, so there are no new views and insights arising to a specific topic. Data saturation was evident after interview outcomes were suggesting similar findings for the main interview questions directed at the identification of developer requirements and current challenges of AR development.

For the interviews with industry professionals, six interviews were conducted with AR application developers in Santa Clara, and three additional interviews with industry experts in Dublin. The participants included marketing and product managers, CEOs, AR culture and museum managers and AR application developers. Interviewees in Santa Clara had a minimum of two years experience working with AR and up to 10 years experience developing and experiencing AR and VR applications. The interviews lasted 36 minutes in average, ranging between 19 minutes to 1 hour and 5 minutes, which allowed a deep understanding of the interviewee's perceptions around the topic of AR and implementation opportunities in tourism. Additional three interviews were conducted with industry experts in Dublin, including a Dublin Tourism consultant, a mobile application developer with expertise in tourism and Sales and Marketing Director who was responsible for the marketing activities of multiple hotels in and around Dublin. All industry experts had some knowledge about AR applications.

The first six interviews were conducted at the Augmented World Expo 2013, an exhibition considered to be the 'world's largest gathering of technology professionals' (AWE, 2014) which is now at its 5th year since being established. Being largely an industry-focused conference, it caters for a large set of technologies and programs that are developed to enhance human-computer interaction and therefore gathers top developers within the AR sphere every year to discuss challenges and share solutions. Using purposive sampling, interviewees were identified according to their field of expertise by having a short conversation

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prior to the interview with regards to their position and background as well as time of experience working with AR. All developer interviews were face-to-face and conducted between June 4th and June 5th 2013, during the time of the AWE 2013 conference. The semi-structured interviews were partially conducted within the exhibition hall due to the responsibilities of the interviewee and some in a nearby lounge area if the situation allowed being in a more comfortable and quiet atmosphere. A visit to Dublin was made from June 26th to June 28th 2013 in order to conduct face-to-face interviews with industry experts in Dublin tourism. EP9 was interviewed within the lobby of The Gresham Hotel, while the interview for EP1 took place at a public café and EP8 in a Clubhouse in Malahide, a suburb of Dublin. While all tourist interviews signed consent forms, expert interviews were conducted in the flow of informal conversation (Gall et al., 2003) to identify a diversity of job roles and expertise in AR. Therefore, consent was provided verbally before starting to digitally record the conversation. All interviewees were informed about the nature and purpose of the interview prior to conducting the interview and agreed to the recording of the interview for the purpose of this study.

5.7.3 Tourist and Industry Professionals Interview Analysis

In order to analyse the data collected in the interviews, thematic analysis was employed. Thematic analysis is regarded as a process that creates themes around a specific topic and identifies reoccurring themes in the data and develops a framework of themes for data interpretation (Flick, 2002). Additionally, Denzin and Lincoln (2005) argue that thematic analysis is often used as communication tool to present and interpret findings between researchers using other analysis methods. The created themes were based on previously identified themes according to the literature, which has been argued as one of the most commonly used method in thematic analysis (Boyatzis, 1998). The identified themes from the literature, such as simple and authentic user interface (Tan, et al., 1998; Herzwurm and Schockert, 2003; Zheng and Pulli, 2005; Pulli et al., 2007; Gafni, 2008), relevant and updated information on the surrounding (Herzwurm and Schockert, 2003; Gafni, 2008), and social functions (Herzwurm and Schockert, 2003; Zheng and Pulli, 2005; An et al., 2008) were used as a guideline to design the interview

questions. They were then coded manually by generating a codebook (Appendix C, F) as recommended by Neuendorf (2002) to facilitate the organisation and identification of themes and relationships in the data. As the primary goal of the interviews was the identification of tourist and developer requirements for mobile AR tourism applications, themes were identified in alignment to the codebook to find newly emerged themes from the interviews. Although the process of counting themes is recommended by Krippendorff (2004) in order to rate the importance of each theme, it was considered a more valid method for quantitative data analysis, and was therefore disregarded in this analysis process. Instead, all emerged themes were taken into consideration in the findings. After generating the codebook, identified themes and requirements were contrasted with the findings from the literature to uncover newly emerged requirements. International tourists were analysed as a group while AR application developers and industry experts in Dublin were regarded homogeneous groups and as a result analysed as individuals due to their different backgrounds. After analysing the collected data from the interviews, two AR application demonstrators were developed which were influenced by the most often reoccurring requirements. Limitations and ethical considerations of all research phases of the primary research will be discussed separately in sections 5.11 and 5.12. The applications were utilised for Research Phase 2, in which tourists tested the application to confirm and identify requirements after experiencing a few functions of a mobile AR tourism application.

5.8 Research Phase 2: Focus Groups (post-experience study)

The second research phase was conducted as post-experience study in form of focus groups for the identification of requiremnets as suggested by Dantas et al. (2009). Therefore, a mobile AR tourism application demonstrator was developed based on identified tourist and developer requirements to provide participants of Research Phase 2 with a personal experience before discussing the focus group questions. Researchers argue that the combination of interview and focus group outcomes can also be used for the purpose of data completeness and confirmation of findings (Adami 2005, Halcomb and Andrew 2005). Previous research suggests the eligibility of interviews followed by focus groups as supporting data collection methods to confirm findings (Plack, 2006). Therefore, this research phase was to confirm the interview outcomes from Research Phase 1 and add or modify requirements if necessary. While it was a second round of interviews was possible for this phase, focus groups were considered for this research phase as inductive method. Lambert and Loiselle (2008) suggest the triangulation of interviews and focus groups as data collection methods to enhance the data richness and improve trustworthiness of findings. Having participants discuss the same application experience among each other was believed to explore whether participants had different perceptions and encourage the critical thought process of interviewees to determine which requirements were considered relevant for the final mobile AR tourism application. Brewer and Hunter (1989) suggest for mixed method designs to use different research strategies, approaches and methods in order to reach superior findings compared to mono-method studies. This was further supported by Johnson and Onwuegbuzi (2004), who highlighted to supplement qualitative studies with a different research instrument to approve previous findings or modify the interpretations of conflicting results accordingly. While one-to-one interviews are considered insightful and often used for exploratory research, focus groups provide the opportunity of encouraging discussions and identify opinions of participants, creating new ideas through gathering thoughts collectively. As Silverman (2013) argued that focus groups are often referred to as 'group interviews'. However, moderators should not ask participants individual questions, but rather facilitate and encourage discussion among group members to

collect meaningful data. This was supported by Kitzinger (1995) who acknowledged that focus groups are an easy way to get a bulk of information from a number of participants in a short period of time, while generating new ideas and helping participants to interact and exchange opinions. Critique or concerns were considered important areas but were argued not to come up frequently in interviews. Therefore, Kitzinger (1995) identified the strength of focus groups for getting participants to raise concerns or criticism about certain subject areas. Participants could therefore feel strengthened in their opinion if another participant raised a similar concern. However, Hair et al. (2007:198) argued that it is difficult to make assumptions solely based on focus groups due to its small size, and suggested that researchers should consider focus groups as "discovery-oriented" method. This was supported by Kitzinger (1995) who revealed that some studies use only a small number of participants in focus groups, while others choose to conduct focus groups with more than fifty participants. A focus group encouraging discussion among participants was regarded as the appropriate data collection method for this phase. According to Morgan (1998), focus groups usually consist of six to eight participants and a moderator who follows a prepared set of questions to guide the discussion. However, due to time and space restrictions, a total of 49 participants forming four focus groups with ten participants each and one focus group with nine participants were conducted between November 4th to November 6th 2013. Semi-structured questions were designed to investigate the reaction to the provided AR demonstrators as well as to examine general expectations about AR tourism applications. Since the aim of the focus groups was to add to Research Phase 1 on basis of experiencing the developed AR demonstrator applications, further questions regarding the future development of AR were not included in the focus group discussion. Instead, the focus groups were guided to encourage open discussion among participants with minimal interference of the researcher.

5.8.1 Focus Group Question Design

A total of eight semi-structured questions including follow-up questions depending on the flow of the focus group were designed and tested for clarity with two students from Manchester Metropolitan University prior to the trip to Dublin. A pilot focus group study was not conducted separately. Minor adjustments in wording were made and Question 7 was divided into personal and potential third person perception. Hair et al. (2007) revealed that semi-structured questions are mostly used in focus group research, as it allows the participants to answer questions freely and for the moderator to elaborate certain themes that emerged within the flow of conversation. In addition, Kitzinger (1995) identified that if group dynamics work well, the flow of the interview could take unexpected turns revealing new insights. Therefore, the semi-structured interview design allows the researcher or moderator to accommodate changes on the order or adding of questions. As Research Phase 2 in form of focus groups was designed as post-experience study, an introductory question to lead into the topic was considered irrelevant. Instead, focus group questions were divided into two categories. The list of questions is attached in Appendix M. Questions Q1 – Q3 focused on the experienced Dublin AR tourism application demonstrators that were designed for the purpose of this study. The following questions (Q4 – Q8) were designed to explore additional tourist requirements for general mobile AR tourism applications after the first-hand experience. Q4 focused on function requirements (Durscha et al., 2004; Zheng and Pulli, 2005; Lee et al., 2007; Github, 2009; Kenteris et al., 2009; Zoellner et al., 2009; Belimpasakis et al., 2010; Hill et al., 2010; Schinke et al., 2010; Song et al., 2010; Carmigniani et al., 2011; Herskovic et al., 2011; Dinh et al., 2013), Q5 and Q6 on content requirements (Damala et al., 2008; van Krevelen and Poelman, 2010; Marimon et al., 2010; Olsson and Salo, 2011; Graham et al., 2013) and Q7, Q8 were designed to address user resistance (Buellingen and Woerter, 2004; Pulli et al., 2007; Wang and Liao, 2007; Gafni, 2008; Mistry et al., 2008; Papagiannakis et al., 2008; Delagi, 2010; Gebauer et al., 2010).

5.8.2 Focus Group Population, Sample Size and Data Collection

While the target market of tourists for mobile AR tourism applications is largely undefined and differs according to the context of implementation (Bulearca and Tamarjan, 2010), the study focused on young adults as the target audience for this study due to their exposure and attitude towards technology and its usage in their daily lives (Caruso, 2004). As public awareness of mobile AR applications in tourism was still limited at the time of research, the young tourist market was considered a suitable sample for the purpose of the focus groups. Caruso (2004) argued that this market segment is the most likely to use new technology naturally, as they have been in contact with technology and the Internet their whole life. For the second research phase, it was essential that participants would not require time to learn how to interact with the application during the research. This would allow participants to focus on the functions and content of the application and reduce potential issues with the interaction. This market segment of 18 to 29 year olds was defined by Lenhart et al. (2010) as the 'Millennial' generation. In a study investigating perceptions of digital technology for learning, Ali et al. (2014) outlined that students were using technology mostly for convenience and timesaving purposes. In this regard, it was generally distinguished between technology used for study purposes and social undertakings. However, Ali et al. (2014) suggested that it could increasingly blend into each other showing that social media sites could also be used for educational purposes. Having been born and grown up with the Internet, Bennett and Maton (2010) argue that young adults have generally accepted technology as part of their lives and would therefore prefer a moderate use of technology in their lifestyle. Bulearca and Tamarjan (2010) further claim that 18 to 30 year olds are likely to be first targeted by AR applications among the target audiences. Although the selected sample population limited the potential users of mobile AR tourism applications for this test, it was considered appropriate to investigate young adults as the key market segment for this study, since the target market highly depends on the context of the application. Most participants were British young adults and visiting Dublin for the first time. As a result, most participants were between 21 and 29 years old, while only some had prior experience with AR.

All participants were invited to O'Connell Street at a scheduled time to experience the developed mobile AR demonstrator applications on site. Due to technical limitations to merge functionalities, two demonstrators were designed and tested by all participants prior to the focus groups. The first demonstrator was generated around GPS-based AR, providing three points of interest in O'Connell Street (The Spire, The General Post Office, The Gresham Hotel) that participants could interact with to receive more information. The second demonstrator was developed within the museum of the General Post Office (GPO). Participants were equipped with three mobile devices with the preloaded applications and invited inside the museum to test the AR applications. Two images were overlaid with storytelling information providing a different view and tourist experience of the applied objects. Focus groups were then conducted in an allocated classroom of the Dublin Institute of Technology to examine participant reactions and identify additional tourist requirements. All focus groups were digitally recorded and lasted an average of 25 minutes. While conducting the focus groups, moderators should record the focus group in order to fully capitalise on all the verbal outcomes, feelings and emotions, especially if facial expressions are of importance for the findings, video recording is considered the best option (Kitzinger, 1995). Therefore, each focus group was recorded on video after each participant agreed to be recorded by signing a consent form (Appendix K). This allowed the capture of discussions as well as the analysis of non-verbal reactions from participants and facilitated the transcribing process for later data analysis.

5.8.3 Focus Group Analysis

In order to analyse the collected data in the focus groups, thematic analysis was conducted. As mentioned in section 5.8, thematic analysis is an analysis technique that inspects data for recurring themes. The themes were compared to previously identified themes in the literature and Research Phase 1, and examined for reoccurring or newly emerging themes. A codebook was designed after transcribing all focus groups in alignment with previous themes identified in Research Phase 1. According to Silverman (2013), the codes are then applied

across the focus group transcripts. While quantitative researchers argue that the coded data then has to be analysed quantitatively (Neuendorf, 2002), qualitative researchers disagreed claiming that valuable parts of the conversation that are not part of the codebook would therewith be lost (Silverman, 2013). Therefore, all identified themes were considered and implemented into Research Phase 3 for the design of the quantitative questionnaire to test and prioritise the outcomes using a quantitative research method.

5.9 Research Phase 3: Quantitative Questionnaire

The quantitative questionnaire was conducted to prioritise and reduce the identified tourist requirements. This step was necessary in order to establish an importance rating among the essential tourist requirements for the QFD model. While the core of this study was of exploratory nature, the quantitative research aimed to provide the scope of tourist requirements that were imported into the QFD model for the development of mobile AR tourism applications. The following will provide details of the questionnaire design, population and sample size as well as method of data collection and analysis.

5.9.1 Pilot Questionnaire

A pilot questionnaire was conducted in order to pre-screen the questions for understanding, as suggested by Sekaran and Bougie (2010). Furthermore, it measured the significance of the themes and questions as well as relevancy of measurement items. It allowed modification before the final quantitative questionnaire was conducted. Gray (2009) argues that pilot questionnaires are generally conducted to ensure the comprehension of questions and reduce any misinterpretations or non-responses. As it was suggested to test the pilot questionnaire in several occasions with a similar target group (Gray, 2009), two tests were run with students from Manchester Metropolitan University who had previously experienced the AR demonstrators in Dublin in close time proximity from each other.

5.9.1.1 Pilot Test Sample and Data Collection

Before conducting the first pilot test, the questions were tested by asking two students to read through the questionnaire and provide feedback on any wording or sentences that were unclear. Most of the issues were identified as using technical jargon in the questionnaire. In addition, it was advised to change the word "user" to "tourist" to make it more relevant for the respondent. Furthermore, 'User Resistance' questions were modified in order to read personal statements (e.g. "People are unaware of Augmented Reality" → "I do not use AR tourism applications because I was unaware of Augmented Reality"). The following questions were modified (Table 5.3).

Table 5.3: Questionnaire Pilot Test

Question	Initial Question	Revised Question
FR1	Simple and easy to navigate User Interface	Simple and easy to navigate through the application
FR 2	Pinpoint user's location on a map through GPS and provide directions to POI	Pinpoint tourist's location on a map through GPS and provide directions to tourist attractions and restaurants/hotels
FR11	One platform to access all tourism relevant information	One application to access all tourism relevant information
FR17	Authentic application design and graphics	Simple and professional application design and graphics
FR21	Secure tourist data management	Tourists' data security
CR13	Application is available in other cities	Application is available in other cities besides Dublin
UR20	People would avoid the application if they are from the area	People would avoid the application if they are from Dublin

Source: author (2015)

After modifying the questionnaire according to the feedback (Table 5.3), the pilot test was conducted on two separate dates. Therefore, the questionnaire was tested to ensure the reliability and validity of the established themes and identified tourist requirements (Hair et al., 2003). The first test was conducted on January 31st 2014 and the second test on February 10th 2014. Both tests were conducted in a classroom at Manchester Metropolitan University. It was suggested by Hair et al. (2003) to conduct pilot tests with no more than 30 participants with a similar profile to the target sample. A total of 19 responses were collected from the first and additional 7 responses from the second pilot test. Students were shortly introduced to the purpose of the questionnaires and invited to participate as respondents. All participants that conducted the reliability test had participated in the focus groups in Dublin for Research Phase 2 and therefore were familiar with the AR demonstrators and context of the study. Since the researcher was

distributing the questionnaires personally, they were filled out and returned on-site, and completeness of responses could be assured.

5.9.2 Quantitative Questionnaire Design

The quantitative questionnaire consisted of two categories. The first questions indicated a brief demographic profile of the respondent including gender, age, current educational degree, occupation, income and marital status as well as previous AR experience in order to record a profile of participants for further analysis. The second part of the questionnaire focused on three classifications that were identified after analysing the qualitative data from Research Phase 1 and 2. The classifications included Function Requirements (FR), Content Requirements (CR) and User Resistance (UR) towards AR tourism applications. Function Requirements (FR) were divided into subcategories previously defined in the qualitative interviews, such as Accessibility (Buellingen and Woerter, 2004; Durscha et al., 2004; Zheng and Pulli, 2005; Lee et al., 2007; Wang and Liao, 2007; Papagiannakis et al., 2008; Github, 2009; Kenteris et al., 2009; Zoellner et al., 2009; Belimpasakis et al., 2010; Delagi, 2010; Gebauer et al., 2010; Hill et al., 2010; Marimon et al., 2010; Schinke et al., 2010; Song et al., 2010; van Krevelen and Poelman, 2010; Carmigniani et al., 2011; Herskovic et al., 2011; Olsson and Salo, 2011; Dinh et al., 2013; Graham et al., 2013), Interaction (Buellingen and Woerter, 2004; Leem et al., 2004; Wu and Wang, 2005; Zheng and Pulli, 2005; Ngai and Gunasekaran, 2007; Pulli et al., 2007; Turner et al., 2007; Wang and Liao, 2007; Gafni, 2008; Papagiannakis et al., 2008; Takacs et al., 2008; Zhou et al., 2008; Dantas et al., 2009; Karahasanović et al., 2009; Kenteris et al., 2009; Morrison et al., 2009; Zoellner et al., 2009; Gebauer et al., 2010; Marimon et al., 2010; Schinke et al., 2010; Carmigniani et al., 2011), Navigation (Wang and Liao, 2007; Gafni, 2008; Grun et al., 2008; Kenteris et al., 2009; Delagi, 2010; Marimon et al., 2010; Schinke et al., 2010; Shi et al., 2010; Herskovic et al., 2011; Olsson and Salo, 2011; Morrison et al., 2011; Dinh et al., 2013), Information Filter (Buellingen and Woerter, 2004; Durscha et al., 2004; Zheng and Pulli, 2005; Swallows et al., 2007; Wang and Liao, 2007; An et al., 2008; Gafni, 2008; Huang and Bian, 2009; Karahasanović et al., 2009; Kenteris et al., 2009; Marimon et al.,

2010; van Krevelen and Poelman, 2010; Herskovic et al., 2011; Morrison et al., 2011; Graham et al., 2013), Language (Marimon et al., 2010; Schinke et al., 2010; Gannes, 2013), Security (Morrison et al., 2009), and Social Media (Zheng and Pulli, 2005; An et al., 2008; Ferguson, 2008; Karahasanović et al., 2009; Herskovic et al., 2011; Milano et al., 2011; Johnson et al., 2012). Content Requirements (CR) was divided into Additional Information (Damala et al., 2008; Zoellner et al., 2009; van Krevelen and Poelman, 2010; Morrison et al., 2011; Olsson and Salo, 2011), Travel specific Information (Damala et al., 2008; van Krevelen and Poelman, 2010; Marimon et al., 2010; Olsson and Salo, 2011; Graham et al., 2013), Map (Wang and Liao, 2007; Gafni, 2008; Grun et al., 2008; Kenteris et al., 2009; Delagi, 2010; Marimon et al., 2010; Schinke et al., 2010; Shi et al., 2010; Herskovic et al., 2011; Olsson and Salo, 2011; Morrison et al., 2011; Dinh et al., 2013), User Review and Ratings (Zheng and Pulli, 2005; Pan and Fesenmaier, 2006; An et al., 2008; Gretzel and Yoo, 2008; Karahasanović et al., 2009; Li et al, 2009; Delagi, 2010; Johnson et al., 2012), Public Transportation and Weather. The last two categories, Public Transportation and Weather were not previously identified in the literature, but emerged in the qualitative research of this study. In order to investigate User Resistance (UR), the following categories were defined from the qualitative research; Software Limitation (Derek, 2004; Durscha et al., 2004; Wu and Wang, 2005; Zheng and Pulli, 2005; Lee et al., 2007; Wang and Liao, 2007; Gafni, 2008; Dantas et al., 2009; Kenteris et al., 2009; Herskovic et al., 2011; Dinh et al., 2013), Hardware Limitation (Buellingen and Woerter, 2004; Pulli et al., 2007; Wang and Liao, 2007; Gafni, 2008; Mistry et al., 2008; Papagiannakis et al., 2008; Kenteris et al., 2009; Delagi, 2010; Gebauer et al., 2010; van Krevelen and Poelman, 2010; Carmigniani et al., 2011; Dinh et al., 2013), Awareness, Risk (Buellingen and Woerter, 2004; Derek, 2004; Zheng and Pulli, 2005; Lee et al., 2007; Gafni, 2008; Papagiannakis et al., 2008; Dantas et al., 2009; Karahasanović et al., 2009; Zoellner et al., 2009; Delagi, 2010; Carmigniani et al., 2011; Herskovic et al., 2011; Dinh et al., 2013; Graham et al., 2013), Learning Effort and Prior Research. Within UR respectively, Awareness, Learning Effort and Prior Research were categories that were defined in the qualitative research stage and not previously identified in the literature. The last three questions in the questionnaire were designed for feedback purposes on the developed AR application demonstrator used for the study.

Measurement items were rated on a 5-point Liker Scale (1 Strongly Disagree/Not at all important to 5 Strongly Agree/Very Important). All measurement items were designed in alignment with previously identified user requirements in the mobile computing context (Herzwurm and Schockert, 2003; Zheng and Pulli, 2005; Pulli et al., 2007; Gafni, 2008; An et al., 2008). Furthermore, outcomes of the initial two research phases were used to identify the measurement items for the quantitative questionnaire. The objective of the questionnaires as deductive research approach was the allocation of importance ratings and prioritisation of identified tourist requirements before reducing them to valid requirements for the development of the QFD model. The final questionnaire can be found in Appendix O.

5.9.3 Quantitative Questionnaire Population, Sample Size and Data Collection

The population for the quantitative questionnaire was targeted at international tourists from the young market in Dublin. Therefore, a stratified sampling method was employed focused on the young tourist market (Yu and Chang, 2008; Peres et al., 2011). However, other respondents, such as other international tourists were not excluded as the AR demonstrators were not designed to target a specific market segment. Since the aim of conducting the quantitative research was to prioritise and reduce tourist requirements, Gorsuch (1983) and Kline (2005) recommended obtaining a minimum sample size of 100 responses to derive meaningful interpretations of the data. This was supported by Garson (2008) arguing that the sample size should either be five times the number of subjects measured, or 100 in total. Therefore, a minimum of 100 responses was considered an acceptable sample size for the purpose of the quantitative study in this research.

The quantitative research was conducted from the 21st of February to the 24th of February 2014 in Dublin. Although participants were recruited in front of the General Post Office, the majority of respondents were gathered in cooperation with the Dublin Institute of Technology, offering to recruit domestic and

international tourists to take part in the research. The research was conducted on Dublin's O'Connell Street due to the location of the General Post Office which was used for the development of the mobile AR application demonstrators. All participants were allocated into groups and scheduled at different times throughout the day. Each group consisting of 3 to 6 people experienced the demonstrator applications before filling out the questionnaire. Therefore, each group gathered in front of the General Post Office (GPO) and were shown the GPS-based AR demonstrator, which was used for the focus groups (Research Phase 2). Afterwards, each group was lead into the GPO museum where the researcher provided three mobile devices with the preloaded marker-based AR demonstrator for the GPO museum. The participants were given approximately 10 minutes to experience the application in the GPO museum on-hand and were afterwards invited to fill out the provided questionnaire. On February 21st, 29 responses were collected, on February 22nd additional 71 responses and February 23rd 6 more responses resulting in a total of 106 completed questionnaires for the quantitative research. Reliability and validity issues will be further discussed in section 5.10.

5.9.4 Quantitative Questionnaire Analysis

In order to analyse the collected data for reliability and validity as well as to prioritise and reduce tourist requirements, all responses were put into SPSS 22 and analysed and reduced using confirmatory factor analysis (CFA) through SmartPLS 2.0 (Hartono, 2012; Hartono et al., 2012). While literature suggests conducting Exploratory Factor Analysis (EFA) prior to CFA (Kim and Mueller, 1978; Thompson, 2004), EFA is typically used to generate a model, while the structure and factors of the model are generally unknown. However, the purpose of using factor analysis in this study was solely the reduction of requirements for entry into the QFD model. Since it was not required to establish a separate model, the step of EFA was disregarded and only CFA was employed. While SmartPLS 2.0 was used for conducting CFA, the analysis software is typically used for PLS regression analysis, which is considered one of the statistical analysis approaches of Structural Equation Modelling (SEM). SEM is a statistical technique "based on analysis of covariance structures that explicitly models measurement errors and

seeks to derive unbiased estimates for the relationships between latent constructs." (Rouse and Corbitt, 2008:846). SEM works with latent variables, which measure the dependency among each of them in order to test a hypothesis (Maruyama, 1998). Since the purpose of conducting quantitative research was to identify importance ratings and reduce requirements, the inter-dependancy of variables was not considered. Other programs for SEM include Lisrel and Amos, however, they are both covariance-based analytical techniques (Haenlein and Kaplan, 2004; Hsu et al., 2006; Rouse and Corbitt, 2008; Chen, 2011) and did not suit the purpose of the quantitative research in this study. SmartPLS 2.0 was selected due to its availability and more advanced method of conducting factor analysis (Nazarpoori et al., 2013). Henseler (2010) argued that SmartPLS 2.0 requires a smaller sample size compared to using other analytical programs, such as Amos and Lisrel. According to Maeding (2009) Lisrel requires a minimum sample size of 200 responses, while SmartPLS 2.0 is able to provide a reliable analysis with as few as 100 samples. SmartPLS 2.0 uses statistical indicators including "extracted average variance, Cronbach's alpha coefficients and composite reliability" (Nazarpoori et al., 2013:4) in order to test the validity and reliability of models. In SmartPLS 2.0, all variables are given a specific weighting based on the mathematical algorithm employed in the software. This is particularly valuable for the reduction of requirements through CFA, as indicators with weaker weightings were assigned lower significance. However, Rouse and Corbitt (2008) have pointed out the limitation of using SmartPLS, as it is not able to explain any co-variations accurately and was therefore argued to provide only a "soft modeling" approach (Maeding, 2009). Hsu et al. (2006) further pointed out the possibility of bias data due to the limited sample size, which can be tackled through a larger sample. Nonetheless, Henseler (2010) stated that software such as SmartPLS and PLS-Graph have added to the reliability of complex model testing. Therefore, CFA was employed in this study through SmartPLS 2.0 in order to test the validity and reliability of the data and prioritise and reduce tourist requirements to generate the QFD model.

5.10 Reliability and Validity

This section will discuss the reliability and validity issues that were considered in this study for all research phases. Hair et al. (2003) argues that validity and reliability of any study are of high concern, particularly for the interpretation and generalisation of data. Validity refers to the accuracy of the data, while reliability is concerned with the consistency of the data (Hair et al., 2003). Therefore, it is crucial that data collection is conducted objectively to avoid misinterpretation and bias data. Robson (2002) identified four potential errors that might occur within the data collection including subject of participant error, subject of participant bias, observer error and observer bias. Subject of participant error can occur while the research is conducted on different times and places, resulting in the change of attitude or mood of participants towards a given topic. As the primary research for this study was conducted with different groups of participants on different times, the condition and attitude of participants towards the research could have had an effect on the provided answers and will be acknowledged in the limitations of the study. Subject of participant bias deals with the issue of participants not answering questions according to their honest opinion, but rather according to their perception of what the right answer should be. Observer error on the other hand can occur when having more than one researcher to interpret the collected data, as interpretations and perceptions can differ. However, as this research was conducted as part of a PhD study and therefore involved only one researcher through the whole study, observer bias was not evident. Furthermore, participant bias was reduced through a mixed method approach in the study.

According to Veal (2011) the mixed method approach is helpful to increase the trustworthiness as well as the validity and reliability of the collected data, since both, qualitative as well as quantitative research are conducted within one study. It was criticised whether qualitative research alone can obtain validity due to the small sample size limiting its generalisability (Hair et al., 2007; Saunders et al., 2009). Quantitative research, which is designed on basis of outcomes of a preceding qualitative research, can therefore increase the validity of the study significantly (Gray, 2009), as qualitative findings can be confirmed and reasons for contradiction identified. Saunders et al. (2009) argues that reliability in quantitative research refers to the consistency of the questionnaire findings regardless of the time and sample. Silverman (2013) added that reliability in

qualitative research is limited and highly dependent on implementing a rigorous data collection method including recordings and accurate transcripts. Hair et al. (2007) supported this argument by stating that reliability in qualitative research depends on the proper and detailed documentation throughout the primary data collection process. Therefore, for the semi-structured interviews and focus groups, trustworthiness issues could be minimised through recording, transcribing and coding of all interview data to create a list of themes that emerged in the interviews. Furthermore, pilot studies were conducted to test the proper interpretation and data collection process. In order to provide a controlled environment for conducting the research and establish a similar research setting for all participants (McNamara, 2009), a conference room was provided by The Gresham Hotel and a space allocated in the lobby of The Fleet Street Hotel for the interviews with tourists in Research Phase 1, creating a quiet and comfortable atmosphere to conduct the research. To ensure research ethics for focus groups (Research Phase 2), a classroom was organised through a gatekeeper from The Dublin Institute of Technology in order to establish a controlled and undisturbed envrionment for discussion. Reliability and validity for the quantitative data collection was achieved by letting all participants fill out the questionnaire immediately after testing the demonstrator application. Since the researcher was available throughout the whole process, it was made sure that questionnaires were completely and individually filled out, while clarification was provided for any questions that arose during in the process. Therefore, the non-response rate could be minimised, as the researcher checked all questionnaires upon collecting them from the participants. However, non-response was evident in some of the demographic questions outlining the profile of the participant. While it was preferred to have a clear indication of tourist profiles for further potential analysis, it was found sufficient for the purpose of this study and not pursued further due to ethical reasons.

5.11 Limitations

There are some limitations that should be considered in the methodology of this study. The first limitation is concerned with the initial interview process of

Research Phase 1. Since this study is a PhD project of one researcher, a multi-observer approach could not be implemented as suggested by Saunders et al. (2009). Although the researcher tried to stay as objective as possible while conducting the interviews, a possible bias interpretation of the collected data was unavoidable. A personal reflection of the researcher's background and philosophy that could have influenced this study is presented in Appendix R. In order to ensure the trustworthiness of the qualitative data, all recordings were transcribed and extracts provided throughout the systematic analysis process. Silverman (2013) and Flick (2002) have suggested additional methods to ensure the trustworthiness of qualitative research studies including the accurate use of various data collection methods, standardisation of the interview process, tape-recording interviews supporting the transcription to be inserted in form of extracts in the data analysis, and reflexivity. In addition, while tourist interviews were further analysed in the quantitative study, a quantitative research was not conducted with developers and industry experts. Instead, AR application developers and an additional IT expert from Manchester Metropolitan University were consulted in order to translate tourist requirements into technical design elements to increase its validity.

A further limitation might have resulted from the interviews being conducted in different places and times, which might have influenced the answers of the participants due to time pressure or the feeling of insecurity in public spaces. In order to ensure the trustworthiness of the qualitative data, the researcher attempted to talk as little as possible and provide freedom to participants to answer each question according to their own opinion as suggested by Flick (2002). However, particularly for the initial tourist interviews in Research Phase 1, the researcher found that occasional explanations were necessary due to the limited knowledge of research participants with regards to AR. While a cross-sectional timeframe was considered in this study, conducting the post-experience research with participants of the initial tourist interviews might have provided interesting insights into their thought development.

Limitations in the sample population of the study need to be acknowledged. While the researcher attempted to conduct the research with a balanced sample, particularly with regards to age and gender, the majority of interview participants

were female and in the age range of 22-30. Tourist interview participants were further limited to samples of the main target markets in Dublin that were identified in the literature and through consultation with the Dublin City Council. Therefore, it is unclear whether additional requirements or further discussion could have been initiated with more male participants or tourists from a different age group. A similar sample limitation was acknowledged in Research Phases 2 and 3, where the majority of participants were female.

The translation of user requirements in the HOQ is typically conducted by the development team to describe respective technical design elements. These form the "Hows" within the HOQ (Mazur, 2003). However, as a PhD thesis and individual study, the researcher was faced with the issue of reliable translation of technical aspects due to personal limited technological background. Therefore, mobile application developers that participated in previous interviews (EP4, EP6) as well as an additional expert from the IT department in Manchester Metropolitan University were consulted to establish the technical requirements for the HOQ. The assistance was sought for formulating valid technical design elements through translation of tourist requirements. The final 18 tourist requirements were therefore presented to each developer and translated via E-Mail and Skype conversation to ensure the validity of technical aspects for the study before they were implemented into the HOQ. Therefore, it needs to be acknowledged that the QFD model was established with the support of AR application developers that assisted in the translation of tourist requirements into technical design elements for validity and reliability issues. However, certain parts of the HOQ, such as the Correlation Matrix, as well as Relationship Matrix, which will be discussed in sections 8.6.3 and 8.6.4, were found highly dependent on the expertise and allocation of resources of each individual development team. The model should therefore be regarded as an overall guideline, but minor changes can occur dependent on the possibilities of the developer. Further limitations of the overall study will be discussed in the conclusion (section 10.4). Nonetheless, the focus of the current study lied within the identification of tourist and developer requirements and should therefore be sufficient for generating a QFD model for the development of mobile AR tourism applications.

5.12 Ethical Issues

Various ethical issues were considered while conducting the research. Saunders et al. (2009:184) state that ethics are referred to as how "we formulate and clarify our research topic, design our research and gain access, collect data, process and store our data, analyse data and write up our research findings in a moral and responsible way". Therefore, ethical issues should be identified and diminished during the design phase of the research.

In order to ensure that all interview participants are aware of the nature of the study, they were informed about the research purpose, their rights as participants with the possibility to withdraw any information or from the whole interview process and confidentiality of provided data prior to the interviews. While everyone verbally agreed, each tourist interview participant signed a consensus form before the interview, which can be found in Appendix A. Furthermore, all interviewees were asked if they would agree to digitally record the interview for transcribing and data analysis purposes exclusively ensuring that all information provided was anonymous. This ethics procedure was conducted for all tourist interviews as well as focus groups respectively. It needs to be acknowledged that the focus groups were organised as part of a student excursion to Dublin with students from Manchester Metropolitan University. A free meal at the Dublin Institute of Technology was provided for the students as gesture of appreciation to participate in the research. However, since the focus groups were scheduled as part of the excursion, it needs to be acknowledged that the responses might have shown differences to tourists that would have participated in the study out of personal interest for the topic. Experts from Dublin were accessed through a gatekeeper who informed them about the study and interviews were recorded after agreement of the participant. Each interviewee was asked for permission to conduct and record the interview and agreed to participate in the study. With regards to expert interviews, the interviews were not pre-scheduled, and therefore no consent form was prepared and signed beforehand. For the pilot questionnaire as well as the quantitative research, each questionnaire had a front page briefly explaining the nature of the research and e-mail address of the researcher for any unresolved

questions in regards to the study. Before conducting primary research, the Academic Ethical Framework of Manchester Metropolitan University was revised and the Manchester Metropolitan University Ethical Checkform was followed prior to any data collection.

5.13 Summary

This chapter commenced with a discussion of applied research methods including research philosophy, research approach and research strategy. For the purpose of this study, a pragmatic research philosophy was considered to provide the most suitable perspective. Since this research explores the implementation of technology in the urban heritage tourism context, it is important to recognise that the research outcomes might only be provisional. It is crucial to understand that studying technological implementations will change over time as new technologies are developed and hardware and software capabilities extend. Pragmatism acknowledges these provisional truths as compared to other puristic views. A mixed methods approach was implemented in this study in order to facilitate the understanding and interpretation of primary data. Therefore, this study starts with an inductive research approach of exploratory nature to interpret the interview outcomes followed by a deductive approach to establish an importance rating from the qualitative research outcomes and develop the QFD model. Therefore, this study used a mixed method design to combine exploratory and explanatory research. Since the nature of this research was based on innovative technology implementation, it was evident that literature in this matter was still limited. Therefore, an exploratory study was necessary in order to gain a better understanding of the current situation. By critically reviewing the literature, a foundation of knowledge was acquired, which was supported by an initial qualitative research process in form of interviews and focus groups to explore the topic in theory as well as in practice in form of a post-experience study. The study expanded into an explanatory research by providing an importance rating of identified user requirements and further requirement reduction for the QFD model.

The research method employed in this study was regarded the most suitable method to assure the reliability and validity of explored findings and to provide a prioritisation of identified tourist requirements for the development of the QFD model. The chapter discusses the three-phase research process that was employed in the study to identify tourist and developer requirements and design a QFD model for the development of mobile AR tourism applications. Aims 3 and 4 were achieved by employing an inductive method in form of semi-structured interviews (Research Phase 1) to newly explore requirements of tourists and industry professionals for AR applications specifically for the implementation in tourism. User requirements from the literature in mobile computing were considered to guide the interview questions and confirm which requirements were still valid for mobile AR tourism applications. However, it was crucial to investigate new emerging requirements to make the final QFD model as close and practical to reality as possible. The gathered data was analysed using thematic analysis by contrasting themes from the literature in mobile computing to set the basis for the primary research of this study. Interview outcomes from Research Phase 1 were used to develop mobile AR tourism application demonstrators to use for a post-experience study (Research Phase 2). Focus groups were conducted as post-experience study to confirm the identified tourist requirements and explore whether new requirements were evident after experiencing the developed demonstrators (Research Phase 2). This phase of the research contributed significantly to achievement of aim 3, as reactions as well as tourist requirements could be explored on a practical basis, compared to the initial tourist interviews, which used AR examples and therefore had the risk to be on a superficial level. The outcomes of the focus groups were analysed using thematic analysis in alignment with the analysis method used for Research Phase 1. To achieve the final aim (Aim 5), a deductive approach was implemented in form of questionnaires targeting international tourists in Dublin. It was used to prioritise tourist requirements and further reduce them to generate the QFD model (Research Phase 3). The data was analysed for reliability and validity using Cronbach's Alpha and CFA to reduce the identified tourist requirements for the QFD model. It was followed by the discussion of reliability and validity, limitations and ethical issues considered in the study. The following chapters will provide a detailed analysis of the research findings. Therefore, chapter 6 will discuss an in-depth

analysis of the initial tourist and industry professional interviews to address aims 3 and 4 of the study.

CHAPTER 6 – INTERVIEW ANALYSIS

6.1 Introduction

This chapter will present the analysis of the qualitative data collection through semi-structured interviews. The first section will commence with analysing the tourist pre-experience interviews, which was conducted before the mobile AR tourism application demonstrator was developed. The interview outcomes aimed to provide a foundation for investigating tourists' current understanding and expectations of AR and its implementation in tourism as well as provide the foundation for the development of mobile AR application demonstrators to conduct a post-experience study in form of focus groups as second research phase. Starting from section 6.3, interviews conducted with mobile AR application developers and industry experts will be analysed.

6.2 Tourist Interview Analysis

This section will present the analysis of the initial tourist interviews that were conducted in Dublin, Ireland. As discussed in chapter 5, the interviews were designed to get an insight into the current understanding and utilisation of mobile devices and AR applications in particular and provide a base of knowledge for further research. Furthermore, the interviews aimed to identify tourist requirements for mobile AR tourism applications and explore potential methods of implementation. The list of interview questions and full transcripts of all interviews can be found in the Appendices (Appendix D, E).

In order to support the interview analysis, each participant was allocated a code depending on the order of recruitment without further consideration of importance. Participants were labeled in numerical order from TP3 (Tourist interview Participant 1) to TP28 (Tourist interview Participant 28). Since the initial two interviews (TP1, TP2) were recorded as pilot tests, they were not included in the analysis. Table 6.1 presents an overview of all interview participants and demographic indications including age group, gender, and country of origin.

Table 6.1: Tourist Interview Participants

Age Group	Gender	Country of Origin	Purpose of Visit	Current Occupation	Initial	Duration of Interview
≤21	F	England	Leisure	Student	TP22	25 min. 44 sec.
≤21	F	France	Leisure	Student	TP15	29 min. 23 sec.
≤21	F	USA	Leisure	N/A	TP4	25 min. 00 sec.
≤21	F	USA	Leisure	N/A	TP5	33 min. 09 sec.
≤21	F	USA	Leisure	Student	TP20	16 min. 50 sec.
22-30	F	England	Leisure	Employed	TP21	19 min. 37 sec.
22-30	F	Germany	Leisure	Student	TP13	21 min. 11 sec.
22-30	F	Germany	Leisure	Student	TP18	22 min. 50 sec.
22-30	F	Ireland	Leisure	Student/ Employed	TP8	22 min. 25 sec.
22-30	F	Northern Ireland	Leisure	Employed	TP10	24 min. 09 sec.
22-30	F	Northern Ireland	Leisure	Student	TP26	33 min. 27 sec.
22-30	F	Norway	Leisure	Employed	TP28	23 min. 58 sec.
22-30	F	Spain	Leisure	Student/ Employed	TP7	28 min. 32 sec.
22-30	F	Wales	Leisure	Employed	TP17	28 min. 58 sec.
22-30	M	France	Business	Student	TP9	22 min. 29 sec.
22-30	M	Germany	Leisure	Self- employed	TP14	25 min. 02 sec.
22-30	M	Germany	Leisure	Student	TP19	23 min. 58 sec.
22-30	M	Ireland	Business	N/A	TP3	17 min. 20 sec.
22-30	M	Ireland	Business/ Leisure	Employed	TP11	59 min. 21 sec.
22-30	M	Norway	Leisure	Employed	TP25	15 min. 32 sec.
22-30	M	Norway	Leisure	Student	TP27	25 min. 14 sec.
22-30	M	UK	Leisure	Employed	TP24	26 min. 08 sec.
31-40	F	England	Leisure	Employed	TP16	22 min. 56 sec.
31-40	F	Spain	Leisure	Employed	TP6	18 min. 54 sec.
41-50	F	Northern Ireland	Leisure	Employed	TP23	21 min. 24 sec.
41-50	M	France	Leisure	Employed	TP12	48 min. 04 sec.

Source: author (2015)

The first 15 participants were interviewed at a conference room provided by the Gresham Hotel on O'Connell Street, while the interviews for the remaining participants were conducted at the Fleet Street Hotel lobby. Interviewees ranged between the age group under 21 to 50, with most participants ranging from 22 to 30. The key tourist markets in Dublin according to the Dublin Tourism Board (FailteIreland, 2013) were covered with additional tourists from Scandinavian countries. Most of the participants were students and young professionals making frequent short trips during the year.

6.2.1 Current knowledge and perception of AR

A challenge during the first stage of the interview was the knowledge gap of interviewees in reference to Augmented Reality technology. Although some participants had heard about marketing gimmicks, such as provided by Audi and Mercedes (Brenzo, 2014) as well as interactive business cards, and QR Codes, for the majority of interviewees this study provided the first AR experience.

AR Knowledge and Promotion

The overall knowledge of AR was investigated in order to form a common understanding of participants' experience with AR. It was found that participants' knowledge of AR was still limited. Most participants seemed unaware of this technology, while more technology savvy interviewees mentioned having seen AR in commercials and marketing gimmicks, such as Mercedes, Audi and Ikea (Brenzo, 2014). However, the majority of interviewees had not yet experienced AR first-hand. TP16 mentioned,

> *"I've used that one where you scan the barcodes and they link you to other things. And we did one where you could photocopy your wine, and it would tell you where you can buy your bottle of wine and things like that."*

Moreover, TP5 claimed that the functions of GPS-based AR were "very similar to Google" Apps, with the advantage to access information faster and easier by stating,

> *"In my mind I was thinking like Google, instead of typing a question on Google you could upload a picture, and it could give you information on that picture like who painted the painting or anything like that."*

TP3 mentioned additionally,

> *"To just gaining information about a building or a landmark, hotel or whatever I'd say it'd be good."*

Other participants who were referring to the image recognition AR described it as seeing the "'inside' of an advert" (TP6) and as "something that represent reality on a screen, on a phone" (TP9). TP22 stated,

> *"I saw that on the website I believe. Advertised on the website and I thought I'd try that and it was really impressive. I mean the graphics, zooming in and out of the car, and even the car fibre aspects of the car, it is really in good detail."*

Interviewees such as TP22 were referring to commonly used websites on the Internet. Depending on the target audience, it was argued that different websites should be utilised in order to reach the market. Since the majority of interviewees had a limited knowledge of AR, TP21 mentioned that AR should be advertised on social network platforms that are used by many people everyday, and therefore reaches a wide audience by saying,

> *"I think Facebook is quite a good way of doing it as well. There is so much stuff that comes through Facebook that you didn't know existed that you just download in seconds."*

On the other hand, TP20 claimed,

> *"It doesn't seem like it needs that much advertisement. It seems like novel technology that people would need and people would want to use it without having to wheel them in the other way."*

It was evident in the interviews that the idea of GPS-based AR was clearer when forming the first impression and expectations of AR, although other examples, such as image recognition were provided during the interview as well. Although the majority of interviewees were not aware of the term Augmented Reality, it could be seen that some had been exposed to AR to a certain extend through gimmicks, such as the Audi AR application, or QR Codes in advertisements. Since tourists would be one of the main audiences for the application, websites, such as booking.com, Expedia and TripAdvisor were mentioned that are known and used by many tourists prior to visiting a destination. The use of established social media platforms such as Facebook and Twitter were further regarded as effective method to spread awareness in a short period of time. TP11 also recommended advertising AR applications on television, mostly due to past experiences of having seen AR ads on television before.

AR Perception

The overall perception towards AR of interview participants was mostly positive, while the actual benefit of the application was debated. TP8 indicated,

> *"I'm intrigued to see what it would be like to use the application, like the Tuscany app."*

Keywords from the interviews suggesting perceptions of AR such as 'useful', 'interactive', 'helpful', 'fast and easy access to information', 'modern' and 'convenient' were used multiple times. TP3 argued,

> *"I haven't really heard about Augmented Reality applications [...] But now after I've heard about it to the end, I'm definitely interested in a lot more"*

and TP19 admitted its usefulness by saying,

> *"I didn't know about this technology or what you can do with it. But now I think I would definitely download it."*

Although content was considered important by TP24, stating,

> *"I would [use it], if obviously the video, the content was of interest. If I looked at it and it was an advert, then no, but if it's something that interests me, then definitely."*

Furthermore, TP3 added,

> *"personally I would say that it would become more useful to random people, more practical."*

In addition, TP3 commented that although positively surprised by the examples of AR,

> *"It will take a while to catch for everyone to spread the word and kind of get it out there, but it does seem very useful."*

On the other hand, TP24 was saying not having found any useful AR applications until now by stating,

> *"They were not as detailed as that one, perhaps that's why. I quite like good graphics, I quite like things accurate. You know I find many of them are quite all over the place."*

while TP8 noted to have "never used it before". TP11 added in this regard,

> *"I wouldn't have the use for it at the moment, but I can see the uses for it, if we do go away, definitely"*

In the interviews it became apparent that although the term 'Augmented Reality' was unknown, more people are expected to be exposed to AR technology in the near future through businesses in various sectors. Many interviewees were relating to GPS-based AR as seen in the provided AR example during the interview and some who were experiencing AR for the first time pointed out the usefulness of AR technology, regardless of their limited knowledge. It was evident that participants were more attracted to an application that would provide convenience and usefulness for everyday activities, rather than entertainment. However,

participants argued that it would take time for the wider audience to accept and implement the technology into their everyday lives.

6.2.2 Reaction and Preference of provided AR Examples

Since for many interviewees this research provided the first experience with AR, this section was aimed at examining their reaction and interest towards AR technology. Furthermore, it should investigate use cases of AR in the tourism industry and examine tourist preferences of implementation. Many interviewees commenting on the provided AR examples during the interview had a positive perception about at least one of the provided examples. However, opinions slightly differed among participants regarding the usefulness of different AR implementations; as in using AR for additional information in form of text overlay, video overlay and GPS-based AR using a video clip of the mobile application Tuscany+ in order to provide different possibilities of AR information overlay further discussed below.

Text Augmentation

The AR enhancement in form of textual information was mostly regarded to be the simplest of all three examples by participants, however, was also considered to have limited benefit. Although interviewees commented positively on the provided AR examples, TP14 stated,

> *"Maybe it would be good, if you could simply, well, that you can look what's going on in the back of house in this restaurant, that you could design everything more visual."*

Participants who preferred the text enhancement based on an AR overlay on top of a menu stated that it was "the easiest one" (TP17) and "very useful [to] see what restaurant there is, what menu, what you can eat and if it's expensive or cheap". For the augmentation of text-based information, tourists argued that it was often available through alternative sources and therefore was highly dependent on the projected content. While it was also considered the simplest type of AR to understand, tourists seemed to be sceptical whether useful information exclusive

to a tourism AR application could be provided. Therefore, it was evident that the AR application should provide additional information more conveniently, which has limited or no accessibility otherwise. As it was pointed out, text overlay had limited use, due to the fact that restaurant menus, prices and opening hours were accessible in other ways and therefore the content of text overlay would not provide additional benefits to the user.

Video Augmentation

The use of video overlay was mostly regarded as valuable source of information, however, some interviewees argued that it would take too much time to watch the whole video as tourists were generally on the move. TP19 noted,

> *"When you're in the hotel and you see a movie, it's okay, it's a funny thing or it's a gadget, but I think it's not that useful like when you're outside on the street."*

Similarly, TP4 and TP6 argued that the video, though providing additional information was too time consuming, which might restrict its attractiveness, TP4 saying,

> *"Like the history part is kind of cool, but I'm normally travelling with groups and I wouldn't be able to see it"*

while TP6 added,

> *"The video is really nice, but usually the videos take time and maybe after one minute or two, you're bored with the video."*

It seemed that although participants were interested in the contents of the video, time was considered to be limited particularly when travelling with other people. Therefore, video overlay was regarded not ideal in outdoor environments as compared to settings where tourists would have more time, such as sitting down in a restaurant or hotel lobby while waiting. While it was perceived to be more entertaining than text augmentation, it was impractical to use for outdoor scenarios due to longer loading times and content projection which would force the user to stop moving until the video was being played. Therefore, the implementation of

video-based content was regarded to be more suitable for indoor environments, such as museums where tourists had the possibility to stay and interact with a particular attraction longer. Since interviewees revealed that outside, tourists would usually move around, text and GPS-based AR were regarded to be more practical.

GPS-AR

GPS-based AR was considered most useful for a wider target audience as map-based systems were beneficial not only for tourists, but for residents respectively. TP18 however was arguing that GPS-based AR had limited usefulness for people who research the destination and attractions beforehand by saying,

> *"You usually book your hotel at home and you do your research on the Internet or something and when you're here you already got your hotel, so I don't know if you still need it then."*

On the other hand, TP7 mentioned,

> *"With it you can look for everything, a restaurant, a cinema, I think that you can do it everyday"*

Others argued that GPS-based AR seemed to be the most useful for a large pool of people out of the provided examples, since it would be implemented in daily life, whether or not being a tourist.

As TP9 claimed,

> *"I think it's very useful, especially if you go somewhere and you don't really know. You just walk on the street and you don't really know what to do. I think it's interesting for information"*

While the information provided in GPS-based AR applications could be accessed through alternative sources, such as websites and brochures in tourist offices, user benefit seemed to be found around the instant access to information in the immediate surrounding that tourists were in, which was argued to be valuable for anyone moving around the destination. Since information on the immediate

surrounding could be accessed instantly, interviewees seemed to have a positive perception towards GPS-based AR functionalities. It was particularly pointed out that GPS-based AR would not only be beneficial for tourists, but for locals alike, as it could be used as a general map application similar to Google Maps. Therefore, GPS-based AR functions were regarded as an attractive feature to implement in mobile AR tourism applications due to the possibility to benefit not only tourists, but also a wider audience. GPS-based AR will be discussed in more detail in section 6.2.3 (Tourist Requirements for AR Tourism Applications).

6.2.3 Tourist Requirements for AR Tourism Applications

The tourist interviews were designed to identify user requirements for AR tourism applications. After investigating general expectations of AR applications for tourism purposes, user requirements were examined. The following will discuss themes that emerged as user requirements from the interviews. User requirements were divided into two categories; function and content requirements as suggested by Law et al. (2010).

6.2.3.1 Function Requirements for AR Tourism Applications

Simplicity

It was argued multiple times that interviewees preferred to use an application that is simple, easy to understand and navigate. TP16 mentioned therefore to develop the application in a way, which was "just really straight forward with steps. Step one, step two and step three, done". TP18 further argued, "it just has to be easy. I just have to use it and do like three or four pushes and then I have to be where I want to be" while according to TP21, it was important to

> *"Make it more simpler. And if there was a requirement for more information, maybe just link it to a website rather than having to scroll through the app and all this information."*

In order to make the application attractive to users, TP22 suggested an introductory window when the application was started for the first time, in order to understand how it was working and controllable, saying,

> *"You could have set instructions of how to use it, so people that don't know how to use it could look at the instructions and they immediately know how to use the app and stuff."*

TP20 on the other hand referred to category implementation saying,

> *"Also what they offered with the different categories and stuff because I know we're here travelling and we'd like to see the nightlife. I really like that kind of aspect, whereas my friend likes to look at landmarks and cathedrals and stuff like that, so I think that would be super easy."*

The aspect of simplicity was evident to be a crucial factor for the use of a mobile application, which is understandable and easily usable by anyone. In order to facilitate the meaningful filtering of information available, many interviewees suggested to include categories in the application that would sort the information into different aspects, such as tourist attractions, restaurants, accommodation or events. This functionality will be further discussed in 'Information Filter'.

Information Filter

The ability to filter information according to search criteria was regarded crucial in order to avoid the overload of information and facilitate navigating through an application. TP13 argued to use booking.com due to its ability to "choose which hotel, like stars and how much you want to pay". The ability to categorise and filter information was supported by TP8, stating,

> *"But the good thing about it is he'd have, you literally would go into a subsection and you'd have 'Restaurants' and you click into the restaurants and you'd have the restaurant and what type of restaurant, for example, you'd have like such and such, an Italian."*

Therefore, TP17 claimed,

> *"Maybe because I know it was categories, into four different categories and colour-coded, so that was easy"*

and TP19 added in this regard,

> *"Maybe it should be sorted like 'hotels, restaurants' maybe there should be something like gas stations, where you can pump your car, or something like beaches, or entertainment parks, or something like that maybe."*

This would further prevent the overload of information and facilitate the search for specific information in the application, as argued by TP21,

> *"so what you want to read is right there. You don't have to do anything extra to see it. With the TripAdvisor app, I found that you had to scroll through so much information."*

While TP19 pointed out,

> *"if it's too much information and you have to scroll down to see what it really is, I think it's not that useful. Just short information about what it's really about and so on."*

The use of filters to categorise the information was regarded necessary for high content applications such as providing tourism related information. In order to facilitate the ease of use, interviewees recommended using categories in order to sort available information into different areas of interest that could enhance the user experience as well as prevent the application to slow down due to overload of information. It was argued that though the tourist application should be rich in information, it should be designed with care in order to avoid information overload. All interviewees who mentioned TripAdvisor stated that the amount of information provided was wide-ranging. It could be seen that Tripadvisor was still perceived by all users as reliable and well-established source largely due to the ability to project honest user ratings and reviews. Furthermore, interviewees were

looking largely for local destination-based information displayed for the duration of their stay.

Recommendations

It was regarded helpful if the application could save the user's profile in order to provide recommendations according to the user's interests and preferences. TP7 claimed,

> *"I would like to have an application, you can see a map of a city, and you can select what you want to see and it makes you a route. [...] I think that is very difficult that you can't join a lot of things like making a plan for you"*

while TP12 added,

> *"The most important place when you arrive for a short weekend. The most important places in Dublin to visit. For example you have two days, you have three days, what you must do to see the most important."*

TP18 further suggested,

> *"It's often like you're doing a guided tour and you're getting so much information and most of them, you can't keep them all, or you're not interested in everything. So if you have a guided tour with your tablet, you can skip something or you can go to another point, or continue the next day or something. I think that would be good."*

While according to TP5,

> *"an app can't necessarily and I'd get frustrated if it picks something for you, but no, I want to do this and not that. So in doing it yourself, or if it does it for you, some way you could change it, like 'oh I kind of like the way it organised that, but I want to do this in the morning and this in the end'. So that there is a way it does it for you and you can modify it manually."*

Meanwhile, TP26 argued,

> *"even places where not to go. Just for personal safety when you're by yourself. Places recommended not going when you're by yourself. Like that, I find as a woman really important, personal safety, just things like that would be really good."*

A common difficulty that was pointed out by tourists was the challenge of planning the trip and designing an itinerary. Some interviewees wished for an application that was able to plan and organise the trip for them and make recommendations on tourist attractions as well as restaurants and other activities according to their preference. Although many participants were suggesting planning functions in the application, it was pointed out that the user should still be able to modify the route and recommendations as well as attractions to visit, while the application should only be seen as guideline and source of recommendation in order to personalise the application as well as the trip to the individual taste (Zheng and Pulli, 2005). TP26 on the other hand claimed that tourism applications should not only provide recommendations on places, but also point out which areas to avoid through user reviews or alternative sources.

Entertainment

Tourists' perception of combining gaming and entertainment aspects with AR tourism applications was investigated in order to examine tourist reactions on entertaining functions in the application and whether users are willing to use the application repeatedly due to additional options. In this regard TP16 claimed,

> *"I like having it separate but I'm not sure other people want that. I like having separate things. They come and fade don't they those kinds of games, you get a little bit addicted and then you don't want anything to do with them. You want an app that you want people to keep on using. [...] I just didn't want to spend all this time if I was there to look at this building I wouldn't play a game."*

TP10 claimed, "I wouldn't have time. […] If I wanted to have time, I'd probably just choose to relax or go shopping".

TP17 agreed with TP16's argument stating,

> *"I don't think games last very long. They're just trends. Or I think they're just trends anyways. I kind of trend my game, so it'd be cute to have a game on the tourist app. But you'd have to have different games. You'd have to keep adding games to it. I'd probably get a certain distance and then stop playing. Or maybe have a different game based on the different cities or things."*

Additionally, TP20 and TP24 were referring to 'Foursquare', a GPS-based game that lets players check-in to various places to collect points and unlock achievements by competing against other players around the world saying,

> *"if there was a gaming side to it, like an achievement for things, say you've visited that place and you get points for that. You checked-in and used a voucher you get points for that." (TP24)*

TP15 on the other hand argued that games could vitalise the tourist experience especially for attractions, such as museums, which could be particularly beneficial to keep children entertained during the visit, claiming,

> *"Maybe we can go to a museum and sometimes, some museum I'm really boring. So I love museum, but it's really boring and you can add an interactive touch. An app and maybe you can propose an app an interactive way to visit museum and to have a game, a questionnaire. [...] It could be a good way to give a playful dimension of some boring museums [...] even for children."*

The majority of interviewees were reflecting the option of games in tourism applications as one type of entertainment, as compared to other types of entertainment such as music, or sports. Although many interviewees were curious how gaming could be implemented in tourism applications, most interviewees were claiming to be willing to try the game as an option in the application. From the ones that absolutely did not see the benefit of games in tourism applications, it was argued that tourists were not looking for entertainment when visiting a destination, but rather be more interested in exploring the sites that the location had to offer. Alternatively, TP5 and TP14 were referring to incorporating a game throughout a whole destination in form of a "scavenger hunt" where tourists were passing through different stages by exploring the destination and were able to

collect prizes and points at various location points. However, it was evident that TP16 and TP17 considered games as a temporary alternative to pass time, and would therefore require constant updates in order to keep attracting the user to come back to using the application. In order to keep a game alive and assure repetitive use by tourists and players, TP17 and TP21 were suggesting a multi-player option, fostering the social aspect of the application by letting tourists compete against each other or solve problems in the game in a team effort. Although tourists were willing to try entertainment options in the application, many interviewees could not indicate how games should be incorporated into the tourism context.

Social Function

The majority of interviewees had a positive attitude towards social functions in AR mobile tourism applications, such as content generation and sharing. TP8 stated,

> *"Yes, I would. I'm a very public person I guess. In the end of the day I don't really put anything private up. I don't really put anything private up on the Internet, and I think that the Internet really isn't private at all, because I have Twitter and that is public. So no, I don't have any problem with that."*

TP9 agreed claiming, "It would be interesting to share with everything". Some interviewees, such as TP3, TP5 and TP17 argued to use social networks, such as Facebook in order to stay in touch with family members and friends living in different parts of the world. TP17 mentioned in this regard,

> *"I'm always on Facebook. I use it a lot because I'm from Wales, but I live in the Lakes. So all my friends are a six-hour drive away. So I don't see any of my friends or my family anymore and I have a nephew. I go home three times, I've been home three times in twelve months. So I use it all the time to talk to my friends, talk to my family."*

While TP3 was strict about sharing, saying "With strangers? No, just with my friends, I'd say", TP18 seemed to be more open arguing, "I think so, sometimes yes. Only with my friends, mostly."

This statement was supported by TP5, who appealed,

> *"I would want to see other peoples' things, just to see what it looks like before I go there. I mean that may ruin it slightly, seeing knowing what it looks like beforehand, but it's different from a picture vs. seeing the real things, so if I'm going to visit the place, I know I'm going to take a trip to a certain city, I could go on the app and look at peoples' pictures from that city to see maybe how long would I want to stay there, how much stuff is there to do."*

TP21 agreed by saying,

> *"I mean it's one thing to get someone's opinions, but to get a first hand view of what it is you want to go and see would be a brilliant idea because you know what you're going to look at before you go and whether or not it's worth it."*

TP16 and TP17 revealed that it was key to design the option of sharing as simple and quick as possible by stating, "I probably would if it's easy to use. If it's not easy then no" (TP17), "Every now and then we'd do the check-in thing, but I won't do anything else. It's literally just press the button 'Check-In' (TP16)". Supporting this argument TP10 added that people were "very comfortable with Facebook and all, and Twitter is becoming quite big as well". TP11 suggested by linking the application with an established social network platform that would foster the social aspect of the application and encourage repeated use of the application claiming,

> *"You know there's people. You're getting peoples' own perspectives on things and Youtube and the link to Facebook of course. You know, the social aspect of it. The more colourful and the more interaction that it has, the more inclined you are to pay more attention; the more engaging."*

Furthermore, TP11 added that using the application to establish a social community might also be a benefit for tourists especially travelling alone and argued,

> *"If you're in a location and someone else in on, connected, I suppose it's a way of communicating with people. [...] A way of bringing people, 'Oh we're going on that bus trip', 'Oh, so are we', something like that."*

It seemed that people were less anxious about privacy issues compared to five years ago due to the wide penetration of Facebook and Twitter users around the globe. Interviewees mentioned that although pictures and videos of a tourist attraction or destination could be shared freely, personal images would rather be shared within a closed circle, such as family members and friends, which might relate to privacy issues. It was pointed out that people were often putting up pictures and comments on destinations on Facebook in order to get recommendations from friends, who have been there or simply to share a part of their life with friends from around the world. TP12 added that sharing content would not only benefit users, but would furthermore result in positive word of mouth for businesses (Ferguson, 2008), supporting the awareness of the business, or the product. It was commented that establishing a separate social platform next to the already established and widely used platforms, such as Facebook and Twitter would be challenging.

Privacy and Security

This section aimed to determine whether privacy and security issues were still widely evident due to the wide spread of internet communication over social networks through mobile devices. TP16 stated, "it should be secure, if it's got to be working, it has to be secure." TP23 mentioned to be cautious with Internet purchases due to a negative past experiences using an insecure Wi-Fi connection. Therefore, TP23 argued that the Wi-Fi was not "secure enough. […] I do purchase online, but on a very secure site". The majority of interviewees had experienced online purchasing through laptops and were used aware of the security risks involved with online payments.

However, TP4 argued,

> *"I think at this point, my debit card number has been stolen you know when I had my debit card, it's really easy for them to fix it. You just call the company and tell them to stop it and they figure out right away. So at this point I'm comfortable with the fact that if I enter something on the Internet it might get stolen, but the company will deal with it."*

Moreover, TP21 among others suggested using safe and well-established payment methods such as PayPal, which was widely known as a secure online payment option, saying,

> *"As long as it's done through a safe gate I mean if you could do it through PayPal or something like that just because you know it's a safe payment."*

According to TP3 implementing transaction opportunities in AR tourism application would be "very effective, because there you just click 'room-pay' and with your card or whatever".

Although participants did not have a negative perception towards online and mobile purchasing, it was mentioned multiple times that the transaction should be made over a secure payment procedure as well as include booking confirmations in order to guarantee the booking and payment. TP16 pointed out that people might be concerned about the secure management of user data, which has been a critical issue after the NSA incident in 2013, bridging privacy rules in and outside the United States by monitoring internet communication activity (Gellman, 2013) as well as Google Glass project, which is frequently criticised due to its potential of breaching data protection regulations (BBC, 2013).

GPS Navigation

Another significant function that was mentioned multiple times was the map and navigation ability of the application. TP14 argued to use "only the ones from the iPhone, actually only the map to get from A to B." TP19 further agreed to use "just maps, just Google Maps", as well as TP25 stating to use "just navigation and maps" for most of the time. By pinpointing the user's location, TP23 mentioned

that it is very helpful if an application could identify "where you are, what's near, if there's a restaurant near here and it gives you directions how to get there".

Similarly, TP24 was suggesting,

> *"if you turn your app on, when you're in a tourist destination, if you're just walking around and you're quite in a close, within a certain proximity of something that's interesting, perhaps quite out of the way that normally you wouldn't know about and it informs you, 'Oh you're only 500 metres from so and so, how about you check it out'. Something like that would be definitely...we're aimlessly walking around to find places, so if you suddenly get a notification you're close to that and that."*

Moreover, TP18 stated, "showing ways is important […] because of how to get to the next site or something". TP21 further argued,

> *"You could choose from the list and get the information you need and where it is and how far from where you are to get to this. I guess accessibility if anything."*

On the other hand, TP23 argued that tourists would use navigation on their mobile devices most frequently by saying,

> *"The ones I use, maps, directions. Whether there is anything near that is interesting really. Because it literally is how to get from A to B because you're out in a strange city. You have no idea, taxis, where to get the taxi, where to get the bus, really is for me."*

The trend of using map-based applications was emphasised in the conducted interviews. Most interviewees claimed to use maps and navigation applications, such as Google Maps to orientate themselves and get directions to certain places. While it was argued that virtual maps should be provided in the application to facilitate navigation to certain points of interest, many interviewees were also recommending to display information of the immediate surrounding on the map, which was increasingly becoming a main function of mobile devices (Shi et al., 2010). Such could include tourist attractions, local restaurants, ATMs, public transport stations and others. The application should be able to pinpoint the user's location and provide directions to specific points of interest. Since today, many

people are familiar with Google Maps and are comfortable using it (Shi et al., 2010), many interviewees pointed out that it would be helpful to have a map and navigation function in the application.

Language

A multiple language function was regarded as one of the key requirements in order to attract a wider target audience. TP11, TP13 and TP16 further added the implications for international tourists to have difficulties "understanding the language" and signs of the visited country. TP11 suggested a function that could directly translate a sign into the user's mother tongue, which would be helpful to get around by saying,

> *"If you're abroad and translation is always difficult. [...] What if a Chinese person wanted to read the same sign, but they couldn't do so? [...] I think I was talking about transport and the sign of where to go."*

Some interviewees (TP11, TP13, TP16) argued that a multiple-language function was helpful especially when visiting a destination that has a complete different language and culture from the home country. According to interviewees such could be helpful not only for tourists, but also for citizens of the area. Interviewees suggested translating the application into various common languages in order to attract a wider market.

6.2.3.2 Content Requirements for AR Tourism Applications

Although some themes were related to functions, the following topics emerged in the discussion with interviewees.

Reviews and Ratings

By showing recommendations in the surrounding, many interviewees found it helpful to refer back to user reviews and comments, since it would provide a non-biased opinion and therefore interviewees claimed it to be more reliable. TP10 added not to only display ratings and reviews of certain tourist attractions, but

claimed it to be helpful to include 'real footages' in forms of "movie clips of people" by other tourists. Furthermore, TP5 revealed,

> *"I think having some sort of rating, maybe, it lists all the attractions in the city and then like, you know the 1-5 star rating and then, so people, other people that are using the same application when they go to it, they can rate that place and so you can just kind of see travellers' ratings on how good it is actually"*

while TP14 was pointing out,

> *"I would look at some comments on the hotel. That is actually an important point. You compare various portals. To filter it for yourself, what's good and bad and where it has been manipulated."*

While TP23 and TP24 mentioned TripAdvisor as being very useful for user reviews and their reliability, as well as additional information on transport, and recommendations on attractions, TP21 claimed TripAdvisor to be "quite complicated to use", saying,

> *"I could use it, but it's too much of an effort. It's going to a lot of different things and it just kind of nut me off of it. I don't have time to do stuff like that. It was like there were too many tabs, too many links to different places and what they gave you didn't quite fit on the screen. [...] With the TripAdvisor app, I found that you had to scroll through so much information."*

However, TP13 pointed out that the degree of influence would highly depend on the "person and source of 3rd party comments". TP16 argued,

> *"I always check TripAdvisor. Always, before we go away, and yet sometimes you think what are people actually wanting. Because they complain about the tiniest things that really didn't need. But then if you go, I think it's just a compromise isn't it, you got to take the bits from everything and you still go to make your own decision about it."*

On the other hand, TP5 stated,

> *"I think first going to a tourist shop would be good because you can see what all the options are, vs. someone that's visiting that place. They haven't seen everything"*

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and TP20 further noted,

> *"With the tourist office they can tell you the popular places and where to go and what to see, but it's less personal rather than really getting to know people and getting what they think of the places and stuff."*

TP18 argued that information gathered from tourism authorities was biased since "they are influenced and they want to sell stuff". TP21 agreed by saying, "you go to a tourist office, they say, 'Oh yeah. It's fantastic. Go do it and spend some money' but it's actually really crap, but they've made some money". TP23 further added,

> *"I think they have their own agenda. And they promote what they're paid to promote. And that's it really in a nutshell. Because there are lots of parts in Ireland that are not promoted in tourist, and they really should be. Probably it's because economically not a good option for them."*

The importance of user reviews and ratings was mentioned multiple times by searching for recommendations for restaurants and attractions of particular places, such as cities. It was found that the majority of participants highly valued reviews and other tourists' opinions to form their own perspective on certain tourist attractions and venues, such as restaurants, which aligned to literature outcomes (Johnson et al., 2012). However, on the other hand some interviewees (TP5, TP13, TP16) argued that reviews on public platforms should be considered with care, since it was merely the representation of one's personal experience and could have been influenced by many aspects apart from the actual venue.

Information Access

Accessing relevant information was debated to require ease of use for the application while the focus was put on providing information on the immediate location of the tourist. While TP18 and TP19 were suggesting using visual aids in form of pictures to support the recognition of tourist spots, information should be limited to the presentation of key points regarding the point of interest.

TP18 therefore argued,

> *"I think also images are pretty important. Images about the attractions and I think it's easier to find something because when you have a map or something and you see a building you're thinking, 'what is this now'. [...] If you hold up your iPhone or something, your tablet and then it's saying there, it would be pretty useful"*

In addition, TP19 noted,

> *"What the buildings are called and what was there; a bit history, information maybe or for restaurants, menu card. [...] But if it's too much information and you have to scroll down to see what it really is, I think it's not that useful; just short information about what it's really about and so on."*

Furthermore, TP20 stated,

> *"If you could include the prices of the drinks and stuff like that, prices for entry, for the landmarks and stuff, that would be easy, or simple to have everything in one place."*

This argument was supported by TP24 and TP25, who claimed, "just has to be simple. Not much chaos, and not too much information. Not too much text. If you want to know more, you can just click it" (TP25). On the other hand, TP21 suggested providing links to websites as alternative to connect the user to further additional information if required, saying,

> *"Just a link with more information would be really good, definitely. I think a lot of the touristy applications focus on where you want to go, not on how you're going to get there. So it'd be very good to see this bus route is going to take you there and how long it's going to take and how many stops along the way, so that's going to take you that long."*

The accessibility of content was seen to be one of the main functions of tourist applications. However, it was mentioned that information should be kept clear and provide the choice to access additional information if desired instead of overloading the user with too much content. Information should be accessible on the main screen accessed by the user, while additional information could be

accessed through navigating the application in order to keep the displayed information compact and mobile-friendly. An additional deterrent for users was described as the overload of information provided in the application. It was argued that the application should be able to categorise and filter information depending on the user's profile and preferences, in order to prevent displaying irrelevant information to the user. In contrast, it was argued that the application should not be limited to one destination specifically, but would be more helpful and attract users if it was available in multiple locations and tourist destinations all over the world. Interviewees were more willing to pay for and download an application that could be used in various destinations, as compared to being limited to one destination only.

Information Relevance

The relevance of information to the time and place of the visit was debated to help preventing information overload. An issue that was raised by TP17 was,

> *"we found something that we wanted to do yesterday but it's not on until the 25th of this month, but we're not here, so that's not good to us. So information about what's on that particular day or after because we are just travelling. You're just here for a set amount of days. You're not going to be here in a month's time. So things that are happening now are more important as opposed to what's going on 4-5 weeks down the line."*

According to TP14, the user should be able to input the dates of travel into the application in order to filter the information provided to the timeframe, stating,

> *"Maybe a calendar in the application that you can say, 'I'm here for six days' and I want to do this then this, then that. That you can make a plan if you are only at the place temporarily."*

This argument was supported by TP28 being interested in "what's going on right now. If it's weekend, any concerts, any big happenings I think that's really useful". One of the information was suggested to be provided around special events and promotions and TP20 added that special discounts for businesses in the area through using the application was helpful to create awareness and attract more users, as it provides direct tangible benefits to the user.

Moreover, TP3 stated,

> *"Menu, specials would be definitely one. Definitely room availability,*
> *price is really important, menu."*

TP9 provided the example of using "your phone to see where you can go like different restaurants or on the region". TP12 on the other hand noted the importance of "local information, when you arrive in Dublin or everywhere". TP28 agreed with TP12 by claiming to look for "where do the locals hang out and where do the tourists normally hang out".

TP17 added that it's important for a tourism application not only to provide local information and recommendations, but also time-relevant information instead of overloading the application with irrelevant information. While recommendations on certain venues and attractions were sought after, many interviewees pointed out to be more interested in local venues, which represent the destination culture and gives insights to information that tourists are usually not able to access unless interacting with locals. Interviewees argued it was helpful to be able to get information, such as restaurant menus, opening times and prices through the application in order to get an insight what to expect and avoid unpleasant surprises. TP27 mentioned additionally that information, such as cultural and restaurant etiquette, "any tipping rules" in the region would be helpful, which might be an area that is researched less frequently in the tourism domain, although creating unpleasant tourist experiences on a regular basis by tourists ignoring sensitive issues for locals (Heimburger, 2008).

6.2.4 Challenges of AR Tourism Applications

This section highlights the potential challenges and technical difficulties that interviewees mentioned during the interviews that would deter users from using the application and were therefore recorded as user resistance.

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Wi-Fi

The most common difficulty tourists were seeing with the application seemed to be the limited Internet accessibility on holiday. TP4 among others argued,

> *"Roaming fees are so expensive. I don't know if it's just because I have a prepaid phone, but I can't really see myself using it while travelling because it just would be too expensive of an option. I'd rather do research ahead of time. I love the Internet, but I think if there was a way to use it without those roaming fees, then I guess I would use it all the time."*

Furthermore, TP6 supported this argument by stating,

> *"I need free Wi-Fi, otherwise my Spanish company is going to; I have to pay lots. So I couldn't use it right now, but if you got free Wi-Fi, I think Dublin has in some parts, that's really good as well."*

In this regard, TP20 mentioned,

> *"there was one where it said it would download and work offline, but it didn't; it didn't offer the full features. It was something that was going to work and I was going to bring it here and it would work fine, when I would be off Wi-Fi, but it didn't have the full features. It would let me see the basic features, but then if I wanted to go further into it, it'd have to connect to load more. It didn't have all the features available."*

TP4 stated to have "been connected to Wi-Fi and that worked. That was great, but it was only in small spots". However, it could be seen that Dublin, as one of the Wi-Fi offering destinations was promoting its newly established free Wi-Fi service through various methods and were aware that tourists will be one of the main market that benefits from this service. TP19 mentioned that free city wide Wi-Fi could be found in Salzburg, Austria already, which had been very helpful for tourists as well as for citizen claiming, "they also had it there in the inner city. I think it was very useful". It was evident that tourists were price sensitive and limited to a certain amount depending on their duration of travel.

TP5 claimed in this regard,

"I would probably yes, be interested in that just because like I said, we are addicted to our phones now these days and we're so used to having that instant gratification. [...] I would definitely pay 5 Euros for a day of Wi-Fi or even two hours. [...] I would pay 10 Euros per day or something like that"

Therefore, TP5 suggested,

"I feel like if it were by hour, it would be better [...] because you might not necessarily want to use it all day. [...] If you do pay per hour, you might not necessarily be using the Wi-Fi for the full length of the hour. [...] Because I feel like when you're travelling, I wouldn't spend my whole time using Facebook app while I'm travelling. I'm probably most likely going to use it for looking stuff up and how to get to places."

Others, such as TP17 and TP18 supported this argument and stated that they would be willing to pay more if it was "counted by Internet available time" without being restricted to a specific timeframe. TP27 argued,

"I don't think I would pay for it at all. Usually, if I really want to go online, it's just for a small thing I need to know and the roaming charges wouldn't be that great. Or I would just go to like a Starbucks and get it for free anyways."

Destinations offering free Wi-Fi services were often found to lack sufficient promotion that would create awareness of this possibility. From the responses it was found that many tourists were still unaware of the available free Wi-Fi service in Dublin (TP4, TP7, TP16, TP18). From the tourists that were aware of the Wi-Fi service, it was argued that the Wi-Fi could not be found in areas that were promoted, and others added that the Wi-Fi was unstable, resulting in connection issues. Although some tourists believed that free Wi-Fi could be accessed more widely than before, the problem of accessing the Internet on holidays still seemed to be an issue in many destinations. Many tourists were willing to pay to access the Internet given the opportunities of accessing free Wi-Fi in venues around the city as well as in some hotels. Interviewees who considered Wi-Fi valuable enough to pay for it suggested having various Wi-Fi using options available. Prices were often compared to the network provider at the home country and evaluated in

relation to roaming charges and other venues offering Wi-Fi in return of a charge, such as hotels. Tourists that were less price resistant (TP3, TP7, TP8, TP11, TP12, TP13, TP15, TP18, TP24) argued, although Internet was perceived very valuable for all interview participants, free Wi-Fi options could be found in venues, such as coffee shops and restaurants. Others were disclaiming using the Internet if not available, since tourists were at the destination only for a limited amount of time. Many interviewees argued that tourists were not using the Internet constantly during their trip and therefore would only access the Internet temporarily to look up certain things or send a quick message.

Application Speed

The speed of the application affecting the overall smoothness of interaction was regarded a key issue particularly for information rich applications. TP22 mentioned,

> *"sometimes it takes too much megabytes to download, it doesn't work at all, so I just have to delete it. That's a bit time consuming."*

Similarly, TP15 stated,

> *"It takes a long time to upload. You have something like bugs. It's really, really annoying when you have to check information and it takes a long time. Just forget it."*

Furthermore, in TP8's argument of application maintenance, it was mentioned,

> *"Like I mentioned before, a glitch or if it was just taking too long to load."*

Designing the application interview participants argued that should be considered whether to offer an offline mode.

Hardware

Hardware issues were highlighted by a large number of interviewees claiming that AR functions seemed to require a minimum hardware capacity that current mobile devices of most people might not be able to meet. While specific hardware issues are further discussed below, TP6 added that the hardware of the mobile device was a key determinant for the use and functionality of certain applications by stating,

> *"I've seen one with the tablet because I always think it's too big to carry around for a while. And with the phone, it's good as well but usually the battery in all of them is really…sucked."*

TP22 additionally argued that "hardware limitations" would be "critical" when using applications that are based on modern technology, such as Augmented Reality. Since it can be quite power consuming, minimum requirements to ensure a smooth operation of the application need to be investigated. TP22 added,

> *"It's just that my phone is an older version, so you don't have most of the applications. So I couldn't download it."*

Hardware limitations were still regarded as one of the key perceived issues for using mobile AR applications meaningfully. Battery life had been an issue that was mentioned by interviewees, since the AR application, being highly technical advanced as well as GPS/Wi-Fi dependant, might require a lot of battery and processing power.

Application Maintenance

Considering the application to project tourism related information, it was mentioned that updated information and a proper functioning application without glitches was a significant requirement for travellers. TP8 and TP9 were referring to past experiences of applications that were showing glitches, which affected the smooth operation of the application.

TP8 therefore argued,

> *"No glitches. That always helps. I always find I download a lot of apps. I try it for the first time, a new app; they always have a glitch in them where they're hard to kind of load. That definitely would prevent, would be a big block for me."*

While TP18 further added,

> *"Often it's like you start an app and it doesn't do anything and then it just goes back to your menu. It's going down, it's just going down."*

TP13 on the other hand argued, "It's definitely important that all the information is always updated, like it's really correct information" while according to TP27, the application should be

> *"Pretty reliable, for instance you have to know that it's updated. That there really is a bus that will arrive and transport you, that sort of thing. If they haven't updated it for six months, then there could be changes as long as it doesn't come from the bus company itself. Then you have to be able to rely on the developer that they're updating."*

On the one hand, TP11 argued, "it really needs to be up to date. If it tells you a place that shut down, it really needs to be updated", while TP13 added, "I mean there is no point if it says the menu costs 10 Euros, when it's like 20. So it must be updated". Moreover, TP8 stated,

> *"Some apps, I find are great for the first two weeks, and then they just stop working. It's almost like app creators create the app and put it out there and then when something went wrong they kind of abandoned it."*

While the speed of running the application was secondary, interviewees were complaining about past applications having difficulties to load properly to start with. Such applications were closed and deleted right away without ever being used. It was pointed out that tourists preferred to have one platform or source of information for all relevant information required for tourists in general. On the other hand, interviewees expected the regular update of the application in order to improve its functionality and smooth operation. While AR tourism applications

were perceived to provide an alternative information source, participants argued that it was required to be reliable, as AR applications were not yet used for mainstream media. According to Gafni (2008), up to date and reliable information was critical for the quality of mobile devices and was supported by TP13 and TP27 seeking an application that supports regular updates to display correct and reliable information, such as public transport timetables and stops.

Application Cost

The theme of price sensitivity was highlighted multiple times during the interviews as depending on the usage and experience with mobile devices, participants seemed to be more price sensitive to buying applications than others. TP7, TP12 and TP15 mentioned that they would be rather inclined to download and "use a free applications". TP7 revealed,

> *"some of them are free and you have another you have to pay for them. So probably, if I have to pay for them, I don't because probably in some months, there is probably another app free like the other one."*

Moreover, TP8 argued,

> *"that would definitely be a deterrent because if I'm going on a city break [...] I'm going to be looking for the free application that would get me around the city. And considering I'm a person that takes a lot of city breaks, I wouldn't take long holidays. If I was taking a long holiday, I might pay the money for a better app, but I literally just take city breaks all the time, three days, so I'm not going to pay 3 Euros."*

As alternative, TP18 suggested to "make a light version or something, saying you can make the tour if you pay 4 Euros." TP11 further mentioned,

> *"If they're popular, and if people are using them and there's a lot of hype about them, people are going to be interested [...] Will it have benefits for me? [...] If it had some discounts, people are always looking for what benefit has it for me."*

It was found that the majority of interviewees were using free to download applications and did not necessarily see the need of paying for alternative applications, due to the large pool of free apps. TP8 on the other hand argued that

downloading a tourism application would only have limited use during the timeframe of holiday and render useless afterwards. While TP8 pointed out the maximum spending of purchasing applications to be limited to 3Euros, TP13 and TP24 argued that it highly depends on the recommendations and the reviews of the application. The study by Holzer and Ondrus (2011) looking at the mobile app developer's view of commercialising mobile applications enforced TP11's argument, who added that being ready to spend money on an application, regardless of the wide offer of free applications available in the market highly depends on the perceived "benefit of the application" to the user. Such benefits can be fulfilled through "social functions", implying a large audience and number of users of the application that would enable social functions, such as recommendations of various places, or monetary benefits in form of discounts for a variety of products.

Accuracy

With regards to Augmented Reality specific difficulties, interviewees argued whether the application was able to distinguish between different landmarks and project the information correctly. While TP28 mentioned the difficulty of having to "keep it still" in a "world […] that is quite hectic and things move around all the time", TP18 argued,

> *"I'm sure that it recognises a lot so that's good, but with buildings and stuff, if you're standing right in front of it, and you're only seeing a little piece of it or if you have to go 50 metres back to see the whole image, that might be something."*

Others, such as TP16 on the contrary were more concerned with the improper projection of information saying,

> *"They could give you the wrong place. Like if you put a picture up like that, what if it got meddled up? So if you end up in something that's not right?"*

While tourists had a positive perception towards mobile AR applications, they were still sceptical whether it could project information accurately.

6.3 Industry Professionals Interview Analysis

While the identification of tourist requirements was the main objective of Research Phase 1, it was regarded necessary to explore requirements considered by industry professionals respectively. This section will analyse and discuss the data collected in the interviews conducted with AR application developers and experts in the field of AR at the Augmented World Expo 2013, and additional interviews with industry experts in Dublin. The list of interview questions and transcripts of all interviews can be found in the Appendices (Appendix G, H). Similar to the tourist interview analysis, each participant was indicated by a code from EP1 (Expert interview Participant 1) to EP9 (Expert interview Participant 9). Table 6.7 provides a demographic overview of interview participants including the initial, gender, job title, AR experience and date of interview.

Table 6.2: Interview Participants for Developer and Industry Expert Interviews

Initial	Gender	Job Title	AR experience	Date of Interview	Duration of Interview
EP1	M	CEO	7 years	June 4th 2013	19 min. 28 sec.
EP2	F	Marketing and Product Manager	10 years	June 4th 2013	50 min. 35 sec.
EP3	F	AR Museum/Culture Manager	3-4 years	June 4th 2013	21 min. 03 sec.
EP4	M	Unity/Application Developer	5 years	June 5th 2013	20 min. 27 sec.
EP5	M	CEO	4 years	June 5th 2013	20 min. 33 sec.
EP6	M	AR Marketer	2 years	June 5th 2013	52 min. 01 sec.
EP7	M	Dublin Tourism Consultant	n/a	June 26th 2013	65 min. 02 sec.
EP8	M	Application Developer	n/a	June 26th 2013	45 min. 34 sec.
EP9	M	Sales and Marketing Director	n/a	June 28th 2013	29 min. 18 sec.

Source: author (2015)

Participants were recruited according to their profession and AR experience, as it was regarded more significant for the interview. Before the actual interview, participants were asked to briefly introduce their area of expertise and experience working with AR. All developers had worked a minimum of two years with AR, while having prior experience with application development in a range of areas. Interviewees were recruited according to their expertise with AR ranging from application developers to CEOs as well as Marketing and Product Managers. It was evident that the development of AR applications was not only dependent on the coding of the programme, but also the distribution and context-awareness through involvement of other areas of expertise such as Marketing. Since AR was still regarded as a new area to explore, interviewees referred to various backgrounds before entering the AR world, including "virtual reality" (EP1), "museums and cultural institutions" (EP3), and "Human Interface Laboratory […] doing visualisation of buildings and doing some Geo location […] and Civil Defence" (EP4) as well as "print publishing" (EP6).

6.3.1 Industry Professional Requirements

The main purpose of the interviews was the identification of developer requirements. Therefore, content as well as function requirements were standardised categories used for all interviews.

Interaction

Accessing information through AR was still experimented as practicality issues with smartphone interaction were pointed out. Within the requirements 'ease of use' for the user interaction was regarded one of the key issues for use requirements. EP1 argued that it is vital to tell the user how to interact with the application by stating:

> *"it's really important that you say to the user exactly the steps that he needs to interact with that. [...] Before you start interacting with the application you have a page. [...] Something that really explains to the user how it's going to be and what he must do inside the application"*

By providing "step-by-step guidelines", it would "prevent users from giving bad reviews and comments to problems" that arose due to lack of instructions resulting in "negative brand image" for the client (EP1). EP6 on the other hand argued that AR applications should be designed with "an intuitive user interface" in order to facilitate natural interaction. However, EP1 agreed that the application should be able to guide the user particularly for the first stages to support the acceptance of the technology. EP1 proposed to keep the user interface as simple and straight forward as possible in order to "be really engaging in just a few tabs and you can access everything" further arguing,

> *"we must keep the campaigns simple, we must keep the things simple with a small size because we are taking care of the user, and how much he is going to download, how much time it's going to take because after all time is money and people don't want to lose time."*

EP9 further added from a non-developer's perspective, "it has to be easy to use and not expensive" in order to successfully implement the new technology in the business. According to EP6, even marker-based AR should have "a full 360 degree element" (EP6) which is able to guide the user "if you're looking at one part, when you're meant to be looking at two parts, it brings up the other parts in a little frame in the bottom of your screen and says, 'you need to go back'" (EP6). EP5 on the other hand proposed the idea, of implementing AR naturally into the camera, without having the user to learn about Augmented Reality claiming, it would naturally facilitate the adoption of AR by

> *"integrating with the camera directly. So that means in the camera you have like little note wheel that says, "hey switch to AR mode" so the customer doesn't have to think, it just works. And the customer doesn't realise that there is Augmented Reality behind it."*

EP6 further highlighted that in the future, other senses, such as olfactory and kinaesthetic would be included in the augmented experience in order to generate a full "un-doubtfully memorable experience" (EP6). EP1 mentioned that one of the common difficulties with using AR applications such as for Augmented Cities in outdoor environments was the issue of "having to hold the camera of the phone steady" to one object to retrieve information. EP7 was referring in this regard to security hazards by holding the mobile device "too long periods of time using the AR application" demolishing the tourist experience" while the only necessity for the tourist might be the access of "information on immediate demand" (EP7). To solve this issue, EP1 suggested to add the "functionality that when you point, all the content is going to stay" no matter if the camera was not pointed at the object any longer. Providing a user interface that was natural without having to learn new functionalities was regarded as a key element when designing applications for the end-user. 'Simplicity' and 'ease of use' were seen to be an additional criterion for developers as well as Industry Experts when proposing new applications.

User Benefit

A common theme that emerged was the idea of providing benefits to the user. Although the individual often identifies personal benefits, the application developer and supplier should be able to ascertain direct benefits that the user can acquire (EP1, EP2, EP3, EP4). EP1 mentioned in this regard,

> *"you must tell him for sure what is the benefit because in general people are sceptical. They think that you're going to bump them with advertisements. [...] It's really important that you give him the clear idea that it's something that you're going to experience things in a new way and it's going to be fun and it's going to be educational, so you must be really clear what you're providing. Otherwise you're going to miss the target."*

EP2 supported this by saying,

> *"AR should be a functionality that is used for some reason. [...] Why are people using the app? Do they have a need, do they have a reason to see a visual digital overlay and if it's relevant to the point of the app, then I think it's useful."*

According to EP8, "if the application can provide something tangible and attract people to use it by giving rewards, people will try it". Providing direct tangible benefits such as discounts and point systems were discussed during the interview. Any benefits that AR is providing for the user, it should occur in "a natural" way (EP5) without "obstructing the field of vision" (EP5). However, EP5 further argued that in order to be beneficial, it requires the smooth and accurate overlay of information and available data. While it was apparent that it would take time for users to adopt new technology, as it does with other products, EP1 argued that it would facilitate and accelerate the adoption, if "it has a straight benefit for the user". EP2 supported this stating,

> *"Is it providing a service that is not already provided by some other form of technology? I think that's the value [...] So, if they're not, and AR or mixed reality can provide a value that's not already been served, then I think it can be and will be adopted."*

Similarly, EP1 argued, "it must make sense [...] to give the whole overview that it's useful". EP2 and EP3 supported this statement, saying, "it has to be meaningful

or aesthetically pleasing" (EP2). The argument was supported by EP6, highlighting, "it really needs to be something that's put into the hands of people". EP3 and EP6 further noted that it should be "incentivised" by giving people "an incentive to activate it" (EP6) arguing that there should be a reason for wanting to use a new application. EP8 suggested using incentives of the virtual world by saying, one method of promotion could be formed around "giving people something to share and show off to their friends" including social elements. Rather than promoting the technology, EP8 believed in providing people with "a good reason to use the app". Additionally, EP5 mentioned the social component of AR applications. As more and more applications follow the trend of incorporating a social element, EP5 argued that "some kind of locating other people sharing the same interest" was a criterion that should not be overlooked. EP8 supported this feature by claiming, any new to the market AR application should benefit from an embedded social media platform such as Facebook or Twitter where users can start sharing their content in a familiar way on "already established social networks rather than creating the own". A possible way to encourage not only the social element but further support the promotion of AR was "to take a picture of the user and create personal digital artifacts in virtual space to share" (EP8) and "show off" to their social network. EP9 further added, "social element will become more relevant in tourist applications" due to the need and familiar use of personal recommendations about restaurants and attractions that tourists are utilising on a regular basis such as "rating functions on hotels, restaurants, menus, etc. […] based on likings of the user". EP1 and EP5 additionally suggested to connect such city guides with social networks, as "people are selecting things according to the recommendation of their own friends" (EP1). This was supported by EP7, claiming that AR tourism applications should include "visitor-rated information of restaurants through AR". EP6 supported the open-sourced tourism application, saying

"you need to give them connectivity, you need to incentivise them and then you need to bring them to crowd source to tourism in the future."

EP3 noted that people would simply "start using and then playing with it" once they got accustomed to the functions supporting the argument posed by Olsson

and Salo (2011). According to EP5, the future of AR in tourism would be built around "interactive use cases, meaning could even be through some kind of gamification elements". Additionally, EP3 suggested that AR gaming could be a potential way to bring the technology to the mass market by "promoting it and getting people involved". EP6 added that it should be able to save user profiles, such as in games saving "levels" and "high scores" that would trigger more regular use of the application. While it was vital that technical issues such as Wi-Fi coverage and application accessibility were in place, EP1 saw the driving force behind tourism stakeholders to benefit the destination as well as small and medium enterprises. It was revealed that at the current stage AR applications would be too specific for individual use cases. However, investigating the perception of AR usefulness by tourists, it showed that they perceived AR as 'useful', 'interactive' and 'helpful' while the majority was referring to the GPS-based AR implementation due to their limited knowledge of AR overall. Although tourists such as TP27 were not experienced with technology, AR was perceived useful and potentially useful for every day purposes such as GPS navigation and immediate access to information.

Context Awareness

In order to implement AR application in a meaningful way, interviewees argued that context awareness was crucial to adjust AR functions to the application content. EP1 pointed out that the future of AR largely depended on its usefulness and implementation contexts. However, "it has to be made in a way that it's not going to have any problems with it" (EP1). EP5 added that AR had passed the hype stage, as "less media are talking about AR". According to EP5 this would imply that AR could now be used naturally, as "part of every day life and this is actually the mid-term stage we're about to enter". As AR was implemented in multiple marketing campaigns already, EP5 implied,

> *"it's no longer Augmented Reality, it's more the focus is on the use case per se, and on the brand and AR is just a facilitator and I think that's a very good thing that we're moving away from the hype and the technology focus to really an end-customer value creation focus."*

EP4 argued that "augmenting [something] purely for the sake of it [which] doesn't add to the practicality" should be done with caution as it could project a negative image on Augmented Reality as a technology for the near future and thus create obstacles for its further development and implementation. EP3 suggested,

> *"it all depends on the specific situation. For this archaeological site, the best thing could be reconstructions, but what if you don't know what was there, then I would say, let's go with some interactive scenario to get people interested. [...] So it all depends on a specific situation what you want to achieve, who is the audience and what are the challenges, why would AR bring benefits."*

EP4 added that 'useful AR', such as for "maintenance applications, map visualisation, architectural visualisation, things that people need and can do better with Augmented Reality" were currently already being developed. EP5 argued for tourism one of the main values of AR being,

> *"guiding the customers through the city, guiding him to relevant points of interest, retrieving information about certain sites and landmarks and doing all that in a very natural way."*

EP7 supported this argument, stating, "layering of information on street zones" was one of the main functions perceived being used in AR tourism applications. Therefore, the aim of utilising the virtual space to provide information on the tourists' surrounding was ideally to tackle the challenge of destination management organisations to "remove signs from the streets" (EP7) due to limited and preserved urban spaces. EP7 argued that it was often difficult for tourists to find local places at unknown destinations particularly in big cities due to limited access to information, which was to be eliminated through such applications. EP8 and EP9 on the other hand discussed the implementation of tourism applications to a specific destination or context in general, claiming, "deeper information needs to be more specific to an only limited audience". Therefore, EP1 argued tourism to be one of the industries, where "AR adoption will come naturally". However, EP3 criticised that it would be highly dependent on the network infrastructure, as "data roaming charges, it's all very limiting the further development of AR". EP5 was supporting the view, suggesting,

> *"It should be part of a tourist application. The implementation should be done very well, so it's really high optimised for that particular use case and the UI [...] achieving that goal you want to achieve. Probably like as a travel guide or whatever, and make the access as easy as possible and make a prominent proposition within the application."*

EP5 on the other hand perceived AR in the context of tourism as an "application that guides me through the city and tells me retrieving information about specific landmarks". EP7 added in this regard that Dublin was already working on a project called, "Tourism Eye" which was based on GPS coordinates on all landmarks in Dublin enabling tourists "to be able to plan their route prior to the trip" (EP7). The landmarks were based on tourist interests by pinpointing tourist sights that were picked by the user. However, the application did not support AR functionalities to overlay information. Instead, it was completely based on GPS coordinates in order to create a map of tourist sights that would assist the planning process for tourists. AR could potentially be implemented as an add-on to project information on the tourist spots and enhance the user experience of the application. On the other hand, it was argued that AR has proven to be beneficial for the education sector, enabling children to learn faster than with traditional media. EP3 added in this regard,

> *"The speed of learning it's really improved with the use of Augmented Reality."*

Although AR was prior often used as marketing gimmick, all developers agreed that it needed to be implemented into useful contexts in order to increase its awareness and usability for the mass market supporting literature findings (Zhou et al., 2008; Van Krevelen and Poelman, 2010). Particularly in the tourism sphere, it was argued that AR was showing high potential, due to the possibility of keeping the focus on the surrounding compared to "searching in books and applications the information that you need" (EP1). As it was stated by TP17 when investigating tourists' content requirements, it was considered useless to project information that was not relevant to tourists' interest and timeframe. Therefore, it was argued in the tourist interviews to be able to input personal interest areas and duration of travel in order to receive only relevant information for that time period (TP14, TP28). All interviewees considered tourism to have a high potential for influencing the mainstream adoption of AR. While AR applications and use cases could be

introduced in the near future, mass adoption in tourism was argued to be limited by the network infrastructure that is laid out in the surrounding as tourists would avoid using data roaming due to the high amounts of costs involved (Dunleavy et al., 2009).

Content Quality

While all interviewees agreed that content and functions were to be seen separately in an AR application, all agreed that they would influence each other. However, content should be the determinant when designing AR functions in an application. EP1 suggested that poor content should be subsidised with great functionality, while rich content required "to keep things simple and really well accessible". EP4 added that it highly depends on the context as "too many interactions [would be] detrimental when all they need is really the visual experience". EP1 argued that the balance should further depend on the device that the application is designed for. Since Augmented Reality requires more hardware capacity, EP1 suggested, "planning functionality ahead" before implementing the content, as both affect one another and should be modified to be compatible. However, on the other hand it was claimed that users would essentially be the ones creating the content on an open source platform and therefore simply "interact differently [by] making art into public spaces digitally" (EP2) in order to generate personalised content. EP7 added in this regard, that "content has to be ready to be presented on AR through content management and preparation". While all fractions of the "triangle" between content, user and device were relevant, EP7 believed that "content is king" and therefore, "content creator will be key" in the future of AR. In order to support rich content it was suggested, "Wi-Fi connection is always important" (EP3), since the application would soon be too big to download as the size of content increases. According to EP5, there were "6000 different use cases in Wikitude, but still the Top 5 are all related to Travel and Tourism". For the future EP1 claimed that no matter the browser or platform that would be used, "content is going to win in the end" since it will be the most beneficial to the end-user. EP6 supported this argument stating,

> *"What it's going to be about is content […] It's a bit like the Youtube brand. […] Everyone can produce content now. […] As soon as*

everyone joins all the dots, for architecture, joining rivets to an AR engine or whatever. As soon as people can create 3D content easily and then they can put it into the back of an AR engine then it's going to explode."

EP2 added in this regard, that content "should be uniquely developed for the AR space. That's a value". Furthermore, EP6 added in order to accelerate the mass-market adoption of AR,

"If you're talking to for example a tourism authority in Ireland, then you need to keep doing campaigns. You need to keep delivering content and make them more relate to each other as well. Tell the story of a group of tourists, allow tourists to tell their story about Ireland and continue their story"

According to EP2, content that was available over other sources would limit tourists to travel to a certain destination and try out the AR application. Therefore, it was argued that

"content should be customised and built and spatially relevant and add value while I'm seeing it connected in AR and its environment." (EP2)

EP4 on the other hand claimed that "content is very expensive and very hard to do well", suggesting not only accessibility of content, but also the creation of content to be a challenge for AR application developers. EP3 agreed saying that the developer could create content, however, it would be more "purposeful" if tourism organisations could implement their own content in the application in order to increase its "relevance and uniqueness". Working with various stakeholders would drastically slow down the development process, as more opinions required being considered, however, it was regarded as an inevitable step in order to create beneficial applications for tourists. Therefore, EP1 suggested making "a dedicated backhand for them, so they can easily input all the information and publish the campaign in a couple of minutes, something that is really useful" as it was found that the cooperation of various stakeholders required attending to different goals and needs.

User Experience

Providing different perspectives on the same object resulting in altering the user's experience was regarded as potentially beneficial for everyday activities. The theme of "assisting people in day-to-day activities" (EP1), while providing a "different perspective" (EP5) on objects was regarded as one of the key functions of AR technology (EP1, EP3, EP5, EP6). EP1 further argued to "help people with day-by-day life and experience the objects and to see things in a different way" was the main driver for their company. Particularly EP4 commented on this issue, stating,

> "the reality of the actual experience is occasionally underwhelming [...] it's isn't as magical than you hoped it would be."

This argument was supported by EP5, who claimed, "to find the right user experience, to manage the user's expectations properly" to be one of the "major challenges in this space" (EP5). According to EP1, although prior experience is necessary to determine "which experience was the good one, which one was not so much, [to] avoid mistakes". Furthermore, it was recommended to empower the tourist of the amount of information that would be projected in the augmentation. Therefore, providing the option of choosing "exactly how to look at the experience and to tune up things what he wants to see" (EP1). This was supported by EP6, arguing that it would not only benefit users, but also tourism providers of the destination, stating,

> "allowing people to make choices about what AR they view in a certain place, what mixed reality they see will be enormously informative for tourism authorities knowing how people engage, like how foreigners are engaging with their city."

Through marker-based AR, tourism authorities now had the possibility to investigate "what people are viewing, when they are viewing it" (EP6) at and engaging with within a given destination. EP3 supported the argument to provide different experiences to people by stating to have come in contact with AR through

> "redesigning the museum experience and getting people more involved, and giving more interaction, providing more solutions so people could appreciate what they see and have the artefact out of the glass cabinet."

Moreover, EP3 suggested the use of AR in museums, such as

> *"a small chart of pottery, with a long text of how this vase looked 100 years ago cannot compare with the reconstruction of the vase that you can see that you can move around that you can touch and then maybe you can fall apart again and you can show the process of decay or the other way around"*

while EP4 was referring to "visualising models on a desktop […] bring out the thing in the real world you get to see the real size of the model". EP9 claimed further, "AR will be used to improve story-telling, especially for people who prefer seeking information on their own". EP7 supported this argument saying, AR having a great potential "to bring traditions and historical stories to life". One of the ideas that EP7 brought up was the use of AR for the 100-year anniversary of the Irish Independence in 2016. While the content "based on events that happened during the Irish Revolution" (EP7) was available, the destination management organisation in Dublin was struggling with "how to make it real for tourists and how to present it" (EP7). While doing so, it was argued that the main aim should be to make "the experience more engaging with AR by viewing the world through the screen" and taking the "world as the screen" (EP8). While information overlay was often regarded as the main purpose of Augmented Cities, EP1 proposed to "reconstruct" buildings from the past in order to provide an additional historical experience to the tourist. This method of implementation was supported by EP4, claiming,

> *"it hasn't been done very well, because most of the people have used GPS technology, which means that the photos don't line up exactly, and then you get a weird sense of depth."*

EP6 on the other hand recommended a story-telling aspect to tourism applications. According to EP6, "telling people a story about a place you want them to come to through AR and then rewarding them when they've come with another" would provide a beneficial way to enhance the tourist experience while benefitting the destination. Particularly in museums, EP3 was referring to "the power of touch" which would enable visitors to actually touch an item without having to worry

about damaging it, providing an added sensual experience. One of the main functionalities of AR should include providing a view and experience that was not noticeable in the known reality (EP2, EP3, EP4, EP6). Customer satisfaction and meeting customer expectations was regarded as an additional non-technical challenge that AR application developers were dealing with. Providing an alternate view of historic and cultural objects was believed to be one of the key implementation areas of AR in tourism.

Accessibility

Another crucial aspect that was mentioned was the accessibility of content anywhere at anytime providing the tools and infrastructure to be meaningful. EP1 claimed,

> *"If it's pretty much taken care of things, I think that it's pretty much the future that you can give to the people the experience and the opportunity to experience everything around them in a new way, in an easy way and to make the things accessible more easy, just by looking at them, or pointing at them. Not searching on the books, or on the webpages."*

Furthermore, EP1 claimed, it was crucial that the infrastructure was put in place, such as Wi-Fi coverage around the city that would attract tourists into trying out the application "because you don't have to worry about roaming if you're a tourist because that is something that really makes the difference of peoples' choices". EP6 supported this argument saying,

> *"Tourists don't tend to use mobiles at the moment. So in order to drive Augmented Reality you have to give them access to your network."*

Similarly, EP9 saw the potential of AR in the establishment of free Wi-Fi networks in the urban space providing grounds for tourists to use their mobile devices on their holiday arguing,

> *"public Wi-Fi needs to be stable and fast enough to facilitate AR applications and functions."*

As rich content requires storage space, it was argued that "it must be Cloud-based" (EP1) to be accessible anywhere without having to download an immense sized application beforehand. However, it is essential to maintain high server accessibility when dealing with Cloud-based content in order to avoid "any kind of drag down, drop down and so on" (EP1). EP6 on the other hand argued that in order to link content to a Cloud server, "3G networks vs. 4G networks vs. Wi-Fi and the load time" should be considered in the development. EP1 mentioned that having an "own Software Development Kit (SDK)" is vital for developers, however it is required to "merge to a standardised platform" where content could be shared among users similar to the Internet being able to be accessed through various browsers. EP3 mentioned that the topic of developing on a "universal platform" had been in discussion among developers two years ago on a convention in Barcelona, however, it could not be realised. According to EP1, "5-6 platforms […] just talking about the big ones" existed at the moment. Since each platform had their own coding mechanism, "the campaigns, the experience that they are providing is that it is not accessible from any other platform" (EP1). At the current stage, it was argued, "everybody is interpreting content differently" (EP4). However, this implied that the end-user would need to switch platforms for each application, resulting in a negative overall user experience. EP1 claimed that one dominating platform, such as in the example of Apple and Android for smartphone operating software would be one of the ultimate solutions for the future of AR unless developers "decided how to make things together […] because the industry is so small that we must fight together to make it big" (EP1). EP3 shared EP1's argument stating,

> *"I hope so because at the moment from the developing side it's quite difficult because they're quite different. […] There is so many of them."*

EP2 on the other hand argued, "there is no standardised platform for mobile right now", thus implying that for the AR industry, "it [would] resolve themselves down to maybe two or three". However, according to EP2, although this would complicate the development of application, it was a healthy industry, since competition existed in the market. EP3 commented on this issue,

> *"There are two or three major ones, but still they all have different developing requirements."*

Nonetheless, EP6 revealed, "as soon as there is a really good publishing platform, things will really start to explode". However, for multiple platforms to exist, it was crucial that "all the base functionalities [were] seen everywhere" (EP1), while it was the choice of the end-user to choose and explore further in a particular platform. EP4 added in this regard that a standardised platform would only be possible, if "you have all the content basically going through the same pipeline and being readable by all kind of different augmented reality browsers". However, EP5 argued that for smartphones the current brand of AR platforms were "not strong enough in the mind of the consumer". EP1 supported this by stating, "[AR] has value for the user and it's easy to be accessed", while EP4 stated,

> *"if you have a universal browser, for example, you only install it once, constantly searching for information and it runs in the background and pops up when necessary, I think that that would also help out with the adoption of augmented reality."*

Providing a development platform for people without the technical capabilities was suggested to greatly improve the communication between the developer and the client. EP1 argued that a "common understanding of requirements" and vocabulary was necessary in order to facilitate the communication between what the client wants and the developer's translation into technical functionalities. This statement further pointed towards the necessity of closing the gap between customer requirements and technical functions, which this study aims to provide. Therefore, from a mediating point of view between the application developer and the client, it was not only significant to be able to develop an application for the client, but foremost, to cater to the specific needs and visions and be able to offer a product easy enough for the client to modify according to their will. As mentioned for the 'Interaction' of the mobile application, it was therefore vital to design an application that was intuitive to use and would not require the need to learn. It was recognised that at the current stage multiple platforms were existent, which was therefore limiting each individual use cases for implementation. Interviewees were convinced that AR would be able to provide information in a more intuitive and convenient way in the future.

6.3.2 Current Challenges in AR Application Development

After user requirements were discussed, current challenges in AR development were investigated. The aim of the question was to identify areas of issues that might arise within the development of AR demonstrators for the study and find alternatives to overcome the obstacles.

Accuracy

It was argued that recognising the trigger image was one of the main challenges for AR developers (EP1, EP5, EP6). Since AR information overlay relies on application recognising an image or object in order to augment the right information, EP1 stated, "the challenge of image recognition and image tracking" as one of the first difficulties when dealing with AR. EP5 highlighted tracking challenges by claiming,

> *"accuracy of the different sensors [...] when you stand on top of the mountains and look at the mountain peak use case, identifying mountain peaks and the compass is 5 degrees off, so you land at a totally wrong peak."*

EP1 revealed, "you don't have the same experience". According to EP1, GPS-based AR was considered not yet ready to be utilised meaningfully, as GPS-based AR at the current stage would be "for one perfect world in which everything is going to be well adjusted and you're going to have the great coverage of the networks". Although EP2 clearly outlined the benefits of GPS-based AR, such as "you can put it anywhere in the world and you don't have to be there" or changing structures and lighting conditions not affecting the geo-location sensor, EP2 highlighted the current inaccuracy of GPS sensors, although having been an existing technology for the last decade. Therefore, believing it might be resolved in the future, EP2 argued, "maybe there is not a huge demand to get it down right to the millimetre".

Environmental Influences

Using AR in outdoor environments was considered particularly challenging due to the changing environmental factors such as weather and lighting conditions that were not possible to control. While indoor environments provided controlled settings with minor changes, it was mentioned that outdoor environments were still creating major challenges for AR developers due to the "conditions that are beyond our control [to] provide a consistent experience" (EP2). EP2 added that issues, such as "lighting conditions, obstacles in front of the viewer, the building or the mirror" as well as the weather were the main issues in outdoor environments as they would not stay consistent, but fluctuate. EP8 supported this view stating, "GPS accuracy is a challenge of AR overlay". EP1 claimed that their AR application were "not based on geo localisation", but put high emphasis on marker-based augmentation. Compared to pinpointing the user's coordinates and projecting information in his surrounding, EP1 suggested a "visual search" in order to avoid errors and assure a better user experience "because what you're going to point at is exactly what you're going to see" (EP1). EP3 on the other hand criticised the lighting issues that arose with marker-based AR applications. In order to avoid current issues, EP3 suggested looking into SLAM, a third tracking alternative, which "brings together both, GPS and feature-based tracking" (EP3, EP6). It was argued that it highly "depends on what you're trying to accomplish" (EP4). This statement was supported by EP5, claiming,

> *"Every approach has its pros and cons, every approach has certain segments and use cases where one of the other is suited better than the other."*

Similar to EP3, EP4 was suggesting finding a mix between marker and GPS-based AR, such as in tourism applications in the case of

> *"augmenting hotspots [...] where the GPS could detect the user's location and prompt them with a simple Augmented Reality maybe bubble saying that there is augmented reality content and ask him if the user wishes to load it." (EP4)*

EP5 on the other hand suggested marker-based AR being "specifically relevant for advertising use cases or for kind of manuals and instructions". According to EP5, marker-based AR was "highly relevant for indoors a tablet use cases" while GPS-based AR "is mostly used for location based services, travel and tourism, and therefore is mostly an outdoor scenario". Nonetheless, since GPS-based AR was highly dependent on external factors, such as hardware capabilities as well as network coverage in the area, EP1 argued, "the whole infrastructure in the whole world is not able to support it in the best way that the user deserves". As alternative, EP6 suggested using Geo-fencing,

> *"pre-fencing the environment around geographical areas so that you can actually change the surrounding AR experience knowing which area someone is in of the same marker. So if someone is carrying a marker with them off a catalogue or whatever, you can actually change the experience when they go from zone to zone as you've predisposed them to."*

While it was argued that AR implementation would be highly dependent on the purpose, a combined technology in the name of SLAM was proposed, which was able to combine GPS-based and marker-based AR to tackle the weaknesses of both tools.

Hardware

In order to use AR in a meaningful way, it was claimed that a minimum hardware requirement was essential, as AR technology requires more hardware capacity than many other applications. EP1 supported this theme by claiming,

> *"There are some kind of level of devices beyond which we're not supporting because there is a need of minimum requirements. I mean you can't run it on the first iPhone as an example."*

EP3 added that museums should therefore have a strategy such as offering mobile devices within a controlled environment, as "many people do not have the devices capable of that". The current hardware capacity allowed experiences to last "20-30 seconds with full hard-core, decent polygon 3D with a decent story to leave an impression" (EP6). EP2 implied that the future of AR was highly dependent on the hardware development and its capabilities, as one of the obstacles that were holding back AR development. Therefore, not only technical capabilities were the issue, but it should be "cost-effective or people can afford it, it's good to look at, people want to wear them" (EP2) in order for AR to "take off" (EP2). This statement was supported by EP3, stating,

> *"it seems like glasses and also Augmented Reality optimised or capable devices because most of the things are quite processor heavy still in terms of rendering and thing like that. Also if the GPS accuracy improves, it could bring a lot to AR."*

EP4 on the other hand claimed that hardware was soon to be ready for high AR experiences, as

> *"3D tracking is very, very good and the AR engine, which is a hardware solution for Augmented Reality would be revolutionary because what it does, it decreases the battery usage of Augmented Reality by 60 times. So the battery usage becomes 1/60th the traditional amount and tracking localisation goes up 60%."*

According to EP4, this would allow AR applications and undermining functions "to run augmentation 24/7, whereas right now you're limited to five minute experiences". EP3 argued that one of the directions for AR would be the growth of AR cities "to have all the information layered around you". EP5 added, "the AR hype might have passed, but now we are in the early wearable hype and the kind of the AR industry benefits from that hype". Therefore, it was crucial for developers to position themselves in the growth, whether "through our platform or through our SDK" (EP5). EP2 noted that Google was rather a late entrant in the industry of wearable glasses, while others such as 'meta glasses' (Brewster, 2015) had existed for quite a while with Steve Mann, the pioneer of augmented reality glassware having "worked on these glasses forever before anybody knew about

them". EP5 on the other hand argued that Google Glasses was regarded "the first wearable computer that [might be] mass market ready". In contrast, tourist interview participants believed that the majority of people were not able to play AR applications due to the limited hardware capacity of common mobile devices. It was believed that the most recent processing power as well as an extended battery life was necessary in order to create smooth AR experiences.

Privacy

One of the key obstacles to overcome particularly as hardware was becoming more advanced were regarded as privacy and security, as AR had the potential of connecting and overlaying information from different sources. EP1 referred to the example of the failed launch of Google Glass as well as AR implemented to assist in cars, stating,

> *"we're seeing things with the Google glasses and things that are about the privacy issues, the things that about putting it in the cars, about the responsibility if something happens."*

This statement was underlined by the importance of data security (EP1). EP9 added further that not only sufficient bandwidth of Wi-Fi was a factor that required pre-elimination, but also the issue of "data and privacy" as it was often debated in the development of Google Glass and wearable computing, and might have lead to its failure to launch the product to the mass market. While wearable glasses were considered by all industry professional interview participants as the next revolutionary hands free mobile device, EP1 stated that the "issue of privacy" needed to be addressed, before development could move any further. According to EP1, people many people were concerned about the capabilities of such technology invading privacy and "violating my space" (EP1). While Google is currently pushing advertisements for their Glass project, EP1 argued that the opinion of users was divided into the ones who were concerned with their personal space, and others claiming "this is the future" (EP1). EP6 on the other hand debated this argument stating,

> *"You can see when the screen is on, I mean it should have a little red recording light as well."*

According to EP1, it would highly depend on the acceptance and adoption of the end-user, since "if the community decides that a product is not good enough for them, they're able to take it down". EP6 on the contrary was convinced "everyone is going to buy it […] I think it will bring people up and out."

Public Awareness

The lack of public awareness towards AR and AR applications was seen to be one of the issues that AR was not taking off. EP2 mentioned the exposed advertisements that were creating issues in the public space. According to EP2, while all devices were controllable to "turn off", it was impossible to "get rid of ads" in the public space while commuting. Through Augmented Reality EP2 saw "a need to undercut the physical way of advertising". According to EP4, advertising to a mass market would imply having "high quality content, available to a large amount of people for the word to get out". EP4 therefore proposed advertising AR to the public through the tourism industry, as

> *"the content that could be created would be very easily accessible by people […] [while] everybody would be interested."*

However, EP2 also mentioned that AR on the contrary had the potential to serve as platform

> *"for artists to make encourages into spaces because before they couldn't legally, or they couldn't afford it."*

EP2 saw the potential of AR to "provide a mechanism where both commercial and private voice can be heard" instead of being exposed to commercial push advertisements. EP2 highlighted the need of "content control" in the public space while referring to alternative content besides ads such as the incorporation of recommendations by technology around the area of interest

> *"where I have a certain interest, but I want this genome project to add content to what I'm interested in that maybe I have never thought of before."*

While not all Industry Experts in Dublin had worked with AR before, all of them were familiar with the technology and perceived AR to provide "rich opportunities" (EP7) seeing AR as well as wearable computing such as Google Glass "become more and more relevant and evolving more" (EP9). Additionally, the marketing of Google Glass as "augmented reality eyewear" was publicising AR as technology "putting all these words […] suddenly becoming acceptable" (EP6). Although EP6 believed it was a miscommunication, as Google Glass was not considered Augmented Reality, it was regarded as benefit to bring AR into the mass-market. EP2 on the other hand argued that advertising to the public would largely rely on leading companies, such as Google, Microsoft and Apple saying, "[big companies] play a role in helping educating the public to what AR is". EP3 supported this method by arguing, "making things interesting and connecting it to big brands" to be a potential alternative for AR advertising. EP7 on the other hand suggested publicising the application "to make it meaningful and under a board, scalable name" such as the Dublin City Council to bring it to the public, as applications were seen as difficult to promote. According to EP2, it would take until the end of 2015 for the public to understand AR and adopt it naturally in every day activities, while EP6 believed in the power of brand campaigns. EP6 argued that currently, most brands adopting AR marketing were simply providing gimmicks of AR without a strategic underpinning. Therefore,

> *"when brands are making AR into an actual strategy, into a media channel, then you don't have to have people downloading apps all the time" (EP6)*

supporting the accessibility of users to the media as well as to engage with the brand. However, it was argued that "frequency of campaigns and strategy" (EP6) was required in order to keep the AR application alive and ensure repetitive use to "hit the mainstream" (EP6). EP6 added that

> *"AR really needs only one or two really big well executed campaigns that if given their time in the sun and every market will sit up and tight and notice that side of the coin."*

Although AR was employed by various companies as gimmick to gain attention (Mistry et al., 2008), EP1 noted that traditional advertisement for the supplier's

benefit based on push advertising to increase company sales was doubted to work in order to support end-users to adopt the technology. Instead focus should be given to user engagement in order to increase awareness of the technology. Marketing should be designed in a pull method attracting the user to want to use the application.

6.4 Summary

The main aim of this chapter was to analyse primary data collected in the tourist interviews to identify tourist requirements for mobile AR tourism applications. In addition, interviews with mobile AR application developers and industry experts from Dublin were analysed to get an insight into their expectations of implementing a mobile AR tourism application in Dublin. The tourist requirements were contrasted to the views outlined by industry professionals in the field of AR and Dublin tourism.

Interviewees in the study were in general familiar with the use of the Internet and mobile devices for achieving various tasks in every day life. Although the use of tourism applications was limited to map navigation and applications encouraging a social element, all tourists had a positive perception towards the usefulness of mobile AR tourism applications. With regards to tourist function requirements, many of the previously identified requirements in the literature could be verified. 'Simplicity', 'social functions' as well as 'privacy and security' issues were still valid requirements. It was evident that tourists increasingly valued 'personalised information' that was able to filter the amount of available information on the Internet according to their interest. 'GPS navigation' was further largely expected to navigate through unfamiliar environments, while 'entertainment' was not as relevant for mobile AR tourism applications. Tourist interviewees were much less concerned to share their information online through mobile devices, as other applications such as online banking, and social media apps proved to work successfully. An additional requirement was identified as 'multiple language' options, since tourists were increasingly thinking globally. For tourists, 'accessibility' at any point and time was crucial. With regards to content

requirements, peer 'recommendations and reviews' were getting more common with regards to tourism-related information, and therefore social functions offering ratings and connecting tourists seemed to be expected. Since information was largely accessible on current mobile devices, it was pointed out that information overload was often an issue. Therefore, information needed to be place and time relevant to the tourist. However, tourist interviewees seemed to be sceptic about using current mobile devices for mobile AR experiences, as it was commonly believed that the processing power of current devices was too weak to generate meaningful experiences. Nonetheless, while AR provided new possibilities to access and project content, tourist interviewees as well as AR developer interviewees regarded the quality of provided content to be the key determinant to use an AR tourism application.

Considering developers and industry experts, all interviewees had a positive perception towards mobile AR applications in tourism as the logical industry to implement AR in countless potential use-cases. However, at this point a potential AR application was not seen as a revenue-generating source, but rather to create positive word of mouth. Developer and industry expert interviewees were able to provide a more technical viewpoint on requirements. It was found that developers were highly concerned with the way the user engaged with the application. Interaction through a 'simple user interface' to provide a positive user experience was regarded one of the main requirements. It was argued that the user needed to understand the value of the application in order to encourage its use and benefit of the application. Therefore, information should be provided with respect to the context and immediate environment of the tourist. Furthermore, it was argued that content quality was crucial, and the dominant factor in the application, particularly for information-providing applications. Developers revealed that 'accuracy' issues were still challenging, which was easily influenced by shifting environmental factors such as changing weather conditions. Moreover, it was argued that current mobile hardware was still limiting full AR experiences, which was a concern not only for AR applications, but mobile devices in general. Industry professionals argued that battery power and accuracy of AR overlays still needed improvement before AR could be used meaningfully. Developers and industry experts still seemed to be largely concerned with 'privacy' issues particularly for the future of

mobile AR. Since wearable computing was regarded as the next mobile device, new privacy issues seemed to be arising.

While similarities could be found from user requirements identified in the literature, additional requirements were identified during the analysis of information provided in the tourist interviews that are closely related to the mobile and smartphone context. Furthermore, tourist as well as developer requirements evolved from the increasing penetration and use of Internet-capable devices and applications that were offered in the mobile context. However, it needs to be recognised that the initial tourist interviews relied on expectations of tourists without having experienced mobile AR tourism applications. Therefore, a mobile AR tourism application demonstrator was developed in consideration with tourist and industry professional requirements and tested for the second research phase. The following chapter will provide a detailed analysis of tourist focus groups as post-experience study, after experiencing the developed demonstrator.

CHAPTER 7 – TOURIST FOCUS GROUP ANALYSIS

7.1 Introduction

The second research phase was conducted as post-experience study to confirm the interview outcomes from Research Phase 1. The focus groups aimed to confirm tourist requirements from the tourist interviews (Research Phase 1) and identify additional tourist requirements after experiencing the mobile AR tourism application demonstrator. Therefore, the analysis will follow a similar pattern to the semi-structured interview analysis of chapter 6. The main headings will be categorised into function requirements (FR), content requirements (CR) and user resistance (UR). The following will provide a detailed description of participant demographics and focus group analysis.

7.2 Focus Group Analysis (post-experience study)

The post-experience study in form of focus groups was conducted with undergraduate students from the UK visiting Dublin for three days. A total of 49 participants forming five focus groups with nine to ten participants each were conducted from November 4th to November 6th 2013. Most participants were British young adults and visiting Dublin for the first time. All focus groups lasted an average of 25 minutes. Table 7.1 presents the demographic characteristics of focus group participants.

Table 7.1: Demographic Characteristics of Respondents (n=49)

Categories	Items	N	%
Gender	Male	6	12
	Female	43	88
Age	<20	38	78
	21-29	10	20
	No indication	1	2
Prior AR experience	Yes	3	6
	No	46	94

Source: author (2015)

A total of four questions (Appendix M) were designed to be discussed within the focus groups with an additional four follow-up questions depending on the flow of the discussion. The questions covered the AR demonstrator experience, usability of the demonstrator and expectations towards tourist requirements for mobile AR tourism applications. The discussion was divided into two main categories, the Dublin Augmented Reality (AR) application, which was referred to as the developed demonstrator and general AR tourism application requirements including content and function requirements as well as user resistance elements of AR applications in the tourism context. The outcomes were analysed using thematic analysis to confirm themes driven from the literature as well as the first research phase (Semi-structured Interviews). The following table provides a list of focus group participants.

Table 7.2: Focus Group Participants

Focus Group	Participant Code	Number of Participants	Participant Gender
1	F1P1 – F1P10	10	5M – 5F
2	F2P1 – F2P9	9	0M – 9F
3	F3P1 – F3P10	10	0M – 10F
4	F4P1 – F4P10	10	1M – 9F
5	F5P1 – F5P10	10	0M – 10F

Source: author (2015)

7.2.1 Dublin AR Application

The first section of the focus group discussion was focused on visitor reaction of the tested mobile AR demonstrator, which was developed according to tourist, developer and industry expert requirements identified in Research Phase 1. Participants had a positive response towards the tested demonstrators and were able to see the value and benefit that AR could offer for the tourist. F1P10 stated, "It's more specific", while F1P4 commented, "It was good, pretty cool, clever" and all participants of the first focus group agreeing it was "impressive" while focus group 4 and 5 stated, "It was really good". Although the demonstrators were limited in functionality, participants were asked to comment on the perceived benefit and potential with regards to their experience.

Accessibility

Focus group participants revealed that accessibility to information at any place and time was the key to successful adoption of mobile AR tourism applications. Having the possibility to access information anywhere at any convenient time seemed to be one of the key benefits that focus groups participants saw in mobile AR tourism applications after experiencing the provided demonstrators. All participants from the first focus group agreed,

> *F1P2: "I think it's a really good idea, because in the future [...] tourists will be able to know any attraction, with possibly pointing the camera at something and know anything about it. So I think it's a really good idea."*
> *F1P4: "I think if a tourist is new to an area, like it's the first time they've been here, with the app they can find places they are good to go and visit and help them find where it is, the location and stuff, it would work really well."*
> *F1P3: "I think it's accessible to use anywhere, at anytime, anyone. I think it's pretty simple to use and especially the new technology involvement in tourism, that's a good thing."*
> *(Everyone agrees)*

Furthermore, F3P5 argued that having all the information in one place would be more convenient, saying,

> *"I think it's really clever. It's better than spending lots of money on all the tourism stuff. You just get the app and go by yourself."*

Moreover, F5P1, F5P4 and F5P10 noted,

> *F5P1: But then it's good if you didn't know where something was, like I wouldn't know that was the Spire, but if you hold it up and it gives you information on it. That's probably what I would use it the most, when I didn't know what something was and I wanted more information on it."*
> *F5P4: "If you didn't know the name of something." (F5P1, F5P8 agree)*
> *F5P10: "They could've used it for the Dubline Trail for the massive colourful things." (F5P1 agrees)*
> *F5P4: "In the Dubline Trail some of the things, like maps or something weren't in the right place, so you wouldn't know which trail was which, so in the app that would be really helpful."*
> *F5P1: "You know we got lost and we asked a local and she had no idea what we were looking for so that would have been so handy."*

It was argued that mobile AR tourist applications would enable tourists to access additional information anywhere at any time, considering overall accessibility issues such as Wi-Fi network coverage, information depth within the application was granted. Furthermore, simplicity and map-based navigation were seen as an expected requirement in order to realise the value of mobile tourism applications (F1P1, F1P2, F1P3). Wi-Fi access, as well as access to content was seen to highly increase the convenience of travel.

Information Quality

The content quality within the application was suggested to be crucial in order to benefit the tourist by providing more in-depth information with regards to points or objects of interest. F2P7 claimed, "It was good to have additional information to what was actually in the museum." F2P3 agreed by saying, "It would actually give you a bit more information than what was given to you in reality."

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Similarly, F5P10 and F5P2 approved to this statement by claiming,

> *"I like the fact that it shows different information ports actually, different information in the museum. (F5P2 agrees) It gives you more depth about what you're seeing."*

In this regard, F4P5, F4P4, F4P7 and F4P1 further commented,

> *F4P5: "I think it was good that when you were inside, one of them was a video, wasn't it? One of them was a picture, and the other one was just text. That was kind of good that it was different. That it was kind of visual, wasn't it." (F4P7, F4P1 agree)*
> *F4P4: "Because usually when you're in a museum it's always just some text."*

On the other hand, F1P6 contradicted,

> *"As we used it in the museum, I think it's not very helpful because the information is already provided, so it's probably a waste of time."*

The majority of focus group participants seemed to value the provision of additional content through the application, while offering various methods of providing information such as textual, auditory and imagery in order to enhance the overall tourist experience. However, it was argued that information should add more depth to existing sources that tourists could access on demand. Tourists further seemed to agree in the tourist interviews (Research Phase 1) to maintain the application in order to keep the content reliable as suggested by Gafni (2008).

> *TP27: "Pretty reliable, for instance you have to know that it's updated. That there really is a bus that will arrive and transport you, that sort of thing. If they haven't updated it for six months, then there could be changes as long as it doesn't come from the bus company itself. Then you have to be able to rely on the developer that they're updating."*

Focusing too much on the application was further argued to potentially lead to missing out on information provided in the surrounding, as tourists were tempted to concentrate on their smartphones.

Simplicity

Participants had a positive perception towards the idea of a mobile AR tourism application, however argued that having an easily understandable user interface was the core of attracting the use of the application. With regards to the provided AR application demonstrators, F1P10 stated,

> *"It's easy. Easy to access even though you have no idea what it is. You just click on it and it works."*

All participants in Focus Group three seemed to agree to the statement,

> *F3P5: "Yeah, it was [a 'wow' effect] (F3P6 agrees) I think it was easy to use, which is good as well." (Everyone agrees)*

Furthermore, F5P5, F5P8 and F5P4 added in this regard,

> *F5P5: "It's like usually for things like that people need laptops and stuff like that. Like how I used it, it just freezed. It just goes to fast and then freezes and just goes off. But with that, it's just easier. It just comes and you click it and it just works instantly. (F5P4 agrees) It doesn't have to load on the street, like the camera is just there."*
> *F5P8: "I'd use that if it works."*
> *F5P4: "Especially if you don't know the street name you can just use the app and you just know." (F5P5, F5P8 agree)*

Others in Focus Group Four on the other hand argued that the application would require an indication of processing information in order to avoid confusion saying,

> *F4P1: "I wouldn't know that we have to hold it and it would come up."*
> *[...]*
> *F4P4: "But if they'd tell you in the application, I would be able to." (F4P2 agrees)*
> *F4P3: "There should be like a box that said, 'Scan'. So we could click a button and it would literally just scan it. Because we were holding it and moving it around." (F4P4 agrees)*
> *F4P4: "Yeah it's true. It should show it's doing something."*
> *F4P3: "Like a 'Loading'."*
> *F4P1: "Or like a light that flashes."*

According to F1P6, "Everyone has smartphones nowadays as well. Everyone uses apps and knows how to use it". F4P6 further stated, "I think that you can use it on the phone, because the phone you have always with you I think."

It was argued that users would generally quickly learn how to interact with the application, while it seemed one of the major conditions of adopting AR applications was provided by developing the application on smartphones or hardware which users were generally comfortable and familiar with. Focus group participants shared the view that learning effort should be kept at a minimum, suggesting an intuitive way to interact with the application similar to the interview outcomes with industry professionals.

Interaction

After participants experienced the AR application demonstrators, many argued that interacting with the application had practicality issues, particularly in public environments. F1P9 argued, "You'll get tired of holding your phone when you're reading the walls in the museum." It was supported by F1P4 among others stating,

> *F1P4: "Holding up the phone to read the information that you want to know about, yeah basically."*
> *F1P2: "I think a good idea would be like take a photo and put on the information through that. It would keep you from scanning for information. All you want to know you just take a photo off and it triggers the information then."*

In this regard, F2P6 agreed, saying, "If you move, it goes away and it doesn't work anymore." Moreover, F5P8, F5P6 and F5P4 corresponded to this statement,

> *F5P10: "Yeah and the one in the museum, you'd have to hold it a certain way for it to pop up. If I was on my own, I wouldn't have thought that anything was there."*
> *[...]*
> *F5P8: "You just had to stand there until it stops."*
> *F5P6: "Yeah, if it was busy then you couldn't stand."*

While F1P4 supported this view, F5P1, F5P2 and F5P4 further added,

> F5P4: "You would have to stay there to play the video but when you moved it."
> F5P1: "If it would stay on once it starts the video, especially if you have to hold it up to watch it. It would be better if you could hold it down and watch it rather than being stuck like that." (F5P2, F5P4 agree)

In order to solve this issue, F1P2 and F2P1 suggested separately,

> "A good idea would be [to] take a photo and put on the information through that. It would keep you from scanning for information. All you want to know you just take a photo off and it triggers the information then."

While F4P5, F4P7, F4P1 and F4P2 on the other hand suggested as an alternative method of interaction,

> F4P5: "But maybe you know when I was holding it like that and the text would come up, I would move it somewhere else, and the text would disappear, so maybe if you could have like a box or something like, I don't know what you would call it, but maybe to freeze it, and then you could put it there swipe it and read it away from having to stand like that. (F4P7, F4P1, F4P2 agree) That would be cool."

All participants in Focus Group Two seemed to commonly agree to the statement raised by F2P3 and F2P6 that "old people" would have more difficulty learning how to interact with the application as they were generally considered less technology savvy. While F5P5, F5P2, F5P3 and F5P4 argued that, "older people wouldn't use it." Moreover, F3P10 argued that AR might be considered too technological for the mass audience by saying, "It would be too complicated for them." F4P5 agreed to this statement saying, "It might be too technologically advanced for them."

Having to learn how to interact using a unfamiliar methods and gestures within an application was considered to deter users, as users would commonly know how to interact with widely used applications in a natural way. It was therefore mentioned that this new way of interacting and accessing information might be challenging

for seniors. Although today's senior market is thought to be more technology savvy compared to earlier generations, such as Internet shopping and increasing use of mobile devices, participants debated whether additional effort to learn operating the application would deter potential tourists from using it. Participants argued that today's users of technology were turned away by having to learn how to operate a certain system or application. Therefore, it was advised to implement already known and adopted systems, such as Google's map system.

System Quality

The issue of sufficient system capacity and quality was argued to be a main driver in the development of mobile AR tourism applications. Since AR was still considered a new technological tool, focus group participants highlighted that minimum system quality was required to ensure a smooth user experience. After experiencing the mobile AR tourism application demonstrators, F1P4 and F1P10 argued,

> F1P10: "It's easy. Easy to access even though you have no idea what it is. You just click on it and it works. I think it has a problem. It only emphasises certain things. So it's easy to miss something. It's easy to miss if you just follow the app."
> F1P4: "It was quite quick as well. So it was working quite fast. So you got the information quite quickly, so that's a good point."

F5P3 on the other hand noted, "It would freeze sometimes. It would freeze and take time to get back in." F2P8, F2P5 and F2P6 further argued,

> F2P6: "You had to try many times. It's true though. It is true." (F2P3, F2P4, F2P5 agree)
> F2P8: "It was also a not in line. Like the buildings and monuments were a bit off side, wasn't it? (F2P5, F2P6 agree) If you just pointed."
> F2P6: "I'm just thinking, it was like upside down."

F3P5, F3P1, F3P7 and F3P4 agreed, stating,

> *F3P5: "The alignment with the Spire one, it was a bit off. Yeah, and we were all like, well apparently it was working for the others, but not for us. Yeah, so just to make sure they're all going on."*
> *F3P7: "Where they're supposed to be."*
> *F3P5: "Yeah. It took me awhile to realise there was something wrong with it, but he told me there was something wrong with it."*
> *F3P7: "We tried it with a different one, didn't we."*
> *F3P5: "Yeah, but it was still the same. I guessed it was just part of it."*
> *F3P7: "Yeah, because the Spire was on the floor." (F3P4 agrees)*

Similarly, F5P3, F5P2, F5P9 and F5P5 revealed,

> *F5P3: "The sensing. You know when it knows. When you look at it, you can get it without waiting. You can get it on a specific point (F5P2 agrees) and then it catches it and gets it, I think that needs to be improved."*
> *F5P9: For example you should like see that the area is there, instead of like moving around." (F5P2 and F5P5 agree)*

In this regard, F2P3, F2P7 and F2P8 suggested that augmented information should blend in with the surrounding "like a hologram in a mobile phone" saying,

> *F2P9: "Seems like it's just like video that you click to play, […] so a bit more like technology wise you could improve it that way."*
> *F2P3: "Yeah, maybe a bit like a hologram in a mobile phone, kind of. (F2P7 and F2P8 agree) So it kind of blends nicely with."*

The findings showed that it was considered crucial that the application was working smoothly with a quick response rate in order to prevent interaction issues such as lag and application freezing and maintain an overall well-established user experience. Although the access of additional information in the immediate surrounding was regarded highly beneficial for tourists, after experiencing the demonstrators, it was argued within all focus groups particularly for the GPS-based AR experience to require more accuracy as information overlay was showing partially alignment issues during the test.

Perceived Benefit

The value added by the application was regarded as crucial for tourists to create awareness of AR tourism applications and encourage its use. While focus group participants had a positive perception towards potential benefits of such applications, it was highlighted to have a bigger impact on tourists with certain disabilities. F2P2 stated,

> *"I think it's a really good idea. And it's good to learn by listening, not just reading. It's more interactive and then it let's you connect more with what you're seeing"*

while F1P3 outlined the idea to be beneficial for people with physical difficulties, saying,

> *"I think it's helpful for some people perhaps with visual impairments if there is audio, so you can actually listen to it, rather than to read all the information on the board. That includes the elderly people, which is also a target market for museums."*

Similarly, all participants in Focus Group Two seemed to agree to F1P3's statement,

> *F2P2: "And it speaks to you, so that's good for children or people who maybe suffer from like dyslexia or something." (F2P8 agrees)*
> *F2P8: "Or blind people yeah."*
> *F2P6: "It's really like, or if you're deaf and you need to read."*
> *F2P2: "So they can experience it, too. (Everyone agrees.) I think that's a good idea for people that struggle with that.*

On the other hand, F3P5, F3P4, F3P7 and F3P3 revealed that augmented information was not only beneficial for children, but for tourists overall as,

> *F3P7: "That it gave information like a video."*
> *F3P5: "And that it read it out to you." (F3P7 and F3P8 agree)*
> *F3P4: "It catches your attention more if someone reads it out."*
> *F3P5: "It's more interesting listening to something instead of reading something."*
> *F3P3: "Like for other stuff, I would walk past, but if there's something popping up, I would stop and start looking at it."*
> *F3P5: "It's for things you don't really realise they are there. Like in the museum, it had that picture and it spoke to you, I would just stand there and it got a bit boring after awhile. But if it had a video and spoke to you about it, it would be more interesting." (F3P10 and F3P6 agrees)*

Furthermore, F1P10 pointed out increased convenience being able to implement different languages in the application,

> *"It breaks the language barrier as well. If a foreigner doesn't speak English in the city if everything is in Irish, and I can't pronounce or looking in a map."*

However, in contrast, focus group participants argued that researching about the travel destination prior to the trip would prevent tourists to download an additional application to use during their time of travel since the benefit of the application was limited. F1P4 argued that additional effort to use the application was a potential drawback that tourists could be facing. Requiring less effort to simply receive information from locals, F1P4 and stated,

> *"Maybe people that are used to using maps and findings things out themselves and where to go to, like the tourism offices in the city centre to use some maps rather than going on their phone and trying to use the technology. It's less effort for them to talk to somebody face to face to find out about all the attractions that interest them."*

F3P1 similarly agreed with this statement, claiming,

> *"Some people just prefer to do their research, without carry books and stuff, like travel guides, without having to use technology first of all."*

While prior research was argued to prevent people from using mobile applications to access information during the trip, all participants in Focus Group Two further noted that such technologies might take the adventurous way of traveling away by revealing,

> *F2P2: "Some people might quite find it a patronizing device, like telling you where to go, what to do. You're holding it up and you feel kind of very touristy. (Everyone agrees) And some people don't like that, do they."*
> *F2P1: "If you're on a day out and use it, you want to enjoy the day out and the people during the day. You're just focusing on your phone for most of it."*
> *F2P2: "Sometimes you just want to work things out for yourself, you know. (Everyone agrees) People like exploring. You don't always want things in front of you as it is. That's part of the fun of exploring."*

F1P10 added to this discussion,

> *"It takes the adventure out of travelling. So there is no risk really. You can always take it out of your pocket. It takes the human mind out of the equation."*

Although none of the participants were experiencing any distraction in their senses, participants argued that overall augmented information in various forms, such as text based, audio based and video based was regarded highly beneficial for disabled visitors, as it would provide alternative sources of information. Some focus group participants indicated that augmented information had the potential of bridging language barriers, which could be a form to enhance the presentation of tourism products. However, while additional information was regarded highly valuable, participants argued that information should be added to already existing sources, such as brochures or signs in order to avoid modifying already provided information deterring the value of the application. Furthermore, participants claimed that they were generally researching their itinerary before the trip. Therefore, tourism applications that were designed being used on the trip itself would lose its perceived value during the tour even though information was accessible at any time. Nonetheless, despite providing information on POIs, enhancing the travel experience was considered to be one of the main use cases for the application. The Focus Group findings showed that even after experiencing

the Dublin AR application demonstrator, no new tourist requirements were evident with direct relation to the demonstrator. Therefore, the following will provide the findings with regards to function requirements, content requirements and potential causes for user resistance for mobile AR applications in urban heritage tourism.

7.2.2 General AR Tourism Application

The second section of the focus group discussion focused on general AR tourism application expectations and was divided into the two main segments; function and content requirements. Additionally, participants were asked to comment on potential aspects resulting in user resistance of AR tourism applications. The following will provide an analysis of Function and Content requirements that were identified in the focus groups.

7.2.2.1 Mobile AR Tourism Application Function Requirements

Function Requirements were found to be very similar to the outcomes of the tourist interviews. Although more detail was provided in the in-depth interviews of Research Phase 1, the focus group outcomes confirmed the findings.

GPS Navigation
One of the main functionalities of mobile AR tourism applications was regarded as the GPS-based navigation functions, which was able to pinpoint the user's location and navigate them to any desired point of interest (POI). In order to assist with orientation, it was advised to provide a map showing the immediate surrounding of the tourist. As F1P4 stated,

> *"a map of the area they're in, especially if they're first time visitors.*
> *If you have to know the places to see or are of interest and you'd have*
> *a map to help you getting around. That would be quite useful."*

F1P6 agreed, suggesting, "if you could zoom out from where you are from close by" would be a beneficial function in the map.

Furthermore, F4P3 and F4P5 suggested, "It could help with the directions. Because signage is not so good in Dublin." According to F1P1, "Instead of just seeing a destination, I would like to navigate where the attractions are rather than looking where you are when you're already there." In order to facilitate the interaction, F2P2, and F2P1 suggested,

> F2P2: "I think it would be good like, you know if you have the talking SatNavs and it tells you, 'turn left' and stuff, actually tells you where to go. I think that would be even more straightforward then. If you could click say on your destination, you want to go to a café, you click and it will start telling you where to go. I think that would be really good. (F2P1 agrees) Yeah, and then you can't go wrong, because there are so many people who are like technophobics."

All Focus Group One participants seemed to agree in this regard to the statement,

> F1P10: "Well, right now, I want to know where James Joyce's house is. It would be nice to have a device where you just search for it, and it gives you directions how to get there. On the way I want to have a cup of coffee, just insert that and get a cup of coffee. Just take the most direct turn." (Everyone agrees)

On the other hand, F1P4 claimed that GPS navigations were occasionally inconvenient and added the benefit of pinpointing the tourist's location by stating,

> "If it was also able to tell whereabouts you were, it could give you different places around nearby where you are. So it doesn't actually give you an attraction on the other side of the city."

Alternatively, F4P1 suggested,

> "It would be good if you could scan down a street, so you can see what there is. So that would be good instead of searching for specific places."

Many focus groups participants repeatedly argued that navigation was a crucial part when travelling in unknown destinations. One of the main functionalities that was desired seemed to be the pinpointing of the user's location and offering information on the immediate surrounding, while some participants argued that

having an application that could search for specific POIs and provide the quickest way to get there would be highly beneficial for tourism applications. While marker-based AR was perceived to enhance the tourist experience overall, participants argued that GPS-based AR would add more benefit to every day activities due to its practicality and therefore attract regular usage of the application.

Information Filter

The use of filters to categorise the information provided in the application as well as facilitate searching for POIs was regarded highly beneficial for information rich applications such as used for tourism purposes. F1P10 stated, "I would like to block some things. If you keep seeing something you don't like you could block it" in order to prevent the projection of irrelevant information. F5P4 and F5P5 suggested, "If you could put your preferences before like if you are near a location that you liked it would give you notifications". F2P7 added the benefit of filters in the search function of the application saying, "If you look for a particular shop and you search for it". F5P10 suggested in this regard,

> *"you type in restaurants and then you can go into Italian restaurants.*
> *I think it would be good if the app had that on."*

Furthermore, F1P10 recommended as an additional function to GPS-based maps,

> *"It would be nice to choose something, if you're looking for a pub, just*
> *search for pubs near here, and if you're looking for souvenirs, just*
> *search for that, so they're not popping out at the same time."*

Similarly, F5P9 regarded it highly beneficial for searching local foods, individual products or personal needs and suggested the filter option for maps as well claiming,

> *"Have different maps, a map all for shopping where you can see like all the different shops, and then one for restaurants."*

As an alternative method of filtering information, F2P7 discussed this issue stating,

> *F2P7: "Maybe you could have like different sections for families, family attractions, and a section for wheelchair, so if you have someone in a wheelchair it gives you what you can do." (F2P9 and F2P3 agree)*

Similarly, F3P2, F3P8, F3P10 and F3P5 argued to add filters for other family members or different personal profiles,

> *F3P5: "If you're going to make it attractive for all market types, then like do things for children. Point out the closest playground or something like that."*
> *F3P2: "You could put different age groups in. So you put in what age you are and it tells you what you could do."*
> *F3P2: "Yeah."*
> *F3P8: "Or like set your profile what kind of person you are."*
> *F3P10: "Yeah." (F3P2 and F3P9 agree)*

While access to information and information depth were regarded as crucial in the application, participants repeatedly argued that overload of information should not be overlooked, as it was discussed within the developer and industry expert interviews respectively. In order to facilitate the specific search for information, it was suggested that filters generated to user preferences and requirements were a good way to specify information and quickly access what was required. Therefore, filtering could occur in two different ways. On the one hand, focus group participants argued to organise the content according to points of interest, such as type of restaurants, pubs, or tourist attractions. On the other hand, filtering information according to the personal interest of the user was recommended in order to find potentially interesting spots for different demographics, such as

children or tourists with certain disabilities. In the focus groups it was evident that personalised information according to the user profile and choice using categories such as 'family', 'wheelchair access' and 'age group' was regarded necessary to be able to indicate requirements that were crucial for travel.

Language

The possibility to make the application available in various languages was considered one of the key elements to attract a wider target audience and increase the pool of users globally. F5P6, F5P3, F5P7 and F5P5 argued that multiple languages would significantly benefit the tourist, suggesting,

> *F5P6: "Maps, language."*
> *F5P3: "Languages as well, F5P6 said."*
> *F5P7: "Like have more choices."*
> *F5P5: "Because you got them in all the tourist places, like at some places, you can like download the tour, before you go on the tour in another languages."*

Since translating the application into various languages would significantly increase the size of the application, F3P10, F3P5, F3P7 and F3P1 recommended,

> *F3P10: "And have it in different languages." (F3P3 agrees)*
> *F3P5: "Well the most used."*
> *F3P7: "Yeah, the top, the most ones that were just going there. Like Spanish."*
> *F3P1: "Chinese." (F3P5 agrees)*

F1P3 referred to the language barrier for international tourists, and therefore agreed with participants of focus group 3 to translate the application into the main international tourist markets coming to Dublin,

> *"There would have to be different choices of languages in the application. So if the target audience in Dublin […] was China, then there would have to be Chinese language available."*

F2P8 agreed to this statement by saying, "Not all of them speak English, the ones that come to Dublin obviously."

All participants in Focus Group Four further seemed to agree to the statement,

> F4P9: "Have multiple languages as well." (Everyone agrees)
> F4P4: "Oh that's such a good shout. But must your phone be able to do that? Have a multiple-language option."

It was argued that AR would highly benefit not only the tourism industry, but also daily interaction in general, if overlay in various languages were supported. This would ideally bridge language barriers, as any sign or text could be translated in the user's mother tongue. Although the main element in the theme of languages was seen to offer the application in various other languages next to English, offering tour guides in alternative languages seemed to be highly valued as it could potentially replace personal as well as audio tour guides while being able to provide a personalised experience. Therefore, it was argued whether non-English speaking tourists would be able to download the application if the choice of languages to operate the application were limited. Translating the application in multiple languages was regarded key to spread the awareness and attract a wider market.

Accessibility

Accessing information was discussed as crucial to encourage the use of the application while travelling. It was argued to require alternative options, which would allow tourists to access information independent from Internet access. F2P3 stated,

> "When you had a folder where you could store information the Augmented Reality is providing you like a little book you can go on an drag on, so you can always go back there."

In order to facilitate the accessibility without having to completely rely on active Wi-Fi connections, F3P8, F3P7 and F3P5 argued,

> *F3P8: "I think there should be one where you can download it onto your phone, because if there was no Internet around, where would you use it?"*
> *F3P5: "It depends."*
> *F3P7: "You can't access the Internet all the time."*
> *F3P5: "Here, we don't use the Internet so often, so as a tourist."*
> *F3P8: "If you're at home and you would want to see it, you could download that." (F3P5 and F3P6 agree)*

On the other hand, F2P8 saw the potential benefit of offline functionality in the post-travel use after returning to the destination of origin stating,

> *"You could have a list of places you have seen or been and you've found information about, so if anyone else was to ask you, where is good to go in Dublin and what is to see, you could go on about and tell them where you have been."*

It was claimed that a temporary solution for the inadequate access to Wi-Fi network needed to be urgently found before AR would have any significant benefits for tourist of could be used meaningfully. Since Internet access was still considered one of the major challenges for tourists, participants proposed to be able to save information and accessed content on the mobile device in forms of Travel books and memos in order to be able to use the gathered information at any point in time during the travel particularly in areas where Internet access was limited. Additionally, some participants argued that a help guide should be available on the application at the very first launch after downloading the application that would guide the user through the functions and ways of interaction in order to prevent any misunderstandings. Although participants claimed to be able to naturally interact with the provided demonstrators, it was still regarded a new technology and therefore should be properly introduced to avoid any confusion. Hence, the application should be equipped with a guide button that could be accessed anytime to help the user with the functions of the application.

Entertainment

Entertainment was another theme that emerged within the discussion of potential AR tourism application implementation areas. Due to the flexibility of the AR functions, focus group participants argued that it could potentially be implemented as form of entertainment with particular focus on children and the young market. F2P7 indicated a function of the application to be directed at entertainment claiming,

> *"Move things around. If there was a building there, you could move it or draw moustaches on people's faces. I think it would make it more fun, if you could draw on it. If you would just give it to a kid and they would walk around and be entertained. So they could draw a car on the road."*

Moreover, F4P3 and F4P7 agreed, saying "There should be a kids version". In this regard, F2P8 suggested implementing various versions of the same information saying,

> *"having information for adults that would understand it and then maybe have two options, one child version and an adult version. The same information, but just adapted to the age group."*

While AR was regarded as highly valuable to access information, another method of implementation was sought by providing entertainment options for children. Particularly in tourist attractions, such as museums and art galleries, participants in Focus Group 2 suggested to offer information tailored for children to make the experience more fun and engaging. Potential methods of implementation included a story mode and game mode, which were discussed within the tourist interviews to help children learn while having fun. Catering to children seemed to be the main reason to implement entertaining content in a tourism application. While the majority of function requirements from Research Phase 1 were confirmed, the focus group discussions indicated that multiple language option, or implementing a language tool in tourism applications was an area that should be developed further. Although semi-structured interviews suggested language functions as an add-on, focus group outcome showed that language functions were increasingly becoming popular and more important for tourism purposes. Furthermore,

entertainment was confirmed and highlighted in focus groups as a way to attract children, even though less relevant for adults.

7.2.2.2 Mobile AR Tourism Application Content Requirements

This section discusses content requirements to identify the quality and type of content that is relevant for tourists.

Information Quality

A brief overview of background information on tourist attractions and venues seemed to be valuable, while the interest of local information was discussed to become increasingly popular among tourists. Although commonly known tourist spots were argued to be of interest, more tourists were additionally curious of local spots where local cuisine and culture could be experienced first hand. Participants in focus group 1 seemed to agree to F1P4's statement,

> *F1P4: "Maybe if it told you the different types of transport that you can get in the city to get around the things that you want to see. Or that you could get information and times and stuff on attraction that you're trying to visit and when they're open and how much it would cost, so like give you some additional information as well as like educational information.*
> *F1P3: "I agree." (Everyone agrees)*

Similar to the functionality of 'GPS Navigation', F3P8 and F3P1 further added,

> *F3P8: "But if there was a 'Nearby' like if there was something going on certain events or like."*
> *F3P1: "You could have like a 'nearby' thing to see what's around. Because when you're lost or something and you point at a building you can then see where you are."*

Similarly, F5P4 agreed to that statement claiming,

> *"It would be good if you can put in where you stand, or if you can log in your hotel and it would give you notifications."*

As additional information F1P3 suggested,

> "If you chose a certain attraction there also might be an entry price,
> or admission. [...] So admission fee would be a good idea, so the target
> audience knows how much they will be expected to pay."

All Focus Group Five participants seemed to agree to F1P3's statement by saying,

> F5P10: "And put prices on it. Say you would look for a restaurant and
> you're on a budget. All that on attractions. (F5P7 agrees)
> F5P1: "Yeah, like entry fees and stuff like that."
> F5P4: "Yeah, opening times."
> F5P5: "Yeah, what is free and what you need to pay for." (F5P2 and
> F5P10 agree)

F4P1 on the other hand suggested additional information on the background of the POI, stating, "If you're scanning a building, when it was built, the history of it". Additionally, F3P3 and F3P7 suggested with regards to restaurant information,

> "If you could call up restaurants and their menus and prices and that
> sort of thing before you would go inside"

For many including F3P2 it was evident that participants were price conscious, as cost was considered highly valuable information, stating, "if there is free attractions, because not everyone is going to pay, for what it is free and what you have to pay." In order to make interaction with the application easier, F1P2 suggested an automatic information provider, claiming,

> "Instead of holding your phone and walking with your camera to see
> if anything is there, maybe if it told you it's such and such a thing and
> then give the information that you have to know."

F4P2 argued local information not only including general information of tourist attractions, but more importantly time-relevant information saying, "I'd want to know events that are going on." F2P6 further argued that it would be valuable if "it would tell me the weather" while F3P1 additionally argued the availability of the application in multiple destinations saying, "you'd like the application pretty much anywhere you go".

Participants argued that additional information on POIs such as opening times, entry fees and restaurant menus were highly valuable for tourists. A typical inconvenience was caused for tourists by walking into restaurants just to find out that the prices were over the budget or the menu not what was sought after. Although such information could be accessed on the Internet, some participants argued it was more convenient to have all the information in one application, rather than having to look for it individually on the web. Additionally, it was claimed that pictures of POIs were helpful to facilitate recognising POIs and navigating to certain destinations. Similar to tourist interview participants, focus group participants claimed to keep the information relevant for the time and destination in order to avoid information overload (TP6). In order to obtain information without having to constantly focus on the mobile device, participants argued that a good alternative method to receive information were location based push notifications by the application whenever information was available and considered relevant to the tourist. It was pointed out that information on local venues, such as restaurants, shops, clubs, accommodation and events were sought after the most by the young adults tourist market coming to an unfamiliar city. Although general information could be accessed online and in tourist offices, participants indicated that information gathered from locals was regarded more trustworthy and valuable. While internationally known tourist attractions are still argued to remain in the typical touristic itinerary, participants argued that information from locals are often the better choice. Information on weather conditions and forecasts is still uncommon in tourism applications to the researcher's best knowledge, however, participants considered it a valuable addition to tourist applications since it would not only indicate a good time to travel, but also assist in planning the day around weather conditions, which were out of the tourists' control. While the demonstrators and the focus of this study was aimed at Dublin, participants argued that making the application available for various destinations around the world would highly affect its usefulness and attract the use of a wider market.

Reviews and Ratings

While previously identified within the tourist interviews, reviews and ratings of other tourists was argued to have a high value for young adults particularly in recent times and the global use of social network platforms such as Facebook and Twitter. F2P2 argued,

> *"I think you could have ratings, […] if it came up in the Café and you're like, 'Oh I don't know' and you click on it, and there is lots of ratings, and they're five star you'd want to go there. You'd be more inclined to give it a try."*

Similarly, F2P6, F2P1, F2P2 and F2P7 agreed to this statement, claiming,

> *F2P6: "If they're good places or not. If I want to eat something, I want to know if it's good." (F2P1, F2P2 and F2P7 agree)*
> *F2P7: "Yeah, with the rating. Like where you can put a bit more information."*

It was noted that through the common use of social media and websites offering user reviews and ratings for retail as much as for tourism products, a possibility to rate and comment on various POIs was highly beneficial for tourists. Since popular tourist websites, such as Trip Advisor and booking.com were increasingly used by a large part of the market, it was seen inevitable to include a rating function within any future tourism application.

Public Transportation

Information with regards to public transport opportunities was regarded highly valuable for tourists to identify travelling alternatives in unknown areas. Participants in focus group 1 argued information on public transportation to be valuable for tourists visiting urban destinations. F1P4 claimed,

> *F1P4: "Maybe if it told you the different types of transport that you can get in the city to get around the things that you want to see or that you could get information and times and stuff on attraction that you're trying to visit and when they're open and how much it would cost, so like give you some additional information as well as like educational information." F1P3: "I agree." (Everyone agrees)*

Particularly for larger cities, which were considered challenging to explore by foot, public transportation was argued to have been an issue in many participants' experience. F3P9 and F3P10 further suggested including in public transport information,

> F3P9: "Like the costs, and the distance and if you put something like what kind of transport is available to get there."
> F3P10: "Yeah what transport."

Moreover, F3P5 and F3P2 added,

> F3P5: "Late and cheap transport. Like a list of cheap taxis, like where it is parked up and ten Pounds after this."
> F3P2: "So what's the nearest transport route, like what's the closest public transport."

Although it is arguable that destinations offer quickly understandable subway maps in public areas within the city centre, it was found that bus transportation as well as taxi stops were quite different from one destination to another and would often not provide clear time indications or information where to find bus stops. Focus group participants noted that tourists often relied on public transportation, as cars were often found to be more inconvenient to get around. Therefore, it was significant that tourism applications could offer information on public transportation. With this regard, it was suggested that information should include times and places of stops, but also provide an indication of the expected fare. Therefore, general information on public transport as well as bus schedules and maps were sought after to facilitate 'getting around' the destination. The sub-theme of Public Transportation was identified as a new theme that emerged in the focus groups. Therefore, it was not contrasted to the literature, as content on public transportation in tourism applications was identified as a gap in the literature.

7.2.3 User Resistance towards AR Tourism Application

The identification of tourist requirements was the focus of this study, and therefore, the main part of the primary research was designed around this topic. However, understanding not only requirements but also user resistance towards using AR tourism applications was regarded crucial in order to avoid any deficits in the application and concentrate on potential flaws.

Hardware

Current hardware limitations on the market as well as on the personal mobile device model were identified to be one of the greatest limitations of using AR functional applications as the technology was perceived to require a significant amount of processing power and battery life on the device. According to F1P2, one of the main issues remained in "It runs out of battery". F5P10 compared the use of the application with interacting using the GPS function in Google Maps, saying, "When you're using Google Maps, it just drains your battery" while F2P8 argued,

> *"The size of the phone screen. Some are large and it's easier, some are small. If it's a small screen you can barely use it as well for something."*

Moreover, F3P8 added in this discussion, "The space on your phone. There might be no room for the app." F5P9 added the issue of "the camera doesn't work well" which was restricting the tourist experience using the application. Furthermore, F2P8 and F2P3 discussed in this regard the availability on various mobile devices, such as tablets, which offered a bigger screen size. In order to facilitate the use of the application they suggested,

> *"If it wasn't just mobile, but a tablet, so older people could see that. It would be better. Or if that would be like an option to get them in the museum right beforehand."*

One of the main areas of influence was seen to be the hardware limitations on the personal phone. This included system qualities, such as hard disk space, battery life, screen size and the current operating system.

Wi-Fi

It was repeatedly argued within the focus groups that the tourists' main challenge of using their smartphones on holidays was due to insufficient Internet access during the trip due to limited Wi-Fi access points in many destinations. F1P1 argued,

> *"Your phone is not connected to the network. [...] If you get charged and you have to go to the Internet you wouldn't be able to use it."*

Similarly, F1P3 agreed with F1P1 saying,

> *"If it requires Wi-Fi then it's going to be very restricted, because there isn't Wi-Fi in many places apart from the city centre here."*

As F1P4 considered international tourists to be the main target market for mobile AR tourism applications, F1P4 therefore stated,

> *"International tourists that are coming here they need the app, because it's their first time. They've got their phone from abroad and it's obviously going to charge it to use it."*

In this regard F5P3 further criticised using data roaming if no Wi-Fi was available,

> *"It could use a lot of data [...] if you have like all these notifications, push notifications."*

Since mobile AR tourism applications are expected to require Internet access, participants argued that a Wi-Fi infrastructure was key to attract the use of the application. While Dublin has launched a free Wi-Fi network throughout various parts of the city centre provided by the Dublin City Council, it was evident that bandwidth as well as network coverage was still limited in the timeframe of this study. Furthermore, focus group participants claimed that tourists might generally be resistant towards using their smartphones on their holidays due to its perceived

connection to work and everyday life. While this trend might be different according to purpose of visit and market segment, some focus groups participants argued having the desire of experiencing the destination personally without having to reach back to a potential distraction. Particularly for tourists who were adventurous and would prefer the exploring a destination without having to rely on mobile applications and alternative information sources claimed to be restrained of using their mobile device as discussed in section 7.2.1 'Perceived Benefits' (F1P10, "*It takes the adventure out of traveling*").

Application Cost

The cost for the application was identified as potential user resistance issue to download and use an AR tourism application. F2P9 and F2P2 considered alternative applications when discussing the issue of cost and stated,

> *F2P9: "If it costs money. If you have to pay for it, then there is a way to get around it."*
> *F2P2: "Yeah, there's a way, Google." (F2P9 agrees)*

Similarly F1P3 agreed to using Google Maps, saying,

> *"If it was up to five Pounds then they would probably buy it, but still it's the effort really and some people would prefer to go to Google Maps, which they're used to using."*

F3P5 added to the discussion the comparison to alternative sources of information by stating, "If you can get the tour guide cheaper than what the app costs, then you would get the tour guide." However, in contrast F1P3 commented in this discussion,

> *"There are a lot of people who have iPhones or smartphones and they download a lot of Game applications, and they pay for it as well. I think they wouldn't mind paying two Pounds for the application, even though there might not be much usefulness for it."*

Since usefulness was argued to be limited, F3P1 added to the value proposition claiming,

> *"I'd pay for it. I'd pay for this if it was worldwide. I wouldn't pay for it, if it was just for Dublin or Manchester."*

This argument was supported by F1P6 who claimed, "If I was going to a city I didn't know, I'd probably pay for it." It was pointed out that the readiness of paying for the application was interrelated with the perceived value taken from it, as F1P4 argued,

> *"It'd be worth if it's not too expensive to find the different places you'd want to visit in a city or where you're going. When you're on holiday, you don't want to be lost in the middle of a city, where this could actually show you some decent attractions that you could go and see."*

The cost of the application was considered one of the main potential user resistances towards any mobile applications. Although participants argued to have spent money on games and other applications, it was largely claimed that alternative applications were often available free of charge and therefore, paying for any application would redeem unnecessary. Focus group participants argued that paying for applications would significantly depend on the benefits and awareness of the application. Making it available in more destinations, or providing additional incentives were regarded as potential possibilities to increase the use of the application despite charging for the download. Therefore, some participants claimed to be happy to pay for the application if the cost was limited due to the perceived usefulness of the final mobile AR tourism application based on their experience of demonstrators in the study.

Public Awareness
Since participants were still largely new to AR before this study they implied that people were still unaware of Augmented Reality overall and therefore would not look for a tourist application offering this functionality. F2P3 argued it would "need to promote it more" as F5P6 questioned, "How would you know about it?" F4P7 added that one of the major barriers to AR adoption was that "Most people literally don't know about this stuff." F3P5 suggested, "It would be good if you

could find it on the App Store as well, for Apple phones." For the use of new and unknown applications F2P2 argued,

> *"But people might find it at first not reliable, because it's brand new as well. (F2P3 and F2P9 agree) So if you got this comment and it says, 'oh this bar is really great.' Like on the Tripadvisor thing, you might not trust it. Because it's brand new and not many people know about it. Because for those things, you build a reputation and then people, everyone jumps on the boat to use it." (F2P3 agrees)*

Although it was considered high-end technology, public AR awareness was crucial in order to familiarise tourists with AR before suggesting downloading the application. For new and unknown applications, it was argued that trust towards the application and its reliability was limited and therefore potentially challenging to attract its use.

Privacy

Participants shared the opinion that downloading new applications highly depended on the amount of users as well as recommendations from trusted sources, such as family members and friends. F2P3 argued,

> *"If it asks you too many personal questions, details. [...] I think most people are afraid that it could be shared with certain parties."*

It seemed that participants believed that the majority of people were still sceptic towards inputting personal information into mobile applications. In the focus groups privacy issues were related to sharing personal details online that were given to third parties. However, the reason for not willing to share personal details has not been discussed further.

Security

During the demonstrator test, participants appealed that it was rather inconvenient to hold the phone in a designated angle in order to use the camera function on specific POIs.

F4P8, F4P2, F4P4 and F4P5 discussed the issue of security and agreed to the statement,

> F4P8: *"It's not very safe. I wouldn't walk around with my phone like this."*
> F4P2: *"Why not?"*
> F4P4: *"It would feel like someone would nick the phone while you use it."*
> F4P8: *"Outside yeah."*
> F4P5: *"Someone could just grab it, while you're holding it up to the Spire."*

Furthermore, F5P4 and F5P10 added,

> F5P4: *Isn't it also like a safety thing, when you walk with a smartphone on the street, someone could obviously muck you."* (F5P5 agrees)
> F5P10: *"I wouldn't use it unless I get lost."*

All participants in Focus Group 2 seemed to shared the same opinion when participants claimed,

> F2P7: *"I think people might feel silly walking around with the phone in the hand [in front of them] and especially in big cities where there is crime, and people just walk and grab it."*
> F2P2: *"Some people might quite find it a patronizing device, like telling you where to go, what to do. You're holding it up and you feel kind of very touristy."* (Everyone agrees) *And some people don't like that, do they"*
> F2P1: *"If you're on a day out and use it, you want to enjoy the day out and the people during the day. You're just focusing on your phone for most of it."*

In addition, F2P7 argued,

> *"It's not good to move around with your phone like that. You will be too focused on that, you don't know what's around you."*

Since the focus group study was conducted as post-experience research, all participants had experienced the AR demonstrator application before participating in the focus groups. Compared to the initial tourist interviews (Research Phase 1), a security issue could be clearly identified during this research phase. Focus group

outcomes showed that practicality and interaction with the application could be another security concern. Focus group members repeatedly claimed it was considered "awkward" to use outside due to the way of interacting with the AR application, having to stand still and pointing the mobile device at specific targets in the environment. It was found that wearable devices could overcome the issue of having to hold the mobile device in front of the user to interact with the surrounding. Participants seemed to be mostly concerned about the security risk that was involved in the process. Particularly while travelling in unfamiliar destinations, it was argued that mobile devices such as smartphones could be easily stolen while focusing on the phone to access information. Therefore, it was considered to be more suitable for indoor environments that were controlled, while focus groups participants seemed to hesitate to use such mobile AR tourism applications outside.

7.3 Summary

This chapter presented the analysis of the second research phase as post-experience study. The mobile AR tourism application demonstrator that was tested by all participants of the focus groups before the data collection was developed according to the outcomes of the initial tourist, AR application developer and industry expert interviews. The data was analysed using thematic analysis and put in comparison with the findings from the first research phase as well as the literature to confirm the identified tourist requirements and adjust them where required. The outcomes of the focus groups showed limited new insights overall but confirmed the findings from the initial tourist interviews.

Similar to tourist interview outcomes, focus group participants pointed out 'GPS Navigation', 'Information Filter', 'Language', 'Accessibility' and 'Entertainment' to be the most important tourist requirements. 'Information quality' was considered crucial for focus groups participants and was argued to be the key for mobile AR tourism applications by AR application developers and industry experts. Focus group as well as tourist interview participants equally valued 'reviews and ratings' on attractions and other venues. However, 'information on

public transport' options was highlighted in the focus groups, which might result from the participant demographics that were chosen for the focus groups in Research Phase 2. As focus group participants were young adults from the UK, public transport was seen to be essential for travel. With regards to user resistance towards mobile AR tourism applications, focus group outcomes showed similar findings to the tourist interviews. 'Hardware limitation' and a stable and fast 'Wi-Fi connection' were still argued to be the main challenges for the application. Furthermore, the 'cost' of the application seemed to be questioned, particularly since developing new applications such as AR was lacking awareness among users. Interestingly, 'privacy' and 'security' issues were seen as separate challenges. While focus group participants seemed less concerned with data privacy issues, security concerns while using the mobile device on the street was highlighted to require alternative interaction possibilities. The findings were categorised in three main categories, function requirements (FR), content requirements (CR) and user resistance (UR) in order to facilitate the analysis define clear categories for the quantitative research, which will be discussed in the following chapter. The three headings were set at this point and remained for the further development of the study.

CHAPTER 8 – QUANTITATIVE DATA ANALYSIS AND GENERATING THE QFD MODEL

8.1 Introduction

This chapter will discuss the analysis of the quantitative data that was collected in the form of tourist questionnaires. It will outline the demographic profiles of questionnaire participants before presenting the pilot test results. The categorisation of tourist requirements from chapter 7 (FR, CR, UR) was adopted for the analysis and assessment of variables. Confirmatory factor analysis (CFA) was used for the reduction of the identified tourist requirements to generate the QFD model. Therefore, the last section of the chapter will focus on the employment of tourist requirements into the House of Quality (HOQ) and the construction of the QFD model for the development of mobile AR tourism applications in urban heritage tourism.

8.2 Descriptive Statistics of Respondents

This section will present an overview of the participants' demographics. A total of 106 questionnaires were collected and data analysed using SPSS Version 22. Table 8.1 lists the demographic characteristics of questionnaire participants in Dublin. It can be seen that the majority of participants are female (84%), while only 16% are male.

As the quantitative study largely focused on the young market segment, while other respondents were not excluded from the sample, the majority of participants were below 20 years old (65.1%), while 22.6% were between 20-29 and some participants were between 30-39 (7.7%) and 40-49 (2.8%). Two participants did not indicate their age group. It can be seen that a total of 87.7% of participants were from the young market segment as defined by Lenhart et al. (2010), who claimed that the young market was to be limited to people between the age of 18 to 29.

It was evident that the majority of participants were university graduates from a 3 or 4-year degree course (62.3%), while 18.9% had a postgraduate degree and above and 14.2% a High School degree and below. Only one participant (0.9%) was holding a 2-year HND course degree.

85.8% of respondents were students. 2.8% were currently working in Sales, while the remaining participants (1.8%) indicated to have a professional occupation or to be self-employed. 1.9% of participants were working as civil servants and 6.6% indicated to have another occupation than the ones that were listed in the questionnaire. One participant did not provide any indication with regards to the current occupation.

Looking at the monthly income of participants, the majority (64.2%) were specifying to have an income of 1000GBP and below per month as it was expected due to the large number of students participating in the study. 4.7% indicated to earn between 1001GBP to 2000GBP per month, while 10.4% earned between 2001GBP and 3000GBP per month. One participant (0.9%) was showing between 3001GBP and 4000GBP and one (0.9%) between 4001GBP and 5000GBP. In addition, 8 (7.5%) of participants specified earnings of 5001GBP and above per month. The remaining 12 participants (11.3%) did not provide any indication with regards to monthly income. From 106 participants, only five (4.7%) were married while the majority (94.3%) were single. One participant did not provide further information in this section. As an additional profile specification, the questionnaire asked participants to reveal whether prior experience and knowhow with Augmented Reality was evident. For the majority of participants (87.7%) this study provided the first time AR experience, and 12.3% ticked to have known and experienced Augmented Reality in any form before the day of the study.

Table 8.1: Demographic Profile of Participants*

	Out of n=106	%		Out of n=106	%
Gender			*Age*		
Male	17	16.0	Below 20	69	65.1
Female	89	84.0	20 – 29	24	22.6
			30 – 39	8	7.5
Education			40 – 49	3	2.8
High School and below	15	14.2			
2-year HND course	1	0.9	*Occupation*		
3 or 4-year degree course	66	62.3	Student	91	85.8
Postgraduate course and above	20	18.9	Professional	6	4.6
			Civil Servant	2	1.9
Monthly Income			Other	7	6.6
1000GBP and below	68	64.2			
1001GBP – 2000GBP	5	4.7	*Marital Status*		
2001GBP – 3000GBP	11	10.4	Married	5	4.7
3001GBP – 4000GBP	1	0.9	Single	101	94.3
4001GBP – 5000GBP	1	0.9			
5001GBP and above	8	7.5			
Previous Use of AR					
Yes	13	12.3			
No	93	87.7			

*Missing values were not included

Source: author (2015)

8.3 Pilot Test Results

The gathered data from 26 respondents was analysed for Cronbach's Alpha coefficient as reliability test using SPSS Version 22 to determine the internal consistency of data and test the internal reliability of each question by correlating responses of all questions to one another. Using Cronbach's Alpha coefficient, Gliem and Gliem (2003) stated that the value lies between 0 and 1, while the measurement item is more reliable the closer the value gets to 1. Therefore, Gliem and Gliem (2003:87) provided the following guidelines, which were used within

the study: "above 0.9 – excellent, above 0.8 – good, above 0.7 – acceptable, above 0.6 – questionable, above 0.5 – poor and below 0.5 – unacceptable". Therefore, each of the three subcategories (Function Requirements, Content Requirements, User Resistance) was measured for its Cronbach's Alpha value determining the internal consistency of the data and reliability of the questions. Table 8.2 provides the Cronbach's Alpha coefficients for all categories tested in the pilot questionnaire.

Table 8.2: Cronbach's Alpha Coefficients for Pilot Questionnaire

Category	Cronbach's Alpha	N of items
Function Requirements	0.887	29
Content Requirements	0.877	13
User Resistance	0.740	20

Source: author (2015)

According to the Cronbach's Alpha coefficients for each category, Function Requirements (FR) and Content Requirements (CR) had a good internal consistency with 0.887 and 0.877 respectively. User Resistance (UR) was showing an acceptable Cronbach's Alpha coefficient of 0.740. Although it is argued that adjustments within those measurement items could have resulted in a higher Cronbach's Alpha coefficient, the nature of the questions were not changed, as they were designed to represent themes abducted from the previous research phase. The tourist reaction towards the provided AR demonstrators was asked in order to get an insight into their expectations and preference. Due to the limited measurement items, a low Cronbach's Alpha coefficient was to be expected. However, as this measurement item was intended as additional information and did not impact on the final model design, it was included in the quantitative questionnaire nonetheless. According to Dennis et al. (2003) it is highly important to establish reliable measurement items when developing new scales, thus a minimum coefficient of 0.7 should be achieved. Since the remaining three categories were showing a reliable Cronbach's Alpha coefficient, they remained unchanged.

8.4 Tourist Requirement Variables for the QFD Model

For further quantitative data analysis, Confirmatory Factor Analysis (CFA) was performed in order to test the reliability and validity of identified measurement items and reduce them through in a following step (Wong, 2013). As discussed in section 8.3 (Pilot Test Results), the questionnaire included three sections, Function Requirements (FR), Content Requirements (CR) and User Resistance (UR), which were tested for each item's reliability in the Pilot Study using Cronbach's Alpha. The three constructs with a total of 62 measurement items were tested for reliability using SmartPLS 2.0. A list of all 62 measurement items can be found in Appendix Q. Table 8.3 provides an overview of the constructs that were measured for their reliability. Since Reaction of AR demonstrators was solely serving for the purpose of tourist perception and preference, the items were not further included in the quantitative analysis.

Table 8.3: Tourist Requirement Variables for the QFD Model from the Pilot Study

Measurement Item	Items	Code for Category	Title
29	FR1 – FR29	FR	Function Requirements
13	CR1 – CR13	CR	Content Requirements
20	UR1 – UR20	UR	User Resistance

Source: author (2015)

Through testing the reliability of measurement items as the first step and further reduction of weak measurement items as step two, it will assist in the reduction of tourist requirements that will be implemented in the QFD model for the development of a mobile AR tourism application in the urban heritage tourism context.

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8.5 Assessment of Tourist Requirement Variables

The reliability analysis was conducted using SmartPLS 2.0. Similar to the pilot test, Cronbach's Alpha coefficients were identified in order to test the internal consistency of the collected data in the quantitative questionnaire. The recommended minimum Cronbach's alpha coefficient reliability of 0.70 (Nunnally, 1978) was used as a standard coefficient value. In the pilot questionnaire, the following Cronbach's Alpha coefficients were identified, 0.887 for Function Requirements (FR), 0.877 for Content Requirements (CR) and 0.740 for User Resistance (UR) respectively.

For the quantitative questionnaire analysis, the Cronbach's Alpha for FR showed a value of 0.8826, 0.8749 for CR, and User Resistance (UR) had a value of 0.8445. The outcomes were slightly better compared to the outcomes of the pilot questionnaire, however, remained fairly steady to the original values from the pilot questionnaires. Hutchinson et al. (2009) suggested conducting a convergent validity test, an alternative method, which identifies factor loadings and average variance extracted (AVE). Therefore, factor loadings of individual measurement items should be above 0.7, while the AVE score was sought to be above 0.5 to be valid. While Jahn (2007) argued that loadings for measurement items below 0.7 to require further attention, Hulland (1999) contradicted stating that loadings between 0.5 and 0.7 should not be simply dropped, but considered with caution. The original model including 62 measurement items showed overall high composite reliability scores of 0.8975 (CR), 0.8965 (FR) and 0.8702 (UR). However, AVE scores of 0.4071 (CR), 0.2388 (FR) and 0.2635 (UR) were evident, while many loadings were below the minimum acceptable value of 0.5. Therefore, measurement items with loadings below 0.5 were filtered out and removed first, while conducting a confirmatory factor analysis (CFA) by continuously testing all factor loadings after removal of one measurement item. Table 8.4 provides an overview including AVE scores, Composite Reliability, R Square, Cronbach's Alpha, Communality and Redundancy of the original construct.

Table 8.4: Reliability Overview of the Original Construct (62 measurement items)

Construct	AVE	Composite Reliability	R Square	Cronbach's Alpha	Communality	Redundancy
CR	0.4071	0.8975	0.000	0.8749	0.4071	0.0000
FR	0.2388	0.8965	0.4803	0.8826	0.2388	0.1062
UR	0.2635	0.8702	0.0928	0.8445	0.2635	0.0145

Source: author (2015)

In order to assure convergent validity of the data, the recommended values suggested by Hair et al. (2010) were used. Factor loadings were recommended to be above 0.7 as well as AVE score above 0.5 and communalities above 0.5 for acceptable convergent validity scores. While the composite reliability was showing acceptable values for all three constructs (CR: 0.8975; FR: 0.8965; UR: 0.8702), testing the convergent validity proved to result in AVE scores lower than 0.5 as well as communalities lower than 0.5, while many loadings were measured below 0.5. Therefore, measurement items were reduced starting with the lowest factor loadings of each construct (CR, FR, UR), placing a milestone after reducing measurement items to 25, which were considered the maximum amount of user requirements that was suggested to input into the QFD model (Griffin and Hauser, 1993). The following table (Table 8.5) provides an overview of reliability analysis for the top 25 measurement items that remained.

Table 8.5: Reliability Overview for 25 Measurement Items

Construct	AVE	Composite Reliability	R Square	Cronbach's Alpha	Communality	Redundancy
CR	0.4716	0.8987	0.000	0.8745	0.4716	0.0000
FR	0.4819	0.8477	0.4107	0.7850	0.4819	0.1942
UR	0.4251	0.8689	0.0877	0.8334	0.4251	0.0254

Source: author (2015)

Comparing the results from Table 8.4 (62 measurement items) and Table 8.5 (25 measurement items) it can be seen that the overall values increased particularly for FR and UR upon reducing 62 measurement items to 25. While the Cronbach's

Alpha coefficients are still in a good area, the AVE and Communality scores have increased significantly particularly for FR and UR. However, as AVE scores and Communalities were still below 0.5, further 7 measurement items were reduced. Table 8.6 provides an overview of the reliability test of 18 measurement items.

Table 8.6: Reliability Overview for 18 Measurement Items

Construct	AVE	Composite Reliability	R Square	Cronbach's Alpha	Communality	Redundancy
CR	0.5036	0.8900	0.000	0.8586	0.5036	0.0000
FR	0.5162	0.8419	0.4169	0.7670	0.5162	0.2087
UR	0.5051	0.8356	0.0648	0.7645	0.5051	0.0133

Source: author (2015)

The reduction to 18 measurement items was considered the highest alternative of measurement items considering the convergent validity test. It can be seen that all AVE and communality scores are above 0.5. However, factor loadings of the measurement items CR4 (0.686), CR5 (0.674), CR10 (0.680), CR11 (0.665), UR6 (0.687) and UR8 (0.691), UR15 (0.652) were below the suggested value of 0.7. Nonetheless, they were still considered as Hulland (1999) recommended considering them with care. A further reduction of measurement items below 15 was considered and expected to provide better results for individual loadings. However, the low amount of measurement items in the individual constructs was suggesting an undesirable Cronbach's Alpha value and lack of representative tourist requirements. Although 25 items were desired as prime indicator (Griffin and Hauser, 1993) for tourist requirements, reliability scores showed weak values showing AVE scores and communalities lower than the suggested value of 0.5 (Hair et al., 2010). Therefore, the model proposing 18 measurement items was considered the best solution and utilised for further analysis in the study.

Additionally, discriminant validity was measured using SmartPLS 2.0. According to Farrell and Rudd (2009) discriminant validity is measured using the AVE score of each latent variable and comparing it with the squared value of a correlation with another variable. While doing so, the AVE score should be bigger than the squared correlation with another latent variable or the latent variable correlation

smaller than the square root of the AVE score (Petrick, 2004). Goetz et al. (2010) on the other hand suggested the use of cross-loadings in order to perform discriminant validity tests. Therefore, a latent variable should provide a higher value within its own construct compared to the correlation with another latent variable. Table 8.7 provides an overview of cross-loadings for all 18 measurement items.

Table 8.7: Cross Loadings for Measurement Items

	Content Requirements	Function Requirements	User Resistance
CR4	0,6856	0,4507	0,054
CR5	0,6737	0,4504	0,1648
CR6	0,7109	0,426	0,1684
CR7	0,7551	0,4031	0,2754
CR8	0,7878	0,5482	0,1211
CR10	0,6805	0,353	0,1766
CR11	0,6650	0,4815	0,1652
CR12	0,7092	0,5138	0,0956
FR20	0,4605	0,7016	-0,0039
FR22	0,3352	0,7029	-0,0091
FR23	0,5304	0,7757	-0,0791
FR24	0,4677	0,7069	0,0737
FR25	0,4849	0,7025	0,1291
UR5	0,1315	-0,077	0,7570
UR6	0,111	0,0712	0,6874
UR8	0,1432	0,0131	0,6914
UR10	0,2208	0,0899	0,7595
UR15	0,1156	0,0699	0,6518

Source: author (2015)

It can be seen that the cross loadings of a determining construct is always showing a higher value within its appointed construct compared to its correlation with another. Therefore, the validity of the measurement items based on their cross loadings was confirmed. Additionally, discriminant validity according to Farrell and Rudd (2009) was measured and presented in table 8.8.

Table 8.8: AVE Score Comparison with Squared Correlation Value of other Constructs

	CR	FR	UR
CR	**0.5036**		
FR	0.4169	**0.5162**	
UR	0.0454	0.001	**0.5051**

Source: author (2015)

It is evident that the AVE score of a determined construct is always higher than the squared value of a correlation with another latent variable. Farrell and Rudd's (2009) confirmed this method to confirm discriminant validity. Furthermore, Campbell and Fiske (1959) stated that discriminant validity was also determined by a correlation value of under 0.85, which has been achieved. Therefore, an overall validity of the selected construct could be anticipated showing acceptable convergent and discriminant validity scores based on the score criterions (Nunnally, 1978; Farrell and Rudd, 2009; Hutchinson et al., 2009; Goetz et al., 2010; Hair et al., 2010).

Table 8.9 outlines the identified 18 user requirements that will be used to generate the QFD model. It was evident that the most requirements were content related, confirming the findings from the literature as well as expert interviews stating that content was dominating over functions particularly for tourism applications (Damala et al., 2008; van Krevelen and Poelman, 2010; Olsson and Salo, 2011). The reduced tourist requirements mirrored what had been discussed in the tourist and expert interviews and confirmed in the focus groups in Research Phase 2. Content requirements were sortable into two main categories; Information Relevance (Wang and Liao, 2007; Gafni, 2008; Kenteris et al., 2009; Delagi, 2010; Herskovic et al., 2011; Dinh et al., 2013) and Information Filter (Buellingen and Woerter, 2004; Durscha et al., 2004; Zheng and Pulli, 2005; Swallows et al., 2007; Wang and Liao, 2007; An et al., 2008; Gafni, 2008; Huang and Bian, 2009; Karahasanović et al., 2009; Kenteris et al., 2009; Herskovic et al., 2011) to personalise the available information to the tourists' interests. Function requirements pointed out the possibility to access and share information with other devices over anywhere at anytime (Buellingen and Woerter, 2004; Durscha et al.,

2004; Zheng and Pulli, 2005; Lee et al., 2007; Wang and Liao, 2007; Huang and Bian, 2009; Kenteris et al., 2009; Delagi, 2010; Gebauer et al., 2010; Herskovic et al., 2011; Dinh et al., 2013). User resistance on the other hand was dominated by practical and security issues using smartphones for AR experiences outdoors (Morrison et al., 2009) confirming focus group outcomes, as well as concerns for data privacy (Buellingen and Woerter, 2004; Derek, 2004; Zheng and Pulli, 2005; Lee et al., 2007; Gafni, 2008; Papagiannakis et al., 2008; Dantas et al., 2009; Karahasanović et al., 2009; Zoellner et al., 2009; Delagi, 2010; Carmigniani et al., 2011; Herskovic et al., 2011; Dinh et al., 2013; Graham et al., 2013) limiting the user experience as opposed to Wi-Fi and hardware related limitations as discussed in the literature and qualitative research.

The Warwick Manufacturing Group (2007) recommends organising all customer requirements into primary, secondary and tertiary types of data prior to entering them into the QFD chart. Therefore, it is possible to organise raw customer data into associated groups and reach a common understanding and interpretation of each requirement within the development team. At the primary level, tourist requirements are categorised into three main areas that were identified within the semi-structured interviews, Content Requirements (CR), Function Requirements (FR), and User Resistance (UR). The secondary level provides more depth within each group and aims to establish separate groups of purpose within the application. Finally, the tertiary level presents the tourist requirements in the most detail and will be used for further analysis and establishment for the HOQ. Therefore, for the final HOQ, only the tertiary level was projected. Table 8.9 shows the organised customer requirements into primary, secondary and tertiary levels.

Table 8.9: Organised Tourist Requirements into Levels

Primary	Secondary	Tertiary	Code
Content Requirements	Personalisation	Information on Special Requirements (food, disability)	CR10
		Option to access Additional Information	CR12
	Destination	Weather Information/Forecast	CR11
		Public Transport Information	CR4
		Information on Restaurant Menus	CR6
		Information on Events, Daily Specials and Promotions	CR7
	Time	Information Relevance for Timeframe of Travel	CR5
		Instant Accommodation availability Check	CR8
Function Requirements	Tourism Function	Exchange Rate Calculator	FR20
		Booking Function for Accommodation and Restaurants	FR23
	Application Support	Sync and Share Content with other Devices	FR22
		Audio/Video support for projected Information	FR24
		Accessibility of Information anywhere anytime	FR25
User Resistance	Safety	Secure Interaction with Mobile Device in Public	UR10
		Privacy of Personal Details	UR8
	Tourist Experience	Facilitate adventurous Exploration of Destination	UR15
		Practical Solution for Interaction	UR5
		Unobtrusive to Travel Experience	UR6

Source: author (2015)

8.6 Generating the QFD Model

The following sections will provide an overview of how the QFD model was established by building the House of Quality (HOQ) in a step-by-step approach. Therefore, a QFD model template provided by QFD Online (2010) was used to design the HOQ for this study. From the beginning of the study, the aim was to identify tourist requirements (Customer Requirements – A) for the HOQ.

Therefore, secondary literature was critically investigated for previously identified requirements in the field of mobile AR applications for the tourism industry, as well as in the wider area of mobile computing. The first phase of primary research was conducted in the form of tourist and industry professional interviews. The aim was to identify tourist requirements for mobile AR applications in the urban heritage tourism context and put them in contrast to mobile AR developer requirements as well as industry experts in Dublin. On the basis of the outcomes from Research Phase 1, a mobile AR tourism application demonstrator was developed featuring a GPS-based AR function creating an outdoor AR experience as well as a marker-based AR function providing an indoor capability. The demonstrator application was used for Research Phase 2, in which tourist focus groups were conducted to confirm identified tourist requirements from Research Phase 1 and modify any requirements as necessary after the post-experience study. Finally, a list of 62 tourist requirements was generated on basis of Research Phase 1 and 2, and used for a quantitative study (Research Phase 3). The aim of the quantitative research was the rating of requirements by tourists and the reduction of requirements in order to generate the final list of requirements that was used as 'Customer Requirements – A' in the HOQ. Once the tourist requirements were identified and reduced, each one of them was inserted into section A in the House of Quality (Customer Requirements – 'Whats') as shown in Figure 8.1.

Figure 8.1: Components of the QFD Model
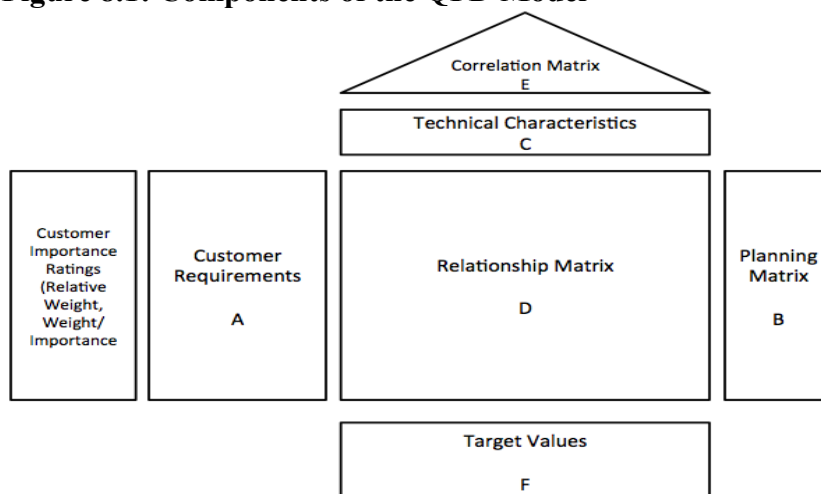
Source: Akao (1990)

8.6.1 Customer Attributes 'Whats'

In order to determine the relative importance of each requirement, the average importance of each user requirement from the questionnaire responses was calculated and rounded to whole values. While the questionnaires were designed in a Likert-scale from 1 to 5 to assist the decision-making process for participants, the average importance of each listed tourist requirement was doubled and rounded into a whole number in order to get a more detailed view of importance ratings, as suggested by the Warwick Manufacturing Group (2007). Since the tourist requirements were reduced using CFA, the requirements that were used for the QFD model all had a minimum average rating of 3. Since the value was doubled using the suggesting of the Warwick Manufacturing Group, the relative importance of all tourist requirements resulted in a value between 6.0 and 9.0. The weighted importance was calculated as a percentage out of 100% and noted alongside the relative importance ratings (Hauser and Clausing, 1988). The relative importance of all tourist requirements was used to calculate the weighted importance. Figure 8.2 shows an excerpt of Customer Attributes for the HOQ.

Figure 8.2: Customer Attributes (A)

Relative Weight	Weight / Importance	Tourist Requirements (a.k.a. "Demanded Quality", "Whats")
8,0	6,0	Information on Special Requirements (food, disability)
8,0	6,0	Weather information/forecast
8,0	6,0	Option to access additional information (link to website)
9,0	6,7	Public Transport Information
8,0	6,0	Information Relevance for Timeframe of Travel
7,0	5,2	Information on Restaurant menus
8,0	6,0	Information on Events, Daily Specials and Promotions
8,0	6,0	Instant Accommodation availability Check
7,0	5,2	Exchange Rate Calculator
7,0	5,2	Sync and Share Content with other Devices
8,0	6,0	Booking Function for Accommodation and Restaurants
9,0	6,7	Audio/video support for projected Information
8,0	6,0	Accessibility of Information anywhere anytime
6,0	4,5	Secure Interaction with Mobile Device in Public
7,0	5,2	Facilitate adventurous Exploration of Destination
6,0	4,5	Practical Solution for Interaction
6,0	4,5	Unobtrusive to Travel Experience
6,0	4,5	Privacy of Personal Details

Design Elements")

Source: author (2015)

At this stage, a competitive evaluation analysis (B) is typically performed, which is found at the right side of the HOQ. However, in order to identify customer satisfaction levels of competitors, surveys are generally conducted to rate

competitive performance on each customer requirement from 1 to 5. Alternatively, data can be gathered by simply listening to customer complaints and feedback on competitor products (Warwick Manufacturing Group, 2007). However, this evaluation was found only possible if the market is already established and competitors with similar applications exist. Since this study deals with the development of a mobile AR tourism application, it was found that this market does not yet provide any scalable competitors, and therefore the competitive evaluation could not be performed. Mobile AR applications based on the hardware's GPS sensor to project information on the surrounding have been developed, however, such were considered still in the testing phase and therefore not able to scale on the satisfaction level of customers. The principle behind the competitive evaluation is the contrast of the current developing application's performance to other similar applications that already exist in the market. Therefore, it is possible to identify areas of improvement and benchmarking within the application (Paryani et al., 2010).

8.6.2 Technical Characteristics 'Hows'

Technical design elements 'Hows' (C – Technical Measures) were formulated with the support of three mobile AR application developers that were consulted separately in order to compare and contrast translated design elements and retrieve a final formulation to input into the HOQ. According to Tan et al. (1998) technical requirements identify how to respond to the customer needs that were presented. The translated technical characteristics should be measurable and achievable in order to provide a clear picture on what should be developed (Warwick Manufacturing Group, 2007). In the process, it was evident that many of the tourist requirements were resolvable by the same technical design element. For the purpose of this study, technical characteristics were identified based on current technological standards and possibilities. As the identification of 'Hows' is typically completed by the development team, AR applications developers that participated in the developer interviews (Research Phase 1) were consulted to confirm the translated technical characteristics. In order to provide a reliable translation, two AR application developers (EP4, EP6) and one additional expert

from the IT department at Manchester Metropolitan University were asked to review and confirm the translation completed by the researcher.

The next step included the value of improvement for each technical characteristic. Therefore, for each characteristic it was determined whether its maximisation (▲), minimisation (▼), or hitting the target (x) was desirable to increase the quality of the application. The desired criteria were set in consultation with the above-mentioned technical experts. 'Save user profiles' was regarded more valuable if multiple profiles could be saved in order to adjust to change of interest fields in different destinations as well as adjustment of itinerary during the trip. It was found by tourist interviews and focus group outcomes that more personalisation of information would ultimately enhance the user experience and convenience to interact with the application. 'Link to Web Browser' was also seen to be more beneficial the more websites were available to access additional information. Since tourism applications are highly dependent on the value of their content, it was determined that the more content was accessible from different websites, the more benefit it would ultimately provide given all remaining requirements would stay unchanged. 'Real-time Updates' were regarded invaluable for tourism applications, as issues such as weather, events and public transport were changing rapidly. Therefore, the more frequent updates were conducted, the more accurate information could be displayed in the application. 'Web Content Sourcing' provided the same outcome as 'Link to Web Browser', since good quality content was regarded key in tourism applications. An increase of 'Content Filter' was regarded as more beneficial for the application, as more detailed searches could be processed. This could save time during the interaction and enhance the user experience. By providing more search criteria, tourists would be able to extract information more purposefully without having to search for keywords multiple times. A similar argument was provided for 'Context aware AR', as the more detailed the application was able to recognise its surroundings, the more precise information could be provided in relation to the circumstances. The 'Link to Global Distribution System (GDS)' was more beneficial, the more access was granted to GDS systems of different hotels. Similar to booking intermediaries such as bookings.com and Expedia, this would facilitate the immediate update and booking confirmation of various accommodations in different regions. While it

was debated whether tourism applications should rely on network access or solely on prior downloaded content, 'Offline Content Accessibility' was seen as more valuable if more content could be accessed without having to rely on a stable Internet connection. Although this would imply that the size of the application would increase, it was regarded vital that tourists were able to use the application during their trip and while moving to different places (Papagiannakis et al., 2008). A maximisation of 'Application Speed' was furthermore recommended since faster loading times with a shorter time to wait for the application to react would enhance the user experience. As this application was built on the functionality of AR, the increased 'Use of Hardware Camera' was regarded more beneficial for the application, since more AR experiences could ultimately be formed.

While for most of the technical design elements, an increase had an improving effect, it was determined that for 'Use of Network Connection' and 'Minimum Hardware Capacity', the minimisation was more desired. Although connecting to a network and Internet was regarded necessary in order to store a large amount of content on the Cloud, a high dependency on the Internet where tourists were still in situations in which free and constant Internet access was not guaranteed could have a detrimental effect on the benefit and use of the application. Therefore, it was determined that the less hardware capacity the application required, the more people were able to use the application and increase its value.

For the remaining technical characteristics, 'Transportation API Link (Google Maps, Travel Line)', 'API Link to Currency Calculator', 'Connection to Cloud', Password Protection', Use of Hardware GPS', and 'Use of Hardware Accelerometer', hitting the target was regarded as most suitable since a maximisation or minimisation of those requirements were not providing additional benefits. The determining factor was lying in the means of incorporating each of them as technical aspects, or to disregard them. Figure 8.3 provides an excerpt of the Technical Characteristics (C) of the HOQ.

Figure 8.3: Technical Characteristics (C)

Legend	
▼	Objective Is To Minimize
▲	Objective Is To Maximize
x	Objective Is To Hit Target

Column #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Direction of Improvement: Minimize (▼), Maximize (▲), or Target (x)	▲	▲	▲	x	▲	▲	▲	▼	x	▲	x	▼	▲	▲	x	x	▲	x
Technical Characteristics (translated Tourist Requirements, "Hows", "Technical Design Elements") / **Tourist Requirements** (a.k.a. "Demanded Quality", "Whats")	Save User Profiles	Link to Web Browser	Real-time Updates	Transportation API Link (Google Maps, Travel Line)	Web Content Sourcing	Content Filter	Context aware AR	Use of Network Connection	API Link to Currency Calculator	Link to Global Distribution System (GDS)	Connection to Cloud	Minimum Hardware Capacity	Offline Content Accessibility	Application Speed	Password Protection	Use of Hardware GPS	Use of Hardware Camera	Use of Hardware Accelerometer

Source: author (2015)

8.6.3 Correlation Matrix

The roof of the HOQ is designed by investigating the inter-relationships amongst each of the technical design elements. Although this value is not included in the numeric calculation of the final outcome of the QFD model, displayed as target values in the Target Values (F), it projects a view on possible trade-offs of implemented technical design elements in the application to assist the decision-making process, if resources are limited and not all design elements can be included in the final application. This picture provides an immediate view of the impact on other technical design elements if one element is increased or decreased (Paryani et al., 2010). The correlation of elements is therefore a matter of interpretation and debate, and is arguable depending on the view of the developer. Once the relative importance is calculated for the Target Values (F) providing a hierarchy of technical design elements, it facilitates to understand how much one requirement can be pushed without having a detrimental affect on other inter-related technical requirements. Figure 8.4 presents the roof of the HOQ. A '+' and '++' indicate a positive and strong positive relationship between the two technical characteristics, meaning if one is increased, it results in an increase or strong increase of the related element. In contrast, '−' and '▼' express a negative and strong negative relationship to each other, stating that an increase in one element results in a decrease or strong decrease of the other. The correlation indicator was left blank for all other requirement relationships that were unrelated to each other.

Figure 8.4: Correlation Matrix (E)
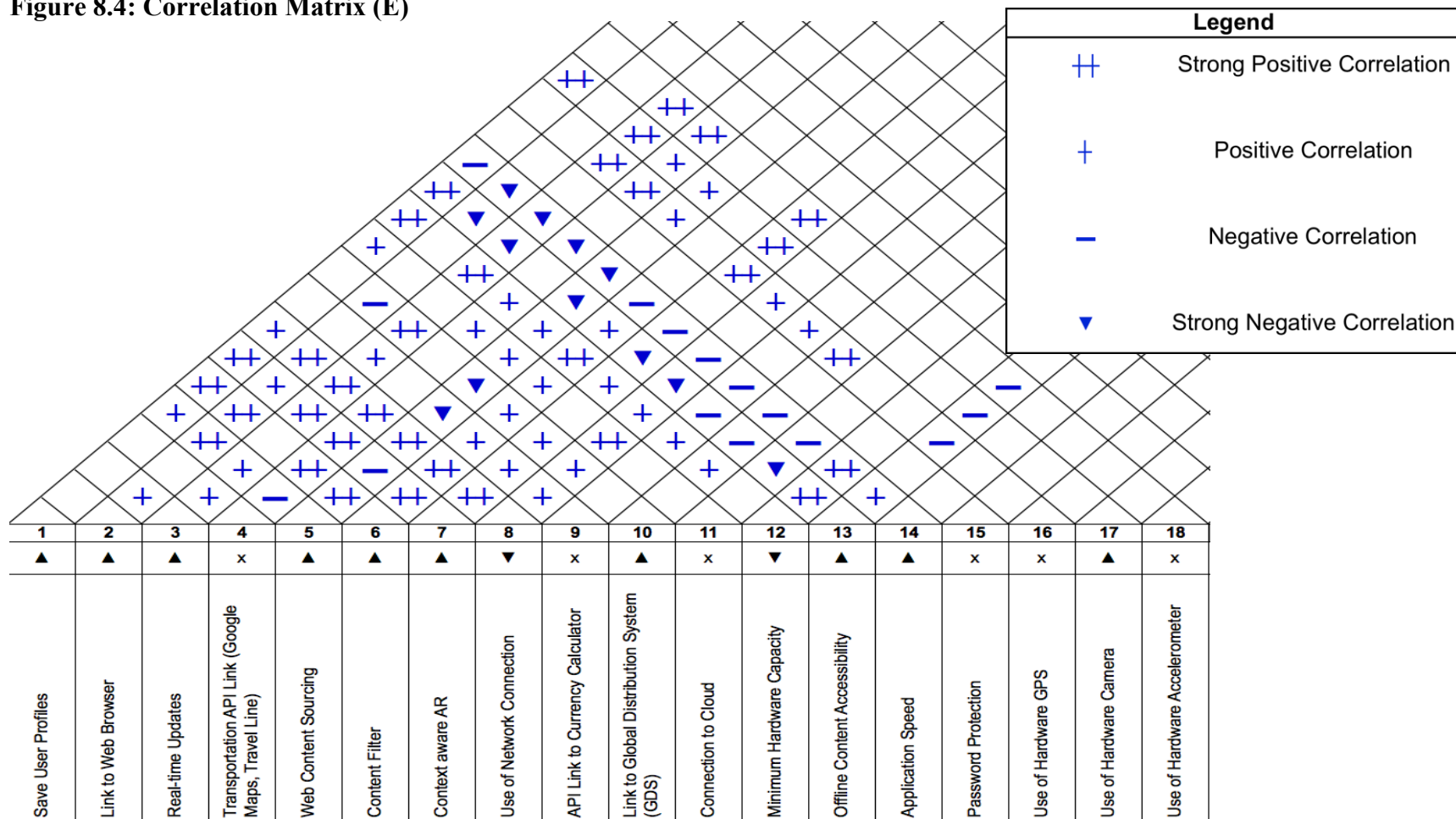
Source: author (2015)

The indicators show that 'Password Protection' is a technical requirement that is unaffected by other requirements as it is uncorrelated to any of the other design elements. It can be seen that it is therefore a matter of whether or not it is included in the application. In comparison all other technical requirements are correlated to and therefore affected by at least one other technical requirement. Furthermore, it can be seen that 'Offline Content Accessibility' is largely dependent on whether the application will be Internet dependent or not. The more Internet connectivity is required to retrieve information, the less offline content will be necessary. Similarly there is logically a strong correlation between 'Network Connection' and other requirements that are Internet dependent, such as 'Link to Web Browser', 'Real-time Updates' and 'Context aware AR'.

8.6.4 Relationship Matrix

The main part of the HOQ consists of the Relationship Matrix (D). Therefore, each tourist requirement (A) is put in correlation with each technical characteristic (C). The goal of the relationship matrix is to determine the association of each customer attribute to each individual technical requirement and examine how many technical requirements are necessary and affected by one customer attribute. As value indicator, the symbols, 'Θ', 'O', '▲' and 'none' are used to indicate a strong relationship ('Θ'), moderate relationship ('O'), weak relationship ('▲'), or no relationship in which case the box is left blank (Warwick Manufacturing Group, 2007). In order to calculate the numeric values for each relationship, the following indicators are typically used to express the relationships, 'Θ' = 9, 'O' = 3, '▲' = 1, 'none' = 0. This value is aimed to provide an indicator but can be debated in the development team depending on each person's own perception. Figure 8.5 provides an excerpt of the relationship matrix correlating the tourist requirements with technical design elements.

Figure 8.5: Relationship Matrix (D)

Legend		Value
Θ	Strong Relationship	9
O	Moderate Relationship	3
▲	Weak Relationship	1

Tourist Requirements (a.k.a. "Demanded Quality", "Whats")	Save User Profiles	Link to Web Browser	Real-time Updates	Transportation API Link (Google Maps, Travel Line)	Web Content Sourcing	Content Filter	Context aware AR	Use of Network Connection	API Link to Currency Calculator	Link to Global Distribution System (GDS)	Connection to Cloud	Minimum Hardware Capacity	Offline Content Accessibility	Application Speed	Password Protection	Use of Hardware GPS	Use of Hardware Camera	Use of Hardware Accelerometer
Information on Special Requirements (food, disability)	Θ	O	▲		Θ	Θ	Θ	O					O					
Weather information/forecast	O	O	Θ		Θ	O	Θ	Θ				▲	▲			Θ		
Option to access additional information (link to website)	▲	Θ	▲		Θ	O		Θ						O				
Public Transport Information	O	O	Θ	Θ	Θ	O	Θ	O					O			Θ	▲	O
Information Relevance for Timeframe of Travel	Θ	O	Θ	Θ	Θ	Θ	Θ	Θ	O	O			O			O		
Information on Restaurant menus	O	O	O		Θ	O	O	O					O			O	▲	
Information on Events, Daily Specials and Promotions	Θ	O	Θ		Θ	Θ	Θ	Θ					O			Θ		
Instant Accommodation availability Check	O		Θ		O	O	Θ	Θ		Θ		▲		Θ		Θ	▲	
Exchange Rate Calculator			O		Θ	▲	O	O	Θ	▲		▲	O			O		
Sync and Share Content with other Devices	Θ							O			Θ	▲	Θ	O	O			
Booking Function for Accommodation and Restaurants	O	O	O		▲	O	▲	Θ	O	Θ		Θ		O	O			
Audio/video support for projected Information	▲				▲							Θ	O	Θ		▲	Θ	
Accessibility of Information anywhere anytime		▲	O	Θ	Θ	▲	O	Θ		▲	O	O	Θ	Θ		Θ	O	O
Secure Interaction with Mobile Device in Public				O							▲	O	▲	Θ	Θ		Θ	Θ
Facilitate adventurous Exploration of Destination	▲		O	▲			Θ						O	Θ		Θ	Θ	Θ
Practical Solution for Interaction	O	▲		▲	O			O	O	O	O	▲	Θ	Θ		Θ	Θ	Θ
Unobtrusive to Travel Experience	O		▲	▲			O					Θ	▲	Θ		O	Θ	O
Privacy of Personal Details	Θ				▲			Θ		O	O		▲		Θ			

Source: author (2015)

It can be seen that content requirements, such as 'Information on Special Requirements', 'Weather Information', and Public Transportation Information' are highly associated with the ability to source content from the web to receive real time updates, and therefore have high dependency on Internet access. Accordingly, the ability to receive information through 'Offline Content Accessibility' has a decrease of importance. Furthermore, it is obvious that technical requirements that relate to a specific functionality, such as 'API Link to Currency Calculator' will be less associative to other components of the application, in contrast to general technical elements, such as 'Web Content Sourcing', which is relevant to the majority of the tourist requirements. As it could be seen in the Technical Correlation Matrix (E), 'Password Protection', although considered to improve security and privacy elements in the application, is generally not considered to affect individual functions of the application. Nonetheless, including password protection in the application in various areas was believed to improve security and data protection for tourists, such as for 'Sync and Share Content with other Devices', and 'Booking Function for Accommodation and Restaurants', where tourist data is shared to external sources. A detailed analysis is discussed in chapter 9 (Synthesis of the Research Findings).

8.6.5 Target Values

The last part of the HOQ presents the outcomes and technical hierarchy that results from the consideration of all other areas within the HOQ. As mentioned in chapter 2, the relative weight is calculated by multiplying each importance indicator ('Θ' = 9, 'O' = 3, '▲' = 1, 'none' = 0) in the Relationship Matrix with the relative weight of each tourist requirement of the column, and taking the sum of all calculated values of the column. Therefore, the relative weight for the first technical requirement, 'Save User Profile' will be calculated as follows,

9x8,0+3x8,0+1x8,0+3x9,0+9x8,0+3x7,0+9x8,0+3x8,0+0x7,0+9x7,0+3x8,0+1x9
,0+0x8,0+0x6,0+1x7,0+3x6,0+3x6,0+9x6,0
= 513,0

Finally, the calculated weighted importance provides an indication which of the technical requirements should be focused on first and carry the highest significance for the overall application. Therefore, weak columns where technical requirements satisfy only a few customer requirements, and weak rows, where 'Whats' are not addressed by 'Hows' appropriately, as well as strong columns and rows respectively to identify what should be focused on are analysed (Paryani et al., 2010). Respectively, it shows which technical design elements can be neglected in case of limited resources due to their limited benefit to the application. Figure 8.6 shows an excerpt of the Target Values (F) for the HOQ.

Figure 8.6: Target Values (F)

	Legend	Value
⊖	Strong Relationship	9
O	Moderate Relationship	3
▲	Weak Relationship	1

Relative Weight	Weight / Importance	Tourist Requirements (a.k.a. "Demanded Quality", "Whats")	Save User Profiles	Link to Web Browser	Real-time Updates	Transportation API Link (Google Maps, Travel Line)	Web Content Sourcing	Content Filter	Context aware AR	Use of Network Connection	API Link to Currency Calculator	Link to Global Distribution System (GDS)	Connection to Cloud	Minimum Hardware Capacity	Offline Content Accessibility	Application Speed	Password Protection	Use of Hardware GPS	Use of Hardware Camera	Use of Hardware Accelerometer
8,0	6,0	Information on Special Requirements (food, disability)	⊖	O	▲		⊖	⊖	⊖	O					O					
8,0	6,0	Weather information/forecast	O	O	⊖		⊖	O	⊖	⊖				▲	▲			⊖		
8,0	6,0	Option to access additional information (link to website)	▲	⊖	▲		⊖	O		⊖						O				
9,0	6,7	Public Transport Information	O	O	⊖	⊖	⊖	O	⊖	O					O			⊖	▲	O
8,0	6,0	Information Relevance for Timeframe of Travel	⊖	O	⊖	⊖	⊖	⊖	⊖	⊖	O	O			O			O		
7,0	5,2	Information on Restaurant menus	O	O	O		⊖	O	O	O					O			O	▲	
8,0	6,0	Information on Events, Daily Specials and Promotions	⊖	O	⊖		⊖	⊖	⊖	⊖					O			⊖		
8,0	6,0	Instant Accommodation availability Check	O		⊖		O	O	⊖	⊖		⊖		▲		⊖		⊖	▲	
7,0	5,2	Exchange Rate Calculator			O		⊖	▲	O	O	⊖	▲		▲	O			O		
7,0	5,2	Sync and Share Content with other Devices	⊖							O			⊖	▲	⊖	O	O			
8,0	6,0	Booking Function for Accommodation and Restaurants	O	O	O		▲	O	▲	⊖	O	⊖		⊖			O	O		
9,0	6,7	Audio/video support for projected Information	▲					▲						⊖	O	⊖		▲	⊖	
8,0	6,0	Accessibility of Information anywhere anytime		▲	O	⊖	⊖	▲	O	⊖		▲	O	O	⊖	⊖		⊖	O	O
6,0	4,5	Secure Interaction with Mobile Device in Public				O							▲	O	▲	⊖	⊖		⊖	⊖
7,0	5,2	Facilitate adventurous Exploration of Destination	▲		O	▲			⊖						O	⊖		⊖	⊖	⊖
6,0	4,5	Practical Solution for Interaction	O	▲		▲	O			O	O	O	O	▲	⊖	⊖		⊖	⊖	⊖
6,0	4,5	Unobtrusive to Travel Experience	O		▲	▲			O					⊖	▲	⊖		O	⊖	O
6,0	4,5	Privacy of Personal Details	⊖				▲			⊖		O	O		▲		⊖			
		Max Relationship Value in Column	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
		Relative Weight	513,0	254,0	502,0	262,0	695,0	384,0	596,0	690,0	129,0	219,0	129,0	285,0	404,0	519,0	153,0	579,0	354,0	240,0
		Weight / Importance	7,4	3,7	7,3	3,8	10,1	5,6	8,6	10,0	1,9	3,2	1,9	4,1	5,8	7,5	2,2	8,4	5,1	3,5

Source: author (2015)

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In figure 8.6, it can be seen in the weighted importance that the most important technical design elements are built on 'Web Content Sourcing' (10,1%) and 'Use of Network Connection' (10,0%) as compared to other technical design elements. Furthermore, the outcome illustrates that 'Context Aware AR' (8,6%), 'Use of Hardware GPS' (8,4%), and 'Application Speed' (7,5%) account for the top five requirements that should be implemented in mobile AR tourism applications. However, it should be noted that the inclusion of more requirements in the final application will result in an increase of the quality of the application.

Alternatively, 'Target' or 'Limit Value' as well as 'Level of Difficulty to Accomplish' the inclusion of each technical design element can be incorporated in the Target Values (as seen in Figure 8.6). However, since both indicators highly depend on the expertise and resource allocation of each individual business, they were disregarded and left blank for the purpose of this study and only included for completeness purposes. Target values should be indicated as high as possible until specific knowledge about available resources for the application development team are known. Figure 8.7 shows the completed House of Quality (HOQ) for this study and the final QFD model.

Figure 8.7: HOQ for Mobile AR Tourism Applications

Legend:

Symbol	Meaning	Value
θ	Strong Relationship	9
o	Moderate Relationship	3
▲	Weak Relationship	1
++	Strong Positive Correlation	
+	Positive Correlation	
−	Negative Correlation	
▼	Strong Negative Correlation	
▼	Objective Is To Minimize	
▲	Objective Is To Maximize	
x	Objective Is To Hit Target	

Column #: 1–18
Direction of Improvement (Minimize ▼, Maximize ▲, or Target x): ▲ ▲ ▲ x ▲ ▲ ▲ ▼ x ▲ x ▼ ▲ ▲ x x ▲ x

Technical Characteristics (translated Tourist Requirements, "Hows", "Technical Design Elements"):
1. Save User Profiles
2. Link to Web Browser
3. Real-time Updates
4. Transportation API Link (Google Maps, Travel Line)
5. Web Content Sourcing
6. Content Filter
7. Context aware AR
8. Use of Network Connection
9. API Link to Currency Calculator
10. Link to Global Distribution System (GDS)
11. Connection to Cloud
12. Minimum Hardware Capacity
13. Offline Content Accessibility
14. Application Speed
15. Password Protection
16. Use of Hardware GPS
17. Use of Hardware Camera
18. Use of Hardware Accelerometer

Row #	Max Rel	Rel Wt	Wt/Imp	Tourist Requirement	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	9	8,0	6,0	Information on Special Requirements (food, disability)	θ	o	▲		θ	θ	θ	o					o					
2	9	8,0	6,0	Weather information/forecast	o	o	θ		θ	o	θ	θ				▲	▲			θ		
3	9	8,0	6,0	Option to access additional information (link to website)	▲	θ	▲		θ	o		θ						o				
4	9	9,0	6,7	Public Transport Information	o	o	θ	θ	θ	o	θ	o					o			θ	▲	o
5	9	8,0	6,0	Information Relevance for Timeframe of Travel	θ	o	θ	θ	θ	θ	θ	θ	o	o			o			o		
6	9	7,0	5,2	Information on Restaurant menus	o	o	o		θ	o	o	o					o			o	▲	
7	9	8,0	6,0	Information on Events, Daily Specials and Promotions	θ	o	θ		θ	θ	θ	θ					o			θ		
8	9	8,0	6,0	Instant Accommodation availability Check	o		θ		o	o	θ	θ		θ		▲		θ		θ	▲	
9	9	7,0	5,2	Exchange Rate Calculator			o		θ	▲	o	o	θ	▲		▲	o			o		
10	9	7,0	5,2	Sync and Share Content with other Devices	θ							o			θ	▲	θ	o	o			
11	9	8,0	6,0	Booking Function for Accommodation and Restaurants	o	o	o		▲	o	▲	θ	o	θ		θ		o	o			
12	9	9,0	6,7	Audio/video support for projected Information	▲						▲					θ	o	θ		▲	θ	
13	9	8,0	6,0	Accessibility of Information anywhere anytime		▲	o	θ	θ	▲	o	θ		▲	o	o	θ	θ		θ	o	o
14	9	6,0	4,5	Secure Interaction with Mobile Device in Public				o							▲	o	▲	θ	θ		θ	θ
15	9	7,0	5,2	Facilitate adventurous Exploration of Destination	▲		o	▲			θ						o	θ		θ	θ	θ
16	9	6,0	4,5	Practical Solution for Interaction	o	▲		▲	o			o	o	o	o	▲	θ	θ		θ	θ	θ
17	9	6,0	4,5	Unobtrusive to Travel Experience	o		▲	▲			o						θ	▲		o	θ	o
18	9	6,0	4,5	Privacy of Personal Details	θ					▲		θ		o	o		▲		θ			
Max Relationship Value in Column					9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Relative Weight					513,0	254,0	502,0	262,0	695,0	384,0	596,0	690,0	129,0	219,0	129,0	285,0	404,0	519,0	153,0	579,0	354,0	240,0
Weight / Importance					7,4	3,7	7,3	3,8	10,1	5,6	8,6	10,0	1,9	3,2	1,9	4,1	5,8	7,5	2,2	8,4	5,1	3,5

Source: author (2015)

Table 8.10 sums up the priority list of technical design elements that should be considered in a mobile AR tourism application and serves for the achievement of Aim 5 of this study. The final table was designed in consideration of the HOQ (Figure 8.7) as the outcome of the study. It can be seen that elements associated with the connection to the Internet are highly significant for the successful development of a meaningful mobile AR tourism application in the urban heritage tourism context. 'Web Content Sourcing' to allow the projection of relevant and updated content as well as 'Use of Network Connection' that is relevant for the majority of tourist requirements are both weighted at the highest important among the final 18 requirements. It is revealed that the most resources should be allocated towards network connection and context awareness in order to present up to date content relevant to the tourist. In contrast, 'Connection to Cloud' to store and share information among different devices and 'API Link to Currency Calculator' seem to be considered as too distinctive functionalities that is not relevant to a large amount of tourists, and therefore have been ranked the lowest in the list.

Table 8.10: Final Technical Requirements Ranking for mobile AR Tourism Applications

Importance Level	Technical Design Element	Relative Weight	Weighted Importance
1	Web Content Sourcing	695,0	10,1%
2	Use of Network Connection	690,0	10,0%
3	Context Aware AR	596,0	8,6%
4	Use of Hardware GPS	579,0	8,4%
5	Application Speed	519,0	7,5%
6	Save User Profile	513,0	7,4%
7	Real-time Updates	502,0	7,3%
8	Offline Content Accessibility	404,0	5,8%
9	Content Filter	384,0	5,6%
10	Use of Hardware Camera	354,0	5,1%
11	Minimum Hardware Capacity	285,0	4,1%
12	Transportation API Link (Google Maps, Travel Line)	262,0	3,8%
13	Link to Web Browser	254,0	3,7%
14	Use of Hardware Accelerometer	240,0	3,5%
15	Link to Global Distribution System (GDS)	219,0	3,2%
16	Password Protection	153,0	2,2%
17	API Link to Currency Calculator	129,0	1,9%
18	Connection to Cloud	129,0	1,9%

Source: author (2015)

8.7 Summary

This chapter provided a detailed analysis of the quantitative research that was conducted to reduce the tourist requirements for generating the QFD model. Therefore, confirmatory factor analysis (CFA) was employed to reduce identified tourist requirements from 62 to 18 relevant requirements for the development of the House of Quality (HOQ). Although SmartPLS 2.0 is typically used for further path analysis and model testing, the sole purpose for its employment was the reliable reduction of tourist requirements. CFA revealed that apart from the 18 reduced requirements, all other were insignificant and therefore could be disregarded for the QFD model. Internal reliability was tested through Cronbach's Alpha with a value over 0.7 as suggested by Nunnally (1978) and further convergent validity test was

conducted through examination of factor loadings and AVE scores. It was evident that reducing the number of requirements to 18 provided the highest amount of requirements while keeping an acceptable measure of convergent validity scores as suggested in the literature. Although 'Information on Special Requirements (food, disability)' (CR10 (0.680)), 'Weather Information/Forecast' (CR11 (0.665)), 'Public Transport Information' (CR4 (0.686)), 'Information Relevance for Timeframe of Travel' (CR5 (0.674)), 'Facilitate adventurous Exploration of Destination' (UR15 (0.652)), 'Unobtrusive to Travel Experience' (UR6 (0.687)) and 'Privacy of Personal Details' (UR8 (0.691)) were below the suggested value of 0.7, they were still considered as Hulland (1999) recommended considering them with care, since a reduction of them would have resulted in too few measurement items within CR, FR and UR. Furthermore, discriminant validity was tested before utilising the 18 final tourist requirements for further process into creating the HOQ. For the purpose of reliability in the HOQ, technical requirements were established with careful consultation of AR application developers and further processed to build the HOQ for mobile AR tourism applications. In the QFD model it could be seen that mobile AR tourism applications are highly dependent on Internet accessibility, as the top three requirements that should be considered illustrated 'Web Content Sourcing', 'Use of Network Connection', and 'Context Aware AR'. All three elements are associated with the connection to the Internet and are highly significant for the successful development of a meaningful mobile AR tourism application in the urban heritage tourism context. 'Web Content Sourcing' to allow the projection of relevant and updated content as well as 'Use of Network Connection' that is relevant for the majority of tourist requirements were the highest rated technical design elements among the final 18 requirements. Therefore, the most resources should be allocated towards network connection and context-awareness in order to present up to date content which is relevant to the tourist. The outcomes of the final QFD model are in close alignment with the outcomes of the qualitative research, while more specific functionalities, such as 'API Link to Currency Calculator' and 'Connection to Cloud' were regarded as least significant in the mobile AR tourism application, which seemed to be perceived as 'add-on' functionalities in the tourist interviews, as they are too distinctive and therefore not relevant to a large number of tourists. The following chapter will provide a detailed

discussion of the research outcomes for the qualitative as well as quantitative research phases.

CHAPTER 9 – INTEGRATED SYNTHESIS OF THE RESEARCH FINDINGS AND DISCUSSION

9.1 Introduction

This chapter aims to review the outcomes derived from the primary and secondary research for this study and discuss issues and limitations as well as newly revealed findings from the current study. Therefore, key outcomes from the primary data collection will be reviewed and discussed. Furthermore, questionnaire results will be correlated to interview outcomes providing considerations for the final QFD model for the development of mobile AR tourism applications in the urban heritage tourism context. While the main section will relate to the current study, future conflicts and directions of research will be investigated to provide recommendations for academia and practitioners in the following chapter 10.

9.2 Key Findings of the Study

The findings of this study showed that user requirements suggested for the mobile computing context in the literature were still significant for today's mobile applications. It was revealed that many of them reoccurred in the tourist and expert interviews as well as in the focus groups.

9.2.1 AR Perceptions

Developer and industry expert interviews had a positive perception towards mobile AR and its future potential particularly for the tourism industry. However, as AR technology was still in its infant stage, it was evident that perceptions of AR benefit were still mainly regarded as marketing and PR purposes rather than being able to directly generate business revenue. Developer interviews revealed that mobile AR application developers were highly concerned with user engagement and enhancement of the user experience using AR applications. Dunleavy et al. (2009) argued that implementing AR in the education sector had high potential, as it was

found that users were able to recall information in more detail and have a faster learning process using AR. Sumadio and Rambli (2010) supported this study and found that although AR was a new technology, it was quickly accepted and adopted by users. Nonetheless, technical challenges need to be overcome to make it usable in every day learning environments (Dunleavy et al., 2009).

According to Morrison et al. (2011) and Olsson and Salo (2011), identifying a clear benefit to tourists was regarded a key development step for any new product. This theme was repeatedly discussed by developers and industry experts, claiming, "you must tell him for sure what is the benefit" (EP1) and "AR should be a functionality that is used for some reason" (EP2). Li et al. (2009) argued that tourists generally had the tendency to research information about a destination before the trip, which was confirmed by participants in the tourist interviews. It was criticised that this fact would make the use of mobile AR tourism applications meaningless to tourists. However, it is believed that the key lies in the instant accessibility of information to deal with unplanned circumstances during the trip and get immediate answers to queries. Nonetheless, as tourist interview participants claimed to research the destination online prior to the trip and make preparations were necessary, it is crucial to consider additional benefits of mobile AR tourism applications in addition to merely providing information. It was evident that the theme of 'accessibility' and 'instant gratification' identified in the tourist interviews were considered key elements of benefit. Being able to access information immediately suggested that tourists often felt the need to research additional information that was unexpected. Similar to tourist interview outcomes, focus group participants seemed to prefer an application that would allow them to immediately receive information about certain points of interest, while more information could be accessed if required. Van Krevelen and Poelman (2010) therefore suggested a Wi-Fi infrastructure to be implemented as a base to employ and use AR applications in a meaningful way. This would provide access opportunities for tourists without having to depend on certain locations such as Wi-Fi spots.

Another encouragement for using mobile AR tourism applications was discussed as offering incentives in direct connection with tourism product suppliers, such as discounts for certain tourist attractions or restaurants. However, this suggests a

stakeholder approach that considers the support and benefit to a number of tourism product suppliers such as restaurants, tourist spots, and the public transportation sector. It is believed that this approach would be necessary for the design of the application content in order to make the application meaningful to tourists.

Interviewees generally had a positive perception towards purchasing options in a mobile AR tourism application. Although the majority of participants did not have high security issues due to regular online purchases through desktop computers and laptops, it was argued that it required the application and the Internet connection to be stable and secure in order to assure a safe payment procedure. It was revealed that tourists appreciated a purchasing function in mobile tourism AR applications and would be willing to use it under the condition that the application and Internet connection were secure and without glitches. It was found that this option would provide more convenience and fast access to potential tourist activities, such as buying tickets to visit tourist attractions. Since many tourists considered online booking and purchasing to be 'normal', a general lack of trust or sense of insecurity was not evident. In contrast, more tourists were willing to use online as well as mobile functions to make purchases. According to Mallat et al. (2009), the user acceptance of mobile purchasing was highly dependent on the users' perception of usefulness and mobility. As the mobile market, such as the development of smartphones and mobile applications continues to grow, it is expected that the resistance towards mobile purchasing will further decrease, while more users will naturally adopt mobile purchasing functions (Mallat et al., 2008). In the following sections, requirements identified in the study will be discussed separately. It was divided into Function Requirements (9.2.1), Content Requirements (9.2.2) and User Resistance (9.2.3) to follow the logical structure of the categorisation.

9.2.2 Function Requirements

9.2.2.1 Simplicity

In the tourist interviews, it was apparent that many interviewees were not aware of AR and its functional capabilities. Therefore, in order to encourage AR adoption, it

is crucial to engage users with useful AR applications. In this regard, tourists noted that designing the user interface in a simple "step by step" (TP16) way was crucial (TP18, TP21). It was argued while the design to interact with the application should be as natural as possible, AR was considered a new technology which many were still unfamiliar with and therefore, users would require an introductory section within the application that could provide explanations on how to interact with the application and use AR functions (EP1, EP6).

'Ease of use' had been repeatedly discussed in the literature (Buellingen and Woerter, 2004; Leem et al., 2004; Wu and Wang, 2005; Zheng and Pulli, 2005; Ngai and Gunasekaran, 2007; Pulli et al., 2007; Turner et al., 2007; Wang and Liao, 2007; Gafni, 2008; Dantas et al., 2009; Karahasanović et al., 2009; Kenteris et al., 2009; Gebauer et al., 2010; Choi and Lee, 2012) and was considered one of the key requirements for mobile AR tourism applications. However, it was evident that 'ease of use' or 'simplicity' to navigate through the application was expected by interviewees, rather than regarded as a separate requirement. A 'simple user interface' (Choi and Lee, 2012) remained a crucial user requirement for mobile AR tourism applications, as it was necessary to design applications intuitively so that users were able to interact naturally with the software and its functions without having to go through a learning process as recommended by Schinke et al. (2010) as well as in the tourist interview (TP18). Choi and Lee (2012) supported application simplicity with the opinion that easily navigatable and interactive applications would encourage repeated use. Takacs et al. (2008) agreed stating that mobile phones provided the possibility to create an intuitive user interface by simply pinpointing users' locations and providing information on their surrounding. However, Carmigniani et al. (2011) claimed that implementing AR in mobile devices was already considered an intuitive and natural way to encourage AR interaction, as the majority of people were familiar with smartphone interaction. It was further revealed that mobile AR devices needed to be non-disturbing to interact with, as mobile phones and PDAs had generally been regarded as social distractions in public. This was evident in the study by Morrison et al. (2011) who developed a mobile AR interface based on 'MapLens'. By collaborating with paper-based maps, it created and tested the interaction with an augmented tangible object and the effect on users among a group. It was found that practical challenges of mobile AR

applications, such as holding the mobile device at a designated angle to trigger the augmented information was one of the technical challenges that needed to be overcome in order to improve the user experience. This issue will be further discussed in the 'Security' section.

9.2.2.2 Information Filter

Selecting preferences on mobile applications was found to be highly dependant on the user's behavioural aspects and habits. Therefore applications should enable personalising functions to increase its attractiveness to a wide audience (Xu et al., 2008). The tourist interview findings as well as focus group outcomes revealed that tourists were increasingly looking for personalised information rather than simply having a large amount of information available. It was suggested that the ability to filter the amount of accessible information was sought by tourists to avoid browsing through unrelated and unnecessary information (Huang and Bian, 2009). In the interviews participants agreed that they were often confronted with too much irrelevant information and therefore stressed the need to filter the information according to their time and place. The need to personalise information according to user interests confirmed the outcomes of previous studies in mobile computing (Buellingen and Woerter, 2004; Durscha et al., 2004; Zheng and Pulli, 2005; Swallows et al., 2007; Wang and Liao, 2007; An et al., 2008; Gafni, 2008; Karahasanović et al., 2009; Kenteris et al., 2009; Herskovic et al., 2011). According to van Krevelen and Poelman (2010), limiting augmented information in order to avoid information overload was already debated for the implementation of AR systems for motor vehicles. While AR had significant potential in the area of car navigation, it was stated that limited information should be provided in the immediate view in order to avoid distracting the driver. Therefore, Marimon et al. (2010) suggested a user interface that provides more information when the user taps on a specific point of interest. While switching to different views when touching a desired element, the user is able to access a wider variety of information. Similarly, Google Streetview enables the user to take pictures of specific locations and places on the Google database that can be accessed by anyone when desired.

Developer and industry expert interview outcomes aligned with tourist interviews with regards to reducing the amount of information to 'user-relevant content' which was previously discussed in the literature (Papagiannakis et al., 2008; Takacs et al., 2008; Dunleavy et al., 2009; Zoellner et al., 2009; Delagi, 2010; Gebauer et al., 2010; Hill et al., 2010; Marimon et al., 2010; Schinke et al., 2010; Herskovic et al., 2011; Olsson and Salo, 2011; Dinh et al., 2013). Particularly AR mobile application developers argued that content was superior to AR functionalities particularly for tourism applications, supporting literature findings (Damala et al., 2008; van Krevelen and Poelman, 2010; Olsson and Salo, 2011). Interviews with industry professionals revealed that accessibility of personalised content was one of the most challenging aspects of application development and required careful planning for the successful implementation. Therefore, application developers and tourists argued that content required primary focus to be maintained and regularly updated (TP13, TP27). The findings by Zoellner et al. (2009) showed similar results suggesting that particularly for areas such as cultural heritage, the presentation of accurate content was a key requirement. Similarly, van Krevelen and Poelman (2010) as well as Olsson and Salo (2011) revealed that availability of quality and relevant content was the key for future commercial applications.

9.2.2.3 Entertainment

The tourist interview outcomes revealed that tourists were generally less interested in gamified content, as it was argued that tourists were visiting the destination to engage with the place and not to spend a large amount of time using their mobile devices. Therefore, the primary focus should lie in the provision of additional information, as tourists were travelling to explore a particular area or destination rather than looking to be entertained (TP16). Nonetheless, tourist interview participants saw the potential of implementing games as viable option to make it more interesting for children or people travelling in groups as a social element in a mobile AR tourism application. Some interviewees supported the prototype development by Gordillo et al. (2013) providing gamified content in form of quizzes or puzzles to learn about the destination or tourist attraction. However, it was evident that tourists' priority was the access of destination-based information, while games and entertainment were considered an option to pass time as an

interactive element in the application. It was revealed in tourist interview and focus group outcomes that participants generally believed gamification elements in tourism applications to be interesting for children. However, this aspect was not regarded highly significant for mobile AR tourism applications overall. Therefore, potential implementation options of gamified content should be investigated further before offering a game-based functionality in tourism applications. The primary function of using mobile AR tourism applications was seen to access instant information on the present destination.

9.2.2.4 Social Function

Connecting the mobile AR tourism application with social functions was considered a highly valuable add-on for mainstream use. Roberts (2013) supported this argument suggesting to link new applications to established social media networks. This was further recommended in the tourist interviews, where it was revealed that tourists were using social networks such as Twitter and Facebook on a daily basis (TP3, TP5, TP17) while TP8 claimed to be open to share their experiences publicly online. This highlighted the study by Morrison et al. (2011), which found that although people were provided individual information through AR in mobile devices, they were nonetheless open to share ideas and experiences of particular destinations. Tourists seemed to have less concerns for privacy issues compared to five years ago (Gafni, 2008; Dantas et al., 2009), as Facebook and Twitter were widely adopted and used among tourist interview participants. The most common trend of sharing content with others was realised on Facebook, as it was regarded a convenient platform that is widely adopted and used (Milano et al., 2011). Seeing other tourists' content could be beneficial for potential visitors that search for information or that would simply like to see what the tourist attraction looks like first hand. Zheng and Pulli (2005) pointed out the importance of social aspects in mobile applications by investigating economic, social and behavioural user needs in the mobile context. Generating and sharing content was mostly regarded as a valuable function in mobile AR tourism applications and could potentially encourage positive word of mouth which would be beneficial to spread awareness of the application as well as its potential stakeholders.

9.2.2.5 Privacy

While privacy was widely discussed in the literature (Dantas et al., 2009; Karahasanović et al., 2009; Mallat et al., 2009; Delagi, 2010; Herskovic et al., 2011; Dinh et al., 2013), tourist interview outcomes showed contradicting findings, as tourists generally believed to have security systems available that could be implemented to make safe transactions online and through mobile devices. It was highlighted that the sole concern for tourists with regards to privacy and security was the secure transaction for purchases on mobile applications. However, implementing support for secure transaction processes, such as "confirmation E-Mails" (TP18) and "secure payment systems" (TP21) were argued to overcome this issue. The majority of tourists were not largely concerned with privacy issues, as Internet shopping and mobile purchases seemed to be largely accepted. Although privacy concerns were discussed in the literature as key determinant for building user trust for computer applications (Zoellner et al., 2009), the time when the studies were conducted needs to be acknowledged, since the technological development, transparency of information and user engagement in public and social media over the Internet has been widely adopted today. Particularly after the NSA incident on privacy protection in 2013 (Buzz Machine, 2013), focus group participants believed that many people might have been affected by privacy concerns and therefore would be more sceptical of inputting personal details into applications. However, only a few focus group participants claimed to be concerned about privacy and data protection. For most of the young British participants, sharing information on Facebook and Twitter were considered a common activity, arguing that official procedures were in place particularly for finance related issues such as in the provision of bank details to make purchases. Therefore, findings suggested that privacy issues were still important, but not key determinants for choosing mobile applications.

Although it was evident in the tourist interviews that privacy issues were becoming less significant due to the increasing use of social media and secure systems, AR experts were still concerned with privacy in mobile AR applications. For developers, privacy seemed to play an increasing role for future acceptance of new hardware technology, such as wearable glasses. BBC (2013) reported that wearable hardware

technology such as Google's Glass was a privacy threat in public due to its potential to breach data protection regulations. Therefore, it was argued that the further progress in the development of AR and its implementations would highly depend on user acceptance, which was confirmed by Mallat et al. (2009). In this regard, Carmigniani et al. (2011) pointed out that mobile AR interactions needed to be designed in a way that was not violating other peoples' privacy in the immediate surrounding. Carmigniani et al. (2011) added that user adoption was not only dependent on the usability of new devices, but furthermore on fashion acceptance, which had been repeatedly discussed in the topic of wearable glasses. Therefore, mobile AR application developers believed although privacy issues were less detrimental to applications, they still required attention before introducing new applications and devices in order to establish an understanding of data privacy for the user. The assurance of data privacy seemed to be regarded as a base requirement for any mobile application, smartphones and wearable computing alike (Carmigniani et al., 2011; Herskovic et al., 2011; Dinh et al., 2013; Graham et al., 2013). The CFA in this study showed that privacy overall still remained a significant requirement for developing mobile applications and therefore should be considered as one of the key quality indicators.

9.2.2.6 Security

The issue of secure interaction seemed to have been a key concern of focus group participants after experiencing the AR application demonstrators. Due to the nature of providing information on the smartphone and tablet, practicality issues were to be expected. One of the key obstacles to accept mobile AR applications had been argued to lie in the impracticality of holding the mobile device at a designated angle for longer time periods. The focus group outcomes showed that there were more concerns about security issues rather than privacy concerns after experiencing the mobile AR tourism application demonstrator. In particular, security issues were highlighted in the focus groups for using the mobile device outdoors. In this regard, participants were sceptical whether it was safe to point mobile devices at certain points of interest for longer time periods and risk the device being snatched out of their hands. Some participants therefore argued that the application should be able to save gathered information for an improved interaction without having to focus the device on a particular object for extended periods of time (F1P4, F5P10, F5P8). F5P6 added that crowded spaces would add to the problem, and therefore alternative design approaches required investigation.

Alternative solutions such as taking photos that the application could recognise for additional information search were discussed in the literature (Morrison et al., 2009) to avoid having to point the device at a point of interest for longer time periods. Morrison et al. (2009) discussed this issue claiming that this technical challenge needed to be overcome to enhance the overall user experience. As an alternative, it was proposed that the application should have an option to save information on the hardware in order to access it at a later time as well as being able to avoid Wi-Fi accessibility issues. According to EP1, alternative AR systems were available that were able to display any obtained information on the screen once the data was retrieved from the Internet and stored on the phone. While it could be seen that data privacy and security issues were not among the top priorities compared to studies conducted previously (Herzwurm and Schockert, 2003; Zheng and Pulli, 2005; Gafni, 2008), it was evident that tourists were nonetheless desiring an element of reliability as discussed in the literature (Kenteris et al., 2009; Herskovic et al., 2011; Dinh et al., 2013).

9.2.2.7 Navigation

Results of tourist interviews as well as focus groups suggested that tourists seemed to increasingly expect map-based navigation systems in today's tourism applications. This could be achieved by linking the application with commonly known map applications, such as Google Maps, or designing an original map showing relevant points of interest (POIs). According to Shi et al. (2010), people were familiar and comfortable with using Google maps to be directed to certain POIs. Interviewees confirmed to use Google Maps in unfamiliar environments during their trip, while TP23 was pointing out that maps were among the mostly used application by tourists. Focus group outcomes confirmed findings in the literature that GPS-based map navigation to assist in way finding and information filter to personalise projected information in the application were among the most useful functions in today's tourism applications (Delagi, 2010; Marimon et al., 2010; Schinke et al., 2010; Shi et al., 2010; van Krevelen and Poelman, 2010; Herskovic et al., 2011; Morrison et al., 2011; Olsson and Salo, 2011; Dinh et al., 2013; Graham et al., 2013). Therefore, having a map system in the application was argued to be required within any AR tourism application. The reason behind using navigation applications, such as Google Maps seemed to be based on the usefulness of pinpointing the user's location and being able to provide directions to certain points of interest. The map should be interactive and designed in a way that tourists could search for specific POIs in their immediate surrounding. However, in alignment with literature findings, it was evident that interviewees preferred information to be filtered and displayed only briefly in order to avoid information overload and make the application unclear (Gafni, 2008).

9.2.2.8 Accessibility

Immediate access of information seemed to be more relevant than before, as the majority of interview participants were using the Internet on their mobile devices for daily tasks (Buellingen and Woerter, 2004; Zheng and Pulli, 2005; Lee et al., 2007; Wang and Liao, 2007; Zoellner et al., 2009; Belimpasakis et al., 2010; Gebauer et al., 2010; Hill et al., 2010; Marimon et al., 2010; Schinke et al., 2010; van Krevelen and Poelman, 2010; Carmigniani et al., 2011; Olsson and Salo, 2011; Dinh et al., 2013). However, due to limited network infrastructure in many tourist destinations, it was argued that Wi-Fi connections were still limited to low speeds or non-existent, which would restrict the ability of tourism applications drastically (Buellingen and Woerter, 2004; Wagner et al., 2005; Pulli et al., 2007; Wang and Liao, 2007; Gafni, 2008; Papagiannakis et al., 2008; Kenteris et al., 2009; Zoellner et al., 2009; Delagi, 2010; Gebauer et al., 2010; Hill et al., 2010; Schinke et al., 2010; Dinh et al., 2013). Similarly, focus group outcomes revealed that limited information accessibility due to inconsistent Internet accessibility was a major issue experienced by today's young British tourists using mobile devices on their trip. Therefore, tourists suggested an offline option for the access of information, which could deal with the issue of limited Internet connection during travels. However, this would ultimately result in a larger application size depending on the amount of content. Papagiannakis et al. (2008) further pointed out that this would increase the chance of application glitches, which could potentially result in a negative user experience. In addition, Munch (2010) revealed that longer loading times could result in users switching to alternative information sources. While it was addressed in the interviews that tourist applications should try to offer more "offline content" (TP20) due to the limited Internet accessibility for many tourists, the final HOQ suggested that 'Web Content Sourcing' and 'Network Connectivity' were crucial for the mobile AR tourism application. Respectively, with an increase of Internet dependency, it was found that offline content access was largely insignificant, as content could be sourced directly from the Internet on demand. Since today's tourists are living in a time of "instant gratification" (TP5), the outcomes suggested that it was crucial that tourism applications have constant Internet access to receive real-time updates and increased benefits through the application. In contrast, the study findings showed that more specific tourist requirements, such as 'Currency

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Calculator' and 'Connection to Cloud' to sync content with other devices were found less significant in the final application, and therefore seen as merely an 'add-on' to exceed tourist expectations.

9.2.2.9 Language

Translating signs, words and short phrases was mentioned in the tourist interviews to be potentially of interest for international tourists, as it was seen as common problem to understand signs in foreign countries. TP11 although being of British origin, mentioned the example of Chinese people, as potentially becoming an important market for the tourism industry. Interview participants revealed that multiple language options were largely sought in modern touristm applications, as global travel was becoming cheaper. Although this requirement has been mentioned in the literature before (Marimon et al., 2010; Schinke et al., 2010; Gannes, 2013), it has not yet been discussed to a great extend for mobile applications in tourism. This function was further confirmed in the focus groups, as multiple language options were increasingly important, as the possibilities of travel continued to increase through infrastructural developments such as increasing supply of low cost carriers and faster railway services. Focus group participants therefore argued that the application should be translated into multiple languages in order to attract a wider target audience.

The method of implementing language functions was still undetermined. A translating function was seen as the most common use of employing multiple languages in mobile applications. This would enable the immediate translation of words into one's own mother tongue without having to use separate dictionaries. While mobile dictionaries are common, other applications adding further benefits are constantly being investigated. One of the more recent advances has become known as 'Word Lens', a mobile application designed for Google's Glass hardware, which is able to instantly translate any text such as signs and menus in the user's selected language (Gannes, 2013). While it would revolutionise the way people interact with their surrounding, it was considered specifically impactful for the tourism industry. Therefore, it was argued that tourism could potentially serve as

the underlying industry to introduce AR to the mass market (Marimon et al., 2010; Schinke et al., 2010).

9.2.3 Content Requirements

9.2.3.1 Context Relevance

Graham et al. (2013) argued that through the development and accessibility of information on mobile devices, users were not fixed on physical locations any longer, but would increasingly access content in the local context of the immediate surrounding. Using AR in urban environments was seen to have high potential due to the available content and the number of potential implementation opportunities. Therefore, Graham et al. (2013) and van Krevelen and Poelman (2010) argued that content design and richness was regarded key determinants for the success of an AR application. Particularly in the urban environment it was considered that providing relevant information was the key to avoid distractions which could result in a negative effect on the tourist experience. Similarly, Morrison et al. (2011) noted that the overlay of information should be carefully designed in order to project information that was relevant and valuable to the user. One of the most common implementations of AR in the tourism context to date are 'Augmented Cities', which are designed similar to a city guide to overlay information on points of interest in and around an urban destination (EP1, EP2, EP3).

One of the most important content in urban environments was argued to be information on public transport options. While there are tourism applications that offer information on public transport, this point was not yet discussed in the literature to the researcher's knowledge and therefore presented a new insight into content requirements for tourist applications. The argument was formulated by TP7 during the tourist interviews, providing the example of London. According to TP7, taking the bus instead of the tube in London was more appreciative, as tourists could see the city while travelling. However, it was considered too "confusing" to use for first time visitors (TP7). Although such information is arguably valuable for any tourist, it needs to be acknowledged that the focus group population was taken from

the young British tourist market, which might have influenced this requirement. Young tourists were generally believed to have limited disposable income and would therefore be more likely to rely on public transportation options during their travels. Nonetheless, the importance of public transportation information was also pointed out in tourist interviews, and therefore should be acknowledged.

9.2.3.2 Information Quality

Damala et al. (2008) developed a museum guide and showed in their study that visitors were regarding content as the most benefitting element in mobile AR museum guides. In this regard, Bruns et al. (2007) developed a mobile AR application for museums that enabled interaction through multimedia presentations to provide a modified view of the underlying object. Huang et al. (2009) on the other hand suggested a mobile AR application, which virtually reconstructed ancient ruins and provided information on the building. According to Papagiannakis et al. (2008) such AR enhancements in cultural heritage tourism had been developed in Greece as well as in Pompeii, Italy in order to visualise tangible and intangible artefacts such as the reconstruction of buildings, ceremonies and myths. Zoellner et al. (2009) argued in this regard that it was crucial to provide scientifically accurate content in the context of cultural heritage, as it had the potential to alter the tourist experience by providing different layers of information. Morrison et al. (2011) supported this view with their study investigating tourists' interaction with paper-based maps that were overlaid with computerised information. While AR was seen as a tool to provide more in-depth information and enhance the tourist experience, establishing a system to provide commercial content for the surrounding was seen to be challenging in the development of AR to increase its use for everyday life (van Krevelen and Poelman, 2010).

According to van Krevelen and Poelman (2010), the quality and availability of content was seen to be the key determinant for the success of commercial AR systems in the future. Olsson and Salo (2011) supported this argument stating that content needed to be personalised and context relevant to provide an added value through the AR application to the user. Although Olsson and Salo (2011) claimed

that a smooth interaction was necessary, content would ultimately determine the daily usefulness of the application. Morrison et al. (2011) discussed the technological challenge that mobile AR applications needed to be developed in each particular context to be viewed in 'the real physical environment'. This would allow the ideal design of content and user interface to match the scenario. Van Krevelen and Poelman (2010) outlined the practical solution of context-aware AR systems, as such would allow the overlay of only relevant information to the user and simplify the user interface tremendously. In this regard, Zhou et al. (2008) pointed out the benefits of augmenting real-life objects used in everyday life which could completely revolutionise the way people interact with their surrounding. Olsson and Salo (2011) concluded that information content and quality were the key determinants of user experience. They argued that it was more vital in mobile applications compared to web browsers, as it required to be relevant to the context while being personalised to the user's interest in order to create an added value through AR. Dunleavy et al. (2009) were showing similar results, however, it was highlighted that AR was still facing technological challenges in order to be used in everyday activities.

9.2.3.3 Ratings and Reviews

Findings suggested that reviews by other tourists was highly valued by the majority of interview participants, supporting the results in the literature (Johnson et al., 2012). The impact of user reviews and tourist ratings were discussed by Gretzel and Yoo (2008) on online travel review sites such as TripAdvisor, and was identified as helpful tool to support the decision making process of tourists. This was found to be particularly beneficial for single travellers and women. The interview findings suggested that participants were often influenced by their own research conducted before the trip and would make an itinerary before arriving at the travel destination. As the transparency of information today allows tourists to research a destination before the actual trip, it was expected to highly influence the decision-making and selection process during the trip (Pan and Fesenmaier, 2006). Tourist interview participants suggested including a function where other tourists could rate certain POIs and leave comments about their experience. However, it was also pointed out

that such information was often bias, as tourists were aware that such ratings could include one-off "complaints" of others (TP16).

Through the wide adoption of social media platforms, the use of user reviews has become popular not only for tourism related products, but for other tangible products alike. Johnson et al. (2012) argued that users were highly influenced by reviews and comments of their peers on the web, which was considered transferable on mobile applications. Therefore, it was suggested that tourism applications should include a social aspect in forms of rating and review systems to encourage user engagement with the application (Gretzel and Yoo, 2008). Pan and Fesenmaier (2006) further supported the idea arguing that the transparency of information on the Internet was the main indicator for the variety of information that tourists were able to access before the trip. Li et al. (2009) agreed stating that the majority of tourists were researching information before travelling to an unknown destination. Therefore, it should be considered to implement a review and rating system next to the pure provision of information and facts when presenting tourism products.

9.2.3.4 Information Source

Google seemed to be considered the primary search engine to look up background information and places to visit at a destination. Although Tourist Offices were generally approached at the beginning of the holiday, it was mostly used to acquire an overview of available tourist attractions and to get a map of the area including public transport information. The information of Tourist Offices and official Tourism Board websites were regarded with a split opinion. Some tourists considered information from official organisations such as the Dublin Tourism Board as valuable since it would provide an overview of tourist attractions and spots, while more detailed information was sought from reviews and alternative websites that included recommendations. Others argued that information provided by official organisations, such as the Tourist Office was often biased, since preferences could be given to promote certain venues with higher financial value. Therefore, it is critical to investigate whether it is possible to create an add-on to a tourism application to assist tourists in the pre-visit stage, since many decisions

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regarding attractions and restaurants are made prior to the trip. Furthermore, the study conducted by Grun et al. (2008) examining mobile tourist guides to assist tourists while being on the move was supported by P18 adding that AR tourism applications could potentially be used as virtual tours instead of being limited to providing information. The provision of recommendations according to user profiles could personalise the application to each tourist individually and avoid overload of irrelevant information that could potentially discourage the use of the application (Herzwurm and Schockert, 2003). Respectively, it is crucial to discuss additional factors that might result in negative user experiences and should be resolved.

9.2.4 User Resistance

9.2.4.1 Internet Access

TP22 pointed out that application speed was not solely relevant to run the application, but moreover for any components that required to be downloaded. Long waiting times in applications would therefore deter the interest of users (TP22). Papagiannakis et al. (2008) adopted the opinion that access to stable and fast Internet was therefore inevitable to prevent negative user experiences based on application speed. This issue was seen as a common challenge that had to be overcome and was mentioned in tourist interviews as well as pointed out by experts. Some tourists such as TP12 argued to consider Internet access valuable enough to pay for during travels, such as through roaming packages. However, others claimed that enough public venues, such as hotels and coffee shops would nowadays offer Wi-Fi access and therefore, paying for Wi-Fi was not required (TP27). TP5, who considered paying for Internet access argued that it highly depended on the offer and duration of Wi-Fi access as well as access possibilities. TP12 furthermore added that it should be cheaper than package deals of current mobile providers in their home country. As a result, limited Wi-Fi was predicted to have a negative impact on the acceleration of users adopting AR applications particularly in tourism (Zoellner et al., 2009; Hill et al., 2010). Therefore, sufficient access opportunities and direct user benefits were regarded key criteria in achieving AR adoption in the

tourism context (Schinke et al., 2010). Papagiannakis et al. (2008) on the other hand recommended additionally to investigate the standard of hardware technology in order to be able to use Internet-dependent applications in a meaningful way. AR systems require sufficient network and database capacities to access and retrieve relevant information by multiple users and provide a smooth experience.Therefore, it is suggested to have sufficient access opportunities for mobile Internet to increase the development of beneficial mobile applications. Van Krevelen and Poelman (2010) however pointed out that it was still considered a necessary requirement that needed to be resolved.

9.2.4.2 Application Maintenance

It seemed that at the current stage of AR development, content should be the primary focus, as functionalities were still being explored to identify their full potential. In the tourist interviews, tourists therefore noted that application maintenance was necessary by constantly updating the content (TP13). According to TP27 commenting on the issue of application maintenance, this would highly influence the perception of application reliability for users. Gafni (2008) further highlighted the importance of updated content to maintain the quality and usability of mobile applications. While technical issues needed to be sorted out, interviewees suggested that the content creator for various parts of the application should be identified before developing the functions of the application. Functionality was regarded as merely a tool supporting the creation of content. Nonetheless, it was highlighted that the right balance was essential to maintain customer satisfaction. The difficulty that arises with an increasing content however lies in the exponentially increasing size of the application that users would need to download beforehand. Users would often give up on applications with long loading times, and look for alternative ways to access information. In contrast, designing a Cloud-based application would require constant Internet access, diminishing the usefulness in areas with limited Wi-Fi. This would result in the application being highly Internet dependent and therefore potentially limit the pool of potential users. In addition, big data downloads were found to often result in glitches during the downloading process due to issues, such as an unstable Internet connection

(Papagiannakis et al., 2008). It was crucial that the application would be continuously maintained to minimise glitches and increase the speed of the application. According to a study conducted by the University of Nebraska it was found that a website loses a significant part of its audience if it requires loading times of more than two seconds (Munch, 2010). This phenomenon is highly transferable into the mobile context, where users do not rely on one application in particular but have a pool of various applications available to download and use for free. However, the provision of up to date and reliable information seemed to be one of the main areas of concern for participants. Since mobile devices are continuously being improved, applications need to be maintained and adjusted to run smoothly on a variety of different devices. This would require the constant monitoring of current and up to date hardware specifications to ensure compatibility with the application. However, regular updates had an effect on the perception of quality for content and function in mobile applications (Gafni et al., 2008).

9.2.4.3 Public Awareness

The majority of interviewees were claiming to be unaware of AR, and therefore did not use AR applications up to this point, supporting van Krevelen and Poelmann's (2010) argument of insufficient awareness of new technology such as AR. This was repeatedly mentioned during the interviews and highlighted through participants' gestures of surprise and excitement when seeing the AR examples provided during the data collection. Nonetheless, the perception of interviewees with regards to AR technology was very positive, reflecting the outcomes of various studies conducted in different contexts that used AR to investigate user adoption and perception for every day activities (Nilsson and Johansson, 2008; Huang et al., 2010). Google Glass, which was mentioned by TP19, was expected to additionally make a significant impact on the public awareness of AR (Houghton, 2013). Unawareness was revealed to be one of the biggest challenges for the successful adoption of mobile AR tourism applications, as it results in insufficient trust in new applications in general.

Utilising established brands, such as Apple, Google or social media giants such as Facebook and Twitter seemed to be the widely suggested methods to increase

public awareness of the application and encourage its use (EP2, EP3, EP6). Tourist interviews revealed that tourists had a positive perception towards using social media in tourist applications for researching a destination and inspirational purposes. It is being argued whether it would be beneficial to develop new social network applications, as market giants such as Facebook and Twitter are controlling the majority of social media market share (Milano et al., 2011). However, in the example of We Chat, the online messenger application that originated in China, it can be seen that separate social network applications can succeed in the market, if targeted and designed in the right context (Keating, 2013). Therefore, providing access to user-generated content through AR was seen to be a potential driver in mobile AR acceptance (Olsson and Salo, 2011).

Belimpasakis et al. (2010) furthermore discussed the need for non-developer platforms to facilitate the content creation of users. By offering platforms that can be used by non-developers such as content publishers and users, the entry barrier for adopting mobile AR, and time for public AR acceptance could be significantly lowered. Similarly, Hill et al. (2010) argued that the wide adoption of AR systems was highly dependent on access and peer-generation of content. Graham et al. (2013) indicated that content sharing among non-developers was already a common trend in today's world of information, which can be seen in the example of Wikipedia, an open source platform where anyone is able to provide information on a specific key term and extend the knowledge in a shared database. Customer engagement was regarded as an indirect way to promote AR and was found to be effective with providing different forms of incentives (Brenzo, 2014). Examples can be illustrated in virtual showrooms used by Mercedes, Audi, and BMW (Gibbs, 2013), as well as Qualcomm's Smart Terrain and Google's Project Tango (Fetters, 2014). Both use marker-less tracking to enhance the surrounding with computerised information for orientation assistance or for creating AR games in the real environment. This statement supported the belief that creating awareness was key to AR market attraction, while usefulness and additional benefits for users would drive the repeated use of the application. Dunleavy et al. (2009) acknowledged the development of AR games as potential form of indirect advertisement for the new technology.

Four out of 26 interviewees had heard of and experienced QR Codes, as one of the pioneering inventions in AR for public use (Kan et al., 2009). However, it was evident that many interviewees who had been in contact with AR before, such as the use of QR Codes and other gimmicks were actually unaware of the technology behind it. According to van Krevelen and Poelmann (2010), AR is still in the verge of being developed and adopted for public use. Therefore, the overall knowledge of AR technology is still very limited. It was evident that the kick-off and promotion of the application needed further consideration towards the first prototype, and various business alternatives should be reflected upon, since applications do not only rely on the amount that is paid by users, but also on partnerships with other businesses and stakeholders that benefit from the application particularly in tourism.

9.2.4.4 Hardware Limitation

Tourist interview participants as well as focus group participants seemed to be sceptical wether current hardware capabilities of modern mobile devices could support full mobile AR experiences in a meaningful way. Tourist interviewees were particularly worried about the lack of processing power and battery life. Since AR was seen to provide high-end functionalities, it was generally believed to require high processing power. This would include not being able to use such applications on older devices or slowing down the mobile device to a degree, which would create a negative user experience. A big issue seemed to be the concern for battery drainage when using high-end applications such as AR. This issue requires further investigation, although developers have recently created a micro chip that is able to increase the battery life of mobile devices exponentially, which would enable many AR and other process-demanding applications to run for longer periods of time (Microchip, 2013).

Additional limited hardware capabilities resulting largely in accuracy issues for computer-generated AR overlays were still considered one of the main challenges (Karpischek et al., 2009; Zoellner et al., 2009; Marimon et al., 2010; Schinke et al., 2010; Carmigniani et al., 2011; Morrison et al., 2011). 'Accuracy' deals the rightful

tracking of the application. In contrast to the accuracy of provided content, which was discussed in 9.2.2.2 (Information Quality), accuracy of tracking is highly dependent on the GPS sensor in the mobile device, and determines whether the AR overlay will point to the right building or structure. The issue was identified in the investigation of GPS accuracy, which particularly in cities with high buildings was found to propose a challenge. Although developers are still examining the accuracy of mobile GPS systems, in 2013 the Illinois Institute of Technology in Chicago argued to have developed a Smartloc system that lets GPS accuracy increase from 40 metres in average up to 20 metres 90% of the time (MIT Technology Review, 2013). However, it might still be insufficient for the accurate overlay of information for GPS-based outdoor AR applications. One of main issues was seen to be the uncontrollable factors in outdoor environments, such as weather conditions and volume of people in the area (Karpischek et al., 2009; Marimon et al., 2010; Schinke et al., 2010; Carmigniani et al., 2011). According to Papagiannakis et al. (2008), four satellites providing the signal to the mobile GPS would be necessary to receive a localisation accuracy of approximately 3 metres. However, Davies et al. (2005) found that many users were satisfied using marker-based AR to access information even though their study revealed occasional errors and increased time consumption during the process. In contrast, Takacs et al. (2008) argued that in outdoor environments, even marker-based AR was proving to be challenging due to 'noisy' conditions outdoors that is affected by various lighting, trees, cars, pedestrians, and other factors. Therefore, Neubert et al. (2007) suggested using 'SLAM' (Simultaneous Localisation And Mapping) technology, which is able to construct models of the surrounding without any prior information on the database and therefore has high potential for outdoor AR tracking purposes. Zhou et al. (2008) on the other hand suggested using multiple small sensors to avoid errors while relying on the readings of a single sensor and increase the reliability of the AR system. Alternatively, Philbin et al. (2007) proposed an algorithm that retrieves object-based information via "visual words" which searches for similar images out of a large database in a short period of time to provide fast access to relevant information. Challenges in 'tracking' were found to be the first and most researched area of AR literature followed by 'interaction' and 'calibration' (Zhou et al., 2008).

Particularly for pioneers of AR technology, hardware limitations seemed to be a big challenge, as they were investigating new technology while new hardware was constantly being developed, requiring continuous modification. Although developers were able to program softwares that would technically be functional, current hardware limitations were seen to slow down the development (Carmigniani et al., 2011). It was claimed that many technical difficulties could be solved once it was realised what was possible and where the limitations were. While the immediate next hardware was considered to be wearable glasses, Carmigniani et al. (2011) noted that the potential of AR was still undiscovered. Van Krevelen and Poelman (2010) supported the development of wearable computing to determine ways users would interact with mobile devices in the future, as wearable computing was providing a more natural way of user interface for personal and daily use. Additionally, Mistry et al. (2008) argued that AR was moving into the direction of interacting with computerised information without the need of an intermediate device such as glasses. However, it was evident that the area of wearable computing was still new to developers and therefore interviewees had a limited understanding and knowledge of the capabilities and limitations of recent wearable developments, such as the attempted launch of Google Glasses and Vuzix Metaglasses. Nonetheless, all interviewees were excited about the near future and the further direction of development in this area. Hardware and processor limitations should be investigated further particularly with regards to minimum system requirements to assure a smooth operation of the application.

9.2.4.5 Cost

Another key theme was identified as the cost of the application. As the majority of participants were considered to have limited disposable income due to the selected research population, paying for mobile applications was argued to be a key resistance factor. Tourist interview participants identified 'Application Cost' as a potential threat to the adoption of new applications, which was supported in the focus groups. Although tourism applications were considered helpful, according to TP8, most tourism applications focused on one destination only and therefore would lack usefulness afterwards, being deleted as a result. Tourist interview

participants added that paying for applications would highly depend on "recommendations" from trusted sources (TP13, TP14). It needs to be acknowledged that the theme of cost might be particularly strong in Research Phase 2. Since focus group participants were in the age group of 18 to 30, it might have made an impact on price sensitivity. Nonetheless, tourist interviews also revealed that price sensitivity for application purchases as well as Internet accessibility were issues for tourists in general. Wu and Wang (2005) on the other hand argued that cost of a mobile application would negatively influence the user's decision to download the application, since alternative free applications were often pursued. Holzer and Ondrus (2011) further supported TP11's argument that the willingness to pay for mobile applications was directly linked to the perceived benefit over a longer time period.

The quantitative research reduced 62 requirements identified in Research Phase 1 and 2 to 18 key requirements for further implementation into the QFD model. The key requirements maintained the initial categories of Function Requirements (FR), Content Requirements (CR) and User Resistance (UR) for consistency as well as practicality issues. The quantitative research supported the qualitative research outcomes, suggesting that the final mobile AR tourism application was highly dependent on Internet accessibility due to its content sourcing necessity. Figure 10.1 provides an overview of the final 18 technical design elements derived from the HOQ and main contribution of this study.

Table 9.1: Final Ranking of Requirements for mobile AR Tourism Applications

Importance Level	Technical Design Element	Relative Weight	Weighted Importance
1	Web Content Sourcing	695,0	10,1%
2	Use of Network Connection	690,0	10,0%
3	Context AR	596,0	8,6%
4	Use of Hardware GPS	579,0	8,4%
5	Application Speed	519,0	7,5%
6	Save User Profile	513,0	7,4%
7	Real-time Updates	502,0	7,3%
8	Offline Content Accessibility	404,0	5,8%
9	Content Filter	384,0	5,6%
10	Use of Hardware Camera	354,0	5,1%
11	Minimum Hardware Capacity	285,0	4,1%
12	Transportation API Link (Google Maps, Travel Line)	262,0	3,8%
13	Link to Web Browser	254,0	3,7%
14	Use of Hardware Accelerometer	240,0	3,5%
15	Link to Global Distribution System (GDS)	219,0	3,2%
16	Password Protection	153,0	2,2%
17	API Link to Currency Calculator	129,0	1,9%
18	Connection to Cloud	129,0	1,9%

Source: author (2015)

The top three requirements were identified as 'Web Content Sourcing', 'Use of Network Connection', and 'Context Aware AR'. These highlighted the outcomes of tourist as well as developer and industry expert interviews, suggesting a highly content-driven AR tourism application, which was able to filter information according to the tourists' interest and relevancy. From the 18 final requirements, the least significant were identified as 'API Link to Currency Calculator', which provide current exchange rates to the destination's currency, and 'Connection to Cloud', enabling to share information on multiple devices. It was concluded that these requirements should be regarded as 'Delighters' as identified in Kano's model (Evans and Burns, 2007). Such requirements are not regarded as crucial, but are rather considered to differentiate the application from the competition, providing an additional benefit and excitement to the user (Kumar et al., 2010). It can be seen that some of the requirements seem to be pointing into the same direction, such as

'Application Speed' and 'Minimum Hardware Capacity'. However, the speed of the application signifies to the overall capability of the mobile application to run smoothly without freezing and glitches, while 'Minimum Hardware Capacity' is referred to as ability to create enhanced meaningful user experiences through AR. Furthermore, it needs to be acknowledged that the requirements are not limited to mobile AR applications, but can be transferrable to any mobile tourism application. It can be seen that AR is therefore regarded as a mere functionality to enhance the tourist experience in a more interactive way. The final 18 requirements are in close alignment with the outcomes of the qualitative research of this study highlighting the need of immediate access to information at any time, while being able to filter the available information to the tourists' context.

This study demonstrated that mobile AR tourism applications in urban heritage tourism could result in a significant enhancement of the tourist experience. While tourists and industry experts were eager to see the further development and implementation opportunities of mobile AR tourism applications, AR was still perceived to be at an infant stage. Nonetheless, tourists and experts regarded AR to have a high potential to be meaningfully implemented in heritage tourism, as it was argued to provide virtual spaces to overlay accessible information (Kalay et al., 2007). This issue was considered to be crucial for urban heritage sites due to the limited space, but furthermore the need for sustainable development while staying competitive in the global destination market (Fritz et al., 2005; Rypkema, 2005). While the GPS-based AR application demonstrator in this study provided information on a few heritage attractions in the city centre, the marker-based AR demonstrator was designed within the General Post Office (GPO) as one of the key heritage attractions in Dublin. However, it needs to be acknowledged that the theme of the heritage site could have influenced participant perceptions, particularly since the study was conducted with young adults as population for Research Phase 2 and 3. Therefore, it is unknown whether other heritage sites would have provided additional findings based on the interest of research participants.

9.3 QFD Model for the development of mobile AR Tourism Applications

The final aim of this study was the design of a QFD model for the development of mobile AR tourism applications in the context of urban heritage tourism. Conducting the research in three stages, namely qualitative research in form of initial interviews with tourists and industry professionals in the field of AR application development and Dublin heritage tourism, followed by in-depth focus groups with the British young market and finally quantitative research in form of questionnaires with domestic and international tourists in Dublin, has revealed a number of findings that confirmed previous findings in the literature as well as revealed new insights. In the initial tourist interviews, it was discovered that most participants did not have prior knowledge and experience with regards to AR applications and therefore could only answer questions on basis of their expectations. In order to counteract this limitation, the research was conducted in three phases. Phase 2 enabled the confirmation of tourist requirements in form of a post-experience study, while in phase 3, tourists were able to give each identified tourist requirement an importance rating which was used for further analysis and identification of relevant tourist requirements for the HOQ.

9.3.1 Differences in Qualitative and Quantitative Outcomes

With regards to tourist requirements for the the QFD model, eight out of 18 requirements were related to content requirements, while five functions requirements remained and five requirements within user resistance. This division was to be expected as it was repeatedly mentioned in the expert interviews (EP1, EP2, EP3, EP4, EP5, EP6), as well as supported by the literature (Damala et al., 2008; van Krevelen and Poelman, 2010; Olsson and Salo, 2011) that content was the dominant factor when developing mobile applications. The interview outcomes showed that 'simplicity' of the application was regarded a significant tourist requirement. Furthermore, a number of findings in the literature indicated keeping mobile applications 'simple' and 'easy to use' in order to encourage repetitive use by a wide market (Gafni, 2008; Choie and Lee, 2012). In the focus groups

'Simplicity' of the application was also mentioned, though not as primary criteria. However, the reliability analysis showed a factor loading far below 0.5 for this external requirement, and it was therefore not able to remain within the reduced tourist requirements for the final quantitative analysis outcome. A SmartPLS 2.0 screen shot providing a detailed view of the factor loadings for all items before and after reduction can be found in the Appendix (Appendix P). While this requirement was outlined in the literature as significant (Kenteris et al., 2009; Gebauer et al., 2010; Schinke et al., 2010; Carmigniani et al., 2011), the low factor loading was unexpected and could not be maintained although alternative user requirement reductions were tested. In addition, it was surprising that the requirement 'Filter Information' was insignificant and not considered one of the final tourist requirements as a result of the CFA, opposing the results from the qualitative research. The requirement 'Filter Information' was initially revealed in the tourist interviews and focus group as significant requirement, as tourists were generally looking for instant information access, and therefore filtering information was a key method to save time. However, after examining the content requirements that were identified through CFA, it was found that CR10 (Information on Special Requirements), CR12 (Option to access Additional Information), CR5 (Information Relevance to Timeframe of Travel), and CR7 (Information on Events, Daily Specials and Promotions) were all referring to the function of filtering information to the tourist's immediate usefulness, and therefore considered the function of 'Information Filter'.

9.3.2 User Resistance (UR) for QFD

For the development of the QFD model, tourist requirements were divided into Function Requirement (FR), Content Requirements (CR) and User Resistance (UR). FR and CR were identified as common categories among application developers in the Augmented World Expo 2013, as well as in the literature (Büyüközkan, 2009; Karahasanović et al., 2009; Delagi, 2010; Gebauer et al., 2010; Herskovic et al., 2011; Dinh et al., 2013) and regarded as suitable for the purpose of this study. However, the investigation of User Resistance (UR) factors in the identification of user requirements has not yet been implemented in the

development of QFD models in the mobile computing and service context. The traditional QFD model in mobile computing and AR has focused largely on the aspect of hardware or software elements to increase and implement higher technical capabilities (Antoniac et al., 2002, Pulli and Antoniac, 2002, Pulli et al., 2003, Metso et al., 2009). While previous studies followed the traditional process of QFD, it lacks the involvement of behavioural patterns that are significant for social sciences. However, while conducting the semi-structured interviews in Research Phase 1, it was evident that issues resulting in a poor user experience were one of the major factors resulting in a negative perception of AR applications, resulting in loss of trust in potential mobile AR tourism applications. By including User Resistance (UR), it was found crucial to identify additional requirements that might have been overlooked apart from typical function and content requirements (Mikulic and Prebežac, 2011). Therefore, it was vital to include factors that would not only exceed tourist expectations, but also deter tourists from using mobile AR tourism applications in the future. Attempts have been made to consider psychological factors of customers into the process of identifying requirements, such as the Kano (1984) model that categorises customer requirements into three levels of customer satisfaction. While the Kano model attempts to categorise customer requirments into Dissatisfiers, Satisfiers and Delighters, the categorisation is employed after the identification of requirements to measure which items result in a higher overall customer satisfaction. However, this study extends Kano's (1984) idea and clearly defines a categorisation into Content Requirements (CR), Function Requirements (FR) and User Resistance (UR) for the identification of tourist requirements. This aims to provide a balanced view of requirements in mobile AR applications based on behavioural needs that are driven by tourist interests. The implementation of CR, FR, and UR in the requirement identification process provides the key theoretical contribution of this study as an extension of QFD within the theory of TQM.

9.3.3 Limitations of the developed QFD Model

Due to the tourist-centered approach to design the HOQ for this study, tourist requirements were explored starting with an initial identification of requirements. In the research process, the requirements were contrasted to previous findings and reduced to the most relevant 18 requirements using CFA as analytical reduction method. Therefore, the tourist requirements in the study are considered a realistic representation of customer attributes. However, as this study was conducted as a PhD research, knowledge of technical aspects for the development of mobile AR applications was limited. Therefore, the researcher continuously consulted with mobile AR application developers which was noted as one of the study limitations in the methodology chapter (section 5.11). Particularly the development of the mobile AR application demonstrator used for Research Phase 2, and the translation of tourist requirements into technical design elements were achieved through assistance of technical experts. While the researcher attempted to counteract this limitation, it needs to be recognised that the QFD model was therefore generated with a limited development team contrary to suggestions in the literature (Mazur, 2003). On the other hand, the aim of the research was not the development of an actual application, but the provision of a model as a guideline for mobile AR tourism applications in urban heritage tourism. Therefore, it was considered more significant to focus on the reliable identification of tourist requirements for this study.

As outlined in section 2.4.1, the origin of QFD is in the manufacturing industry (Mizuno and Akao, 1978; Akao and Mazur, 2003). However, the successful implementation in previous studies showed that QFD was employable in other industries including mobile computing (Buellingen and Woerter, 2004; Zheng and Pulli, 2005; Pulli et al., 2007; Turner et al., 2007; Gafni, 2008; Dantas et al., 2009; Kenteris et al., 2009; Gebauer et al., 2010), but also in the service sector such as tourism (Dube et al., 1999; Pawitra and Tan, 2003; Das and Mukherjee, 2008; Paryani et al., 2010; Chang and Chen, 2011). However, while measuring success in manufacturing and production is achievable through investigating the business revenue and profit margin, measuring success in the service industry is often not as clear (Dube et al., 1999). As tourism is based on an intangible product, namely the

tourist experience, it becomes more difficult to clearly present the benefits of QFD in the tourism industry. Nonetheless, the QFD model provided as the outcome of the study is expected to reduce development cost for developing mobile AR tourism applications, as developers are equipped with necessary technical design elements in the application. Including the outlined requirements of this study in tourism applications, mobile AR tourism applications are expected to result in an increased tourist satisfaction and user experience. Additionally, by serving as a guideline, the QFD model from this study could potentially open opportunities for other tourism product providers, such as restaurants and the transportation industry. Although the study was based on urban heritage tourism, the technical design elements are expected to be relevant for other tourism areas respectively.

9.4 The Future of mobile AR through Wearables

Experts in the field of AR argued that wearable devices such as Apple and Samsung's smart watches and other devices such as smart glasses were seen as the future of mobile computing (Curtis, 2015; Haque, 2015). Similarly, EP9 pointed out that although wearables were not yet meaningfully implemented in the consumer market, they would "become more and more relevant and evolving more" suggesting the importance of considering wearable computing when developing mobile AR applications. Through the examination of industry expert requirements, this study revealed that experts were considering AR in wearable devices to have high potential for many areas, particular within the tourism industry. Nonetheless, it was found that content would ultimately define the quality of any mobile application, while AR was considered a tool to support the content. Google recently stopped the release of their version of wearable glasses, while other use-cases in the industry are being examined and tested in different studies (Campbell, 2013; Muensterer et al., 2014; Waller, 2014). EP5 further added that the AR hype was slowly fading out. However, "the early wearable hype" was approaching which would further drive the AR industry. In the context of tourism, Leue et al. (2015) tested a mobile AR application for Google's glass in an art gallery setting that provides alternative and in-depth information on various paintings to enhance the visitor experience in art galleries. Allen (2014) added that wearable computing had

the potential to revolutionise the tourist experience within museums and similar settings. In the meantime, Facebook has acquired 'Oculus', a pioneering device in virtual reality, and Microsoft is about to release Hololens, suggesting alternative methods of AR overlay (Merel, 2015). While the market is still in its infant stage, estimates suggest the AR and VR market to hit USD 150 billion by 2020.

However, the implementation of wearable computing and using AR functions through wearables is still considered an area with limited knowledge in tourism. Curtis (2015) argued that it is not yet clear how long it will take before consumers understand the value and benefit of wearable devices and will use them in daily life. Orland (2015) on the other hand claimed that the future of AR will replace any screen, and will be able to directly overlay computerised information, which would open new possibilities for tourism purposes. However, while people were generally found to easily install and try mobile AR applications (Olsson and Salo, 2011), it was mainly driven by the novelty factor of 'trying something new'. Therefore, mobile AR applications need to provide a real benefit to the user to avoid being deleted shortly after (Olsson and Salo, 2011). While the benefit of wearable devices was clearer due to the hands-free interaction, privacy issues and the acceptance of the technology were regarded crucial to the adoption of wearable devices (Andrabi et al., 2015). EP5 therefore suggested using well-known and trusted brands, such as Google and Apple as potential influencers for the acceptance of AR in the consumers' minds as "current brands of AR platforms [were] not strong enough in the mind of the consumer" (EP5). The developer interviews furthermore identified that currently AR developers were putting more focus on marker-based AR, arguing that GPS sensors in mobile devices were still too limited to implement AR experiences meaningfully. The developer interviews revealed that AR application developers were constantly looking into alternative solutions, such as SLAM technology, geo-fencing and combining marker-based and GPS-based AR to create complete experiences. While exploring new hardware such as wearable devices, user benefit for every day life purposes and acceptance of the new perceived technology were key to bring mobile AR applications to the consumer market (Xu et al., 2008). The study findings are considered particularly valuable for further research in the area of mobile application development for tourism purposes and

are expected to be partially transferable to alternative technology implementations for tourism products.

9.5 Summary

The integrated synthesis of research findings provided a detailed discussion of the research findings with regards to the final aim of this study, the design of a QFD model for the development of mobile AR tourism applications. The discussion illustrated that key technical design criteria such as 'simplicity' were significant, although not of primary concern. Furthermore, 'privacy'-related issues were still considered important to tourists. Privacy issues however did not only refer to data privacy and the sharing of user data to third parties, but were increasingly discussed with regards to interaction in outdoor environments. The primary concern seemed to be the risk of theft while accessing information in public spaces, pointing the mobile device at certain points of interests for an extended period of time. The quantitative analysis showed that the highest requirements were linked to Internet access, since contents, such as real-time updates, way finding and recommendations were all dependent on instant information access. In contrast, more specific requirements, such as 'Cloud Connectivity' to sync and share content with other devices and 'Currency Calculator' to provide information on exchange rates were regarded as less crucial, but adding to the overall value of the application.

For the development of the QFD model, tourist requirements were divided into Function Requirements (FR), Content Requirements (CR) and User Resistance (UR). Particularly the investigation of UR factors for the identification of user requirements was regarded crucial, as it would include factors that would discourage tourists to use mobile AR tourism applications in the future. Previous studies in QFD mostly focused on functional requirements in a product aiming to exceed customer satisfaction. As the study explored tourist requirements starting with an initial identification of requirements, the tourist requirements in the study are considered a realistic representation of customer attributes.

Knowledge of technical aspects for the development of mobile AR applications was limited. Therefore, the development of the mobile AR application demonstrator used for Research Phase 2, and the translation of tourist requirements into technical design elements were established through consulting technical experts. However, as the aim of the research was not the development of an actual application, but generating a model as a guideline for developing mobile AR tourism applications in urban heritage tourism, it was considered more significant to focus on the reliable identification of tourist requirements for this study. The QFD model presented in this study outlines technical design elements for mobile AR tourism applications that originated from psychological and behavioural factors put forward by tourists. Therefore, the HOQ in this study provides a balance embracing technical as well as social aspects. Including the presented requirements in the development process, future mobile AR tourism applications are expected to result in an increased tourist satisfaction and user experience. The future of AR for wearable technology was regarded a crucial area of research, as it had the potential to change the way tourists could interact with tourism products. Therefore, it will be discussed in more detail in the following Conclusion chapter along with the contributions of this study to academia and industry.

CHAPTER 10 – CONCLUSION, REFLECTION AND RECOMMENDATIONS

10.1 Introduction

This research aimed to identify and analyse tourist, application developer and industry expert requirements in order to establish a QFD model for the development of mobile AR tourism applications in the urban heritage tourism context. This study extended the existing QFD model by including psychological and behavioural requirements of tourists in the identification of tourist requirements. This chapter provides a review of the key research outcomes and the contribution of this study to academia and industry. Furthermore, the theoretical and practical limitations of this study will be discussed followed by the recommendations for future research and implications for urban heritage destinations to implement mobile AR tourism applications in urban heritage destinations.

10.2 Conclusions

This section will provide a detailed outline of the achievements of each research aim for this study. Therefore, each aim will be discussed separately to present the step-by-step process of the study leading to the final outcome (Aim 5) as the main goal of this PhD research.

10.2.1 Aim 1

To critically review existing theories in quality management.

The first aim was designed to establish an understanding of quality management by reviewing key theories of quality management and build a foundation for quality product development particularly in the area of mobile computing. To achieve this aim, the development of quality management was discussed by critically reviewing quality theories, such as the Juran Trilogy, Zero Defects, Deming's 14-point

Philosophy and Total Quality Management (TQM). As QFD has been acknowledged as a product development technique in TQM, these theories were identified to have influenced TQM, leading to the QFD model which was discussed in detail. QFD is a continuous improvement process that incorporates the customers' views and has been largely implemented in various industries in the design stage of product development to create a consumer-focused product in a cost-effective manner. For the purpose of this study, it was considered suitable to explore how QFD has been employed so far in the mobile computing and tourism industry. While it was found that QFD can be successfully implemented for software development, the implementation of QFD in the tourism industry has been limited to only a few use cases. However, it has not yet been implemented in the urban heritage tourism context. As user requirements are identified as part of the overall process, the literature review of quality management was concluded with the identification of user requirements in the mobile computing context that were discussed and debated in previous studies. These generated a list of key requirements that were used for the further development of the study. Based on the requirements, the research questions for research stage 1 of the study were developed, allowing the researcher to contrast and update requirements to make them relevant for this study context. In the identification of user requirements in mobile computing, it was found that they were largely based on product-related requirements, such as software and hardware capabilities. However, although previous studies were investigating customers, they did not include indications on the psychological and behavioural needs of users, presenting a knowledge gap.

The key outcomes of this aim were presented through in-depth investigation of user requirements in the literature in the mobile computing context. A reoccurring theme in software and mobile computing was identified as 'simplicity' and 'design of the user interface'. Information should be 'sufficient' for the purpose of the application and be 'relevant' for the user. However, a common difficulty with in-depth information was found to be the 'speed' of the application and decreased application reaction and longer loading times. Furthermore, 'safety and security' issues were not to be ignored and 'privacy' should always be considered a priority. 'Access' to the application was another key theme with regards to time, location and browsers/hardware. The application should be accessible at any time, anywhere

and be designed to run on various platforms. Although 'social functions' were among the newer themes, it was obvious that social networking and reviews were getting increasingly important, as more people exposed themselves to global social networking platforms such as Facebook and Twitter. Furthermore, a trend was identified towards 'personalised' interfaces and service, as peoples' expectations of personalised marketing messages and services was increasing. While people were in more time-pressure than ever before, mobile devices should be 'efficient' and 'time-saving'. Due to current hardware limitations, the challenge of 'battery capacity' was holding back high-end technological developments and was a key issue for many mobile applications. Mobile applications consuming much of the devices processing power such as AR features would therefore require being power-efficient. Current mobile devices were expected to be increasingly 'context-aware', particularly for augmenting the immediate environment. While the 'usefulness' and 'added value' of a mobile application is not considered a technical requirement, the user needs to understand its value to be meaningful. On the other hand, 'content co-creation' by peers was increasingly gaining importance for modern applications for entertainment and social purposes. In addition, as the amount of mobile applications was rapidly increasing, the 'price' of the application as well as in-app purchases should be aligned with its added value. Finally, it was regarded crucial that mobile applications are 'reliable' in their performance to assure a positive user experience.

10.2.2 Aim 2

To critically explore Augmented Reality (AR) applications in urban heritage tourism.

Aim 2 was achieved in chapters 3 and 4, which critically discussed the development of AR with particular focus on the perceived benefits and implementation use cases in the tourism industry for the development of mobile AR tourism applications. After the identification of user requirements in the literature, aim 2 was designed to critically review the adopted technology (AR) and the research context. This allowed the in-depth understanding of AR systems and the development and current use cases of AR in various industries. Since the study is conducted in the context

of urban heritage tourism, the focus was on the critical review of AR employment in the tourism industry. Furthermore, to understand the research context, the development of cultural tourism was explored, leading into the critical review of urban heritage tourism as the study context.

Aim 2 provided an in-depth discussion of urban heritage tourism including an overview of Dublin as research site for this study. AR has a high potential in the tourism industry due to its possibility to provide instant information on the surrounding. Mobile devices such as smartphones are seen as the logical device for AR, while tourism creates the ideal context to realise benefits for users. While it is still unclear whether AR will be ready to be commercialised, investigation of existing prototype use cases of AR in tourism has shown the potential of AR systems. They are believed to revolutionise the tourism experience through enhanced views of the past and way-finding assistance in unfamiliar surroundings. In recent years, AR in the tourism industry has been increasingly investigated on the enhancement of the tourist experience, compared to prior feasibility studies focusing largely on user interfaces in AR browsers. Furthermore, prior studies showed that AR has the potential to be meaningfully implemented in the urban heritage context.

Since urban heritage was regarded as one sub-segment of cultural tourism, the value and significance of heritage tourism were critically examined and the development and challenges were identified. Considering the model of heritage tourism, urban heritage was concluded to be a subsection of heritage tourism, while it often overlapped with other concepts in the heritage spectrum, such as cultural and artificial urban tourism. It was illustrated that AR had a significant potential to assist sustainability of urban heritage sites for instance through reconstruction of historical sites or for accessing information in the immediate surrounding. While technology is seen to be increasingly important for supporting the development of European cities, AR in the heritage sector is gaining more attention in recent years. The successful implementation of ICT in tourism was regarded as potential tool for the sustainable development of urban heritage sites. While using technology in urban heritage sites has been largely employed in form of a communication channel using the Internet and mobile services to deliver information, limited effort has been

made for the enhancement of the tourist experience. Furthermore, there is a need to investigate the use of technology for the interpretation and promotion purposes of heritage sites and the potential effects it has on visitor interpretations. Therefore, this study was further regarded suitable for increasing the knowledge of technology implementation, in particular of AR systems in tourism to enhance the tourist experience. Dublin was selected as the context for this research to generate a model for the development of mobile AR tourism applications to enhance the heritage tourism experience. It is anticipated that the identification of requirements for the development of mobile AR tourism applications for hand-held mobile devices will be largely transferable to wearables as well, and therefore will be largely transferable even after a potential mass adoption of wearable computing in the future.

10.2.3 Aim 3

To analyse tourists' requirements for AR applications in urban heritage tourism.

The third aim was considered the main objective of the study and therefore embodied the largest section of the research. To achieve aim 3, three forms of primary research were conducted with tourists. First, in-depth interviews were conducted, followed by focus groups and finally quantitative research using questionnaires. Aim 3 was designed after careful revision and identification of user requirements in the literature. The tourist interviews from Research Phase 1 aimed to develop an understanding of tourists' expectations of AR and to identify tourist requirements and contrasting them to the user requirements from the literature.

The outcomes of aim 3 revealed that tourists were largely unaware of AR and that their knowledge was limited to QR-code based applications. However, it was evident that tourists were generally looking for applications that would provide benefits for daily life, such as context-aware information for events and tourist attractions, way-finding assistance through GPS-based interactive maps or peer reviews and recommendations. The key function requirements that were identified in the interviews were 'simplicity', 'information filter', 'real-time updates',

'recommendations', 'entertainment', 'social function', 'privacy and security', 'navigation' and 'language'. For content requirements in contrast, 'reviews and ratings', 'information access' and 'information relevance' were regarded as the key requirements that were identified in the tourist interviews. Potential problems that would deter tourists from using mobile AR tourism applications were identified as 'Wi-Fi access' issues due to limited free Wi-Fi opportunities during travels and costly roaming charges, as well as limitations in 'application speed' to create full AR experiences. Furthermore, tourists were expecting 'hardware limitations' in current mobile devices, 'cost' of the application, and whether a tourist AR mobile application could be 'maintained' regularly to provide up to date information.

The focus groups in Research Phase 2, were conducted with a sample of the British young market as post-experience study for the mobile AR tourism application. This research step aimed to confirm the outcomes that were identified in the tourist interviews and examine whether additional tourist requirements were evident after participants experienced mobile AR tourism application demonstrators. The focus group results showed very similar outcomes of tourist requirements and therefore confirmed the significance of the tourist interview findings. However, a crucial difference was noted by contrasting the identified user requirement 'simple and authentic user interface'. While past findings suggested 'simplicity' and 'ease of use' of mobile devices, focus group outcomes suggested the design of the application to be 'unobtrusive' to the travel experience. It was recommended to design it 'intuitively', in a way that facilitates the natural interaction with the application without having to adjust the user behaviour and lifestyle. Furthermore, focus group findings revealed that the issue of data privacy was not as significant as before. While the developer and expert interview outcomes supported the literature suggesting that privacy issues were one of the key requirements, primary data collection from tourist interviews as well as focus groups showed that tourists were less concerned about data privacy than before. The majority of research participants seemed to trust in standard procedures that were implemented by businesses in case of privacy issues. Instead, more emphasis was given on security issues while using mobile AR applications in public environments due to potential theft (Section 7.2.3).

In order to reduce and prioritise the identified tourist requirements, a third research step was conducted in form of quantitative questionnaires. It aimed to give an importance rating to the identified tourist requirements from Research Phase 1 and 2, reduce them to 18 requirements by conducting CFA. Table 10.1 sums up the key tourist requirements that were identified in the study.

Table 10.1: Tourist Requirements for mobile AR Tourism Applications in Urban Heritage Tourism

Tourist Requirements
Information on Special Requirements (food, disability)
Weather Information/Forecast
Option to access Additional Information (link to website)
Public Transport Information
Information Relevance for Timeframe of Travel
Information on Restaurant Menus
Information on Events, Daily Specials and Promotions
Instant Accommodation availability Check
Exchange Rate Calculator
Sync and Share Content with other Devices
Booking Function for Accommodation and Restaurants
Audio/Video support for projected Information
Accessibility of Information anywhere anytime
Secure Interaction with Mobile Device in Public
Facilitate adventurous Exploration of Destination
Practical Solution for Interaction
Unobtrusive to Travel Experience
Privacy of Personal Details

Source: author (2015)

10.2.4 Aim 4

To investigate key design requirements considered by AR application developers and industry experts when developing AR applications in urban heritage tourism.

To get an insight into perceptions of AR application developers and industry experts in Dublin, this aim was designed to obtain requirements that were perceived significant for industry professionals when developing mobile AR tourism applications. While the identification of tourist requirements was regarded as priority of this study, the design of aim 4 allowed an insight into requirements considered by industry professional that could be contrasted to the tourist requirements and critically evaluated. The interview outcomes were further considered for the development of the mobile AR application demonstrator for

Research Phase 2. In addition, the interviews with AR application developers assisted in the understanding of technological challenges and potential future use cases of AR in tourism and other industries. The research context was critically reviewed for the achievement of aim 2. However, as aim 4 involved the investigation of requirements considered by industry experts in Dublin, the research site could be further assessed through the outcomes of the industry expert interviews. To achieve aim 4, semi-structured interviews were conducted with nine industry professionals. In order to obtain comparable data, the interviews were designed in alignment with tourist interviews into developer requirements as well as potential user resistance elements.

Aim 4 outcomes showed that experts regarded 'simple' interaction with the application, perceived 'user benefit', 'context awareness', 'content quality', an enhanced 'user experience', and 'accessibility' as crucial when developing mobile AR tourism applications. On the other hand, interviewees revealed current challenges as 'accuracy' issues, uncontrollable 'environmental influences', 'hardware limitations', and 'privacy' issues, particularly for future applications and alternative hardware such as wearable devices. It was revealed that AR application developers still needed to overcome major hardware challenges, such as GPS sensor accuracy and reliable image recognition in order to generate meaningful AR experiences. The expert interviews however illustrated that AR was regarded as having a high potential for tourism purposes, however, it was still too early to measure return of investments. Therefore, AR at the current stage would provide an opportunity for marketers to create public awareness. The data obtained from Aim 3 and Aim 4 provided the data for the achievement of Aim 5.

10.2.5 Aim 5

To develop a QFD model to implement mobile AR applications into the context of urban heritage tourism.

After consideration of the previous aims, the HOQ for the development of mobile AR tourism applications in the urban heritage context could be designed for the achievement of aim 5. Although user requirements in mobile computing were

identified for the achievement of aim 1, it was important to investigate whether they were still relevant for current mobile devices to develop a mobile AR application for urban heritage tourism. Therefore, the study was designed to establish a ground of knowledge first (Aim 1), and thereafter to build towards the achievement of Aim 5. The final QFD model was developed using the 18 tourist requirements that originated in the identification process from Aim 3 which were then reduced and translated into respective technical design elements.

The results indicate that mobile AR tourism applications highly depend on the quality and accessibility of content. The QFD model recommends focusing on access to web content and a stable network connectivity, which is largely due to the amount and need to access content instantly that is sought by tourists. It was evident that the more specialised a function was formulated by tourists, such as 'Connection to Cloud' to share content on multiple mobile devices, and 'API to Currency Calculator', the less significant it was in the final ranking of technical design elements as it did not affect other functionalities in the application. Therefore, the model revealed that the most important functionalities within mobile AR tourism applications were 'Web Content Sourcing', 'Use of Network Connection', 'Context Aware AR' and 'Use of Hardware GPS' in order to be beneficial for tourists during their time of travel. The findings reflect the identified outcomes from the literature and tourist interviews. It revealed that most functionalities and content that tourists are seeking highly depend on Internet accessibility for instant information on demand and should be filtered according to tourist interests. In addition, the issue of inter-connectivity in form of peer recommendations, entertainment and social functions were repeatedly identified as themes in the interviews which are all highly Internet dependent.

'Simplicity' in the application which can be achieved by a simple and easy to navigate user interface was interestingly reworded into 'Practical solution for interaction' and 'Unobtrusive to Travel Experience'. It could be seen that tourists tended to emphasise the natural interaction with mobile devices in contrast to simplicity to use. This trend towards intuitive interaction is understandable, as more users are familiar with smartphones and other 'smart' gear such as smart watches

and other wearable devices, which are increasingly built on basis of natural interaction.

Interestingly, 'privacy' and 'security', which were found crucial in Internet capable mobile devices before seemed to decrease in importance. Although interviews revealed that tourists still found the issue of privacy and security important, interviewees seemed to be less nervous about that topic, as standard procedures were in place for cases such as theft and data privacy. Nonetheless, 'privacy' and 'secure interaction' in public environments, for instance when visiting heritage attractions were included as tourist requirements in the final QFD model, since they were still regarded key quality elements in Internet-connected mobile applications. Particularly for outdoor heritage settings, as in many cases in urban heritage tourism, it was regarded crucial to identify requirements that are affected by the immediate environment.

10.3 Research Contributions

This section will provide the key contributions to knowledge for academia and research as well as implications for industry such as Destination Marketing Organisations (DMOs) in urban heritage destinations as representative industry.

10.3.1 Contribution to Knowledge

The main contribution to theory is the extension in the identification process of tourist requirements in the QFD model. While previous studies in QFD have mainly focused on product functions and features, such as software and hardware capabilities, the QFD model in this study categorises tourist requirements before the identification process. In this regard, this study adds to knowledge through investigation of tourist requirements from a behavioural and psychological perspective, before translating them into technical design elements. Although QFD has been implemented in industries such as tourism and hospitality, this study not only explored customer needs as in previous studies, but extended requirements into user resistance criteria, which would potentially affect future use of mobile AR

tourism applications. This study extends Kano's (1984) idea of categorising customer requirements, but defines a categorisation into content requirements (CR), function requirements (FR) and user resistance (UR) before investigating requirements, which are then translated into technical design elements in mobile AR tourism applications. The aim is to provide a balanced view of requirements for mobile AR applications based on behavioural needs that are driven by tourist interests. Including these criteria as customer attributes in the HOQ, the traditional QFD model was extended in the identification process of customer requirements which is valuable for the further development of QFD particularly in social studies. The implementation of CR, FR, and UR in the requirement identification process provides the key theoretical contribution of this study as an extension of QFD within the theory of TQM.

Another contribution to knowledge was provided through the identification of tourist, developer and industry expert requirements for mobile AR tourism applications by outlining and establishing a hierarchy of relevant requirements. The identified tourist requirements using semi-structured interviews, post-experience focus groups and importance ratings through quantitative research are therefore considered one of the main contributions of the study. Table 10.1 (Section 10.2.3) summarises the identified tourist requirements for mobile AR tourism applications in the context of urban heritage for this study. These findings are particularly valuable for further research in the area of mobile application development for tourism purposes and have provided a valuable contribution for the personal reflection of the researcher on this topic. While the focus of the study lies in the identification of tourist requirements and their perspectives, the study also incorporates developers' perspectives, which were identified through semi-structured interviews. The outcomes are anticipated to assist informing further studies on the development of QFD as well as studies on AR.

In addition, this study employed a mixed method to explore current understanding and expectations of tourist, developer and industry expert requirements through qualitative research and test the reliability of the found data in form of quantitative research. The mixed method was suggested in the literature to get more accurate data and reliable findings. While mixed method studies have proven to be

successful in various research areas, it has not yet been employed for the investigation of tourist requirements for the development of mobile AR tourism applications in the urban heritage tourism context. Therefore, it was identified as an additional contribution to knowledge.

By identifying tourist requirements and translating them into respective technical characteristics, this study provides a hierarchical set of technical design elements that are crucial for mobile AR tourism applications as the outcome of QFD. Whereas the QFD model has been employed in various industries up to this point, it has not yet been employed in the urban heritage tourism context. The final QFD model for the development of mobile AR tourism applications in urban heritage was presented as the final aim of this research, revealing that Internet connectivity for tourism applications is critical for the application in order to receive instant information on demand. Being connected to the Internet, it was discovered that context-awareness was crucial for mobile AR tourism applications, enabling the real-time update of provided information that is relevant for the tourist. The final QFD model for the development of mobile AR tourism applications in urban heritage is projected in Figure 10.1.

Generating the HOQ starts with the identified tourist requirements in the left column of the HOQ. The relative weight of each requirement is calculated by using the importance rating of the requirement from the quantitative questionnaire and multiplying it by 2, as suggested by Warwick Manufacturing Group (2007). The weighted importance is then calculated as percentage value out of 100. Once the values in the left column have been calculated, each tourist requirement is translated into a respective technical design element and noted in the Technical Characteristics. Each Technical Characteristic is evaluated whether its maximisation (▲), minimisation (▼), or hitting the target (x) is desired to increase the quality of the application which is noted in the 'Direction of Improvement'. The roof of the HOQ presents the Correlation Matrix in which technical requirements are put in contrast to each other. This evaluates the effect on one technical design element, should a corresponding one be changed. The correlations are noted as '+' and '++' for a positive and strong positive relationship between the two technical characteristics, meaning that an increase of one element would results in an increase
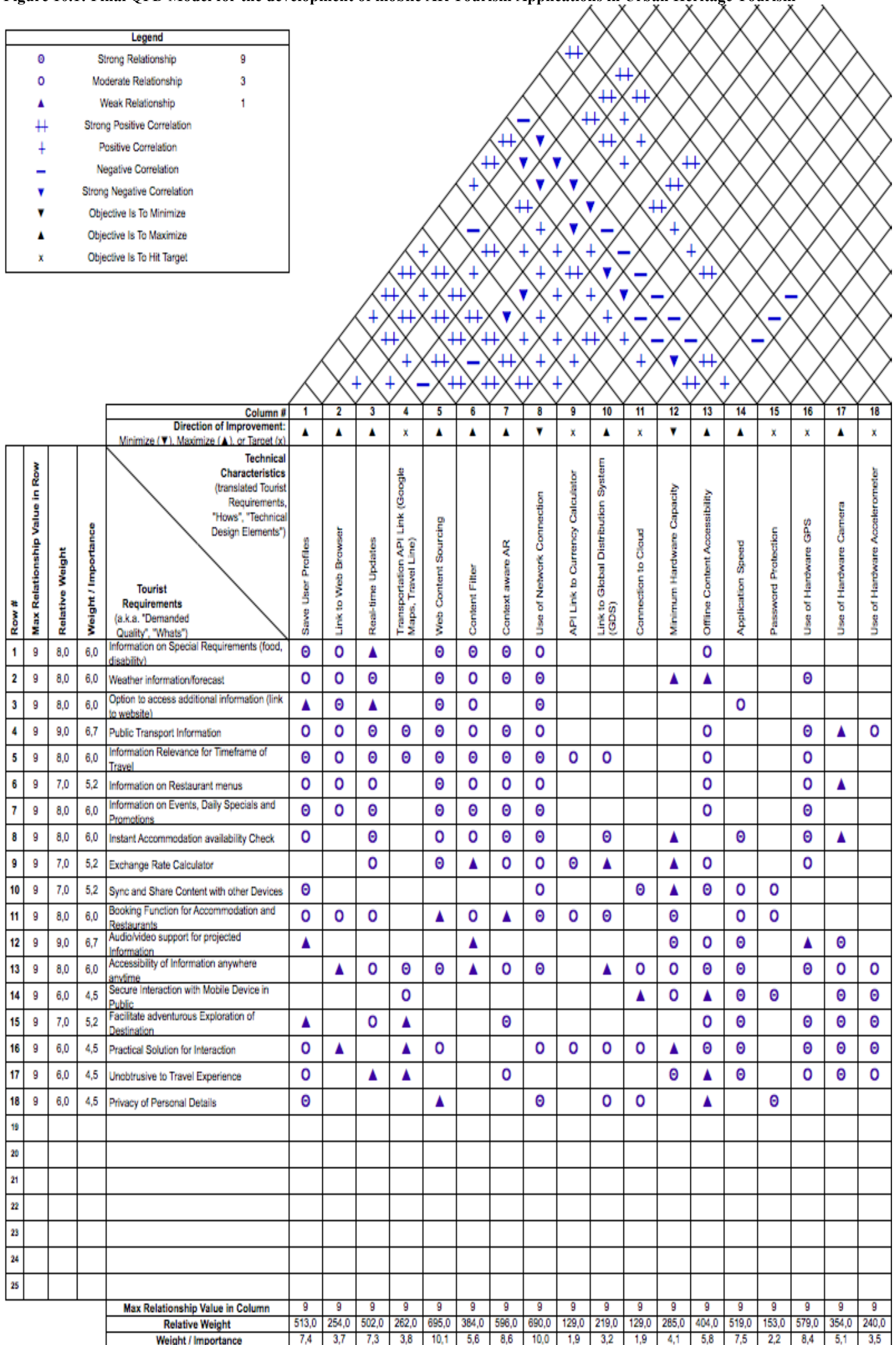
or strong increase of the related element. In contrast, '−' and '▼' express a negative and strong negative relationship to each other, stating that an increase in one element results in a decrease or strong decrease of the other. The correlation indicator was left blank for all other requirement relationships that were unrelated to each other. As resources are typically limited and require to be allocated accordingly, this is particularly important for the development team that is dealing with the implementation and adjustment of technical design elements. In the following step the Relationship matrix in the centre of the HOQ is calculated, which correlates each tourist requirement to each technical design element. Doing so, it can be seen which tourist requirements are affected by multiple technical design elements. It provides a first indication which technical design element is likely of higher importance, as it will influence a higher number of tourist requirements. The symbols, 'Θ', 'O', '▲' and 'none' are used to indicate a strong relationship ('Θ'), moderate relationship ('O'), weak relationship ('▲'), or no relationship in which case the box is left blank (Warwick Manufacturing Group, 2007). In order to calculate the numeric values for each relationship, the following indicators are typically used to express the relationships, 'Θ' = 9, 'O' = 3, '▲' = 1, 'none' = 0. At last, the relative weight can be calculated for each technical design element which is expressed in the Target Values at the bottom of the HOQ. The relative weight is calculated by multiplying each relationship indicator ('Θ' = 9, 'O' = 3, '▲' = 1, 'none' = 0) in the Relationship Matrix with the relative weight of each tourist requirement in the importance rating, and taking the sum of all calculated values of the column. Therefore, the relative weight for the first technical requirement, 'Save User Profile' is calculated as follows,

9x8,0+3x8,0+1x8,0+3x9,0+9x8,0+3x7,0+9x8,0+3x8,0+0x7,0+9x7,0+3x8,0+1x9,0+0x8,0+0x6,0+1x7,0+3x6,0+3x6,0+9x6,0
= 513,0

By calculating the percentile of each technical design element as 'Weight/Importance', the percentage of importance is determined, which provides the final ranking of technical design elements. In the HOQ, it can be seen that the design element with the highest percentage is Web Content Sourcing (10,1%) followed by Use of Network Connection (10,0%) and Context Aware AR (8,6%).

This indicates the top three technical design elements for mobile AR tourism applications in the urban heritage tourism context.

Figure 10.1: Final QFD Model for the development of mobile AR Tourism Applications in Urban Heritage Tourism

Legend

Symbol	Meaning	Value
⊙	Strong Relationship	9
○	Moderate Relationship	3
▲	Weak Relationship	1
╫	Strong Positive Correlation	
┼	Positive Correlation	
−	Negative Correlation	
▼	Strong Negative Correlation	
▼	Objective Is To Minimize	
▲	Objective Is To Maximize	
x	Objective Is To Hit Target	

Direction of Improvement: Minimize (▼), Maximize (▲), or Target (x)

Column #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Direction of Improvement	▲	▲	▲	x	▲	▲	▲	▼	x	▲	x	▼	▲	▲	x	x	▲	x

Technical Characteristics (translated Tourist Requirements, "Hows", "Technical Design Elements"):

1. Save User Profiles
2. Link to Web Browser
3. Real-time Updates
4. Transportation API Link (Google Maps, Travel Line)
5. Web Content Sourcing
6. Content Filter
7. Context aware AR
8. Use of Network Connection
9. API Link to Currency Calculator
10. Link to Global Distribution System (GDS)
11. Connection to Cloud
12. Minimum Hardware Capacity
13. Offline Content Accessibility
14. Application Speed
15. Password Protection
16. Use of Hardware GPS
17. Use of Hardware Camera
18. Use of Hardware Accelerometer

Row #	Max	Rel. Weight	Weight/Imp.	Tourist Requirements	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	9	8,0	6,0	Information on Special Requirements (food, disability)	⊙	○	▲		⊙	⊙	⊙	○					○					
2	9	8,0	6,0	Weather information/forecast	○	○	⊙		⊙	○	⊙	⊙				▲	▲			⊙		
3	9	8,0	6,0	Option to access additional information (link to website)	▲	⊙	▲		⊙	○		⊙							○			
4	9	9,0	6,7	Public Transport Information	○	○	⊙	⊙	⊙	○	⊙	○					○			⊙	▲	○
5	9	8,0	6,0	Information Relevance for Timeframe of Travel	⊙	○	⊙	⊙	⊙	⊙	⊙	⊙	○	○			○			○		
6	9	7,0	5,2	Information on Restaurant menus	○	○	○		⊙	○	○	○					○			○	▲	
7	9	8,0	6,0	Information on Events, Daily Specials and Promotions	⊙	○	⊙		⊙	⊙	⊙	⊙					○			⊙		
8	9	8,0	6,0	Instant Accommodation availability Check	○		⊙		○	○	⊙	⊙			⊙		▲		⊙	⊙	▲	
9	9	7,0	5,2	Exchange Rate Calculator		○	○		⊙	▲	○	○	⊙		▲		▲	○		○		
10	9	7,0	5,2	Sync and Share Content with other Devices	⊙							○			⊙	▲	⊙	○	○			
11	9	8,0	6,0	Booking Function for Accommodation and Restaurants	○	○	○		▲	○	▲	⊙	○	⊙			⊙		○	○		
12	9	9,0	6,7	Audio/video support for projected Information	▲					▲						⊙	○	⊙		▲	⊙	
13	9	8,0	6,0	Accessibility of Information anywhere anytime		▲	○	⊙	⊙	▲	○	⊙		▲	○	○	⊙	⊙		⊙	○	○
14	9	6,0	4,5	Secure Interaction with Mobile Device in Public				○								▲	○	▲	⊙	⊙	⊙	⊙
15	9	7,0	5,2	Facilitate adventurous Exploration of Destination	▲		○	▲			⊙						○	⊙		⊙	⊙	⊙
16	9	6,0	4,5	Practical Solution for Interaction	○	▲		▲	○			○	○	○	○	▲	⊙	⊙		⊙	⊙	⊙
17	9	6,0	4,5	Unobtrusive to Travel Experience	○		▲	▲			○						⊙	▲	⊙	○	⊙	○
18	9	6,0	4,5	Privacy of Personal Details	⊙						▲	⊙			○	○		▲		⊙		
19																						
20																						
21																						
22																						
23																						
24																						
25																						

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Max Relationship Value in Column	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Relative Weight	513,0	254,0	502,0	262,0	695,0	384,0	596,0	690,0	129,0	219,0	129,0	285,0	404,0	519,0	153,0	579,0	354,0	240,0
Weight / Importance	7,4	3,7	7,3	3,8	10,1	5,6	8,6	10,0	1,9	3,2	1,9	4,1	5,8	7,5	2,2	8,4	5,1	3,5

Source: author (2015)

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10.3.2 Implications to Industry

By highlighting challenges of urban heritage destinations, this study contributed to the industry by providing a guideline to develop mobile AR tourism applications in urban heritage tourism destinations. It was identified that many destinations struggle to compete on the global market, while sustainable development was argued to be costly and rely on external funding for many destinations. Furthermore, challenges were evident for the effective provision of relevant information for tourists without compensating the heritage environment. Throughout the primary research of this study, it was pointed out that destination management organisations were often eager to implement new technology as a form to provide access to information and to remodel their brand image such as in the case of Dublin. However, the proper implementation of new technologies was regarded to be challenging by Destination Marketing Organisations (DMO).

This research contributes to professionals, Destination Marketing Organisations (DMO) as well as mobile AR application developers, by providing a model for the development of mobile AR applications in the context of urban heritage tourism that has incorporated tourist requirements as well as mobile AR application developer considerations. By providing a hierarchical model of tourist requirements, urban heritage destinations are supplied with a guideline of which requirements are valued by tourists and should be implemented in potential developments of mobile AR applications in their destination. The top three requirements were identified as 'Web Content Sourcing', 'Use of Network Connection', and 'Context Aware AR'. These highlighted the outcomes of tourist as well as developer and industry expert interviews, suggesting a highly content-driven application, which was able to filter information according to the tourists' interest and relevancy to their trip. From the 18 final requirements, the least significant were identified as 'API Link to Currency Calculator', which provide the functionality to convert any currency into the local currency and 'Connection to Cloud', providing the possibility to share information on multiple devices. Furthermore, it needs to be acknowledged that the requirements are not limited to

mobile AR applications, but are transferrable to any mobile tourism application. In addition, by identifying tourist requirements, the study outcomes contribute to urban heritage destination marketers by highlighting specific areas that should be considered when designing a marketing message to tourists using mobile applications. In this regard, the study identified areas of collaboration for private tourism businesses in urban heritage destinations by highlighting the need for content development in mobile applications, as well as potential methods of communicating content to tourists. While mobile applications developers were considered in the study, the research outcomes provide the view of potential users for mobile AR application developers and therefore contribute the development of future applications.

During the study, it was found that technical limitations were among the key challenges for developing full AR experiences. Furthermore, mobile AR tourism applications are likely to highly depend on an active and stable Internet connection, which should be considered particularly for outdoor environments. The study also revealed that developers currently focused on marker-based AR instead of GPS-based AR due to technical difficulties with satellite positioning and environmental blockages such as buildings for urban heritage settings as well as changing weather conditions. However, alternatives are being sought to increase the use of GPS-based AR, as it has a high potential for tourism purposes. While such challenges still need to be overcome, many opportunities exist to implement mobile AR tourism applications in the urban heritage context for indoor and outdoor scenarios. By considering tourist requirements and developer considerations, this study provides a list of design elements that should be focused on when developing mobile AR applications in the urban heritage destination. While this study was conducted in the context of urban heritage, it is expected to be transferable to other areas in tourism as a guide to application development.

10.4 Limitations and Reflection on the Research

Every research has its limitations which need to be acknowledged. One of the key limitations of any study is regarded to be the background of the researcher, which has an influence on the way the research is conducted during the primary data collection as well as for the interpretation of collected data. Although the researcher attempted to remain as objective as possible, it still should be acknowledged that the style of interview such as wording and approaching potential research participants, as well as conducting research was influenced by the researcher's personal background. In particular, knowledge and interest in technology as well as a background in international tourism and hospitality could have influenced the way of explaining the study and communicating with research participants.

Since AR was considered a new technology that has been implemented in limited ways particularly in tourism, the semi-structured interviews with tourists and industry professionals provided a foundation of knowledge while investigating tourist and developer requirements that were perceived to be crucial to include in mobile AR tourism applications. However, one of the challenges conducting the tourist interviews was the participants' knowledge of AR. As many tourist interviewees had not heard of AR before, the researcher provided examples of a text, video and GPS-based AR enhancement to give the interview participant an understanding of the research topic. Therefore, initial interviews might have been based on expectations rather than on actual knowledge of requirements. In order to confirm the findings of the tourist interviews, the post-experience study was designed as reliability test to confirm the identified requirements.

All interviews and focus groups were analysed by the researcher using thematic analysis. While the PhD thesis is considered an individual research project, a more thorough analysis by other researchers might have provided an alternative interpretation of identified themes to avoid bias interpretation of a single researcher. However, this limitation was inevitable due to the nature of the study.

While tourist, developer and industry expert interviews were conducted in a time efficient manner, the employment of various research methods required expanding the timeframe of the primary research over various months, including different locations, to conduct the interviews and focus groups. Although the focus groups were designed as post-experience study using the developed AR demonstrators, participants of the focus group were mainly from the British young market. While it was considered one of the main market segments by the Dublin Tourist Board, considering other market segments might have resulted in additional knowledge gained in this research step. Nonetheless, the quantitative research participants who ranked and prioritised the identified tourist requirements were recruited from a domestic and international tourist population in Dublin.

For the reduction of tourist requirements, confirmatory factor analysis (CFA) was the employed method to replace the traditional EFA-CFA approach. While traditionally Exploratory Factor Analysis (EFA) is conducted prior to CFA, EFA is typically used to generate a model, while the structure and factors of the model are generally unknown. However, the purpose of using factor analysis in this study was solely the use of a valid reduction method of requirements for generating the QFD model. Since it was not required to establish a separate model, the step of EFA was disregarded and only CFA was employed. As qualitative research was conducted prior to the quantitative study in the research, key themes could be identified. Since no further model and hypothesis testing was required, it was considered sufficient to use CFA for this purpose.

For the quantitative research, a sample size of 106 participants was collected and analysed using SmartPLS 2.0. While it was considered a sufficient size (Gorsuch, 1983; Kline, 2005), Garson (2008) argued that the sample size should be five times the number of subjects, or 100 responses in total should be gathered in order to derive meaningful data. While it was considered to collect a larger sample size, the importance ratings to reduce the tourist requirements were anticipated to remain unchanged based on data findings of the collected participant answers. In contrast, it was regarded more meaningful to conduct a separate study using a different prioritisation method, such as AHP to compare and contrast the findings. Although other software exists for conducting CFA analysis, SmartPLS 2.0 was

selected due to its availability and more advanced method of conducting factor analysis. As the aim of the quantitative research was solely the reduction and prioritisation of tourist requirements, the sample size was considered to be sufficient for the purpose of this study.

Finally, the limitation within the literature review for this study needs to be acknowledged. At the time of study, AR had been widely researched for industrial use, such as medical, product assembly in manufacturing and for military purposes. Therefore, it was revealed that AR was not considered a new technology. However, most primary studies in this field were related to separate AR devices, which were not accessible to the public. Howver, it was evident that AR was increasingly studied in fields related to public use, such as the tourism industry and was increasingly introduced for marketing and public relation purposes by using smartphones and tablets. While various secondary literature sources were reviewed particularly in academic research, it was found that at the time of this study, literature in the area of AR in urban heritage tourism was still limited to mostly examining AR interfaces and design opportunities. Therefore, it was required to access industry sources in form of reports and articles from the Internet to gain an up-to-date understanding of the technological advances and current use cases in the industry and in the consumer market. Although the literature review was updated before the submission of this research, it should be pointed out that AR is quickly gaining attention by researchers from various industries particularly in tourism, including the urban heritage context. In recent years, a number of studies have been conducted that aim to enhance the tourist experience and attempt to bring history at heritage sites back to life through the use of augmented and virtual reality. Therefore, it is expected to be increasingly examined particularly in collaboration with wearable technology.

10.5 Recommendations

The following section will provide recommendations for urban heritage destinations from the knowledge that was gained after conducting this study, as well as recommendations for further research within the area of mobile AR applications in urban heritage.

10.5.1 Recommendations for Urban Heritage Destinations

This research investigated the implementation of high-end technology in the current trend of mobile applications for urban heritage destinations. As discussed in the beginning of the study, many heritage destinations are facing challenges to develop sustainably and to build a competitive advantage. On the one hand, heritage destinations struggle with the need to provide information and make it accessible to tourists, while on the other hand, physical signposts and material would potentially destroy the heritage site and image. Therefore, technology has been identified as a tool to support the sustainable development for many destinations. However, while the trend in the use of mobile applications is steadily growing, the implementation of mobile AR applications for tourism purposes has been limited due to the limited knowledge of AR and few meaningful implementation cases. While destinations offering free Wi-Fi services in cities are increasing, there is a demand for tourism applications that are able to offer instant access to tourism-relevant information without having to spend a large amount of time for prior research. This provides an opportunity for tourism suppliers, such as for tourist attractions in the urban heritage context, but also the transportation industry and restaurants to promote an inter-connected network where tourists are able to access relevant information instantly in any place. Destinations are therefore highly encouraged to implement mobile AR applications that can benefit the marketing of the destination as well as serve as information access point for tourists by providing personalised and enhanced experiences.

This research has shown that tourists are valuing applications where an immediate benefit is eminent and provides the capability of being constantly connected to the

Internet. Travel has become more affordable for today's tourists and weekend city trips are more popular than ever before. Therefore, more research should be conducted make heritage in urban destinations attractive to especially the young adult market. Mobile technology in this regard can serve as a platform of communication and should be investigated further to enhance the overall tourist experience in urban heritage destinations. On the other hand, in today's market it is crucial to cater to individual interests and needs, and therefore additional research is recommended to explore different tourist profiles and target markets. Additional insights of the different value of information and use of mobile AR tourism applications would enable destinations to cater to visitors more accurately.

The quantitative outcomes revealed that tourists were particularly concerned with the tourism product to build a memorable experience. Therefore, it is crucial to enable the instant access of information on demand that is personalised for each individual tourist. The quantitative study showed that a large part of tourist requirements were built on the ability to access content on demand, which demonstrates that Internet connectivity is crucial for tourists. Urban heritage destinations should therefore consider providing free Wi-Fi access around the destination, as it is increasingly implemented by many destinations around the world particularly in urban areas. The QFD model for the development of mobile AR tourism applications in urban heritage destinations therefore recommends focusing on the technical functionalities, such as 'Web Content Sourcing', 'Use of Network Connection', 'Context Aware AR' and 'Use of Hardware GPS' as some of the most important technical design elements in tourism applications.

10.5.2 Recommendations for Future Research

While this study was conducted in Dublin, Ireland as an urban heritage site, further research could focus on other heritage destinations, urban as well as rural, to confirm the findings from this study as well as complement it with additional findings in this area. Furthermore, a similar study could be conducted in different cultural settings such as in Asia, while recruiting participants from eastern cultural backgrounds to investigate whether opinions with regards to AR and urban heritage are similar or different in responses. Exploring tourist requirements of different market segments could show additional insights and contrasts to the identified requirements of this study. The value of using a mobile AR tourism application could show different areas of focus depending on the profile of the target market. In order to get a more specific picture of requirements from different market segments, this study could also be conducted by investigating specific target markets in order to design a mobile AR tourism application according to the relevance for one particular market. While this study has been focused on the young British tourist market, future studies are suggested to investigate alternative market segments. Therefore, not only demographic markets should be considered, but increasingly market segments that are shaped by psychographic and behavioural means.

This study was designed as a mixed method research to identify tourist requirements and provide an importance ranking of a reduced number of the most significant requirements. Although the key outcomes from the qualitative studies were supported through the quantitative research analysis, inconsistencies still occurred, as a few tourist requirements that were believed to be valuable, such as 'multiple language options' and 'simplicity' of the application interface were dropped and not included as one of the final 18 requirements. Therefore, a separate study could be conducted on basis of the qualitative research outcomes and compared with the final outcome of the current study.

While the traditional QFD method recommends using a questionnaire based on Likert-scale ratings on items, more recent studies concluded that a QFD-AHP method would provide more accurate results. The QFD-AHP method suggests a

pair-wise comparison of identified user requirements and therefore can provide a more accurate picture of the importance of each individual item. However, the Warwick Manufacturing Group (2007) recommended using the traditional QFD method with a 1 to 5 Likert-scale questionnaire to determine importance ratings, as this makes it easier for questionnaire respondents to rate the items. Since the topic of AR was revealed to be largely unknown to tourists, the traditional rating method was considered to facilitate the data-collection process as much as possible. AHP, although argued to be more accurate, was regarded questionable if the participant could not accurately understand the function of the identified items. Therefore, for this initial study in the identification of tourist requirements for mobile AR applications in urban heritage, the traditional QFD rating approach was seen to be appropriate. However, research using the QFD-AHP method could be conducted in the future and compared with the outcomes of this study.

The mobile application environment is continuously changing, while recent technology advancements are shifting towards the use of wearable computing for everyday life purposes. However, wearable devices have not yet made a revolutionising impact in the consumer market. While exploring new hardware capabilities such as wearables, the interviews showed that user benefit for daily life purposes and acceptance of the new technology were the key to bring mobile AR applications to the consumer market. While this study was conducted in the context of urban heritage, it is expected to be transferable to other areas in tourism to guide application development. Furthermore, this study provides guidelines for recommended requirements that are expected to be valuable not only for current mobile devices, but for future 'wearables' respectively. In this study, the mobile AR tourism application demonstrators were designed for smartphones and tablets as current mobile devices. Therefore, future studies could focus on wearable devices as the next form of mobile hardware and investigate the similarities and differences to tourist requirements identified in this research.

This study focused on quality product development by employing the QFD model to incorporate the customer's voice in the development process. However, although industry professional interviews were conducted, they solely served the purposes of getting an insight into developer and expert perceptions for mobile

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AR tourism applications and to develop the mobile AR tourism application demonstrator for the next research stages. Further research could be conducted with various stakeholders in urban destinations to include the requirements of tourism stakeholders for the development of a mobile AR application in a particular destination. Such stakeholders could include Destination Marketing Organisations (DMO), as well as tourism product suppliers, such as restaurants, tourist attractions and the transportation industry. Increasingly, mobile applications should be developed to bring tourism products together and therefore investigating different stakeholders becomes crucial to develop meaningful applications to benefit various tourism participants.

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APPENDICES

Appendix A: Tourist Interview Participant Letter

Dear Participant,

First of all I would like to thank you for participating in my research. Hereby, I guarantee that all of your provided data will be kept confidential and are not used for other purposes but for this research.

This study aims to explore the current use and motivation of tourists in Dublin in regards to mobile technology and investigate user perceptions of mobile Augmented Reality applications for tourism purposes and motivation factors driving their use.
You were selected as you were identified as a suitable participant that meets the characteristics of the target sample. Your participation is voluntary, however is of great importance as you would provide a valuable perception and opinion for the completion of this research which is an important part counting for the completion of my PhD degree.

The interview should take around 20 minutes and will be conducted in the Fleet Hotel, Dublin.
Please do not hesitate, should you have any questions, as I will be happy to be of assistance at any time.

Thank you for your help.

Mr. Dai-In (Danny) Han

I hereby acknowledge and understand the purpose of this research and the use of the answers provided.

Signature

_____

Appendix B: Tourist Profile Sheet

Tourist Profile (Demographics):

1. *Country of Origin (From?):*
2. *First time visitor to Dublin, or repeated visit?*
3. *Purpose of visit?*
   Business
   Leisure
4. *Travel behavior*
   Average Number of trips per year:
   Method/Means of travel:
   > Plane
   > Train
   > Car
   > Other:
5. *Gender:*
   Male or Female
6. *Age:*
   ≤21
   22-30
   31-40
   41-50
   51-60
   61≤
7. *Education level*
   Less than high school
   High School
   College
   BA/BS
   Masters Degree
   Doctoral Degree
8. *Occupation*
   Student
   Employed
   Self-employed
   Unemployed
   Retired
   Other
9. *Income level (yearly)*
   Less than $19.999
   $20.000 - $39.999
   $40.000 - $59.999
   $60.000 - $79.999
   $80.000 - $99.999
   ≥$100.000

Appendix C: Tourist Interview question Codes

Smartphone/Mobile device usage

Possession and interest of mobile technology

Perception of smartphone/mobile device

Using behaviour of smartphone/mobile device

Readiness to purchase applications

Augmented Reality

Current level of knowledge and use of Augmented Reality technology

Prevention of usage up to this point

  Potential Methods of promotion

Reaction of provided AR examples

  Preference of graphical enhancement

Tourism Application

Use and past experience of tourism applications

Travel Planning behaviour

User requirements for (AR) tourism applications

Tourist criteria (for AR application)

Potential methods of AR implementation

Potential problems of AR tourism application

Social Network

Perception of information source and importance of 3rd party recommendations

Readiness to generate and share content

Importance of social aspect in the tourism application

Public WiFi in Dublin

Promotional success of free public WiFi in Dublin

Maximum value of WiFi for tourists

Additional functions of the AR tourist application

Perception of Gaming/Entertainment in tourism application

      Potential method of implementation

Readiness to purchase over tourism AR application

Further suggestions for improvement

Appendix D: Tourist Interview Questions

Smartphone/Mobile device usage

1. Are you currently using a smartphone, tablet or other kind of mobile technology?
2. How useful do you consider having a mobile device?
3. Which applications are you using on a regular basis?

Augmented Reality

4. Have you ever heard or experienced Augmented Reality technology? Are you currently using any AR applications?
4b. Why haven't you used any applications so far? How/where could the use of applications be promoted?
5. After seeing the provided examples, which Augmented Reality function did you enjoy the most? Why?

Tourism application

6. Have you ever used tourist applications on your mobile device? If yes, which one, how did it work? Was it beneficial? What was your experience?
7. Which aspects do you consider important in tourist applications?

Tourist criteria (for AR application)

8. How would you implement AR into a tourist application?
9. If you would design your own AR tourist application, which aspects would you include? What are important functions in the application?
10. Do you see any problems with AR applications, or tourist applications in general? What would prevent you from using it?

Social Network

11. What do you think about information from an official organisation compared to information that is provided by other tourists?
12. Would you consider generating and sharing your own content with your friends or others on tourist applications?
13. Would you be interested in other people sharing their experience and recommendations on destinations and attractions?

Public WiFi in Dublin

14. Are you aware of the free public WiFi that is being implemented in Dublin?
15. If you would have to pay a certain amount for WiFi around the city you're visiting, how much would you pay per day/week and be happy with using the Internet everywhere?

Additional functions of the AR tourist application

16. What do you think about combining gaming and other types of entertainment with a tourist application? How could you implement gaming into a tourist application?
17. If you could do more than access information, such as buying things or making reservations through the tourist application, would you consider doing it? What would prevent you from using this function?
18. Can you think about any other suggestions to make the AR tourist application more user friendly, improve the tourist experience?

Appendix E: Tourist Interview Transcripts

Interview Transcript: TP3

P3: Like how do we meet, how do we…

I: Like eh…for what purposes?

P3: Ehm, for everything really. Since I've started work up here. For work, to get in contact with Alex. I use E-Mail a lot. Apps, quite a bit, to keep in touch with contacts. Facebook, social media, stuff like that. (I: Okay.) So everything really, user friendly for every sort of…

I: Okay. And do you use any other applications?

P3: Yeah, ehm, I use…have you heard of Halo? (I: No…) Like it's a taxi one. (I: Oh, okay.) So basically, it's where a taxi comes and picks you up wherever the map, where your location is. I use Yelp a lot. It's kinda…it's a bit like that. (I: Yeah, mhmh.) It's a kind to see reviews and stuff. (I: Yeah, mhmh.) Ehm, what else, I highly use Skysports a bit for news…all these, all these apps for news, social media a lot. So I kind of use a lot of those apps.

I: Okay. Ehm, and what…what do you think, why is it useful to have a smartphone? Why do you find it's very useful?

P3: Oh, it's just I'd definitely be lost without an iPhone. Like 100% *I laughs* like…when I go on nights out, just the thought of losing. Like the work and everything, really. (I: Yeah.) Keeping the contacts, it's just…because I couldn't go back to a normal basic Nokia, you know after using a smartphone. (I: Mhmh.) So everything really is just…yeah, it's just really handy.

I: Yeah, definitely. Ehm, okay. So ehm, after I've shown you some…you know Augmented Reality ehm…experiences. Ehm, how would you describe Augmented Reality in your own words?

P3: Ehm, from what I've seen so far, it's seems like it's new technology, like it will…like it will take a while to catch, like for everyone to spread the word, say…and kinda get it out there, but it does seem like very useful. See if you were a tourist or something and you have this app. Or say, it was an app, and you were going abroad and you didn't know anything really, and you take your phone out and you scan, like you just take your phone out, but the one you showed me, isn't that the one with the video (I: Mhmh.) I think it could…it could work out. Yeah. I think it's…it's pretty useful.

I: Okay. Ehm, what do you think about Augmented Reality in general?

P3: Ehm, well it's kinda very new to me. I don't really know what's about it, but it does seem very cool now. It does seem very helpful. I reckon it'd be like very helpful to…to like…tourism and stuff…and stuff like that. To just gaining information about a building or a landmark, hotel or whatever. (I: Yeah.) I'd say it be good.

I: So, if there would be applications, no matter in tourism, or any other things that you are currently using. Maybe Yelp…eh using Augmented Reality. Would you make use of it?

P3: Definitely. I'd definitely download it anyways. I would…I would download it, yeah. And I would use it. Depending on how good that was (I: Yeah.) I would repeatedly use it.

I: Okay. Ehm, so what do you think are…are some factors that would prevent people from using Augmented Reality applications?

P3: Well, maybe a charge would be…(I: A charge?) A charge on the app maybe. (I: Okay.) Ehm…other factors…ehm, I'm trying to think. Maybe the different locations maybe. Will it be available in different cities…how…how big would the availability be? Will it…do you know…how…like how you're planning on…like how…

I: Like where can you use it? (P3: Like where…yeah the location…) Like how big is the spectrum?

P3: Yeah. Ehm…yeah, that'll be pretty much it. That's all that springs to my mind, really.

I: Okay, how about for yourself? Why haven't you made use of Augmented Reality applications?

P3: I haven't really heard…(I: Okay.) about Augmented Reality applications. That's really it. This is kind of…kind of new to me. Ehm, actually that will sound kind of…kind of stupid, but I first heard of it playing a Batman game. (I: Okay.) Playing the Batman game Augmented Reality. That's really how I've heard of it. (I: Oh, okay.) So, that's like literally. That's the only reason I've heard. But now after I've heard about it to the end, I'm definitely interested in a lot more. (I: Okay.) So yeah…

I: Can you tell me more about that Batman application? How do you…what is it about?

P3: Yeah, it's Augmented Reality training. It's literally…I sound like such a gamer now.

I: *laughs* It's alright. I'm also pretty interested in that.

P3: Yeah, it's a…it's the Ark ham City game. It's the same like you're doing…you're doing your missions or whatever but then there is training sequences and it's like literally…like virtual reality. You have to like fly through hoops and that…it's just called Augmented Reality. (I: Uhuh.) So that's just how virtual reality…I kinda got to know about it. (I: Oh, okay.) And stuff but I would, you know if there was…it's not really…I suppose I'm not really that technical person, like I would not be able to take in that much, but I would have heard of it. Like I would be a lot more interested than now. (I: Alright.) It seems very…like it seems very…like it would go alright.

I: Okay. Ehm, when…when you use it. Which factors, or which areas do you think…do you find important that it's included in those applications?

P3: Definitely ehm hotels. Definitely tourist…like anything that has to do with tourists. Like to do with tourism. Restaurants, bars (I: Mhmh.) Anything like that. That's what I would…that's what I would be thinking, like personally (I: Okay.) would be most useful for it.

I: Alright, can you like tell me…more specifically? For example, in hotels, what would you include there?

P3: Ehm, if it was hotels, maybe…if you'd scan it maybe room availability. I know that's probably really advanced now, is it. (I: Uhuh.) Probably will be. Ehm…maybe get really…the location of the rooms maybe. Ehm, specials, daily specials (I: Okay.) they have going on in the bar. (I: Alright.) I'm trying to think what else. Maybe brief history. I'm not really. Maybe that's it really. (I: Okay.) But day to day room availability and specials. (I: Okay.)

I: Ehm, from the examples that I've shown you before. Do you think, or what's your reaction?

P3: Yeah, I think it's…it'd be very useful for tourist…tour…tourism. If anyone just comes in and scans it. See the video, they'd learn a lot about the hotel. Very brief even when interacting with anyone…they can just find out for themselves. Yeah, I think that would be very useful.

I: But was it like a 'wow' factor, because it was pretty new, like this Augmented Reality for you, or was it just like… 'Ehm, nothing really special."

P3: Ehm, no it definitely was, just to see the new technology because I've never seen anything like this before. (I: Okay.) So I was very impressed with it.

I: Alright. (P3: Yeah.) Ehm, so after seeing those couple examples…now you've seen the one for the Madigans, the one for the hotel and the Tuscany one. (P3: Uhuh.) Which one of…or which kind did you prefer?

P3: Ehm, maybe the one…maybe the one in front of Madigans. Because it was like…you put your…over the sign of whatever (I: Uhuh.) with the lapt…or the iPad (I: Uhuh.) and it tells you straight away the menu, so you can read it. I think people would be more interested in that, rather than maybe the history (I: Mhmh.) like the Gresham. It is done very well. But personally I would say that…that it would be come more useful, more useful to random people. (I: Uhuh. More practical?) More practical. That…that's the word. (I: Okay.) But don't get me wrong. It is really impressive like how the video is done, really. But yeah.

I: Okay, ehm…so if you have like this information for example like this menu. What other information would you like to have available on…in the application? (P3: Mhmh.) Can you think about anything else that you think is important?

P3: Ehm, menu, specials would definitely be one. Well this would be the menu for a restaurant or would it be just…

I: Eh, apart from the menu, in any tourism application…you mentioned before a couple of things, hotel, restaurant.

P3: Yeah. Well definitely room…room availability. Like prices… (I: Uhuh.) Price is really important. Ehm…menu, yeah. Can't really think about…really from the top of my head. Everything is just to me…

I: No, that's alright. In a couple of questions, we're gonna cover a bit more. Ehm, what's your personal perception about any content that's generated by the Tourism Board, for example Dublin Tourism Board compared to other tourists who generate the content?

P3: Ehm, well I don't really know that much, but I know that the tour…that Dublin, they obviously promote Ireland. They'd promote it more…intensely. But I don't know much about it to be honest.

I: No, that's alright. Or any other business, it doesn't have to be the tourism board, like any other business compared to other consumers.

P3: Ehm, don't know really. Ehm, obviously they'd promote Dublin in a lot…a lot better light, let's say. Ehm…don't know.

I: Alright, no that's fine. No problem. Ehm, if you'd have the possibility to ehm…generate your own content (P3: Right.) and share it with other friends. Would you consider doing that or… (P3: Ehm…) in Facebook for example you know…you often take pictures of something and you share, you check in to places and things like that. (P3: Right, right.) So…

P3: So what were you asking me again? Sorry.

I: So, if you could do that, if you could do that just like…just like in Facebook ehm to generate your own content, to take pictures of places with you in there, or without, it doesn't matter and then share it with other people. Would you consider doing that?

P3: Oh yeah, definitely. (I: Okay.) Definitely.

I: Also with strangers?

P3: Eh…with strangers? Mh…no just with my friends, I'd say. It wouldn't be…yeah I would share like I would now share a lot of photos and stuff like that on Facebook, I would share content, I probably would yeah…

I: Uhuh, so would you be interested in other peoples' content?

P3: Oh, I would be, yeah. I know when I visit a few friends, I'd be on Timeline, on Newsfeed and checking in, or whatever. I would be interested in seeing you know…such and such is…in England, or you know. It's good to keep tracks of friends you know when they check in and stuff, and share content and stuff.

I: Okay. So you definitely think those kind of things are important, or are valuable…

P3: Yeah, definitely, 100%.

I: Okay. So what's your…I mean you gave me a little bit of insight already, but what's your approach or perception about combining this kind of application with gaming?

P3: Well, it's just…it was brief now…that's how it first started as a…(I: Uhuh.) but it's definitely…well Batman is a new enough game, so I'd say it's pretty…it's pretty modern, yeah, you'd probably see a lot more games coming out this way. But it's very interesting and now I'm very impressed what it has to offer.

I: Okay, ehm, do you think you would actually…like say, someone would introduce like an application, a tourist application where you could walk around in the city and play a game while doing that while exploring the city, would you consider downloading that application?

P3: Ehm, maybe that might complicate things a little bit. You know what do you mean like playing…playing a game while…

I: Like for example, you would start the game, and it would tell you 'Walk to this and this location.' And then once you're there, it would tell you, 'Okay ehm…you know play this game, or solve this puzzle, do this and this and this…' or you have to solve this puzzle in order to get to the next location. And like this you kinda explore the city. (P3: Right.) Would you be interested in this kind of application?

P3: Mh…well personally I probably wouldn't, no. (I: Okay.) Yeah, but that's just me. But I have to maybe see it in action, trying to see what it's like. (I: Yeah.) But it sounds interesting, alright. But definitely I wouldn't say I'd be that interested in that, to be honest. (I: Okay.) But the app where you would…with the buildings or whatever that you showed me. With the menu… (I: Yeah.) That would definitely work, I'd say. (I: Okay.) Yeah that's what I feel.

I: Alright. Ehm…so If you could, ehm…for example for the restaurants or hotel, if you could actually do more than just access information, for example you could book a room, you could book this special or you could actually purchase something through this application, would you consider doing that?

P3: Yes, it's definitely. Yeah, 100%. If that…that option is available (I: Uhuh.) That would be very effective, alright. 'Cause there you just click 'room-pay' (I: Uhuh.) and with your card or whatever. Yeah, I'd say, that would be…that'll work alright, yeah.

I: Do you…do you have any like trust issues for applications or anything?

P3: Mh…not really. Maybe…maybe I should. *I laughs* But I don't…I don't to be honest. (I: Okay.) I have friends now that are…that are very worried using online banking (I: Uhuh.) say Bank of Ireland. Online or on the computer they ask you for three steps of the password, whereas on the phone, they ask you for two

steps (I: Uhuh.) So like some of my friends they don't trust that. But personally, not me. It wouldn't affect me really. But it would for a lot of people I'd say. (I: Uhuh.) So that would definitely be one of the major issues to look at, I'd say. But I'd say…I'm fine with that.

I: Okay, alright good. Ehm, just one more final question. (P3: Okay.) Ehm, what do you think what…you know, what features, or what…what would you like to have more on this application that would make it more attractive for you personally…on the tourism application?

P3: Ehm…right. Ehm…see...it's all very new to me, but definitely one that I would say is maybe, if you…you scanned it over a hotel, and if you could see the availability of the rooms, and maybe more advanced the location of the rooms maybe (I: Mhmh.) you know 'cause maybe some people might have preferences, like say if they mean like the…whatever suite is in…or if there are special suites available. But maybe I'm talking too much down the line right now. *I laughs* But yeah, the specials would definitely be one, room availability, ehm…if there is entertainment, say tonight you know…maybe stuff like that, like general stuff that people would be looking for, when they're looking at a hotel to see if they wanted to stay or not. (I: Okay.) Those options… (I: Yeah, yeah.) Yeah, that would be pretty much all.

I: Alright, okay, very good. Ehm, thank you already for…for your time, the whole information (P3: I hope it helped.) Yeah, definitely. Just one last thing, would you…would you mind to eh…provide your E-Mail address, just in case for later you know if there is any other question that comes up in the research you know that I can come back to you…that'd be great. If you'd just pop it on there.

P3: How are you getting on with it anyways?

I: Ehm, it's alright. It's pretty much just a pilot project what we're doing right now. (P3: Right.) And then later, in the later stage, we're gonna do like a…another research with an actual prototype of the…developed app. And then before we actually consider developing a proper app. (P3: Right.) Yeah, so at this stage we just want to find out what do you guys think about at the moment, what's your current knowledge, what would you like to have?

P3: Right. If you need to get in contact with me, if I can help out any more. That's…if you can read that there…

I: Is that an 'F'?

P3: F, I, A, C, H…gerry (I: Mac?) Yeah, m.a.c. at yahoo.com.

I: Yeah, no problem.

P3: Yeah, see if I can help out any way. (I: That'd be great.) I work with Alex anyways.

I: Okay, alright. Let me just ehm…give you a complementary drink…A…R…Alright here we go. Thank you so much for your time. And I'm probably gonna see you around.

P3: Yeah, sometime during the day or during the week. (I: Thanks a lot.) Yeah, what's your name? (I: Danny.) Danny, thanks Danny.

Interview Transcript: TP4

I: Just for later, it's not gonna be used for anything else, but for my research. So later, I have to transcribe everything and stuff like that.

P4: So it's not paired with anything?

I: No, no, no…just for the research really, nothing else. And there is no personal questions gonna be asked. Alright, thank you. Okay. Ehm, before we start, eh…we showed, I eh showed you two examples already. (P4: Mhmh.) And eh…that's another example of how it can be done. Another approach of Augmented Reality. This one was done…it was an application that was done in Tuscany ehm…a couple of years ago already. Just have another look and see…to get a better understanding or a better feeling for the possibilities of Augmented Reality.

playing Tuscany movie clip

I: Alright, so that's another approach of…a GPS based Augmented Reality actually. (P3: Mhmh.) Okay?…Okay, so before we start with the actual interview, first of all, thank you very much for your time. And eh…eh..yeah, the information that you will provide during the interview. Ehm, are you currently actually using a smartphone, tablet, mobile application, mobile device?

P4: Ehm, currently in metropolis right now, or in general? (I: In general.) I have a smartphone, yeah.

I: Okay. An iPhone?

P4: An Android?...

I: Oh, okay. That's fine. Alright. Ehm, and how are you currently using it? Ehm, for what are you using your Android?

P4: I use it a lot for…texting people back home. And also in…within Germany with Whatsapp to text people and videos…ehm, Facebook, (I: Uhuh.) Internet, just looking up things and ehm…radio.

I: Okay. So ehm…do you…I assume you're using it most of the time for like…social aspect? (P4: Yeah.) So text messaging..ehm…and why do you think it's useful actually that people have a smartphone?

P4: It's good…kind of safety net, I think. (I: Okay.) That's the number one reason I invested in it, and of course use it. Not often, for it's not the main time I use it, but if you're travelling and you get lost, it's very expensive of course to switch on the roaming fees (I: Yeah.) but you can use that. (I: Yeah.) And also if you're kind of in your area and you get lost, I've definitely used that before where you're in town and you have no idea where it was. (I: Okay.) But most of the time, it's…I use it for social, for communicating with people (I: Okay.) and ehm I guess it's more common than to carry books around when you're waiting at the bus stop you can put an app on your phone.

I: Alright. Okay. So ehm, which application do you actually use when you…for example when you get lost in a destination? Do you use like…

P4: I don't have an app, I just use GPS.

I: Okay, do you just use Google Maps, or…(P4: Yeah, Google Maps.) Okay, ehm…ehm…I wanted to just ask you. Oh yeah, do you like…share any… like photos or anything like that on Facebook, Facebook application, where you can ehm…where you can update…update like photos of your current status or locations where you've been and check-in to places, do you use that at all?

P4: Ehm…Facebook. On my mobile phone not as much, but ehm…I don't know, last…a couple of days ago, I was in Amsterdam (I: Uhuh.) I thought about

checking in and the posting thing, but we had…we didn't have free connection to the WiFi, so…(I: Okay.) Ehm, I don't normally do it, but on like special travel occasions I guess (I: Okay.) you'd like to say like… 'Oh, I'm at the Temple Bar' in Ireland in the area and just that type of things.

I: Okay, okay good. So mostly on holidays you would do that…

P4: Yeah, but otherwise when I'm on my computer, yes, but not when I'm on my smartphone.

I: Okay, alright. Ehm so why did you decide to …you know invest into a smartphone? Or when…when did you get the phone actually?

P4: Just when I went abroad. (I: Oh, really? Okay.) I ehm…I would have to pay for it myself and that's stupid, expensive *I laughs*, but ehm…both of my sister now have a smartphone so that would make it back…but for ehm…yeah the main attention was for communication with people back home and also having a safety net was why I was invest in it. Ehm, it's also cheaper in Germany (I: Yeah.) than it is in the U.S. Ehm…now they're coming out with great family deals, so… (I: Yeah.) But that was my main motivation (I: Okay.) I had my dumb same old phone for a very long time. (I: Okay.) But now that I have a smartphone it's kinda hard to go back. *laughs*

I: Yeah, exactly. You can never go back anymore. *laughs* It's enorm what you can do actually with it. (P4: Yeah.) Ehm, so having seen you know Augmented Reality ehm…you said you kind of heard about it, but you never really knew what it was before. (P4: Yeah.) Ehm, how would you describe it in your own words, if you would have to explain it to someone else, asking you, 'What is Augmented Reality?' or 'What is the research about?' How would you explain it, what it is?

P4: It's a faster and easier way to connect with ehm online sources of what you're seeing in person. (I: Okay.) Or getting background of what you're seeing in person.

I: Alright, okay good. Ehm, so after seeing those examples, what do you think about it? Ehm, you were mentioning a couple times before, how do you know what to scan or what to look at?

P4: Yeah, I think the problem is, you don't really know what it is you're looking at. Ehm, that would have to be made more clear. Also, it's useful for travel, I mean roaming fees are so expensive. I don't know if it's just because I have a prepaid phone, ehm but I can't really see myself using it while travelling (I: Yeah.) because it's just…it just would be too expensive of an option. Ehm, I'd rather do research ahead of time. (I: Yeah. *laughs*) I love the Internet, but I think if there was a way to use it without those roaming fees (I: Mhmh.) then I guess I would use it all the time, but when I'm not using roaming fees I'm in a place where I've been a lot. But I guess in Germany that would help. When I was in Berlin, I'd definitely use it (I: Okay.) but for most of my travel… (I: Yeah.) it just…wouldn't be worth the expense.

I: Yeah, true. Understandable. Okay, ehm so until now, you haven't really been in contact with a lot of Augmented Reality. Ehm, I believe you haven't really used any Augmented Reality application, so ehm what were some factors why you haven't used any Augmented Reality applications?

P4: Technology tends to confuse me. (I: Okay. *laughs*) I think I would just get frustrated in trying to figure things out and I think when I was travelling I wonder if it wasn't every building, if it was more another way for people to pay the app…like the app company to advertise themselves (I: Yeah.) like all the touristy stuff here. Ehm…and mostly, I just haven't had a need for it for travels (I: Okay.) I've been good just researching ahead of times to see what kind of museums or

places…(I: Yeah.) so I never had a need and so there is no point in investing the time to figure out how to use it.

I: Yeah, fair enough. Okay, ehm so…let's say you could ehm…actually use the…the application. What kind of features or what kind of things would you want this…this application to include? Especially like in tourism now. In a tourism application.

P4: Ehm, I think the hardest thing while travelling is to find cheaper things to eat outside of Burger King and McDonalds. I mean really?...

I: It's so American, come on. *laughs* You guys brought it here.

P4: Yeah, because other times you're just spending way too much because you're in the touristy area. So if that had kind of a section. Also, I'm lactose intolerant, which kinda makes… (I: Oh.) apologies if I use a bad word. *I laughs* Makes it very difficult (I: Yeah, exactly.) so kind of an option, with maybe those alternative restaurants, I mean if you do have to pay more, just like those types of things. I think food is what people end up spending more money on than they really want to (I: Mhmh.) when they're travelling. (I: Yeah.) Ehm, and…I guess comparing against the main in the tourism trip…all the trip seeing all the different types all compared against each other (I: Mhmh.) being able to reduce it and making it easy access to all of those (I: Okay.) vs. having to go to each individual page to see it. To see the prices straight away with the…click easy to see reviews.

I: Okay. So this review part, are you using it a lot? In other applications?

P4: Oh, absolutely. (I: Okay.) No, booking here we were going through so many seeing what people thought about them…just…I think that's really important when you're travelling because so many times, when…you're investing so much money to be there, you don't wanna do something where people have…it's easy to find that people say, 'This was not worth the money.' (I: Mhmh.) Ehm, so for me that's really important, it's to hear that from other people.

I: Okay, alright. Ehm…what do you think about like the individual…eh, I showed you a few experiences now…or different examples of AR. What do you think about each of them? What's your opinion? Which did you prefer? Which did you like best?

P4: Ehm…I guess the…no. *I laughs* I was gonna say the menu, but those are often posted out front. Ehm, like the history part was kind of cool, but I'm normally travelling with groups (I: Uhuh.) and I wouldn't be able to see it. I don't know, I guess I didn't think really…I guess I think overall that the application will be very cool and I'd really have to use it to answer that question. (I: Mhmh.) Because I don't know definitely don't know how to apply to it.

I: Okay. Is…Is there like a…or which one did you find most useful?

P4: Of the option between the two that you showed me, or also with this one?

I: Also with this one.

P4: Ehm….I guess what they were posting on the…what they were doing on the…(I: In Tuscany?) Yeah.

I: Okay. Eh…can you like give me more details or why did you decide on this?

P4: *laughs* Can you explain it, so they were showing, it'd show buildings of like…

I: Exactly, it was basically what they do is they use the GPS of the phone to pinpoint your location. And then what you can do is, when you scan your environment, they would show you, 'Okay, this one is an attraction, this one is an attraction,…' and they pinpoint different buildings, right? (P4: Yeah.) So, when you point on this, or when you click on this on your phone, they give you like

exactly the name of the building, information, you know when was it built or whatever, how to get there, you know. And just like, yeah…information about your environment, your area.

P4: I think eh…that would be nice, because I don't know people once in a while need to figure out when they're on the street know exactly where…(I: Yeah.) ehm, and also if anything involves directions, because I get lost a lot. (I: Okay.) Anything that's like, 'This is where you are now.' And if you want to get to this attraction, like 'Yes, we have maps.' But like for instance we have them…we flicked out six different maps and all of them cut off right before where we were staying. *I laughs* Probably three blocks and a GPS would not have that problem. (I: Yeah, yeah.) Like in a taxi and drive around for like 20 minutes in the worst case. So ehm, I feel like a GPS *I laughs* has a helpful aspect to it. And if you could just pull out and see in a clear view like where the clubs of the touristy spots are. (I: Uhuh.) That would be very nice. Like I'm gonna take this tram around here in order to get to that next club.

I: Yeah, that's very interesting. So basically to have different views of the map. (P4: Mhmh.) Okay. So I don't know what do they call it, 'Birdview' or something? (P4: Yeah.) To have a look actually. Okay, alright. Ehm, so…what's your perception of a…ehm any content, it doesn't have to be AR applications now (P4: Yeah.) but in any content which is designed by the tourism board or tourist office, compared to any content which is you know, designed by other people, by other consumers?

P4: Eh…I mean I think every time you go into something that's run by the tourist, tourism office, you can go in, thinking someone can pay to have theirs more advertised. (I: Mhmh.) Or I assume it's that way. (I: Yeah *laughs*) That's the way I'm seeing it. But ehm…so you know things are gonna be more expensive or whatever. But I also think that it covers…it's more good that you have those organised things. You're not going… 'cause you know it's gonna be regulated. You're not gonna be ripped off. You're not gonna pay this money there and nothing is gonna happen. (I: Mhmh.) It's really easy if you have any problems to go and talk to someone to have it solved. So I think it's less stressful. (I: Yeah.) Even if you're investing more money into it potentially, I think the less stress when you're travelling is really important to me. So I eh…depending on where you're going. If I go to Berlin or something, I have friends there, they can show me around. For that, I know someone in the city. But if not, I'd rather go to something like a tourism office (I: Okay.) rather than trying to figure it out by myself.

I: Yeah, yeah. That makes sense, okay. How about the content from other users? Do you look at those at all? Because you were mentioning reviews before.

P4: Yeah, reviews, I look at, but I also look at who are the type…psychological. 'Who are the people who are going to post here?' *I laughs* The best time, and the worst time you kinda have to take out to grade themselves, (I: Yeah.) but I think you kinda have to discover the truth within it. Ehm, so I think that's good.

I: Okay, and ehm…do you like personally, write reviews and stuff like that as well? (P4: No. *laughs*) Okay, you just make use of that.

P4: Yeah, I just use ehm…I kinda feel like, you need to have a strong experience to write a review, unless it's gonna be a good person to tell…(I: Okay.) I just ehm do so much travelling I'd be tired and lazy (I: Yeah.) so no, ehm…I've never written a review myself, but…(I: Okay.) I read them a lot. *laughs*

I: Alright, so ehm if you had like an application, a tourism application where you could generate your own content. Ehm, say of pictures or…say those kinda things,

with the menu, or video that I showed you. Would you actually…so make that and you could share it with your friends or with anyone, would you make use of that?
P4: Would you have the option of just sharing it with your friends? (I: Yeah.) Or would it…because with everyone it kinda get into privacy…instinct of privacy…(I: Yeah.) I mean depends if you could post it anonymously or whatever, but…(I: Mhmh.) ehm definitely with my friends. Especially during this abroad year, everyone is going to the same places at different times. So it would be really cool to go to Prague and see, 'Oh my friends, they checked out this place and really liked it.' (I: Uhuh.) I think definitely within that international student community that would be really awesome. Especially we don't…everyone that is an international student…(I: Yeah.) I sort of see myself using that a lot within friends, but I don't think I would post it just pure to the public. (I: Okay.) I'd just instinctively feel weird.
I: Yeah, yeah, okay. Alright good. Ehm, so what's your perception of…if you think about combining an actual tourism AR, or Augmented Reality application with Gaming or Entertainment? So let's say for example you would go to an…a city or an area where you've never been before. And ehm, since you don't know your way around, you just open the application and they pretty much want you to play games on the application, say for example you have to go to this first destination and find out certain things about the destination or the area, the attraction, and then you could go to the next point and find out more things about that and then…pretty much like a quiz almost or…it can be different approaches of games. But what do you think about this kind of entertaining, entertainment?
P4: If it would be like an option or would I be required to do it?
I: Yeah, as an option.
P4: I think that would be cool. I know a lot of people who would do that. There is something I don't know in California where they give you GPS points and you have to find it and then find what people left there (I: Oh, okay.) and I know so many people that on the weekends that's what they do. (I: Oh really?) Go and do that, so I think they would love that. I definitely think there is demand for something like that. (I: Mhmh.) Ehm, depends on who I am travelling with. (I: Yeah. Fair enough.) Some people are totally against that, some people that are like, 'Yeah, let's do it!' So I think I would try it with certain people I think that would be fine. (I: Okay.) As long as it's optional, because I know I would be really frustrated like, 'No, I just want to know.' (I: Yeah. *laughs*) So if you could just pull away on that stuff.
I: Okay. Ehm, what's the application called? Do you know what your friends are using?
P4: I have no idea. Ehm, I just know that…I could be completely wrong. I just know they give GPS points and then you go there and there is like a box or something in the middle of the woods somewhere. (I: Oh, alright.) And you open it to see what other people have left in it. (I: Oh.) And it's just a big hip…I don't know if it's just something like in the California hippie area (I: Uhuh.) but yeah.
I: No, that's fine. Alright, okay. Ehm, let's say on this application you could go one step further and not only find information but you could also purchase things. For example, ehm, let's say you go to the…to the movie theatre or to a theatre, opera, musical and you could actually over this application purchase a ticket. Would you do that? Would you consider doing that, or…
P4: And you wouldn't have to print anything off?

I: No, it's all electronic. So when you go there, you could actually just scan your phone and then that's your ticket.

P4: I think that would come handy on this trip. *laughs* I don't have access to a printer so it's so not…ehm, yeah, I think you know…with all these roaming fees come into effect if I was in Germany and any other place I think I would use that (I: Mhmh.) vs. if I was in Ireland. (I: Yeah.) Ehm…but yeah I think it would be really cool and a lot of people would use that. I would use that. (I: Okay.) Because…as long as there was no glitches. (I: Yeah, exactly.) You know with people you feel safer. Ehm…but yeah.

I: Okay, so ehm you don't have any like trust issues putting your credit card details in the application itself?

P4: It's…I mean depends on how long known the application is (I: Okay.) or if it's known for safety, if it explain clearly…ehm with the logo, 'Travellers protected.' (I: Yeah.) or whatever. Ehm, I don't think my mother would do it (I: Uhuh.) *laughs* I think she would be too paranoid but I think at this point, my debit card number has been stolen you know when I had my debit card, (I: Oh wow.) it's really easy for them to fix it. You just call the company and tell them to stop it and they figure it out right away. So at this point I'm comfortable with the fact that if I enter something on the Internet it might get stolen, but the company will deal with it. (I: Okay.) So as long as I know the company I'm using the credit card with, yeah.

I: Okay, so it's really up to the business. (P4: Yeah.) If you can trust the business, then it's alright. Okay. Ehm, alright, eh…just a last question ehm, can you maybe I mean, just in terms of a tourism application could you give some suggestions, or things that you would like to have or would think would be cool on this application, which would make it more attractive for you to use it.

P4: Simple. (I: Okay.) Like, I get really confused by technology, I have issues with technology, but I also get lost a lot too. So as long as it's very organised and…I hate when there are pop ups going at the top and when I click on something, you accidentally click on the pop-up and you have to go back. (I: Yeah *laughs*) Especially on the smartphones it's really hard to go back. (I: Yeah.) So I think just…organisation. I think all the other elements of it, just if it's included like food or whatever, just if it's easy navigate able and you can choose to add elements or take elements away (I: Okay.) and if you could have like 'most commonly used' part things (I: Yeah.) that you can use. So if there is a lot of aspects and even has this gaming one you know that it's always an opt out, just as an option.

I: Alright, very good.

I2: Do, do you know that Dublin provide free WiFi by any chance?

P4: All of Dublin?

I2: No, no some main tourism.

P4: Oh, yeah. The tourist offices, yeah. We've been connected to WiFi.

I2: Yeah, and how is it?

P4: And that worked. That was great. But it was only in small spots. So every time we'd get lost we're like…(I2: Alright.)

I: You have to find…where are we…

P4: Exactly.

I2: Would you…you know, would you want to pay for any kind of extra WiFi? There is free WiFi, but if you pay a certain amount of money, they can get a faster WiFi connection. Would you…eh…

P4: Through all of Dublin? Or just to these spots?

I2: Yeah, all of Dublin. Would you pay extra money to get some connection? Or to explore tourist…

P4: I…potentially, ehm that kind of…so you're saying just to those specific tourist spots or tourist areas you could have connection to WiFi? (I2: Tourist area.) Depends on how expensive it is. I…I think so, because it's just…you know comes in handy to have WiFi. *laughs* And then you can still communicate with people like ehm it would be easier, if you're travelling with a group to separate ehm because you know if you have WiFi, it's…in your smartphone you can just free text each other over the Internet. It's good to have that.

I2: How…how much would you pay? In Dollars?

P4: How much would I pay…

I2: Up to this amount I'm happy, but (P4: Yeah.) above that, I wouldn't.

P4: Ehm, if you could pay by…so could you just pay by day, would you pay for hour of use or like, so if you could say, up to like 500Mb of use (I2: Mhmh.) so that it's not just like to a certain time. (I: Mhmh.) Ehm, I'd be willing to pay like 8 Euros or something. If it's up to like 500Mb, yeah. Because that would give me a lot of use. (I: Yeah.) Ehm, yeah so but I think just doing it, because is it also possible to use short ones, for let's say half an hour of time in this area if you just want to explore and meet back up, so I think different options or like just one hour or…I think Megabyte of use everyone is just killing 2 percent, they don't feel like they have to step in all their WiFi use in one time. Just in different locations use it and then… (I: Mhmh. Yeah.) Like it's probably a lot. I don't know how much 500Mb is *laughs*, it's like I can watch a movie on that. (I: Yeah, exactly. *laughs*) I don't know like…I don't know maybe 100.

I2: Yeah, actually they're offering some free WiFi and they're paying a certain amount of money (I: Yeah.) for one day and one week. (I: Yeah, exactly.) Some Euros.

I: Alright. It was very interesting. Thank you very much. (P4: Yeah.) Ehm, I'm just gonna…

Interview Transcript: TP5

I: Do you wanna see yourself? Hehe

P5: No thank you!

I: hehe, ok..first of all, thank you very much for your time, thank you very much for coming.

P5: No problem.

I: ehm…first, I'd just like to ask you, are you currently using a smartphone, tablet or any other mobile device?

P5: eh..you see yea. Well back in the states I have an Android, but here in Germany I only have an iPhone.

I: Ok…no tablet?

P5: No…

I: Ok..and ehm..how are you actually using your iPhone or your Android, and eh…what kind of things are you doing on it?

P5: ehm…well of course normal phone calls, text messages (I: mhmh) and that stuff and then like games…and actually on the iPhone because I'm doing a lot of travelling, because I'm in Europe and Europe is so small..ehm you can visit so many places (I: yeah..) a lot more easily than you can in America..(I: yeah definitely.)ehm…I have like travel apps (I: oh, ok), travel itinerary, or like there is one that's like a local…it's ehm you can look up a city, and it gives like suggestions on what to do in that city (I: oh, ok) ehm…but there is none about the camera (*laugh*) yea but eh…so I have a lot of travel apps on it..on the iPhone here…I don't really have much else. I don't use iCloud because I don't really have any other device besides my computer (I: Alright) and that's not a Mac. And..yeah that's probably..I think that's about..(takes out her iPhone and browses through) I can look. Oh, I use like the…like..all the cities in Germany like they all have..so..the public transportation is really good..so I have like apps for like train times (I: yeah) and about the bus schedule (I: Ok) and all that stuff..ehm, but yeah that's about it.

I: Ok, alright good. Ehm..and what do you think, or why do you think it's useful that people have a smartphone? (P5: Ehm) For you personally, why is it useful to have a smartphone?

P5: I think it's useful because I get lost easily (I: Ok), so..you have Internet wherever you go, so if you need to look up something, or ehm..you know find directions to some place or anything like that you can. I think like this day in age, we expect instinct gratification, so you know something like, if it's just a stupid questions, something like when a movie came out (I:mhmh, yeah) you can look it up instantly, just because you know these days we have computers. Back then they would say "Back in the day, we didn't use to have iPhones" (I: haha yeah). Well, also back in the day, like technology wasn't as good. You didn't have Internet, so you couldn't look things up. We're used to having these kind of resources when you're at home, when you're travelling you don't wanna be frustrated all the time (I: yeah) and…not knowing where you're going or you're so used to be on and look something up and google it and within milliseconds they give you the answers (I:yeah) so, I think that's really important and it's basically like…it's a funbook and everything..you can talk to everybody vs. you having to write mails (I: mhmh) and E-Mail and what not..so..ehm..but mainly I think it's for instant gratification.

(I: Okay, alright) Instead of like having to walk into a store and like "Can you give me directions", take a map "Can you draw this for me"..haha

I: Okay. Very good. Ehm..why did you personally switch from a "normal" phone I call it now, to a smartphone?

P5: Ehm.. I actually didn't choose to, it's just everybody has 'em these days..(I:yea haha) so my phone..I had like this old brick phone and…it broke eventually, and I went to the store to go and get a different phone, but pretty much every single phone now these days you have to have a data plan (I: yeah) and they all have Internet, so I was kinda like…forced into it (I: yeah, haha) I was like "I'm never gonna use the Internet on my phone (I: Exactly, haha) I'm never gonna do it, I'm not gonna be like everybody else" but, now you do. (I: Ok) So, once I had it, then..there is no going back.

I: Yeah, exactly, ok. Ehm…good so after…before actually, ehm I showed you the examples upstairs, did you know about Augmented Reality? (*P5 denies shaking head* mhmh) Not…or did you…ok, then ehm…after seeing those examples like the last one here as well and someone would ask you, you know "Can you tell me what Augmented Reality is?" what would you say or what would you tell them in your own words?

P5: Ehm…it's kind of like…well from what you showed me you had the camera. And…you can hold it up and…it'll be more advanced later on, perhaps more developed, but ehm..you can get information on anything just make sure you have the picture of it. And in my mind I was thinking like google like…instead of typing a question on Google (I: uhuh) you could upload a picture, and it could give you information on that picture like who painted the painting (I: Yeah) or anything like that. That's kind of what I was thinking in my head (I: mhmh) basically like going under Google and instead of typing something to look it up, you could show a picture of it and you'd get that information about it (I: Ok). That's kind of what I was thinking in my head.

I: Alright, ok. Intersting, good. Ehm…

I2: How was it when you see all those…it must be something new to you, yeah? (P5: Yeah) How was it, when you experienced that?

P5: It was…well, it was interesting, I was thinking how is it possible to do that (*laugh*) ehm…I don't know I'm not as techn…most people these days are supposed to know everything about technology and I personally don't, but ehm…I mean just interesting to see how far things can go these days, it's just interesting. And I was like "wow" there's so many new things that are invented and they just blow your mind and…yeah, so it was…it was very surprising…

I: Ok and ehm…what were some factors that prevented you from using AR applications? Because ehm…nowadays like eh…when you click on the Apple Store for example and you type in "Augmented Reality" there is so many applications coming up, but ehm…why do you think you have never used one?

P5: Ehm…I've never known about one? (*laugh*) Ehm…That's mostly it. I've never really known about it. (I: Ok) Ehm…yeah (*laugh*) I don't know what else to say.

I: Alright, so when you like, later on in the future when you know about the application, would you consider using them?

P5: Probably, just to play with it. Like I definitely just…just purely out of curiosity would be the first step to downloading one of the apps, like "oh that kind of interesting, I kinda wanna know how it all works" (I: yeah) and you just wanna play around with it and then after playing around with it, you think "oh, I need to

use those in real life (I: mhmh) and…so that's kinda like how it merges you in probably (I: Yeah, exactly). First, curiosity and then like "wow that's really cool, I could actually use that".

I: Yeah, and then you can' t live without it anymore. (P5 agrees and laughs) yeah exactly. Alright, ehm…in such tourism applications, you use a lot of tourism applications you told me, right? What aspects or what services do you think are really important that they have? That they are included in the application? (P5: Ehm) Or what things should the application do actually for you?

P5: I think having like some sort of memory, like a "Favorites" type of thing is important. Like in my itinerary app you can look up cities. That has like a list of all the cities in the world, pretty much and…you can make an itinerary, so you…it remembers what cities you looked up, and so…(I: mhmh) I think it would be cool like, if you looked up something it remembers what city, and it might suggest other cities around it maybe, for like your next trip like if you like if you enjoyed visiting Dublin, it might suggest other cities around Dublin so (I: Ok), or say if you are, so for example for this app, it you show a picture or hold it up to a restaurant or something and you might think "oh actually I kinda don't like this restaurant pretty much, it could suggest other types of restaurants, like say it's an Italian restaurant it can suggest other types of Italian restaurants if you simplisticly didn't like this one for some reason. (I: Ok) So, I think having some sort of memory…kind of like the ads on the Internet, they know what you've looked up and that's how they trap you (I: Yeah, haha)

I: Alright, so recommendation is really important for you? (P5 nodds) Ok. Alright, ehm…so after seeing those three or four examples, which one do you think was like most striking or most useful to you? Or would be, you know…if that'd exist?

P5: Ehm…I really liked the hotel one, where you just showed the look of the hotel, I believe? (I: uhuh) And it had a video, because personally when you're travelling, you wanna see like pictures of the hotel so you know you're not staying in some back alley…roof barely standing up kind of hotel (I: yeah), you wanna see where you're going, I mean you're travelling all this way, you want to have some sort of know, or knowing where you're going (I: Yeah) type of thing, and the same thing with like the restaurant one ehm…like it may say like Thai restaurant, but you maybe kinda wanna know exactly what kind of types of food they have…ehm, so I think the menu thing was really cool (I: Ok). That way…ehm, you don't have to go inside and ask for a menu and really embarrassing if you don't wanna eat there, and you walk out (I: Yeah **laughs**). I feel really bad (*laughs*), so yeah.

I: Okay, alright, ehm…so, what kind of information, ehm…I asked you a similar question before, but ehm what kind of information would you find very useful in ehm a tourism application? For example, you said with this itinerary, this recommendation (P5 nodds, yeah), but is there any other? Or within this recommendation even…ehm, regarding a specific, specific recommendation? What information would you like it to have?

P5: Ehm, I think some sort of a planner, so when you're looking up things…You're going on a trip and you're looking up things, you can kinda start making an itinerary? (I: Ok) Ehm, say like "I wanna go to this place, this place and this place" there might be a million and one things you wanna do, but we might say you only have two days (I: mhmh), then, some sort of way to organise it? Maybe like a priority list or something like that? (I: Ok) Any type of way, so..you can yeah, organisation. I'm a really big person of organisation, so (I:yeah?)…

I: That's why you study Mathematics, right? (P5 laughs, yeah, exactly)

P5: I like order. I should have been born in Germany! *laugh*

I: But eh, you think it's very…ehm organising, but also a very personal thing is very important? That everyone can pretty much organise their own thing, like they want (P5 agrees, nodds), or would you like the application to organise it for you?

P5: Ehm, I think organise it how you want, because technology is super advanced these days, but can't quite read your mind (I: Ok), actually it can sometimes, I mean an app can't necessarily and I'd get frustrated if it picks something for you, but no I wanna do this and not that, so in doing it yourself or, if it does do it for you, some way you could change it, like "oh I kind of like the way it organised that, but I wanna do this in the morning (I: yeah) and this in the end. So, that there is a way it does it for you and you can modify it, manually.

I: Okay, alright. That's very interesting. Ehm…what do you, or what's your perception in general about information, which is provided by the tourism board, or example here in Dublin, the Dublin Tourism Board compared to information that is provided by other tourists, or other consumers?

P5: Ehm…by what types of information they provide?

I: Ehm…for example on a specific attraction. You know the Dublin Tourism Board has a way to promote, or give you information compared to other tourists telling you about their experiences about this attraction.

P5: Oh, like an actual info shop vs. a person. (I: Yeah, exactly) Ehm, I think a person telling you something is going to tell you their honest opinion about it vs. a tourist shop, they're gonna try and sell you on it, I guess I should say (I: mhmh) I mean, they're obviously not gonna say that their service is bad. Nobody is gonna say that "oh, services are terrible, you should never sign up for it" vs. an actual person will tell you their honest opinion and say "I personally think that this attraction is better than this one, and that one wasn't very much fun, ehm, you should probably do that instead" vs. yeah.

I: Okay, then ehm, which one do you prefer, personally?

P5: Ehm, it depends, ehm…a tour…I think, first going to a tourist shop would be good, because you can see what ALL the options are (I: mhmh) vs. someone that's visiting that place, they haven't seen everything (I: yeah). But, before you go, like if you have a friend that's gone there you could say "oh what did you do when you were there?" you kinda already have an idea in your head before you're going into the tourist shop. Ehm, I guess if I HAD to pick one or the other, I would pick tourist shop, just because all the options are there for you to see vs. (I: yeah) someone who has travelled to Dublin for two days "oh yeah, I have seen everything I was there for two whole days" *laughs*

I: He was in Temple Bar for two days…

P5: Exactly. Sit in bars the whole day "Yeah you should go and check out that museum, maybe…*laughs* yeah, so I think the tour operator would be better, just because you have all the information vs. just a little bit from someone who has just visited for a short time.

I: Yeah, okay. Alright, good. Ehm, do you actually use Facebook to share different things of your life, like status update, or share photos of where you've been like check-in places, things like that?

P5: Ehm, I don't update my status on Facebook very often, but I do (I:Really??) *laughs* I know! I'm a terrible person! But I do like to look at my friends' pictures when they go some place (I: Okay) just because…and I'm a very visual learner…ehm, so I like to visually learn things vs. someone telling me something. It's not gonna stick in my head as much as when I see it, so if I'm looking at

pictures, I might remember like "oh this place is really cool" but if someone just says "oh I visited this city, it was a lot of fun!" then, I wouldn't remember. But I personally…yeah, so I don't update my status very often, and I don't post as many pictures another person does, but I do enjoy looking at other people's ehm…photos from their trips and stuff.

I: Okay, ehm, if this kind of thing, like ehm, to generate your own content and to share it with your friends or with other people in public, or whoever, would be available on a tourist application, would you make use of it?

P5: Ehm, yes, not because I would be the one wanting to share, but because I would wanna see other peoples' things, just to see what it looks like, like "yes, there is a Dublin castle, I know there is a Dublin castle, but what does it look like?" and stuff like that, so I wanna see other peoples' pictures of it, so I could see what it looks like before I go there. (I: Okay) I mean, that's…that may ruin it slightly, seeing knowing what it looks like beforehand, but it's like, it's different from a picture vs. seeing the real thing. So, if I'm gonna visit the place, I know I'm gonna take a trip to a certain city, I could go on the app and look at the peoples' pictures from that city to see maybe how long would I wanna stay there, how much stuff is there to do (I: Yeah). If I'm making a huge trip to a bunch of different cities, then…how much time would I want to invest in this one specific city.

I: Okay, alright. Ehm, okay, so what's your opinion on combining a tourist application with eh…the gaming part? 'Cause you like gaming, right? (P5: slightly..) I mean come one, half of your applications on your iPhone are probably games, aren't they? *laughs*

P5: Ehm, eh, I mostly like puzzle games *laughs* to be honest (I: Like Sudoku, and all) yeah and like…we have to move the blocks and get the one red block out (I: Oh, Unblock me) yes, exactly! *laughs* exactly, yes! Ehm, and things like that, ehm..I don't really like Racecar games and anything like that (I: Okay), I usually like ones that are…a bit challenging, I like challenge games, I guess. (I: Where you have to solve things?) Yea, exactly!

I: So how would you like if eh, for example you would have to go to different, you, you open the application right, and you are in a city where you've never been before and ehm, you have to walk or you have to get to different destinations and solve like puzzles, quizzes, whatever in order to go to the next destinations, and you know, find things around this destination, or you know whatever..

P5: Like a scavenger hunt type of thing?

I: Yeah exactly, like ehm, which takes you around the city to explore, but combines it with this gaming part.

P5: Ehm, I think that would be really cool. I wouldn't wanna do that for my whole vacation, but, have you ever heard of Geo Cashing? (I: No) Okay, Geo Cashing…I do this thing it's called Geo Cashing. So basically, it is…it's worldwide and it's…when I first heard about it I thought it was really interesting, it is…so there is a Geo Cash website, and people take a box or something and you put a log sheet inside of it and you can put like anything you want inside of it. And basically you hide the box. It doesn't have to be a box, it could be like a magnet. Anything, you hide something around the world wherever you want, and you upload the GPS coordinates onto the website (I: Okay) and you like make a name for the little hiding spot and stuff, so what other people do is, there is so many of these all over the world, and it's really interesting because there could be one in front of your doorstep and you don't even know. (I: Oh really?) 'Cause it's hidden! And so you go on, so when I go on vacation, sometimes, I don't do this all the time, but *laugh*

(I: Right…) sometimes, no really, it's only sometimes…ehm, I go and look at the city, and maybe the place where I'm staying and I might look up Geo Cashers that are around that area and so you look, you write down the coordinates, or you download the coordinates and you just use like Google Maps or something, or whatever, or some compass or something and you navigate, you have to navigate yourself to that hiding spot (I: uhuh) and then, it's just really exciting cause then you get to name, you get to sign your name and sometimes, like sometimes it'll be like a really big box like eh…one of those from like back in the war with the big…(I: oh okay, like a treasure box or something) yeah! And sometimes there is like toys or something in it or ehm…I go out to the desert a lot out in California and they hide huge boxes and they put like zipties, or something that might be of use, like a screwdriver that kinda thing (I: Okay). So, the rules are if you take something out, you have to put something with greater or equal value back in. (I: Oh wow) So it's kind of like a scavenger hunt, 'cause you have to find this box in some place (I: yeah), so yeah, I like scavenger hunts and things like that, so I think that would be really cool just as like something to do, but not something to do the whole time. (I: Okay) Just like as a side thing.

I: So, you…you never know what's actually inside the box? Unless you know…until you open it? (P5: No.) Okay, and that's really…what, famous in America?

P5: It's all over the world actually. (I: Okay) It's gone into fashion in Germany already (I: Oh, wow. I need to check that out.) Yeah, it's really cool, just make an account and then…yeah you have to have some sort of GPS, like your phone is Okay…but it's really hard, 'cause the accuracy for…'cause it pinpoints to the exact spot (I: Yeah), but the accuracy of the phone might be like…20 meters off or something (I: Yeah, exactly), so it's really hard because it's hidden and you don't see it. Like, I've had ones that are a sign pole, you know the poles are hollow (I: yea yea), there was a magnet inside the top, in the whole from the top (I: Are you serious?) and this magnet…yeah, I thought it was really cool. And like, there is hints to it, if you can't find it. Like people, on a thing you can say "Show Hints" and it will give you a hint like…I don't know, I don't know what, it will give you some sort of hint (I: Okay) to find the object, yeah. So…(I: Oh, wow) so I really like puzzles, and scavenger hunts, and anything that's challenging to you. That would be fun!

I: Okay, so what do you use then for like GPS, if you don't use your phone? What else can you use?

P5: An actual GPS.

I: Like eh…car navigation, or…

P5: Well, a little hand-held GPS that you plug into the computer like with the cord (I: Okay) and you can download the coordinates on the GPS.

I: Oh, I see. Wow, interesting. Okay, alright then ehm, let's see, eh..when you have an application, and we take this one step further, what if the application could not only provide you the information, but also you could purchase a ticket, or book a room or book a table in a restaurant ehm…through this application? Would you consider doing that?

P5: Ehm, I know there are some application where you do things like that already, and I'm one of those people who are really paranoid, so I probably wouldn't just like "how do I know that it actually booked it?" *Laugh* And, ehm, I still use like the phones or call places rather than just booking it online (I: Okay) just because I'm a super paranoid person (I: Alright) so I probably wouldn't use that, but I mean

it'd be a good idea to look at prices (I: Mhmh) maybe, to see how much that is, and then going and booking it just 'cause it's…I mean you always have your phone with you pretty much, so it's easier to just look it up instead of like, yeah…call somebody first and then be like "oh I actually don't like that price" (I: Yeah) I'm not gonna book it. (I: Yeah) "Thank you anyways!" *Laugh* (I: "Thank you for wasting your time! Thank you!") So, I'd probably use it for that aspect, but not for the actual booking process.

I: Okay, so is it more like ehm, eh…for you…a trust issue whether or not it's actually done rather than putting your credit card details in and thinking "oh, what if the company is not that trustworthy?"

P5: Oh that's true. *thinking* yeah, that too actually. Like I know there is like this new thing, that stores can do that they can now accept credit cards, when you like plug it into the headphone jack or whatever on your iPhone (I: Yeah) or whatever and you just swipe like (I: You just swipe away your card)… *hesitating* I don't know about that *Laugh* Yeah, so I think it's mostly a trust thing for me (I: Okay, for both?) For both. Yeah, the credit card information, plus like "how do I know if it actually booked?" (I: Yeah)

I: Okay, alright good. Ehm, just a last question, what do you think, ehm…after discussing this topic, do you have any other, like suggestions, or advice, or things you would like to see on a tourist application, that you think would be really cool if you… you know, this application could do it, or something like that? And that doesn't have to be like ehm,…anything restricted to what is available now, but whatever you want, whatever you would like this thing to do (I2: In Augmented Reality apps, yeah?) Yeah.

P5: Ehm, well, whenever I plan on going some place, like maybe go to a city, I always google top things to do in that city. (I: Okay) So, ehm…I think having some sort of rating maybe, like…so it has an attract…it lists all the attractions in the city and then like, you know the 1-5 star thing, and then so the people, other people that are using the same application when they go to it, they can rate that place (I: Okay) and so you can just kinda see like travellers' ratings on how good it is actually, whereas of someone just typing something "yeah these are the best places" but that's just something about my personal opinion (I: mhmh) vs. it would be like a collaboration of everybody's (I: Yeah) opinions as a rating (I: Okay)

I: So also like reviews, yeah, star rating like they do on Amazon for example? (P5: Exactly) Okay (P5: Yea) very good (I2: WiFi? You should ask about that) Ehm, are you aware that eh…Dublin is currently working on eh…connecting the whole city or you know, distributing a WiFi network throughout the whole city? *P5 denies* 'Cause your friend was telling me about the WiFi issue that roaming is really expensive and stuff like that. (P5: Yeah) Ehm, what if you could or use WiFi…ehm, anywhere in the city for a certain price? Would you consider doing that, especially when you go travelling somewhere else?

P5: A set price for using the WiFi?

I: Eh yeah, like say for example like per one day, or for certain amount of bytes or Mega bytes, or a week or…

P5: Hm, I would probably yes, be interested in that, just because like I said, we are addicted to our phones now these days and we're so used to having that instant gratification but like right now in Dublin, I can't because it costs so much money (I: Yeah) for me to use roaming data fees, so if we don't know where we're going I'm like "I can't look it up!" And you get all paranoid (I: Laugh) because you're so used to get that instant gratification (I: yeah) but if I…I would definitely use it.

It were obviously depending on the price, but if it wasn't too bad, I would definitely be interested in doing that, just because you have it, just so you have it (I: Yeah) and…

I: How much would you pay then? Like what was… what would be the maximum that you would say "Okay, I can…you know pay this and be happy with my WiFi" without having to think "Oh I spent so much for having the Internet"

P5: Ehm, I would probably say *hesitating* I'm not sure. I don't know how much Internet is..*laughs* How much is the Internet worth? Ehm, but I know like for…the roaming, I'm trying to compare like how much the roaming fee is (I: mhmh) to ehm…I think if…I would definitely pay 5 Euros for a day of WiFi (I: Okay) or even two hours of WiFi *laugh* (I: Wow, that's a big difference!) Yeah, that is a big difference! I was just thinking like "Oh what if I only wanna use it for like an hour, or two hours?" Then I'd probably still pay the 5 Euros for two hours of WiFi. (I: Okay) Ehm…yea, so I'd…if it were like…if it cost maybe 5 Euros for an hour, or per hour that you use it or like…no, more like 5 Euros for two hours. So for two hours, 5 Euros, I probably would pay that. (I: Okay) So I would…So if I would use it for like 6 hours that day and I'd have to pay 15 Euros, mh..*hesitating* I don't know if that'd be like…that'd be like the maximum I would pay (I: Okay) absolute maximum. If I'm desperate, that would be the absolute maximum that I would pay.

I: Yeah, alright. So it's more like maybe around 10 Euros per day you would say, around 10 Euros per day and you would be happy to pay that and use the WiFi.

P5: Yeah, I would pay 10 Euros per day or something like that. (I: Alright, okay. Very good.) I don't know I feel like if it were by hour, it would be better. If you could buy it like for an hour, because you might not necessarily wanna use it all day. (I: Mhmh, yeah, exactly) Type of thing…but yeah. I don't know, I don't know…it's pretty cool that one is working on that. That's really…how is that even possible like…you need a really good router.

I: Would you just you know…regarding the WiFi. Would you rather pay by hour, or by time, or would you rather pay by the amount of WiFi, or the amount of Internet you can use? Like 500Mega bytes, 200 Mega bytes, 100 Mega bytes?

P5: Well, I'm not sure how much the Mega bytes would go…I don't know, I don't know how much Internet that is…I don't know ehm…I guess going by Mega bytes would probably be better, just because it asserts in what you're doing…'cause when you're going on a Facebook app or googleing something on the Internet (I: uhuh) those two things, if you're doing it for the same amount of time, it would be different Mega bytes, right? (I: Yeah, exactly) Well, then I think probably Mega bytes would be better? *hesitating* Maybe, just because it's more exact (I: mhmh) vs. if you do pay per hour you might not necessarily be using the WiFi for the full length of the hour? (I: Yeah) So, I feel like Mega bytes is just kinda…for saying how long you're using the Internet for? 'Cause I feel like when you're travelling…I don't know I wouldn't spend my whole time using…Facebook app (I: Yeah) while I'm travelling. I'm probably most likely gonna use it for looking stuff up and how to get to places, so it's gonna be the same type of things that you're doing the whole time. So it'd be like it wouldn't matter, so it should be based on length because you're doing the same type of thing the whole time. Do I make sense? (I: Yeah, definitely) So I think they're both based on time, but this is…the Mega bytes would be a more exact time length vs. "oh I only used it for 45 minutes, but I still paid for the full hour", so I'd be like "Mega bytes is probably better"

I: Okay, alright. Good, very good. Thank you very much! Ehm, just ehm…before I let you go ehm, is it, or would you mind to leave me an E-Mail address so I could if, regarding this research, ehm 'cause you know it's just the initial stage. It's gonna go on later and if I have like one or two more questions that pop up later on if I could just contact you per E-Mail and ask you over E-Mail?

P5: Eh, yeah. Ehm…like how far, like three years down the road, or…

I: Eh, no no no, just within this year probably.

P5: Oh okay. Do you want me to write it on the paper?

I: That'd be great.

Interview Transcript: TP6

I: Do you wanna see yourself on the camera? Or should I just black it out?

P6: No, I don't…

I: *laugh* Alright.

P6: BA is university?

I: Eh, yeap. It's just a Bachelor. (P6: Okay, thank you.) You're welcome.

P6: And what do you mean when you ask for 'method or means of travel'? Like Leisure?

I: Ehm, 'means of travel' like plane, train, car… (P6: Ah, okay) Alright. Thank you very much. Ehm…before I ask you the questions, I want to show you a third example of how it can be done, which is a bit different from what I've shown you before. (playing Tuscany+ video clip) Alright. This application was actually developed a couple of years ago in Tuscany. (P6: uhuh) Okay. Alright *laugh* Okay, when did you guys arrive here actually?

P6: Today! (I: Oh, just today?) Yeah.

I: Oh, wow so you just got here. (P6: just today)

P6: Yeah, well actually we were living in Birmingham. (I: Birmingham?) Yeah.

I: Oh, I see. (P6: Yeah) Are you studying there, or…

P6: Before yes, now I just work there…

I: Okay, what are you…what are you majoring in, or working in?

P6: But, in Spain I studied Journalism (I: Oh, okay) but here it's really hard to find a job like that and I'm working as a Sales Assistant (I: uhuh)

I: Oh, I see. Oh that's great! (P6: yeah) Okay, good. Alright. So, ehm…I mean I've shown you some examples already… are you, do you currently have a smartphone or tablet, or anything like that?

P6: I've got a smartphone.

I: Okay. And ehm…how do you…or currently, how are you using your smartphone? (P6: well…) for what purposes?

P6: Usually to contact with my friends (I: mhmh) and… yeah the majority as…I use Facebook, Whatsapp and a lot of connection with WiFi. Yeah…

I: Okay, alright, so…Internet is very like Social Network and stuff like that?

P6: Yeah, actually I don't use so much for college.

I: *laugh* Okay, yeah that's fine. Me neither. (*laugh*) Alright, good and ehm…what do you think ehm…why is it good that people have a…have a smartphone?

P6: I think…you…you are connected with everything in a second. (I: Okay) Like the application here you showed me is…is really impressive. You go to a place and just with a tablet or smartphone you can see where you can go. (I: mhmh) Because when you're going…you're travelling…you arrive the first time to a city, you have no idea where to go. For example today, we take a trip and they tell us some of the places where you can go. Usually you think, maybe they get paid for that (I: Yeah) and they begin that path for something. But with that, you're the one that chooses (I: Yeah, okay) For example the…I think the application show you different restaurant (I: mhmh) and you say 'okay. I can go to that one.'

I: Exactly. Yeah, alright. So ehm…you think it's very important that eh…you have pretty much the power to decide for yourself (P6: yes *nodds*) or what you want to see, what you want to do. Okay, then travelling…good, alright. *P6 keeps nodding* Ehm…and how would you describe like now you told me before you

didn't know about Augmented Reality, right? (P6: Yeah) And if you would have a friend for example who asked you 'yeah, what is Augmented Reality?' and now that you've seen some examples (P6 nodds) how would you describe it in your own words?

P6: Ehm…I would say, you've got an advert for example in a restaurant and if you put your smarp…smartphone or tablet on the top you…the screen changes (I: mhmh) and you can see 'inside' (I: Okay) that advert.

I: Alright, that's very interesting, okay. Eh…so which one of those examples did you actually like the best?

P6: I think the first one you showed me. The one where you can see the…the menu of the restaurant.

I: Okay, that you liked the best? Why is that?

P6: I don't know, like…the video is really nice. (I: Uhuh) But usually the videos take time. (I: Uhuh) and maybe after one minute or two, you're bored with the video. (I: Okay, I see) But with the other, with the menu, you see en I…well, just in a sec, you can see about the different dishes they've got (I: Yeah) and the price (I: Okay) and you think 'Okay, I'm going in'.

I: Alright, okay good. How about the third one, the…the Tuscany one?

P6: That, I like it as well. Is…is the one…I didn't know they've got that kind of application where you can choose the different restaurants and if you…it's like Google (I: Mhmh) and they tell you 'where are you' and 'where you want to go' (I: Exactly, yeah)

I: Like ehm…what's that…the GPS kinda thing (P6: Yeah). They do that a lot.

P6: It's really good as well. The video as well. But I prefer the other ones.

I: Okay, yeah. Very good, alright. Ehm…so, which, why haven't you used these Augmented Reality technology before, or applications? Because when you actually type in 'Augmented Reality' into the App Store for example, you would get a lot of applications about Augmented Reality (P6: Uhuh). So, why do you think you've never…you know…used it?

P6: I…to be honest I haven't hear about that. (I: Okay) I…it's the first time I hear about that kind of thing (I: Just…alright.)

I: Alright, okay. Ehm…so which…you know…aspects would you find most important, or important or valuable for those applications in…in…while you're travelling or…on holiday?

P6: Well first…first of all I think, the thing I told you, you would have the power to make a decision (I: Mhmh, yeah) and…you're gonna be more confident when you go to a place, a new place. (I: Mhmh) Because you know with that, you are gonna be…are gonna know where you are gonna be all the time. (I: Yeah) You're not gonna lose yourself or anything *laugh*

I: Yeah, that happens to me quite a lot actually! (P6: Yeah, me too!) Okay.

P6: Yeah, I think it's really good, yeah.

I: Alright, good. Okay, ehm…let's see. And ehm…do you see any maybe problems that you could…you know come up while you use those kind of applications?

P6: Well, maybe I've seen one with the tablet. (I: Uhuh) Because I always think it's too big to carry around for awhile. (I: Okay) And with the phones, it's good as well but usually the battery in all of them is really…sucked. (I: Okay, yeah) So probably you go…oh well and also the WiFi. (I: Yeah, okay) Because if you live here in England and you've got an English phone you can use the WiFi, but for

example…eh, with my Spanish one, it's the one that I've got on my smartphone, I need free WiFi, otherwise my Spanish company is gonna…I have to pay lots…

I: yeahyeah, and there is a couple thousands already summed up you know (P6 laughs and nodds) very fast.

P6: So, I couldn't use it right now (I: Oh yeah), but if you got free WiFi I think Dublin has in some parts, that's really good as well.

I: Okay, yeah. Oh so you're aware of the free WiFi in Dublin? (*P6 nodds* Yeah) Are you using it?

P6: I used it just for two seconds. After, I lost it *laugh*. I was inside the bus and I see 'Free WiFi' I tried, I connected, but after, I lost the connection (I: Uhuh, oh)

I: Okay, because the bus was probably moving somewhere else (P6: Yeah, maybe as well.) I think until now they have only like in certain streets they have the WiFi (P6: Oh, okay) but they want to expand it more and more.

P6: That's really good as well.

I: Okay, what if ehm…for example you would have to pay for WiFi to…you know…I don't know, a certain amount to have this much WiFi, would you eh…be willing to pay it?

P6: Yeah, if it's not too much, and you can use it in the time you're gonna be in the city (I: Uhuh), I would pay for that.

I: Okay, how much do you think you would pay and still be happy to use the WiFi?

P6: Well, not as much as for example a call or text message is gonna cost. (I: Okay) I don't know, maybe…mh…I would say I don't know 3 Euros a day or something like that (I: 3 Euros a day?) or 2?

I: Okay, that you would say you'd pay and be happy with it? *P6 nodds*

P6: Yeah, because if it's more I would…it's the…I think it's the amount of the Spanish company I have to pay.

I: Yeah, okay. Alright, good. Ehm…can you tell me maybe, or can you think about some criteria, ehm…you would love to have in the application, that you would love to use in a tourism application that would…you know make you open it repeatedly, or make you use it repeatedly?

P6: Hm, I don't know. Maybe…I don't know if you can comment the applicat…that kind of things. I don't know if the application has that (I: Mhmh)

I: It doesn't matter. I mean we're still like…it's not developed, yet (P6: Okay) So…

P6: Okay, well I would like to comment (I: Uhuh), and…also, maybe you can have some kind of…not price, but if you got some…you need people to use that (I: Mhmh) so you can put some kind of price or…some kind of play with the different adverts you've got…I mean that's fine as well.

I: Okay, alright. Okay, good. Ehm, do you think there are ehm…factors that would, after using it that would make you stop using it, the application, where you think "Oh no, I don't want to use that anymore!"

P6: I think, if that happens, it's because you've got too many choices and maybe you're over confused with that (I: Okay) so lot of things. That happens sometimes when you are eh…with Internet, and you type something with Google (I: Okay) and suddenly appear 100 pages and you don't know which one to view (I: Exactly, yeah)

I: Where do I start now? (P6: Yeah) Okay, alright. Ehm, do you think, or what do you think about eh… the content, you mentioned 'comment' before, right? (P6 nodds, yeah) So what do you think about any content or information that is

provided by a tourist board, or tourist office compared to information that is provided by other users?

P6: Eh well, tourist… tourist information is usually good, because usually they can give you more information for example I can give about a city (I: Yeah). But for people like me, is it gonna say things I want to know and is there are…or…the…no the…ehm…ah…opinion, their own opinion! I mean (I: Okay) for example if you…I'm going to a pub and the staff is not good to me, I'm gonna say that (I: Yeah). And if the tourism, I think they would never say that. (I: Okay, yeah that's true) Or for example you go to a place and the carrot cake is amazing (I: Mhmh) you can say 'You have to go there and try the carrot cake (I: Yeah)

I: And the tourism board cannot give you like specific like…this type of information.

P6: I don't think so. Maybe they can do it. But I think people trust more in another people (I: Yeah) because you are a tourist as well.

I: Yeah, okay alright okay. That makes sense, okay. Ehm, what do you think about ehm, eh…like those kind of contents. Let's say you could create those contents yourself (P6: Yeah) and you could share it with your friends or with anyone in public. Would you be interested in that kind of thing?

P6: Yeah, I would be interested!

I: And also like to share it with the public?

P6: Yeah I think so. I…actually I do it. (I: Okay) For example with Easyjet (I: Oh, yeah?) when you travel with them, they after send you like a questionnaire on your mail (I: Uhuh) and you can answer, and the rest of the people can read about the travel, well the trip (I: Okay) and also with some hotels you can do the same (I: Yeah). Eh, the thing…when my friend and me we go, we book the hotel here, we check eh…the things they've got and after the comments of the people that went there

I: Oh, I see. (P6: Yeah) Okay, interesting.

P6: And that's one of the things we decided to pick that one.

I: Oh, okay. So you're actually staying in this hotel, or…

P6: No, it's not this one, it's another one. (I: Oh, okay) But we picked it for that. (I: Oh, I see.) I don't remember the name now…

I: Alright. *laugh* Okay, alright good. Ehm, so what do you think about ehm…like…do you play any games on your cellphone?

P6: Well, ehm… (I: Come on…) *laugh* See, yeah sometimes. I…well, I know the name in Spanish. I play one, it's similar to Scrabble (I: Okay) but I don't know the name. (I: Alright.) It's in Spanish it's called 'Hablarados'. So you (I: Okay) you play it with some friends. You put a word, and after the other puts another…

I: Oh, I see. Okay. So you're actually connecting with your friend and playing it together?

P6: *nodds* Yeah. Eh…

I: Would you…oh go ahead.

P6: Nono, it's okay.

I: Would you be…or what do you think about combining games with like tourist applications?

P6: I think it sounds really good. (I: Like…) Yeah because you're doing…it's the same when you are…when you travel with your school (I: Uhuh) I remember one trip we went to a city and you know the city they did about…like eh…'Jinkana' I don't know if they change the word. (I: 'Jinkana'? Was it a…) It's like…when you've got like different steps to do (I: Mhmh) and in every step you do you've

got for example a little present and when you…it's like a puzzle. (I: Okay) And when you put all together you've got the treasure.

I: Oh yeayea. It's like a 'treasure hunt', isn't it? (P6: Yeah, something like that.) Okay, and you…you would like those kind of games?

P6: Yeah, I remember… I think if I had something like that, I would do it.

I: Okay. (P6: Yeah) Would you also like…download an application just for this?

P6: Yeah, because it's a play, but at the same time you are…knowing the place. (I: Yeah) I mean for example if you got something interesting about Oscar Wild (I: Mhmh) but you can read that in the books. But the people who do the application know something (I: Yeah) so you have to try to figure out…figure out what's that thing (I: Yeah) or something like that.

I: Alright very good. Okay, ehm…would you…let's eh…if you take that information thing a little bit further. Let's say you could use those application to not only see what the menu is like, but also to book a table, to buy you know…tickets to a theatre, opera, or whatever. Ehm…to actually purchase something, would you be interested in doing that?

P6: Yeah, as well. Yeah, it's the same as like eh…use your computer at home. (I: Okay) It's similar.

I: Do you think there is any problems when you…in an application that has that option? Or where do you see any problems?

P6: No, I mean…I think at the moment, I haven't seen anything. No because you can use the same, you said to book a table or whatever? (I: Yeah) You can see the information first, and after call them or book on…with the E-Mail (I: Yeah) or…I think I haven't seen any problems in that.

I: Okay, and ehm…you usually do like eh…have you used your mobile application to actually buy something?

P6: With my mobile just eh…tickets for the coach. (I: Okay, alright) Coach tickets, yeah.

I: So you don't have any problem with like…you know, putting in your credit card details or anything like that?

P6: No. *shakes head*

I: Alright, okay. Ehm…just a last question actually… (P6: Uhuh) ehm…do you, after seeing those applications and for tourism when you think about it, do you have any ideas how…you know, we could make it better for tourists, or more attractive for tourists, the application, to actually download it?

P6: I don't know the things I told you maybe put some kind of games or… (I: Mhmh, okay yeah) or some kind of puzzle and you can have a picture at the end or…(I: Okay) I don't know, something like that.

I: Alright, okay good. So entertainment. To combine it with some kind of entertainment? *P6 nodds*

P6: Yeah maybe that would…maybe that works.

I: Yeah, good! Okay good, very good. Alright, thank you very much already. (P6: It's alright.) It was very…very informative. Ehm, just a last point, would you mind ehm…giving me your E-Mail address just in case, because ehm…right now those questions, it's all pretty much at the initial stage, at the very beginning of our research (P6: Uhuh) and actually we're developing the prototype this year in around summer (P6: Uhuh) and then maybe there is like one or two more questions that I'd like to ask the…you know the participants that participated already and eh…if I could just you know, contact you by E-Mail if there is anything coming up, that would be great.

P6: Yeah, should I just write it there?

I: Yeah just here is fine, yeah. Alright. Thank you very much for your help.

P6: It's alright. It's really interesting.

I: Thank you, I'm glad.

Interview Transcript: TP7

I: Okay, let's see. Before we start, I want to show you another thing, actually. Two of the…ehm, examples you've seen already, right? I've shown you upstairs. And here's another one. Ehm, this is a bit different, the approach, but it's also using the same kinda technology. (P7: Mhmh) Just have a look. *playing Tuscany movie clip* Alright. Ehm, that's my supervisor, Dr. Timothy Jung. (P7: Ah, okay)

I2: And you're based where? From where?

P7: Eh, well, I'm from Spain, but I'm living in Birmingham. (I2: Oh)

I2: Spain? Spanish? (P7: Spanish, yeah) But what are you doing in Birmingham?

P7: Eh, I'm studying English and working.

I2: Oh, sounds good English, your English, yeah? (P7: Well…) Good good.

I: Alright. So eh, before we start, would you mind filling out this, eh…profile sheet for me? (P7: Yeah) Would you like a glass of water? (P7: Eh, yes please)

I2: Did you two have a drink, or not yet? (P7: No, not yet.) After this one? (P7: After this one, yeah.) So how did you come…did you come here?

I: Eh…on the street *laugh* (I2: Street! Oh…very very good.)

I2: So you're representing Spanish tourist, I think.

P7: *laugh* My friend is Spanish as well.

I2: Alright, so another one is waiting?

I: Nono, I interviewed her already.

I2: Finished the interview? (I: Yeah.) Ah, okay, so she is waiting up there then? (I: Exactly.) I think we don't need any Spanish. No more Spanish. *laugh*

I: Alright. Thank you very much. Okay. So ehm…you…when you travel actually. You put here '3 times per year' like in average I guess, uhm…do you travel usually by...by plane, by train…

P7: Uhm, well this…last year, I came here…I came during like April (I: Yeah) and I was in a college like…in Summer School, in a Summer School. (I: Uhuh) So with the college we travelled a lot. (I: I see, okay.) In the college we travelled a lot, so…more or less 3. This year more than three times (I: Yeah.) but usually two times, three times. (I: Alright.) Like eh…normally we used the plane, eh travel by plane, (I: Alright.) but coach, whatever train…(I: Yeahyeah, whatever is most convenient.) Yeah, and cheaper.

I: Alright. Yeah, exactly. That's true. *laugh* Alright, good, ehm…do you actually have a…or use a smartphone or a mobile device or anything like that?

P7: Yes, I have a smartphone, yeah.

I: Okay, what do you…what do you use? Apple, or Android?

P7: No, Sony Ericsson, Experia.

I: Oh, okay. Are you happy with it? (P7: Yeah, very happy.) Yeah? Alright. What do you use it for?

P7: Eh, well…in Spain, I have a…like eh…tariff? I don't know, (I: Uhuh, yeah.) where I have Internet so eh…I just use my phone for everything. Looking for cinema, eh…almost for everything. Chatting, Whatsapp, (I: Okay.) for Facebook, (I: Uhuh.) my E-Mail…is directly to my…for almost everything.

I: Okay, when did you actually, eh…get that smartphone? When did you change?

P7: Eh, last year, in January. (I: Oh, okay.) Because in Summer I lost my…eh…other phone. (I: Alright.) So I have to buy a new one.

I: Yeah. And now, do you think if you would have to switch…to switch to another phone, you would eh…

P7: I would like to eh….iPhone 5. *laugh*

I: So you would stay with smartphone, nothing else?

P7: Yeah, nonono.

I: Alright, okay. Do you think ehm, or why do you think it's good for people to have a smartphone? For you personally?

P7: Well, because eh…I think that eh…you can search almost everything…and everywhere. (I: Mhmh) Eh…if you wanna…I don't know…eh…going to a restaurant, or…eh looking for something to do, (I: Mhmh) you don't have, you are not at home, you can check on Internet. (I: Okay.) Eh, I don't know, to the Social Networks, you can add your pictures, and keep in cont…keep in touch with your friends. (I: Yeah.) I don't know, even watching TV? *laugh* (I: Okay.)

I: Do you use it to watch TV, actually?

P7: Ehm, not in the street, because here I can't use it. (I: Uhuh.) But not watching TV, for example in Youtube, I used to watch like 'paramount' comedy (I: Okay.) but in Spanish. (I: Yeahyeah.) I used to watch it all the time. (I: Oh, really?) Yeah.

I: Is the Internet good enough to…you mean outside, with WiFi?

P7: Mh, it depends, for example in my college, there is a good WiFi. So in the freetime I used to watch it…(I: Yeah, in college…) *laugh*

I: In the library, right? (P7: Yeah, exactly.) Alright, ehm. Do you actually do, or is it fast enough outside as well? Outside of the WiFi?

P7: Eh, it depends. Not always. Sometimes, for example in Starbucks or some cafeterias (I: Yeah.), you can use the WiFi, (I: Yeahyeah.) but it's not good enough to watch videos, for example in Youtube. Just for check my E-Mail, (I: Okay.) or send some text in Whatsapp or something, (I: Yeah.) not more. (I: Alright.) Sometimes, you…if you wanna search something, eh…I don't know on Google Maps, (I: Yeah.) for example you wanna go to some street, it like…takes forever. (I: Uhuh.) So simple things in some WiFis. (I: Okay.) For example in my home it's very fast. So it…it's good. (I: Yeah.) Or in the college, actually it is very good, very fast. (I: Mhmh.) But usually not in the cafeteria or in the bars.

I: Okay, not in the public WiFis? (P7: No.) Okay. But do you know that Dublin also has a WiFi network now?

P7: Yeah. This morning, in the Sightseeing Bus (I: Yeah.) I watched like an advert 'Dublin Free WiFi' (I: Yeahyeah.)

I: Did you use it?

P7: No. No because I didn't find it.

I: Oh, you couldn't find it. (P7: No.) I see, okay.

P7: I…I think that I connected to the hotel WiFi (I: Okay.) in the bus, Sightseeing, (I: Oh, I see.) yeah. It's like 'Gresham' something, I don't know. (I: Yeahyeah) But I couldn't connect. Stupid. *laugh*

I: Okay. Ehm, yeah that's probably because the WiFi, they're still building it. *{7 nodds* And until now they only have it in a couple of streets. So, but eh…if you get the chance, definitely try it and see how fast it is, alright? It's free anyways. (P7: Yeah.) Alright, ehm…it…let's say you would have to pay for WiFi, you know, to use it. Per day, or per month, whatever time. Eh, would you be happy to pay for WiFi, like in the city for example?

P7: Ehm, not really, because for example, my situation here is temporary. I don't know how many times I'm gonna be here. (I: Uhuh.) Eh, eh…so I don't have a contract with WiFi all the time, (I: Yeah.) but in Spain with my contract I have WiFi all the time. (I: Yeah.) So I don't need this kind of service, yeah. (I: Okay.)

I: While you're travelling you don't need it as well? For example, if you could buy like 1 hour, two hours WiFi?

P7: Yeah, well, if in every place you have to pay, it's gonna be alright. You have to pay for using it, (I: Mhmh.) but the most of…a lot of cafés, coffee shops, or…some shops, or whatever (I: Yeah.) you can use WiFi for free (I: Yeah.)

I: Okay, so you wouldn't bother using it on the street.

P7: I don't think that I…I would be happy with this.

I: Okay, so would you say, you would rather look out for another coffee shop then? (P7: Yeah. *nodds* Probably. I used to do that in Birmingham, yeah.) Just wait until you're there. Yeah, me too. *laugh* Alright, good. So after, you know..you told me you've never seen Augmented Reality before, the technology. (P7: No. *shakes head*) So I showed you like three examples now. (P7 nodds, yeah) What do you think ehm…you would say to someone, say, your friend asked you, you know 'What's Augmented Reality?' How would you explain it in your own words?

P7: *thinks about it* Well, actually, I don't know if it's the same, but sometimes eh…it's like…I don't…some adverts have like eh…thing like this *shapes a square with her hands* in black and white (I: Mhmh.) and if you use…I don't remember the name, the name of the app, but you put in, you like…take a picture (I: Yeah.) of the thing, the phone tells you what is the, I don't know, the company, the use, what you can do with this thing (I: Mhmh.) I don't know if this is the same.

I: Yeah, it's actually a part of it. It's called QR-Codes. (P7: Yeah.) Yeah, you scan it pretty much with your phone, yeah.

P7: Yeah, exactly, you scan. Eh, well. How to explain…mh…for example, eh…let's say ehm…something that only ehm…without take a picture because it's only with camera (I: Uhuh.) you can know more about…I don't know eh…hotel or a…you can for example with a…restaurant (I: Mhmh.) you don't need to go inside and ask to see the menu. (I: Yeah.) You just with your phone you can just check if you're interested in this thing or not. (I: Mhmh.) It's useful I think, I think.

I: Okay, very good. Ehm…so after, you know, seeing those three examples, which one do you think would be the most useful for you, or do you think is the best of those three examples?

P7: Which three examples, for the…? (I: The, the ones I showed you, the menu, …) Oh the…okay. (I: …video, and now the third one here) Yeah. Eh…most useful…

I: Or which you liked the best simply.

P7: I think that the…the last one. (I: Okay. Why is that?) Eh, because you know with it you can look for everything. (I: Mhmh.) A restaurant, a cinema, eh…I think that you can do it everyday. For example with the…*pointing to her back* it's useful as well, the other ones. But I think that…in my case I use this kind of research everyday. (I: Okay.) 'Everyday', mostly in Spain, but here…as well, when I can.

I: Yeah, if you would have WiFi for example you would use it here as well. (P7: Yeah.) Okay. Ehm, what do you think are factors that have prevented you from using Augmented Reality applications until now? Or why didn't you use Augmented Reality until now? Because when you, for example in the App Store, when you type in you know 'Augmented Reality', there is a lot of applications coming up, but why do you think you have never used it?

P7: I don't know, I didn't…I didn't know that this actually exists. (I: Okay, yeah that's fine.) So…I heard about this application (I: Yeah.) you can scan this thing (I: Mhmh.) but I didn't know that you can take a picture of something, and they give you information about it. (I: Okay.) I did not...it's just…unknown.

I: Okay, yeah. Alright. And ehm, now that you know about it (P7:Yeah.) would you make use of such applications? (P7:Yeah!) Or be interested in finding out more about such applications?

P7: Yeahyeah, if I could this…you have to upload an application or something like that? (I: Mhmh.) Yeah, yeah.

I: Okay, and ehm where do you think would be maybe some problems that you'd think 'Uh…I don't think it's gonna work' to use those applications?

P7: Pr…probably you know for example I have an App Store in my phone, you can upload, eh…apps. (I: Uhuh.) But some of them are free and you have another you have to pay for…for them. (I: Yeah, I know.) So probably, if I have to pay for them, I don't…(I: Yeah. *laugh*) because probably in some months, there is probably another app free (I: Yeah.) like the other one (I: Alright.) so…

I: So, you don't generally, don't pay for applications? (P7: No.) You wouldn't, even if it's like a really good application, you wouldn't pay?

P7: Well, a good application…I don't know. *nodding and laughing* I don't know probably…it depends. It could be, but I don't know. I have to…you know, think about it.

I: Yeah. Probably see the application first, (P7: Yeah, exactly.) and how it works exactly. Alright. And ehm, what do you think would be some, ehm, you know some, some things that the application could do, alright, that you want to have in the application that would make you use it again and again and again? For example for like the tourism application, what do you want it to do for you?

P7: For example, I think the…you mean an application who is useful for me when I travel, right? (I: Yeah.) For me, this morning I was thinking, eh…I would like to have like an application ehm…you can, you can see a map (I: Uhuh.) of a city, and you can like select what you want to see (I: Uhuh.) and it makes you a route. You know what I mean? (I: Yeah, I know what you mean.) Like eh…it makes a route for you. I want to see for example here in Dublin eh…I want to see the Guinness Storehouse (I: Mhmh.) and Oscar Wilde house (I: Mhmh.) and Dublin Castle, blablablablabla and it can make a route for you (I: Yeah.) eh…I'm gonna stay two days, or something like that. (I: Uhuh, yeah.) I was thinking this morning. (I: Alright, very good.) Yeah.

I: So, pretty much like a planning…a planner. (P7: Yeah.) Okay, alright. And ehm, do you think there would be in the future maybe, after using such applications or whatever application that is, what do you think could make you stop using an application for example, all of sudden? Where you think 'Uh…I don't like this application anymore.'

P7: *pauses and thinks* I don't know. I don't know. Probably because there is another better than this? (I: Okay.) An application coming up better than this? (I: Mhmh.) I don't know.

I: Okay, alright. Do you…or which applications do you use the most on your smartphone? *P7 thinks* You were saying Whatsapp…

P7: Yeah. Whatsapp, eh…Shazam for music (I: Okay.) you know, you 'shazam' something. For example you're in a pub and a song is sing, eh sung, eh…it's eh…*laughs* and eh the phone tell you what song it is. (I: Yeahyeah.) It's really useful for me, I like music, so…(I: Okay.) eh, Viber? Viber is like a…it's for call,

free calls, (I: Oh, I see, okay.) but it's for…you don't have to pay, it's free. (I: Yeah.) Eh…Google Maps, Youtube. Mh…I don't remember more now. Like some games, silly games. (I: Okay.) Yeah? You know why, because here I don't use too much. I don't have…(I: Yeah, only in Spain.) yeah. I can't remember more. In Spain I…I use a lot. (I: Yeah.) Or my E-Mails, for the time. (I: Yeah.) And I think that's all. Ah, eBay as well. (I: Okay.) eBay, and I have like a Zara Shop, and H&M shop.

I: Oh, I see, so you shop actually on your mobile phone then?

P7: No, I don't shop on my mobile phone, but I check the…you know the clothes, and I buy…I buy it in my laptop. *laughs*

I: Okay. Oh, I see, alright. But what would happen if eh…you could actually with the tourist application…let's say, you saw the example, for example there is a menu, or there is some information about the hotel and stuff like that. Say if it goes one step further…eh, you could actually buy something. See, you see the menu and you can use your application to book a table. You can see for example the concert time and you could use the application to buy a ticket. You know, would you be willing to actually buy things on your mobile phone? (P7: Yeah, yeahyeahyeah.) Through this application, yeah?

P7: Yeah, because I think it is very useful. It's…it's faster than if you have an application you can choose restaurants, eh leisure, I don't know, all the things that you can do in a city, (I: Mhmh.) it's very useful. Yeah.

I: Okay. How come you haven't bought over eBay or H&M or anything like that?

P7: In my phone? (I: Yeah, on your phone.) I don't know because I always do it in my laptop. I…I feel that is eh…safe, some more safe doing it in my laptop. (I: Okay.) And I think that is not true, because it's my WiFi (I: Yeah.) so it's…it's the same thing.

I: Okay, alright. So you'd be willing to buy on your mobile phone as well (P7: Yeah.) eventually? (P7: Yeah.) Okay, ehm…what do you think in general about eh…while you're travelling for example eh…for example any information that you get from the tourism office compared to…or any information from other companies compared to any information eh…that you can get from other users or other tourists?

P7: I used to check before, for example when I booked a hotel, a hotel. I used to check the…the customers' opinions. (I: Okay.) Always, in a hotel, always. Eh, well the tourist, you mean for example the tourist centre in the middle of a city? (I: Yeah, exactly.) I used to go to the tourist centre for get a map. (I: Oh, just getting a map, nothing else?) Just getting a map, or ask 'how can I get here?' or 'what, which bus I can get to go here?' (I: Okay.) or something. I used to check before I came in a city (I: Mhmh.) what I want to see or what I want to do.

I: Okay. So do you think eh…it would be useful to have all those things in an application? Would you rather use the application rather than tourist office, or would you still go there?

P7: Yeah, because even though I upload a map in my phone, just in case I can't get one here. (I: Okay.) Because in some cities, it's very easy to get a map (I: Yeah.) in every place (I: Yeah, exactly.) in a lot of…but in other cities, you can't. So I say, this time I wanna get a map in my phone just in case I don't get…

I: Oh, I see. Okay, alright, good. Ehm, what do you, or you mentioned that you play some games on…on your mobile phone, right? (P7: Yeah.) Eh, what kind of games do you play?

P7: *laughs* I don't know if I have to say that.

I: *laughs* No you don't have to.

P7: Well, it's an app, I…I work as an Aupair, so I eh…I look after a kid. (I: Uhuh.) She is all the time playing a game that's called 'Pooh'. (I: Okay.) It's like a mini pet, and I used to play this game. *laughs*

I: Do you just play for like, you know, passing time, entertainment, or…

P7: Yeah, in the bus, or…

I: Yeahyeahyeah. What do you think about ehm, if you could play games on the tourism application? What do you think about that?

P7: I'm not sure if you're gonna go to the tourist application to play games. (I: Mhmh.) I'm not sure about that.

I: Ehm, for example if you could play a game like eh…

P7: Online, with people or something?

I: Yeah, online with other people, or…you know solving puzzles while you are being a tourist, you know you go like to different attractions and you see, you have to solve a problem there and then in order to go to the next eh…destination or attraction. You know those kinda games that you can play with many people maybe.

P7: I don't know, I'm not sure, I don't think so.

I: You wouldn't play that?

P7: No, I…I used to play eh…like it's a game online, (I: Mhmh.) eh…it's…the name in Spanish is 'Hablaparados'. (I: Okay.) It's like a game of words (I: Mhmh.) that you have to make words with some letters. (I: Yeah.) The game gives you some letters and you have to…I used to play with my friends, you know. But it's online, but I don't know if I would play tourist game, online tourist game or something. (I: Okay, alright.)

I2: Or if you have a quiz about a castle, some game about a castle.

P7: Oh, something like that.

I2: To find some questions about a certain place.

P7: Like eh…quiz or something.

I, I2: Yeah, exactly.

P7: Yeah, yeah, it could be fun, yeah, yeah. I would try that, I think.

I: Mhmh, but would you like download the application just to play the game, or try the game, or what do you think…

P7: Well, I don't know. I don't know that. *laughs*

I: Alright, okay, fair enough. Altight good. Ehm, let's see, just a last question, after you know you got introduced to this tourism application, or mobile application, do you think you…there are some things you would like this mobile application to do for you, or where you think 'Oh, if there would be some function like this, it would be great, it would be awesome. I would use it.'?

P7: *thinks* Well, I think as…I told you before, I think that if there is an application, I think that is very difficult that you can't like join a lot of things (I: Mhmh.) like eh…making a planning for you, you can plan all the, for example in the morning, I'm gonna go to the Guinness and I'm going to the restaurant, so I can book for the restaurant, (I: Mhmh.) and in the afternoon, I want to go…I don't know to an attraction, and then book the dinner and then looking for the bus near the, for example Dublin is not…eh…is walking distance (I: Yeah.), so you can…for example in London is very big, so you can find a restaurant in your area you know…with your preference. (I: Okay.) I don't know, you can register and choose your preference, or…I don't know..I just can't…

I: That's alright. That's already really good. Okay, where did you encounter many, I mean you've been travelling for some time now. Where did you encounter some…some problems while you were travelling? Or some things where you were saying 'Oh, that was really annoying while I was travelling.' And that doesn't have to be on your mobile phone, but anything while you travel.

P7: *thinks* Eh, sometimes the ehm…you know the facilities in the city, for example in London it's a little confu…for example the tube is easy to use. (I: Uhuh.) But for me at least, the bus, the bus in the centre is like crazy. (I: Oh, really?) You can't understand anything. No, I can't understand. The tube is very easy, but for me, it's better to go for the bus, because you can see the city. (I: Yeah.) If you go for the tube, you are…you can't see anything. (I: Yeah, exactly.) But I always take the tube, because it's easy.

I: Yeah, fair enough. So you would like to have a clearer bus system? (P7: Yeah. Yeahyeahyeahyeah.) Okay, alright. Very good. Okay, thank you very much already. That was great. It was great information. Just maybe, if I could ask you, would you mind giving me your E-Mail address, because this is actually just an initial stage of the interview, or research, so with those answers, we're gonna analyse them and then see 'Ok, how can we develop a prototype?'. And then, once the prototype is developed, maybe there is like some more questions that I would like to ask the participants, right? Just you know if I could E-Mail you in any case. (P7: Okay.) It's gonna happen within this year anyways. So just in summer maybe around that time. (P7: Okayokay.) That would be great. If you just write your E-Mail address just maybe underneath. Thank you very much. Thanks a lot for your help. (P7: Thanks to you.)

Interview Transcript: TP8

I: Okay, let me ask you the first question.

I2: Wait, show her the Tuscany video first.

I: Oh, yeah, we need to show you the video as well, just as third option.

playing the Tuscany video

Okay, so I start with the first question. Okay, are you currently using a smartphone, tablet or other kind of mobile technology?

P8: Yes, I am.

I: Okay, ehm, and how are you currently using your smartphone?

P8: How am I using it? I'm using an iPhone.

I: And are there any like…or do you use it for example…

P8: I use it for the Internet, Social Networking, ehm…what else do I use it for…ehm, camera and my music as well.

I: Okay, perfect. And why do you think it's useful to have, or use a smartphone? Like why do you think it's useful?

P8: Ehm, I use my smartphone for pretty much everything. I think it's useful for, it's definitely useful for, if I'm on the go to check my bus timetables, or for example if I'm travelling to look up information on the area ASAP, or I use it, I also use it for my alarm, everything.

I: And what do you use it on a daily basis?

P8: Yeah, I use it everyday.

I: Okay, how would you describe AR to other people in your own words?

P8: Describe what, sorry?

I: Augmented Reality.

P8: Ehm, how would I describe it? (I: Yeah.) I think it's very, very useful, very modern, ehm, I don't…I don't exactly know what you're looking for in that question.

I: Like after, for example after viewing the three different Augmented Reality applications we showed you, like for example text based, video based, like what were your views on that? How would you describe it in your own words after viewing the previous examples?

P8: Yeah, very, very useful. Ehm, I'm interested, I'm intrigued to see what it would be like to use the application, like the Tuscany app.

I: And would you use, would you use the application on a daily basis?

P8: Yeah, everyday.

I: So, what are the factors that would prevent you from using AR applications?

P8: There would be no factors.

I: Have you used any previously?

P8: No, I've never used it before, so I'm intrigued to use it now.

I2: Would you ehm, say, let's say after you saw what it was actually (P8: Yeah.) and ehm, some friend would ask you, you know 'What's Augmented Reality?'. What would you tell them actually? How would you explain it?

P8: Eh, that's…that's a hard one actually. I'd say that you know, you hold your iPhone or your iPad up to your…this block, and all the information comes down instead of actually having to look it up online or go into the place. You can just hold it up and it will come up straight away, all the information and what you need to know. (I2: Okay.)

I: Okay, and which aspects do you consider important or viable in an Augmented Reality application?

P8: Ehm… (I: Which aspects?) I don't know like, if it was a restaurant, I'd like to know what is on the menu, or if it was somewhere like a tourist attraction, I'd like to know why is it, or what was…what was the interesting aspects of the tour.

I: Okay, ehm, okay what do you think about the AR experiences that we were showing you before? Which for you was the most useful out of the three?

P8: Ehm, I like the Tuscany app. Yeah, I think that's very interesting. I'd like, definitely like to use that.

I2: Why is that?

P8: Ehm, I just thought that it's great the way you can, all the information like ehm…like all the restaurants, and places you can visit, you can add to your favorites, I think that's brilliant.

I2: So do you like to be in control actually, of your things. (P8: Yeah, all the time.) With your favorites, you know, for example.

P8: Yeah, I would be the type of person that would have an itinerary, so… (I2: Okay.) and a list of things I would like to do, so that definitely looks useful, that definitely looks like something I would do.

I: Ehm, do you see potential problems when using Augmented Reality applications?

P8: Ehm, no, I think the only thing that I probably see a problem with is that if it required WiFi? (I2: Mhmh.) And WiFi wasn't available? But then again, WiFi is always available nowadays, so…everywhere, so probably not, no.

I2: Is WiFi available in…on the streets?

P8: Ehm, in most parts of Dublin, yeah. (I: Okay.) Like up in Grafton Street there is, but there is not on O'Connell Street. (I: Okay.) So you might have a problem right there, but not on Grafton Street and Temple Bar. (I: Mhmh.) Yeah…

I2: So, what if ehm you would actually have to pay for WiFi that ehm…let's say you'd go to another country (P8: Yeah.) and eh, you know, you don't have WiFi, and you would have the option to pay for a limited amount of time, or a limited amount of Megabyte, or whatever. (P8: Yeah.) Would you be willing to do it and be happy with using the WiFi?

P8: I probably would. To be honest because I'm so addicted to actually having my iPhone and having constant access to Internet. I probably would pay for it, yeah. (I2: Mhmh.)

I: And how much would you be willing to pay for the application?

P8: How much would I be willing to pay? Never more than 3 Euros.

I: Okay, and what are some criteria for you in applications, for example tourism applications that would make you want to use it repeatedly?

P8: What tourism applications?

I: Tourism applications, or applications in general, like what aspects would you wanna make it repeatedly use it?

P8: Oh, ehm…no glitches. That always helps. I always find, I download a lot of apps. I try it for the first time, a new apps, they always have a glitch in them where they're hard to kinda load, or…you know. That, definitely would prevent…would be a big block for me.

I: And would you be more inclined to download tourism apps or would it be general day-to-day applications you download?

P8: Eh day-to-day applications, like Social Networking apps and games for example, but eh…if I was going away on holidays or taking a city break, I'd

definitely download all the apps I could to help me out in getting around the city and you know, not getting lost, kinda being up to date on the information before I visit the place.

I: And…

I2: What, sorry, what kind of applications have you downloaded before? (P8: Ehm.) When you go travelling for example?

P8: Let me see, when I went to Valencia last year, I downloaded 'VisitValencia' app. (I2: Okay.) That gave me all the information about the city. And then I went to Benicassim festival in Spain and I download…I downloaded an application for visitors of Benicassim to you know, tell them the restaurants around. You know what time the local Carrefour opened til for example, (I2: Okay.) so things like that.

I2: Can you tell me a bit more about those applications, like how did you get to them first of all, like how did you…

P8: Well, obviously, everytime before I go away, I do my research. (I: Okay.) And having been a very active iPhone user I would say 'Oh, I go into the App Store and see what information I can get.' Prior to visiting. (I: Okay.) You know Valencia or Benicassim, so and I also download like, usually download like little Spanish phrase apps that I can use while I'm abroad. (I: Mhmh.) It's always nice to have something like that. That's definitely useful, yeah.

I: Okay, that's very interesting. And ehm, can you tell me a bit more about the application itself? (P8: Which one?) Like ehm, both of them. What did they actually do, were you happy with it? Or what would have been better?

P8: Yeah, eh, I remember the Benicassim app, eh, wasn't great. (I2: It was not?) No, it was kind of like, it was, it was like a visitor. An experienced app creator made it just for the benefit of…you know just for the benefit of Benicassim visitors. (I2: Mhmh.) And obviously, just kind of did put as much in as he could with regards to like 'This is the hotel' and like 'This is the hotel you can visit' or 'This is the restaurant you can visit' and the day. But the good thing about it is he'd have, you literally would go into a subsection and you'd have 'Restaurants' and you click into the restaurants and you'd have the restaurant, and what type of restaurant for example you'd have like such and such an Italian, open 9am to 10pm, that's all you know, but it was all very, very simple, but it was also very helpful, but it, you know… like I found when I went back in after Benicassim, it didn't work (I2: Oh.) so you know, it wasn't consistent. It wasn't great. (I2: Okay.) But definitely, ehm that 'VisitValencia' app I had was brilliant. It was like, kinda like the you know some big guys in tourism office that paid a lot of money or like the Valencia tourism office had paid a lot to put into this app, and I found that it was very useful, it was very quick, it was very, you know whenever, the map was brilliant, there was no glitches, it was…it was very good, yeah.

I2: Okay, was it just information, you know about the, the destination, or…

P8: Yeah, it was like, ehm I can't remember. I think you went into the map, and you pressed on the restaurant tab or a café tab and it would show you, you know where on the map it was. And I now remember as well, like there was like ehm, I wanted to find a Starbucks, so I typed in 'near starbucks' or 'starbucks' or something like that and they showed you like the Starbucks around the city as well. (I2: Oh, okay.) So that definitely, that definitely was brilliant, yeah. (I2: Alright, okay.)

I: What would be the factors that would make you stop using an application?

P8: Ehm, stop me using an app? Like I mentioned before, a glitch or if it was just taking too long to load, or ehm, yeah or like some apps I find are great for the first two weeks, and then they just stop working. It's almost like ehm, app creators, you know, create the app and put it out there and then when something went wrong they kind of abandoned it. Do you ever find that? (I: Mhmh.) Yeah. Yeah that, that definitely, just glitches, and things taking too long to load.

I: Mhkay, and what would be your perception of content generated by the Dublin tourist board or other companies compared to content provided by other tourists? (P8: What do you mean?) Like would you find content more informative if it was by a tourism body or if you would've heard reviews from other tourists that had visited an area?

P8: Ehm, I'd rather take the information of someone who had experienced it other than like Dublin tourism themselves.

I: And why would that be?

P8: I always find that a tourist opinion is more reliable than the tourism office, for example. You know, a tourism office is gonna say, 'Dublin is great! Come, visit Dublin and go here!' but there's gonna be a tourist that comes along who's gonna say 'Oh don't go here, it's overpriced!' and as a student I'm gonna be saving as much money as I possibly can, so…

I: Okay, and what do you think about the possibility of generating your own Augmented Reality content and sharing it with your friends and others? Would you be interested in others sharing their content with you?

P8: Yeah, yeah I would.

I: Would you have an issue with the content you upload being public, or would, would you just like to share it with friends?

P8: Ehm, no, see you know I'm a very public person, I guess. In the end of the day I don't really put anything private up. I don't really put anything private up on the Internet, and I think that the Internet really isn't private at all, 'cause I have Twitter, and that is public. So, no I don't have any problem with that.

I: Okay, perfect. So what is your perception of combining Augmented Reality with Gaming or other types of Entertainment while exploring the city?

P8: Yeah, that'd be cool. I'm big into the iPhone games and applications that you can download, so…

I: And could you give me a few examples of where gaming could work in the tourism industry?

P8: *thinks* Hm, I don't know actually. That's a tough one.

I: Like for example what would you look for in a tourism application that implemented elements in Gaming? What would really trigger you to say 'Wow, I would really download this application'?

P8: I don't know, like, if you managed to incorporate Angry Birds into it, I don't know. *laughs* I, I have no idea.

I: Well, for example if you download a tourism application, (P8: Yeah.) what would be the type of applications for a destination? Like would they be Review based, would it be…

P8: Yeah, yeah.

I: Okay, so if you were to use elements of Gaming how would you like it to enhance the application? Like, do you think Gaming would be a big element in relation to tourism applications?

P8: No, I don't think so. (I: Okay.) 'Cause like, 'cause from the top of my head, I'm trying to think…Gaming, no. It would be, I suppose, it would enhance it, but

I can't think of, you know how you would incorporate Gaming into a tourism application.

I: And what do you think would deter its use? Why would Gaming not work in tourism in your opinion?

P8: I don't know, like when, you know if someone is like travelling around the city and they are looking for information on areas, you know areas of interest, restaurants, hotels, you're not gonna be playing games. Unless like it's…unless it's a quiz or something like that. That's, that's a good idea. (I: Okay.) But I can't…I can't see myself, you know when I'm abroad, when I'm in Paris, and I'm trying to do as many things as possible I'm not gonna be having my head in my iPhone and playing games, I'm gonna be having my head in my iPhone seeing where exactly the Louvre is, for example.

I: Okay, perfect. And would you consider perhaps buying theatre tickets, or booking restaurants, excursions over an AR application?

P8: Yeah, I have done that before.

I: And could you give me a few examples?

P8: Ehm, when we were in Valencia, we booked, we actually, when we were in Benicassim, we booked our hotel in Valencia over my iPhone, so…

I: And were you comfortable with booking through an application? (P8: Yes.) And you didn't have any privacy issues? (P8: No.) Okay. So what would be some suggestions to improve the user experience of AR applications?

P8: Ehm, what would be suggestions…I suppose put as much into it, as you ultimately can without…without it being, you know 'cause some applications might have too much…too much content and make it kinda slow it down. But I think it's a good idea if you're going to have an Augmented Reality app to have as much in it as you can ultimately fit in, like ehm, as much information as the tourist…the tourists want, yeah.

I: Okay, and are you aware of the free WiFi that is now, has now been implemented around the city? The Dublin WiFi?

P8: I've heard about it, but I've tried to access it, and it hasn't worked for me.

I: Okay, and where did you try to access it in? Can you remember?

P8: Eh, I tried to access it on O'Connell street. That's where they said they'd have it.

I: Okay, well I think at this point in time, it is not actually available yet on O'Connell street, but if you were in another area and you saw there was the Dublin free WiFi, would you be interested in using it?

P8: Yeah. *nodds*

I: Okay. Eh…I think that's all.

I2: Ehm, just one question. Have you ever paid for an application that you've downloaded? 'Cause you said you play a lot of games and stuff like that. Are you downloading a lot of applications where you…

P8: Yeah, yeah, I do. I often pay for applications.

I2: Ehm, is there like a limitation of how much you would pay for an application?

P8: Yeah, I'd never spend like over 3 Euros.

I2: Never over 3 Euros?

P8: Yeah, I spent, I remember I spent 5 Euros once, and that was a big jump for me. That was on a Grand Theft Auto game, but (I2: Okay.) yeah, nothing else.

I2: Was it worth it? (P8: Yes! *laughs*) Okay.

P8: I love Grand Theft Auto.

I2: But why would you pay for an application? Or why do you pay for an application?

P8: Why? (I2: Yeah.) Because if I…I like to have…like I said, I use my phone all the time. I have my iPhone on my hand constantly. It's like a limp, but if I saw something that I was really interested in, and usually most of the applications are free that I'm interested in, but if I really want it, I will pay the money for it, yeah.

I2: Okay. It's not, it's not dependent on like what you've heard from other people that the application is good? It's just out of your own interest?

P8: Yeah, if someone came up to me, 'This application is brilliant! It's 2,50, but it's well worth paying 2,50 for it!' I would say, 'Ah, yeah! It's 2,50, but…' It's like the, you know Whatsapp, you know that was like 1,…something. (I2: Yeah.) And Viber was free, I downloaded Viber, but apparently I heard Whatsapp is way better. Download Whatsapp. It's 1,…something, it's fine. So I got it like you know. I do also on my own opinion, but also, I listen to others as well. (I2: Okay.) So I'm quite easily lead.

I2: The, ehm…application in Valencia and the other one that you mentioned, did you pay for that or was it free?

P8: They were both free, yeah.

I2: Okay. Would you pay for tourism applications?

P8: Ehm, I don't think so. I think that would deter me. (I2: Okay.) That would definitely be a deterrent, because you know if I'm going on a city break, like I said, I'm…I don't know, it's probably different for other people, but I'm a student and I don't have very much money. (I2: Yeah.) So, I'm going to be looking for the free applications (I2: Yeah.) that would get me around the city. And considering, you know, I'm a person that takes a lot of city breaks, I wouldn't take long holidays. If I was taking a long holiday, I might pay the money for a better app, but I literally just take city breaks all the time, so…ehm…three days, so I'm not gonna pay 3 Euros. (I2: Yeah, okay.)

I: Okay, that's all the questions I have. Thanks Rachel. (P8: No problem.)

I2: Thank you very much. (P8: That's no problem at all. I'm glad I could help.)

I: I can give you a free drink!

P8: What is it?

I: Well, it's any drink in the hotel. (P8: Oh, really?) Yeah.

P8: Can I use it at another time?

I: Yeah, you can use it anytime you want.

I2: Ehm, just for like future reference. Would you mind providing an E-Mail address? (P8: Yes.) 'Cause this is just the initial stage of the, of the bigger research, and ehm, when we actually develop a prototype then we might have other questions, you know we'd like to ask the first participants (P8: Okay.) that eh took place in the interview. (P8: Yeah, that's no problem.) That'd be great. Just here on the…on her sheet we can write it, that you filled out, yeah. That'd be great. Alright. Thank you very much. (P8: No problem.) Thank you for your time.

Interview Transcript: TP9

I: Alright, so, eh…upstairs you saw two examples already. This is just a third example. (P9: Mhmh.) It's the same technology, but eh, a little bit different approach. And that's an application that was actually launched in Tuscany already like couple of years ago, ehm…which uses GPS. *playing Tuscany video clip* Okay. Do you wanna see yourself, or…*laughs*

P9: No that's fine. *laughs*

I: Alright, okay. Before we start, can I ask you to fill out one of those forms? (P9: Yes.) Just a little bit about your profile. (P9: Okay.)

P9: If I live here, I just don't say anything about business/leisure?

I: Eh, no that's fine.

P9: Here you go.

I: Alright, thatnk you very much. Ehm, okay. Just to let you know that whatever you answer here is only gonna be used for our research, for hers and mine. And ehm, it's not gonna be you know any, any other third party, okay? (P9: Okay.) Ehm, so before, I mean, let's see. Do you travel often, like internationally, or just domestic?

P9: Eh, I don't travel much. I just go back to France sometimes, and…(I: Okay.) yeah I travel as well in summer, (I: Alright.) if I can, yeah.

I: Yeah, fair enough. Do you use, or do you have a smartphone at the moment, or a tablet, or anything like that?

P9: No, no I don't have a smartphone.

I: Okay, would you…do you think smartphones in your opinion are useful?

P9: Eh, I think they are interesting. They have a lot of applications, (I: Uhuh.) but I don't really feel the need at the moment for a smartphone, but I think if I had one I would be interested in trying out all the applications.

I: Okay. But you know a lot of people who have smartphones, you have tried it already and stuff like that?

P9: Nah, not really tried already, no.

I: Okay, like smartphones in general, you have not tried a phone…

P9: I've tried the phone, but I didn't try the application.

I: Oh, oh, that's fine. Okay. Ehm, why do you, or what's the reason that you for yourself didn't get a smartphone?

P9: Eh, it's more for the price at the moment, yeah. (I: Okay.) And…I don't, yeah, I don't really feel like I need it for the moment. (I: Mhmh.) I think, in the, in the future, if I have a good job, I have money, I would buy one.

I: Okay. But why would you decide to buy one in the future then?

P9: Eh because, I think they look good, yeah, and to have more applications than on a basic phone. (I: Yeah, yeah. Okay.)

I: Good, so more things in one actually, to be able to do. (P9: Yeah.) Okay, good. Ehm, so, after you've seen those examples. You said you know a little bit about Augmented Reality already, or you've heard about it. (P9: A bit, yeah.) Ehm, how would you describe it to a friend of yours, who doesn't know Augmented Reality? How would you describe it in your own words? What is it?

P9: Ehm, I will say, it's something that, ehm represent reality, on a screen, (I: Uhuh.) on a phone. Yeah, something that will help someone to get information (I: Okay.) from the reality…

I: Okay, alright, good. Ehm, so, those three examples, that I, that we've shown you. What do you think of them? Which one was maybe most useful, which one you didn't like at all?

P9: Ehm, I think the one with the, with the menu (I: Mhmh.) was useful. (I: Okay.) Then the other one I didn't really…like people can actually know that they can see something...(I: Okay, yeah.) I wonder how that's…yeah.

I: I mean, yeah, okay. Why do you think the menu was useful? Or why did you like the one with the menu so much?

P9: Eh, it's not that I really like… 'I like this one more!' (I: Okay.) I find it's more, it's more useful. And the other one you can get information more like the Internet, if you need it.

I: Okay, yeah, yeah. How about the third one, with the Tuscany? What do you think about that?

P9: Ah, the Tuscany, I think it's very useful, if, especially if you go somewhere and you don't really know. You just walk on the street and you don't really know what to do. I think it's interesting for information.

I: Okay, would you be interested in those kind of applications?

P9: Yeah, it looks, sounds good, yeah.

I: And all three of them, or…just like Tuscany?

P9: More Tuscany, yeah, yeah.

I: Okay, alright. So when you, when you actually travel, I mean ehm, do you use your phone a lot, when you go somewhere else?

P9: Eh, no I don't. I really don't use my phone, no.

I: Okay, so how do you travel? Tell me about your travel behaviour.

P9: Eh, well, usually, I just get a book and I try to find where I would like to visit. (I: Uhuh.) Something like that, when I go travel actually.

I: So, how do you, how do you get the directions of where to go?

P9: On a map…

I: Alright, just like a paper map? (P9: Yeah, yeah.) Okay. Alright, good. Do you ehm, listen a lot to other peoples' opinions before you go somewhere? Do you go somewhere because it's your own interest, or do you go somewhere because someone recommended it to you?

P9: Eh, it's more for my own interest (I: Uhuh.) but I still like to listen to other people what they think about this place, etc. (I: Okay, alright.)

I: Do you have ehm, like a specific preference of places you go, like for example 'I only go to beaches. I only go there, I only go this…'

P9: Eh, no I just like to go somewhere new, somewhere I've never been before, yeah.

I: Okay, alright. Ehm, can you tell me about the place that you remember the most, which was most memorable that you visited? And why?

P9: Eh, I think it's in Greece. I went in the different islands. And that was something really…that was my first really, eh…my first important travel. (I: Mhmh.) That was memorable. (I: Okay.) It was very different, culture and food and…

I: Okay, alright. Did you, what did you enjoy the most about Greece?

P9: Eh, I think it's just the nature. The sea, the sun as well, the people, yeah. (I: Okay, alright, yeah.)

I: Alright, very nice. Okay, ehm, so let's see. After seeing, you know, or in applications in general for smartphones, or after seeing the examples, why do you think you would like to use those examples, eh I mean applications?

P9: Eh, I think that gives more information. (I: Mhmh.) And it's true that sometimes I think even if you have a book, you don't really bother to read it. (I: Mhmh.) I think it would be like, easier just to use your phone to get information. (I: Yeah, okay.)

I: And ehm, do you think this application should have something that would, I mean obviously it would facilitate you, right, make it easier for you. But ehm, what would you, you personally like to have in a tourism application?

P9: Eh, I would like to have for example for skiing, eh I like skiing, (I: Okay.) I think it would be useful for this.

I: Uhuh, how do you mean?

P9: Eh, like for example to use your phone to see where you can go (I: Okay.) like different restaurants, or … on the region.

I: Okay, so in the location itself, like GPS, and then what's near you?

P9: Yeah. (I: Okay.) And the name of the mountain as well would be interesting.

I: Alright. Cool. Very good, uhuh. Ehm, so let's see, ehm do you see any problems that might arise, that might come when you use those applications? Or when people use those applications?

P9: Ehm, maybe I don't know, maybe it can be slow. It can not working very well. (I: Okay.) I don't know if it works with the WiFi or something (I: Mhmh.) so it depends on that. (I: Alright, good.) And yeah maybe people just don't like to use the screen and prefer books. (I: Yeah.) Or they can't have a smartphone. (I: Uhuh.) I think it would be the issue.

I: Alright, okay. Ehm, do you think, or what do you think would be then some good things about the application that would make you use it again and again?

P9: Ehm, I think if it's something that's written often, like if we have new information regularly.

I: Oh, okay. So updates? (P9: Yes.) Information regularly, okay. (P9: And eh…I don't know.) Alright, information, regular updates, good. Ehm, how about if you're using an application, ehm, what would be some factors which would make you stop using an application?

P9: Like, if I don't…I think I would use it when I arrive in a new city I don't know. (I: Uhuh.) Then, when I know the city, I would just don't bother to use it, 'cause it will not be very useful.

I: Yeah, yeah. So do you think that maybe there should be other things, ehm in the application that could make it useful again? Like even after you know the city. What do you think you would still need in the application?

P9: Maybe if there is new…like new restaurants, if there is a new museum, or…yeah.

I: Okay. So ehm after, I mean your answer is very interesting because ehm, I feel exactly the same way. After you use an application because you don't know the city, right, you use it to get directions, or whatever. And let's say you stay for one week, then the first two days you use it. And then you know pretty much for way around, right. *P9 agrees* So what do you think would be some factors, how you could use the application for the remaining 5 days, still? Would be some interesting things about the application?

P9: Ehm, maybe if the application can show you what you did and see it. And maybe if you could, I don't know which route, but if you can press 'I've seen that, I've seen that' and it can show you the rest that you didn't see.

I: Okay. That's very interesting. Very good. What do you think in general about, or you told me that you very often use a book before you travel somewhere. So do you use like tourist office, and stuff like that a lot, when you go somewhere?

P9: Not really, no. I use like book, or I use Internet.

I: Okay, so what do you think about content, or information that was given to you by a company or…whether Internet or book, it doesn't matter, compared to information that was given to you by other tourists, or users?

P9: Eh, I find more interesting to get information from people because they have seen, seen it and say something more reliable. (I: Uhuh, okay.) But it's still useful I think to get information on Internet to see where you wanna go, to plan your stay.

I: Okay, alright. Ehm, do you in general, read a lot of like users' review and comment and stuff like that?

P9: Yes, I do, yeah.

I: Okay, so you're very interested in that? (P9: Yeah.) What other people say obviously, right? Ehm, what do you think about if the application could make you generate your own content or own, you know, Augmented Reality, and share it with other people? Would you use that? (P9: Eh, yes. *nodds*) Okay. Do you have an issue with eh…or would you use…or how would you use it? Just like internally, in public?

P9: I don't, I don't get it, if…

I: Ehm, like I mean would you share it with your friends only, or would you be okay to share it with everyone like in public?

P9: No, it would be interesting to share with everyone. (I: Okay, and vice versa?) Yeah, vice, everybody yeah.

I: Alright, good. Ehm, so, do you…okay, what do you think about mobile games in general?

P9: Eh, I don't really like it, because it's small. It's a small screen. (I: Okay.) It's more…it's nicer to play on the big screen, yeah.

I: Yeah, fair enough. Okay, ehm, what do you, what would you think if a tourist application could be combined with gaming, or with music, or with film, any entertainment. What do you think about that?

P9: Ehm, I think it could make it…it could make it interesting, more, yeah.

I: Okay, and do you have maybe an idea of how it could work?

P9: Eh, to combine…(I: Yeah, to combine that.) with a game, or with…(I: Mhmh.) Eh, I don't really have ideas.

I: Okay, that's okay. It doesn't matter. No problem. Ehm, which, which one of those, like I gave you three examples now, eh would you prefer to combine it with?

P9: Eh, with a game?

I: Game, music, or movie, filmclips.

P9: Ehm, maybe with film.

I: Why is that?

P9: Eh, I don't know. I think it would be easier to use the theme of a movie.

I: Alright, while being in a destination? (P9: Yes.) Okay. Alright, ehm, do you or would you ever buy something over your mobile phone?

P9: No, I never do that, but I do it on Internet, so if I had good Internet on my phone, I would do it, yeah.

I: Okay, so for you there is no difference, whether it's a big screen or a small screen?

P9: No. No.

I: Okay, and how about if you could buy actually something using the application? Not like a web browser, but the actual application. (P9: Uhuh.) Would you be interested in that? (P9: Yes, I would, yeah.) And is there any problems that you think would come?

P9: To buy in the application on the phone? (I: Yeah.) If I buy it and I don't like it, it would be a big problem.

I: Okay. How about like any trust issues?

P9: Yeah, I will need maybe the comments of other users, to see if (I: Okay.) it's something good, or…

I: Alright. So do you, how do you…how do you decide on the Internet whether you buy or not buy?

P9: Ehm, it's more someone tells me it's something good. (I: Okay.) I will, I will believe it. (I: Alright.) Of someone I know. (I: Oh okay, I see.) Or if I…someone has the application and I can use it on his phone (I: Mhmh.) I would buy it on mine as well.

I: Okay, alright. Would you actually pay money for buying an…or for using an application?

P9: If it's a very good one, yeah. If it's useful.

I: Okay. How much would be the maximum you would pay for an application?

P9: For an application, eh I would say like 5 Euros?

I: Okay, alright. How about for, for WiFi actually? Do you know that in Dublin they, you know, make the free WiFi now in the city? *P9 nodds* Ehm, let's say you could pay for WiFi for a limited amount, you know for whatever, I mean couple of hours, one day or one week. How much would you, or would you pay for the WiFi?

P9: Eh, I would, if…yeah, if it's a good connection, yeah.

I: Yeah? Okay. And how much would you pay and still be happy to use the WiFi?

P9: Eh, if it's…only if it's cheaper than paying the company for Wireless, yeah.

I: Mhmh, yeah obviously. Alright, like ehm, can you give me like an example, for example per day, how much would you pay maximum?

P9: Eh, per day I would pay like 1 Euro, maybe? (I: Okay.) Yeah.

I: Alright. Ehm, let's see. Do you think, like for…it's kinda hard to give me an answer, but maybe you could think about or have any ideas, if you would have a tourist application or tourism application. Ehm, what would be some things that you would like the tourism application to have, or be included in that application? *P9 hesitates* For example, we have information like the one that you saw 'Tuscany' you could have information or direction. Are there any other aspects or things, where you would think 'Oh, that would be pretty cool if the tourist application would do that!'

P9: Yeah, I don't know if it's already do that, but maybe find where is the closest taxi… (I: Okay.) or a phone, public phone. (I: Okay.) Or maybe sports, like a sports resort, a football play somewhere.

I: Okay, so pretty much locate the things for you? (P9: Yes.) Don't you, you don't wanna have anything else on the tourism application?

P9: Mh, maybe something that shows the activity by price, like until 5 Euros, between 5 and 10, and like that.

I: Mhmh, okay, so have a ranking you mean? (P9: Yes.) Alright, in what terms? Or ranking, price of what?

P9: Like museums, for… (I: Okay.) everything that you can visit in the city.

I: Okay, alright. Alright, good. Ehm, thank you very much already for, for the information. (P9: You're welcome.) Ehm, just one more thing. Would you mind eh, giving me an E-Mail address? Because this is actually the first stage of the research and after we develop a prototype of the application, maybe there is like one or two more questions, ehm, that we would like to ask the participants of the first interview. That'd be great if we have something to contact you.

P9: Okay.

I: Alright, thank you very much. (P9: Can you read it?) That's p.a.s.t.o.r.? (P9: Yeah.) Okay, that's perfect. Thank you very much for your help.

P9: You're welcome.

Interview Transcript: TP10

I: Alright, well thank you very much first of all for your time. (P10: You're welcome.) I'm sure my supervisor Dr. Jung has briefly explained to you already what it is about. (P10: Yeah.) Eh, I'm doing a research about smartphone technology, and you know about Augmented Reality technology in particular implementing into a tourist application. (P10: Yeah.) Ehm, so before we start out, are you currently using a smartphone or a tablet or anything like that?

P10: Yes, I have an iPhone and I also have an iPad, so…

I: Okay, and could you, you know briefly tell me what you use the iPhone or the tablet specifically for?

P10: Probably just searching online, really. (I: Okay.) I don't really use it probably to its full potential. *laughing* I don't really use the apps that much, but I am intrigued to find new apps sorta…you know like this looks very interesting and I'd probably wanna use something like this.

I: Okay, so are you referring to your iPhone or tablet at the moment?

P10: iPhone probably. (I: Okay.) 'Cause I would use my iPhone a lot more than my iPad, 'cause just it's handy.

I: Okay, yeah, yeah. Alright, okay. Ehm, do you take your tablet along quite a lot, or is it usually just…

P10: No, it just stays in the house.

I: Okay, when do you use your tablet then?

P10: I just use it at home, at night time really. (I: Oh, I see. Okay.) That's the only time I'm gonna use it. But probably should use it more. *laughs* I just, my phone is just so handy that…

I: Yeah, okay. Could you maybe tell me some of the applications that you are using?

P10: Ehm, Facebook, Twitter, ehm probably just the E-Mails (I: Okay.) that's really. And my little boy uses some of the apps. (I: Uhuh.) But that's really all I would use, sort of it…

I: Okay, alright, ehm, do you use the tablet to access the Internet as well? (P10: Yes, I do.) Alright. For the same purpose then, or? (P10: Yeah, mhmh, yeah.) Okay. Good. And ehm, why do you think it's useful for, for you personally to have a tablet or an iPhone?

P10: Ehm, it's handy if you're outside somewhere. You can just google something. Like you see it and you can just look it up online, if you can find it cheaper elsewhere, or… (I: Yeah.) you know if I wanna find somewhere…I actually used it last night to find a restaurant. (I: Okay.) Yeah, use it that way.

I: So instant information (P10: Yeah.) or access. Okay. How about the tablet? Why did you get a tablet?

P10: You know I got it like last year, about a year ago, sorta last Christmas, so…

I: Uhuh, did you have a particular reason what you wanted to do with it?

P10: No, I just thought it looked really nice. *laughs*

I: Everyone else has one, so why not?

P10: And it was really handy as well, and while I have a Macbook, a laptop (I: Uhuh.) and it's just not as you know, handy, just to pull out and sit and you know just read and, you know what I mean, it's just so much handier, sorta this, definitely.

I: Yeah, okay. Alright, ehm, do you, are you aware of the WiFi that's currently spreading around Dublin? They are actually currently working on providing free WiFi through the whole city.

P10: Yes, I actually heard it on the news recently, sorta I did, yeah.

I: Alright. Have you tried it while you were here?

P10: No, but I tried it today in the hotel, so I'm linked on to theirs straight away, (I: Okay.) so I haven't tried it. So we haven't actually…we only had dinner last night. We haven't actually (I: Oh okay.) been in the city, yet. We're going shopping today.

I: Yeah, okay. Do you, in your city, do you have eh, WiFi like access?

P10: Not really. Only in some restaurant or cafes. (I: Okay.) Some of the Starbucks and stuff like that, but nothing really. (I: Alright.) You'd have to just do the 3G to use the Internet.

I: Okay, alright. Ehm, so ehm, do you actually travel a lot?

P10: No. Not really.

I: Outside of Ireland?

P10: No. Not really, no.

I: Not really. So I'm guessing that everywhere in Ireland you can use your 3G, right? (P10: Yeah. *nodds*) Okay. Ehm, imagine that you would travel to some other country and you would need the Internet, or you would like to use the Internet, would you actually be ready to pay for the Internet?

P10: No, I wouldn't want to pay for it, when I'm abroad. (I: Okay.) I'm trying not to use it when I'm down here. You know I didn't know it was everywhere. So last night, I was kinda cautious of using it. You know, my bills gonna be…(I: Yeah, exactly.) You know what I mean, so I was fine when I used it back here in the hotel, but when I was in the taxi trying to find the hotel, I was like uh...Yeah, I don't really wanna be using this. (I: Okay.) But ehm, yeah, it would be good if it's accessible.

I: Alright, then you would also make use of it? (P10: Yeah.) Okay. Alright, fair enough. Ehm, so after we've shown you some examples of Augmented Reality, you said you didn't hear of that technology before. (P10: No.) So, if your friend or someone else would ask you 'What is Augmented Reality?' how would you describe it in your own words?

P10: Ehm, I would say that, like you showed me the example of a picture, ehm you just take your tablet up to it and it shows you a description, or a menu or whatever from behind the picture (I: Uhuh.) on your notebook, I think.

I: Okay, alright. Ehm, do you think it's useful this technology for…(P10: Yeah, yeah.) Or for which parts do you think it's useful? Which areas maybe? It could be useful?

P10: Ehm, especially when you're at a restaurant and you didn't have a menu, I think that could be very useful. (I: Okay.) Or let me see. I can't think of any other except of this one. Phone numbers maybe… (I: In what regards?) you know of ehm, restaurants. But I don't know how you would actually, hm not sure. I don't know.

I: Okay, no that's okay. So out of those three examples that you saw, which one do you think was the most appealing to you?

P10: Ehm, that one you showed me ehm in the hotel there. (I: Okay.) I thought that was very good. The one of the, the stand and… (I: Yeah.) where you would see right in the hotel (I: Mhmh.) I thought that was very good, sort of.

I: Could you elaborate why exactly it was good for you?

P10: Ehm, just you could actually see the bedroom and everything, without to having actually to click in on a subject myself, you know it just did it for me basically, so…

I: Okay, alright, so this one you liked the best? (P10: Yeah.) Okay, ehm, so what are, or what do you think are some factors that have prevented you, you know until today, to use those applications?

I2: Maybe you've never heard?

P10: No, I haven't heard of it.

I: Okay, never seen this kind of technology at all?

P10: No, I haven't, no.

I: Okay, so it makes sense then.

P10: Yeah, yeah. *laughs*

I: Okay, ehm, do you, can you imagine any aspects or services that would be very useful to include in tourism applications per se?

P10: Ehm, for tourism probably just really…I don't know what you would actually do, probably show people around. (I: Mhmh.) But, ehm, maybe it would be good on a map (I: Okay.) you know, for it to pinpoint the… (I: Yeah.) tourist places and give you a description (I: Okay.) not sure really.

I: Yeah, I mean that, that's really good already, yeah.

I2: And how…you know you're gonna spend some time today to look around Dublin. And if that's available how, what's…you know…useful to where…in which aspects? Eh, any, can you think of any?

P10: Eh, probably to find out where some shops are and…yeah, I'm not really sure. *laughs*

I:Have you ehm, it's alright, no problem. Ehm, have you used any tourism applications before? (P10: No, I haven't.) Not at all? (P10: No.) Okay. That's alright. Ehm, do you see any potential problems maybe, when you…or in any tourism application? That doesn't have to be now, or in regards to technology, but ehm, why you wouldn't use them?

P10: No. Not really. There isn't really. None of which I can see.

I2: Any reason?

P10: No. I don't really look at any, so I don't really know any, you know.

I: Okay, but would you be interested in looking at some?

P10: Yeah, I probably, yeah.

I: Okay, so when you travel in general, you take your mobile phone with you?

P10: Yeah, mhmh.

I: And you would also be ready to try out some applications there, or…

P10: Yeah.

I: Okay, ehm, maybe just as background information. How do you usually travel? How do you usually…what do you, you know when you go to a new destination…

P10: By plane, usually.

I: Okay. And ehm, do you look up any destination prior to your…

P10: Yeah, just use the Internet to look up, to see a few, where it would be nice to go really. (I: Okay.) I've been to Florida a few times, and things like that.

I: Mhmh, and how was that, like when you went to Florida, how did you actually plan your travel?

P10: Ehm, online.

I: Everything like at home? (P10: Yeah.) Okay.

P10: Everything was online.

I: Did you do anything after arriving at the destination as well?

P10: Ehm, we…I think we bought our tickets at some of the…hotels, I think they sold the tickets. I can't actually remember where we got the tickets. That's…everything was basically planned. (I: Okay.) From start to finish. (I: Alright.) We didn't really have to do anything.

I: Oh, I see. So just enjoy once you're there? (P10: Yeah.) Alright, good. Perfect.

I2: Very well organised. *laughs*

I: Okay, ehm, when you use your applications now, not only in regards to tourism, but you said you use Facebook, and something like that. *P10 agrees* Ehm, what makes you use it actually repeatedly? Or why do you use it again and again, those applications?

P10: Ehm, probably because they're so easy to access (I: Okay.) and probably because I have nothing to do. That's what I think, really. I just go on really and have a look at my Newsfeed. I wouldn't really be on it all the time. It's just probably out of boredom, really. (I: Alright.) So I wouldn't probably be into it that much and leaving comments or anything, but ehm, yeah that would make me probably just really, nothing to do. (I: Alright, just to pass time.) Just to pass time, yeah.

I: Okay, okay, good. Ehm, what do you think in general about any information that is provided by, let's say ehm a tourist office or another company compared to information that is provided by other users?

P10: Ehm, it's probably more legit. It's probably… (I: By which?) I'd say, it's probably more ehm, guaranteeable? The information is correct.

I: You mean from the tourist office, or the users?

P10: Yeah, from the tourist office.

I: Okay. Do you in general have like, or read a lot of other tourists' opinions, or other users' opinions? (P10: No, not really.) No, okay. So you just…

P10: I would read some reviews sort of it, but ehm…I suppose I would go about some of the reviews, I suppose (I: Okay.) but, generally I would just look on the main tourist website (I: Okay, alright.) sort of it.

I: How about ehm, I mean you said you use Facebook a lot to pass time, right? Ehm, do you…I mean you're interested in other users' content, right? *P10 agrees* like in the Newsfeed and anything like that. Do you personally think you would make use of it, if this was available on the tourist application as well? (P10: Yeah.) That they share content, and you know, you can share your content as well, if you like.

P10: Yeah, I probably would. If it was as easily accessible (I: Okay.) like Facebook. I think Facebook probably has, if you would pick the tourist information into Facebook (I: Mhmh.) it would probably have a big, you know a lot of people looking at it (I: Okay.) but I think if you have another app, I think really, people don't know what it is, and I think people are very comfortable with Facebook and all, so…and Twitter is becoming quite big as well, (I: Yeah.) sorta…

I: Alright, ehm, so would you also be ready to share your information about let's say specific location or anything like that? Or interested in sharing your things with the public? (P10: No.) Okay, so just look at other peoples' opinions, other peoples' photos and stuff like that? (P10: Yeah.) Alright, a bit selfish, aren't you? *laughing* I'm just kidding.

P10: I don't really like sharing mine.

I: Yeah, me neither. Ehm, what do you think about any other forms of entertainment to incorporate into applications, for example a tourist application?

P10: Ehm, what sort of entertainment, say…

I: Let's say gaming, music, movie clips, something like that.

P10: Ehm, not really, no.

I: No. Do you play any games, like any other games on mobile…(P10: No.) No. Not at all? Not interested.

P10: Not really, yeah. No.

I: Okay. You also wouldn't be interested in playing games like, I give you a specific example now say you would explore a new destination (P10: Mhmh.) and while doing so, you could, you know move to one attraction, solve, or need to solve a puzzle in order to go to the next one (P10: Mhmh.) and you know, just like a 'treasure hunt' or what do you call that? (P10: Yeah.) So that one point connects you to another and you have to solve the whole puzzle. Would you be interested in something like that?

P10: No. (I: Not at all?) No. I wouldn't have time, really. My baby boy takes a lot of my time off, so I don't really have the time. (I: Okay.) And if I wanted to have the time, I'd probably just choose to relax or go shopping, or…

I: Alright, that's good, yeah.

P10: I wouldn't be begging to…I'm at the computer most of the day at work and when I'm at home I would really just like to surf the Internet, (I: Uhuh.) rather than anything too…

I: Fair enough, alright. So how do you like ehm, when you relax, or when you go shopping, do you think any application could help you do it better, or enjoy it more?

P10: Ehm, not really. Probably, ehm see now I think we're all very price conscious. So when I see something, I wouldn't just buy it. (I: Okay.) I would go home and take a look, or take my phone on the street and I would have a look, you know. I used to just 'Okay, I want that and I'm gonna buy that.' And not think about the price, (I: Uhuh.) but now, you know online you can get it cheaper. (I: Yeah, exactly.) for a fact, so…

I: Okay, so you usually go like home and check online and then you decide whether or not to buy it, or where to buy it?

P10: Yeah, so maybe an application would be good for that time, so you don't have to go home and…you know what I mean?

I: Yeah, exactly, for example. Okay. How about when you relax, ehm I don't know when you relax, you just lie around the beach or what do you usually do to relax?

I: I'm very…I wouldn't really know how to relax. I'm not really a relaxing person. *Laughs* I'm quite up tight. (I: Alright.) And this is why I'm away for the weekend, to try and relax. I'd be always doing something. (I:Yeah.) Cleaning, you know, I'd always be keeping myself busy, sorta would, but ehm so relaxing is not a good point for me. *laughs*

I: Alright, okay. Alright, no problem at all. Okay, ehm how about with the, if we go back to the shopping, (P10: Yeah.) one idea would be if you could access information to compare prices, maybe eh directly, instantly. (P10: Yeah.) Eh, if it would go one step further and it would actually enable you to buy something online straight away, not only to access information, but to do the purchase (P10: Uhuh.) Would you be willing to do that?

P10: Yeah, I would, yeah.

I: Okay, so that you could just click away and you bought it straight away?

P10: Yeah. It would be good, because when you actually have to go home and then really you're waiting there again. You're getting it there and then (I: Yeah.) now

you would have to wait until it comes, but whenever you see something, you want it (I: Uhuh, yeah that's true.) I don't wanna wait, you know. You wanna do it now.

I: Okay, good. Ehm, do you have any, or have you bought anything online on your mobile phone already?

P10: Yes, I have. Ehm, probably things for my son on Amazon. (I: Okay.) Like DVDs and stuff I bought him on my phone.

I: Did you have any issues while doing that, or purchasing anything online on your mobile phone?

P10: Ehm, probably the screen is not really big enough (I: Okay.) but ehm, it's not as quick (I: Oh, I see.) so it's not…I find it quicker at home, the WiFi, obviously.

I: Okay, you use 3G on that, or…

P10: Ehm no. The WiFi, just…

I: But it's still slower than the…(P10: Yeah, yeah.) Okay. So how do you…

P10: Our 3G is not that great in our area. (I: Oh, I see.) So it's not…and we don't have a lot of free WiFi as you were saying around. (I: Exactly, okay.)

I2: I think you said the screen is too small, yeah? There is different types of tablets, big one, some 5inch? 7inch? (I: 7 inch I think.) Well, between the tablet and the smartphone, are you or would you be interested in using the middle size of the iPad, when it comes to screen size?

P10: Yeah, I probably would, yeah. Because iPad, it is good. But ehm it's maybe a bit big. (I: Okay.) Now I know you can get the, is it the notebook? (I: The Mini iPad) The Mini iPad, which I haven't actually seen, so I haven't…but it might be more handy for me. (I: Okay.) You know, I might wanna buy it. (I: Yeah.) But at the moment, my phone just…(I: It does the job?) It does the job. *laughs*

I: Okay, alright, eh, ehm, okay, just a final question. Do you think from you know, top of your head you could, you know, give us some ideas of what would be maybe more attractive, more attractive, more convenient for you in regards to any functions that should be included in the tourism application like for your personal, you know…

I2: What would you like to have there? Like what you prefer, if the mobile apps, AR app is available, what would you like to have there?

P10: Ehm, what is there at the moment?

I: It doesn't matter. Anything from the top of your head that you'd like.

P10: Ehm, probably…you mean like what I would like to see in it, like ehm of places, or sort of…

I: I mean, ehm let's say that you would develop the application for yourself. You could develop the application solely for your purpose, not for anyone else. What would you put in there?

P10: Ehm, it's hard to say, because I don't really know what entails in the application at the moment. So it's basically a tourism application, so ehm…

I2: Maybe your wish. What can be done?

P10: I'm not really sure. I'd have to think about it.

I: Okay, that's okay.

P10: Have you any ehm things that are in it already that I could go from? For example…

I: Ehm, say for example the tourist application that you saw here in Tuscany that they pretty much provide you, or you know show you the things around you. (P10: Yeah.) They give you information about the things. They show you a route of how to get there. (P10: Yeah.) Ehm, also what a lot of application have is just information. (P10: Yeah.) You know, where is what, and what is it, and…

P10: That's probably the things that you would like to see. I can't really think of anything, you know different to that. Ehm, maybe other peoples' reviews on it. (I: Okay.) You know ehm other peoples' ideas of where to go and what to do. (I: Yeah.) Part of their experiences maybe, you know, maybe the movie clips of people.

I2: You want to see what their experience is…

P10: Their experience of some places, you know just so you can see it for yourself and visualise what it's like.

I2: So you want to see their own experiences. Of some more people, yeah? (P10: Yeah.)

I: How do you, how do you usually plan your holiday online at home? How do you go about it?

P10: Just, just eh go into either the Thomas Cook, or Expedia (I: Okay.) any of those, and just really search for the cheapest.

I: Cheapest, do you look for the hotel first, or what do you…

P10: I look for flights first (I: Okay.) and then I usually look for the hotel afterwards. But if I get the flights really reasonable, then obviously for the hotel I spend a little bit more. (I: Uhuh, okay.) It's the flights really that you don't wanna pay big money for. (I: Yeah, exactly.) You want your accommodation to be nice. (I: Yeah.) You do want your flight to be comfortable and nice, but you know, it's only really taking you to it. You know what I mean, you're not gonna be there for a long time. *I, I2 agree* So, yeah.

I: Okay, alright. Well, thank you very much. Ehm, just eh…

P10: Sorry, I wasn't very…

I: No, no, that was great. Ehm, may I just ask you to fill out the profile sheet just to have an idea about the profile and maybe if it'd be possible to provide an E-Mail address, 'cause this is actually only the initial part of the whole research and later on, we're gonna develop a prototype, so there might be like one or two more questions that I would like to ask the participants that you know actually did the first interview. (P10: Yeah.) That'd be great.

Interview Transcript: TP11

I: If you don't like to see yourself.

P11: No, no.

I: Okay *laughs* I'm just gonna make it a bit darker.

I2: Yeah, yeah.

I: Eh, would you mind just filling out the profile sheet for me? (P11: Yeah.) That'd be great. Thank you.

P11: Something to lean on, maybe, a little bit, 'cause I probably just go and trip. Okay, country of origin, Ireland. Okay, first time visitor to Dublin or repeated visit, so I would say…

I2: Repeated.

I: Repeated.

P11: Okay, business or leisure, I'd say both. Okay, travel behaviour, number of trips per year, method, means of travel. Now, I haven't been away in about four years. Because I was always busy studying (I2: Mhmh.) and I've been, I've worked, I've worked in Germany. (I: Oh, okay.) I've worked in Duesseldorf. (I: Oh.) I've worked in Spain, and I've never been outside of Europe, but I've travelled all over Europe. (I: Yeah.) But a good, a good… many places in Europe, not all Europe, but I travelled. So, travel behaviour, number of trips per year. My family have a holiday home. (I: Oh, yeah?) It's in Waxford, which is South of Dublin. You have Dublin, Wicklow, Waxford. I live in Wicklow, so Waxford is further South. And they have a holiday home beside the sea. So we travel there for more than 10 years, 'cause they have the home there. (I: Yeah, okay. Fair enough.) So, so, that's a family holiday home, so travel behaviour, number of trips per year, means of travel, so, hm…methods of travel, yeah so, I would say, ehm…

I2: Car, or…

P11: Car, yeah. *laughs*

I2: For the…either car, or flight, coach, or…

P11: Car, ehm, car and flight, yeah. Ehm, that would be around it, really. If I was, if I wanted to go, I would go to London and I would just get a flight, you know (I: Mhmh.) and that would be it. Ehm, I'm hoping to travel to France this year. (I: Oh, yeah?) I want to Spain, and France, and there by car, by camping trip. So…

I: Oh, where abouts in France, do you know?

P11: Ehm, I'm going to…I have an interest in wine. So I like…

I2: Wine tourism.

P11: Wine tourism, yeah. I've been to Ruedesheim in Germany (I: Yeah, yeah.) which is, which is ehm, they, ehm, they make some very good wine, ice wine.

I: Yeah, exactly. I'm from that area actually.

P11: Ruedesheim?

I: I'm, I'm from Mainz.

P11: Okay, and where is that exactly?

I: It's like 15-20 minutes from Ruedesheim.

P11: Ah, yeah. So I, I know Ruedesheim is a great town.

I: Yeah, definitely.

P11: You know it's…I was there in off-season in the winter time. (I: Okay.) so it was like the…the town, it was a little bit like a ghost town. *I laughs* But in the summer I heard it's supposed to be (I: It's beautiful.) very very lively. I climbed up to the big statue. The statue, you know the statue of…*pretends to have wings*

I: Ehm, I'm not sure.

P11: You know the statue of the hawk or something.

I: Eh, I, I haven't been there, no.

P11: Oh, you haven't been.

I: I've just been in the area, because I'm from there. But I haven't really been…

P11: There is a big statue up the, up the mountain. So there is like a wine tourism walk, where you can walk from the town all the way up to the statue and then you view down at the Rhein, and, yeah. So, yeah, I would like to travel and I do want to travel a lot more in the next, next, next couple of months. In the, in the summer time. So I want to take a couple of holidays. So flight, car, and camping. Camp…how would I say that. Travel behaviour, car, flight, can I put camping there.

I: Yeah, camping is fine, yeah.

P11: Camping. 'Cause I like to get outdoors, you know. It's like, it's cheaper headed and it's a lot more freedom, it's…you know.

I: Exactly, yeah. For a holiday, outdoor is the thing to go. *P11 agrees*

P11: Okay, so gender, I'm male. Okay, and I'm 30, so 22-30. (I2: Okay.) And education level, I've got a ehm a regular, just a degree and a honours degree.

I2: So, BA/BSc then, yeah?

P11: BA/BS, okay.

I2: What did you study?

P11: Ehm, I did wine and beverage management.

I2: Ah, hospitality?

P11: Okay, that was 3 years, and I also did a honours degree in business management.

I2: Oh, that's very good, yeah.

P11: So I, all together…

I2: Two degrees then?

P11: Yeah, all together it was 4 years. (I2: Oh, 4 years?) 4 years. It was all together. It was ehm, it was 3 years of the ordinary degree and then moved on for the fourth year, an honours degree. (I2: Okay.) A joint, because a lot of modules that I've done in the wine (I2: Okay, yeah, yeah, yeah.) they were also, and I was able to join on. And ehm, (I2: Okay?) I've also took ehm, I've also done a…I, I have a hobby where I, I ehm…in music. In music technology (I2: Oh, okay. You've done lots of…) yeah, eh a city of guilt course. I did a part one of city of guilt in sound engineering. (I2: Oh.) I have a home studio in my house, where ehm, I make like electronic music. I love electronic music and I have, I, I purchase records. All vinyl records. That's a hobby of mine, (I: Okay.) which I've been doing for the past 10 years. (I: Oh, okay.) (I2: Okay.) So, yeah, yeah…so that's something that I have a passion for in my life, which is, which is you know what I like to do. It's music, which I love.

I: Do you, do you DJ somewhere as well?

P11: I do DJ, yeah. (I: Oh, really?) I organise some events ehm, in the past which have been successful. They haven't been overly successful (I: Mhmh.) but I managed to cover my costs (I: Okay.) with advertising, and promotion and stuff like that. I covered my cost, and, and I have a lot of friends that are DJs, so I get them to play with me. And they don't cost much money *I laughs* so they're happy to play.

I: Yeah, exactly. That's great.

P11: So, yeah, that's something that I want to get more…spend more in time (I2: Yeah.) You know it's, it's a hard industry to make some money in, so… (I: Yeah.) so I know in time, if I keep at it, and you have a passion for something, eventually (I: Exactly. Then you're gonna get there, exactly.) things are going to happen, you know. It's the same in this industry, you know ehm not that far away from that industry, because hospitality, hospitality (I2: Yeah.) is, is linked, of course, so…so it's kinda something that I need to have a job to, to, to…

I: To support yourself at the moment.

P11: To support myself and then (I: Exactly, yeah.) exactly. So, occupation, so I would be (I2: Employed.) employed. Okay, ehm and my income, right. And that's in dollars, so…*laughs*

I2: Is 1.5? Pound and dollar is 1.1?

I: Not sure…

P11: I, I know what it is. (I2: Just vague.) I would say it's 20, between 20 and 40. And hopefully that will go up. (I2: Yeah.) *laughs*

I: It's not enough.

P11: Not enough, exactly. Otherwise I'm gone. *laughs* 'Cause I know that I am capable of (I2: Yeah.) of so much more, you know.

I2: I think you have very interesting hobbies and interests.

P11: Yeah.

I2: Ehm, which, you know I would like to have a chat with you at some point, yeah?

P11: You know, it…it's a…I love the hospitality industry, you know. I've been around it from a very, very young age. (I: Okay.) And with my family, when I was younger, they, they had…I lived in a hotel, for two years. My, my father they've rent their own restaurants. (I2: Mhmh.) So when I was younger, I was starting off, I was living in the hotel. My parents didn't own the hotel, but they rented the hotel. (I: Mhmh.) (I2: Okay, yeah.) So they had a lease on the hotel and…and I started to going to stocking shelves, cleaning the bottles, cleaning the dishes in the kitchen. Doing small jobs in the hosp…in the hotel, where my parents were rented and they had…after that they had a restaurant, and another restaurant (I: Okay.) yeah, so I've always kinda…got into it, you know. And plus another, another aspect to the music industry was, in the hotel we'd have live bands every weekend (I: Mhmh.) and I was always in you know, every weekend I was always looking forward to what band was playing (I: Okay.) you know, and they had a, a function room. It was only, it was only a small hotel in the country. Nothing like this. Only, let's say 40-50 bedrooms, but it had, it had a function room, and it had a bar, a lounge and restaurant. But only a small hotel in a small town in the West of Ireland, in Roscommon, and…

I2: Okay, I think he has very good knowledge, yeah? So probably we can ask some smartphone thing now, yeah?

I: Yeah, definitely.

P11: Ehm, that one is done.

I2: Yeah? Yeah.

I: Thank you very much.

P11: Yeah, so no yeah.

I2: He will ask some about smartphone tourism.

P11: No, I'm really interested in technology. (I2: Okay.) You know at home, I have, I have a Macbook, I have an iPhone, I also have an iMac (I:Oh, yeah?) in my studio, so… (I2: Oh.) So I'm very… (I2: Technology…) I'm very interested in technology. I'm always, you, you know with electronic music and stuff like that.

(I: Yeah, yeah.) Technology, and I'm always on the Internet. Always on the Internet…*laughing* (I2: Online…) Too much actually. You know, so…

I: Do you have a tablet as well?

P11: Ehm, I have, have, have…I don't have a tablet. I am, I am going to eh, get an iPad. (I: Okay.) I am on the iCloud, you know (I: Yeah, yeah.) the iMatch from iTunes. I purchased that last week. I, I decided, I have so many tunes on my hard drive and if I just put everything up on the Cloud (I: Yeah.) and then I can just get everything as I need it. It's all there, and… (I: Yeah, exactly.) I'm able to store 25.000 tracks up there, whereas on the hard drive, it's, it's, it's limited. But whereas you put everything up there, and it organises everything for me. It's, it's you know, it's an easier way of accessing, you know. (I: Yeah.) (I2: Mh.)

I: But I was actually always wondering about this iCloud, because aren't you like ehm, a little bit anxious about privacy issues?

P11: Privacy? Not really, no. (I: Oh, yeah?) Not really, you know, I'm not, you know, what…the Internet is social, how I see it. (I: Uhuh.) You know, what have I got, what, what's there you know, maybe they have, you know, what, what is, what is, what, what is…I…you know, I know there…is a profile of people (I: Yeah, exactly.) and marketing and stuff that they can, and I know that Tesco, and all those supermarkets (I: Yeah.) they want to know your purchases, so they can target you exactly… (I: Uhuh, yeah, exactly.) what most, most of all this marketing does ops, ops-out of it, you know. Send me what you want, but I block, I block whatever I can. (I: Mhmh.) You know, I'm not, I'm not…I'm a really open person that way. (I: Okay, yeah, yeah.) What is there, you know…(I: Okay, there's nothing that could hurt you.) Yeah, exactly. Yeah. (I: Of what you put out there.) There's not, not, I'm not like,…yeah that's it…yeah. I, I know what I'm trying to say, but…

I: *laughs* I think I know what you wanna say, yeah.

P11: You know there's so many mediums out there. (I: Mhmh.) There's so many networks and everything else. You know, everyone is there, you know, and everyone is…it's just the way things are and it's the way the, the way the, the way the, the…social medium is nowadays and how everything it is part of parts you know…I've got friends, who are like 'No, I don't. I delete my Facebook.'

I: Yeah, exactly.

P11: You know, eh, I don't want people to see my business. I see where they're coming from. I understand, (I: Uhuh.) but, you know…what you put in is what you get back. (I: Exactly.) This, it is…if you want to be part of it, be part of it. If you don't, don't. (I: Okay.) As long as you have the option 'You don't have to do this.'. (I: Mhmh.) You know, but yea…

I: Yeah, that's a fair point, definitely. (P11: Yeah.) So ehm, how are you using your smartphone at the moment? What do you do with it?

P11: Ehm, well, I'll take it out, I'll look, what…ehm, smartphone right. (I2: It's an iPhone, yeah?) It's the, it's the iPhone 4, ehm, I had got a cover on that thing, but I said to myself it just looks, looks too bulky. It's big and they save the phone, but if it's gonna fall, it's gonna fall. *I laughs* I get it replaced, you know, it's…*phone rings* I'll just get this one. Duty Manager Andrew speaking. 349, okay…okay. 349, okay, I…I'll go and…go I have to…349. I'll have to pass that…could, could…yeah, how I use it, is ehm…first for the banking, the Youtube a lot. (I: Okay.) I love it. (I2: Right.) Youtube especially for watching videos on, on music. (I: Okay.) For learning, in you know, in…it's a good information to see, to see what's happening around the world. (I: Yeah.) How the, the technology of

the music industry is…is evolving. (I: Is evolving, yeah.) In South America and places (I: Yeah.) and how it's developing in other different countries, and how…so, it's a good way of keeping…you know of what's happening, and keep opening for new…genres and new…what people what their listening to, and it's…and I see how they're doing things. A lot of people put on stuff in how they're doing this, and how they're doing that and I can learn from that. (I: Mhmh.) So, it's very good for just a learning…a learning…a learning…(I: Source?) a learning source, exactly. Ehm, the Internet, eh Google Maps is here, I have the banking, voice memos, so I just press 'boom' on the smartphone if I need to for example say, 'Okay, lights are broken in room 241' I put it in my voice mail. (I: Oh, I see.) So, I would listen to it in the end of the day, you know, instead of writing it down. I have my phone, so I don't forget. That's pretty handy. (I2: Ah, mhmh.) Ehm, I tether from this thing a lot, you know, so I have a really good connection at home, so I don't need an Internet cable at home. (I: Mhmh.) The Internet connection is good, so I just tether this. I'm on a free Internet, eh…free Internet allowance. You pay a certain amount and then you have…an unlimited amount. (I: Yeah.) I tether all my computers through this, which is pretty good. (I: Oh, I see.) Ehm, the App Store, which is great, 'cause there is so much apps there. (I: Yeah, definitely.) And ehm the free, the free Social Networks, like Skyping, eh Whatsapp all these…E-Mail is very handy. (I: Mhmh.) Ehm, eh the Dropbox, that's really handy. The Tripadvisor of course, ehm and then the music apps, which is, which are…

I2: Yeah, you're utilising most of times, smartphone…

P11: Yeah, really much utilising it, yeah. You I had got an Android before as well, and then I said, you know the iPhone is good, for what I'm using it, so… (I: Yeah, yeah.) So yeah, so yeah, I use it pretty much. It's a very useful device. I got contacts and everything else (I: Okay.) and it's very easily synced with the other…the other products I have with Apple, so… (I: Yeah.) so yeah, ehm…

I: Alright, ehm, why would you or why do you plan to get a tablet? How would you use the tablet?

P11: How would I use a tablet? (I: You personally.) Ehm, basically back to the music again. (I: Okay.) For me, it's Internet for Youtube, obviously, main thing for me would be the music. It's the apps, there is more and more apps, music production apps (I: Mhmh.) but also the social networking, (I: Yeah.) the Youtube. Ehm, the…and everything else that comes with it. You know, the, the camera and everything else (I: Mhmh.) are handy little add-ons, you know, but mainly just for music and…

I: Okay, but can, can't you use those applications on your phone?

P11: You can, but it's a lot more…it's bigger, it's more…(I: Okay.) There's some apps that don't come on this *pointing at iPhone* that do, that both, but that don't come on that. (I: Okay.) It's like, it's like when, when you use music apps, you need to be more like 'hands-on'. (I: Exactly.) You know…(I: Yeah.) I like, I like touching, and twisting knobs and stuff like that. (I: Okay.) I like using computers, I know…but it's, it's the interface between those (I: Mhmh.) is, is more 'hands-on', yeah.

I: Okay. Alright, good. Ehm, why do you think it's useful for people to have a smartphone or a tablet?

P11: Mainly, for the same reasons what I use…a lot, a lot of people (I: Yeah.) use the same, ehm, the social networking, the Youtube (I: Okay.) and keeping in contact with friends. Ehm…it's yeah, once people have them, it's…they're…you know…last Christmas, my mom got one on Christmas, eh…you know she

wouldn't be technology savvy, but once she had it, she was like, 'Oh, I can do this, I can do this.' (I: Yeah, exactly.) They're, they're very…especially the iPhone, you know, once you pick it up, it's very easy to use. The interface is very simple. Ehm, set up an E-Mail and you have an iTunes, iTunes account, if you go on the App Store, it's a very easy to spend money module. (I: Mhmh.) Because once you set up your account, 'boom' it's that one, and you know…it's, it's.. (I: It's purchased.) it's purchased. (I2: Mhmh, yeah.) So, yeah, yeah, it's an easier way with purchasing, and…you know, purchasing stuff and finding out new information about stuff you know…you wouldn't more or less know what's going on (I: Yeah.)

Like the regular sources of media, like radio, television and so on. (I: Yeah, yeah.) It's just another source for me…

I: Mhmh, sorry, would you say it's more up to date than other sources, or…

P11: Ehm, well, up to date in regards to yeah, you know it's…it's…more people are online. It's more alive, and more…(I: Okay.) it's rather than, rather than, you know. Whereas television, and radio, it's on, but television nowadays, it's becoming more and more like a…more…eh…more..you know television is becoming more pre-recorded. (I: Uhuh.) You know, with all the eh…with all the eh, called it these, these, Netflix and so on, (I: Yeah.) you know, live TV is becoming a little bit more…ehm less, less eh…less predominant, let's say (I: Yeah.) because of the Internet is there as well. (I: Yeah.) And the more, more the Internet gets more and more popular, the more, more it will…it…you know ehm…the look, the looks of HD coming on (I: Mhmh.) you know more, with Skype and everything else, more and more alive. (I: Yeah, yeah.) And that's definitely becoming more and more prominent. (I: Yeah, okay.) Yeah.

I: Ehm, coming now to, you know Augmented Reality technology (P11: Aur…sorry? Oh yeah, yeah…Augmented Reality.) You saw these…yeah, yeah. Ehm, after you…or you knew about that, or already heard about it, and eh, seeing those examples, let's say a third person would ask you, who doesn't know what it is, 'What's Augmented Reality?' how would you describe it to, to him?

P11: Ehm, I, I…from what I've seen I would say that it would be, kinda, kinda like a virtual…virtual map, I would say. Ehm, a virtual interactive map, I would say. (I: Okay.) Virtual interactive map, would that be saying with the, with the use for…marketing, with the use for…not marketing, but with the use for you know, helping people from different cities find what's…what's what, and what they're looking for (I2: Mhmh.) based on their preferences and so on. (I: Alright.) Yeah, ehm I can see the uses for it. I can definitely see the uses for it. *I, I2 laugh* You know you walk around like this *holding iPhone in front* hoping your phone doesn't get taken away. (I: Exactly. *laughs*) You know…

I: Okay, ehm, why do you think you didn't use, or didn't look for Augmented Reality applications so far?

P11: So far, ehm…because as I said to you, I haven't been away in quite a while, four years or so. (I: Mhmh.) And technology is moving so fast, so quick (I: Yeah.) recently that I didn't have the use for it because I haven't been abroad. (I2: Mhmh.) (I: Okay.) And I know my way around Dublin quite a lot. (I2: Yeah.) So you know, I wouldn't have the use for it at the moment. But I can see the uses for it, if we do go away, definitely.

I: Okay. Alright, ehm, what do you…which aspects do you think if you…if you travel, in a tourism application you know, in regards to AR now, but in regards to tourism applications per se. (P11: What would I use?) Which aspects would you

think would be nice to have? (P11: Which…sorry?) Which, eh…(P11: The phones?) functions would be nice to have on tourism applications? Or when you go travel, and you would use a tourism application. What would you need?

P11: Ehm, well if I was going to China, maybe…(I: Mhmh.) or HongKong, Japan or somewhere like this ehm…I, I…not having…you know something like…in a train station. Looking up at the time and the ehm…the locations, you know. I might want to know in English, like I might know, if I scan (I: Mhmh.) the eh…the eh…the time, not the time, but the location where I'm going. (I: Yeah.) You know, gate A going to Shanghai, or like 'Okay well is that that way, or is that that way?' *holding the iPhone in front of him* (I2: Mhmh.) (I: Oh, okay.) You know something like that. (I: Yeah.) I think that might be handy. Eh, where is the nearest…I don't know bank or something. (I: Okay.) You know, you know where closest Irish Pub. (I: Mhmh.*laughs*) Zoom or something.

I: That's gonna be hard to try to find.

P11: I wouldn't say so. They're everywhere. *laughs* But eh, something like that might be handy.

I: Okay, alright. Very good. Ehm, do you see any potential problems maybe that might arise when you use any Augmented Reality applications?

P11: Yeah, walking around like this *holding iPhone in front*. It might get robbed. That's an issue. (I2: Ah.) (I: Yeah, okay.) Stolen, you know. Ehm, hm…*thinks* yeah, what else, what…eh…(I: Any like potential problems.) problems…it brings you to the wrong place, when you're in a hurry. You need to get there quick, so it really needs to be up to date. (I: Okay. Very good.) You know, if it tells you a place that shut down, (I: Mhmh.) it really needs to be updated. (I: Yeah, definitely, yeah.) And…what else…I…eh…(I2: Yeah, yeah.)

I: Yeah, that's already very good. Could you just tell me about, what's your favourite app on the…on your phone? *I2 laughs*

P11: Oh…ehm…

I2: Lots of apps…

I: Or which one do you use the most?

P11: The most, eh…it would be definitely the social…the, the Youtube. Ehm, the Youtube, ehm…Youtube I'd say, I'd say the Youtube.

I: Okay. And can you tell me why you're, you're so hooked to that?

P11: Ehm, it's, it's because it's real. It's a lot more real than than TV, there's you know there's people..you're getting peoples' own perspective on things (I2: Mhmh.) and Youtube and the link to Facebook of course. (I: Okay.) You know, the social aspect of it.

I: So you're really like involved into the social media?

P11: Not, really, it's…I know it's there and I use it, but ehm, I don't update my status, like every minute of every day, you know. (I2: Mhmh) (I: Okay.) I just use it to probably see what's going on *laughs* (I: Yeah, okay. Fair enough.) (I2: Observer, rather than…yeah, yeah.) (I: Alright.) So, yeah. That would be…I use…iTunes, iTu…iTu…iTunes wouldn't be…yeah, probably iTunes. (I: Mhmh.) Ehm, iTunes and Social Networking and Youtube. They would be the top 3.

I: Alright. Okay, ehm what do you think in general about ehm content that is generated by you know, companies, or tourist office compared to content that's generated by other users? (I2: Other tourists, yeah?) Yeah, other tourists. (P11: Say that again? Why…) What do you think in general about any content or information that was provided by tourist office or companies compared to information that was provided by other u…other tourists?

P11: Okay, so you're saying, what would be…(I2: Compare.) compare between, between independent (I: Yeah, exactly.) and the tourism board, like the Irish, Irish Tourist Board. (I: Irish Tourist Board, exactly.) Ehm, tourist board would probably get, probably get less…probably get more indigenous. (I2: Mhmh.) Ehm, Irish represented companies, rather than… (I: Okay.) Ehm, rather than outside, you know international companies (I: Yeah.) you would get more (I: Local.) local kind of information (I2: Mhmh.) and probably ehm probably, probably better integrated into the services. The government services you know like (I: Mhmh.), you know eh bus…not busses, but you know like (I: Public services.) public services, integrating the public services than it would be, would be with the private, private.

I: Mhmh. Okay, alright. Do you, eh you mentioned that you…observe, look at other tourists' or other users' you know…whatever they share. (P11: Mhmh.) Ehm, you also mentioned before that you use Tripadvisor, is that correct?

P11: I, I don't use it per se. It's on the phone, but I don't use it really much. (I: Okay.) But you know I do know its capabilities. I do know that's linked into Facebook now. (I: Uhuh.) And I do know that people working in the industry now they can see people they have a threat. They, they see that, oh you know…people in the hotel that you don't, if things are not up to their standard or if they don't, if they feel they have a bargaining tool (I: Mhmh.) against hotels and hospitality industry. They can say, 'Oh well, if you…we're going to put this up on Tripadvisor, if you don't…' (I: Exactly, yeah.) They feel that they have…which is good they have…(I: Some sort of power..) some sort of power. People can very easily…take that they're gonna be you know…take one over on you because of this. They don't see…they have points let's say you know it's hard to…it's hard always for them to…to keep everyone happy all the time. (I: Yeah.) You try your best and you try to…to eradicate any problems before…be proactive (I: Yeah.) before anything happens.

I: Yeah, exactly. That's actually a very interesting point, like what do you, working in a hotel, think about those threats, if you want? (P11: Ehm, at the end…) Do you take them serious, or…

P11: At the end of the day, you do your best, you know. (I: Mhmh.) You do your very best. Ehm, I like…you know I like interactions with people, you know, I am most of the times, it's…it's, it's pleasant you know (I: Yeah.) working with people. Because you…in a busy hotel like here, you can't always see what's going on around you (I2: Mhmh.) and it's all different clientele. (I: Mhmh.) You have different people in at different times of the day. No one is the same. (I: Yeah.) But ehm…the question again…I'm going off, I know…

I: Do…*laughs* do you think or do you…you know as a person working in a hotel and someone comes to you with this threat, do you actually, are you concerned about this?

P11: Not really, because I believe, I believe, I believe within, I believe in the product that we have. (I: Okay.) You know I believe…you believe in the staff that you have (I: Mhmh.) and you believe in the…you believe in the communication that you have between…you know you have good communication about what's going on around. And you believe in what you have and what you're doing is right. (I: Mhmh, yeah.) You shouldn't feel threatened at all. It's just another day. (I: Yeah.) You just get on and deal with it, you know.

I: Okay, yeah, it makes sense. Ehm… (I2: Come back to tourists…) Yeah *laughs*. Yeah, coming back. (P11: It's supposed to be a tourist…) If eh, if things

like this social networking or sharing things would be available on the tourist application, would you…you know, would you make use of it?

P11: Yes, of course. As I was saying to you, before I was going abroad, you know, and I haven't been quite a while, in a few years. (I: Mhmh.) I would definitely use something like that, for sure.

I: Would you like just to gather information, or would you share things as well?

P11: Ehm, yeah, it's…when I'm away in a different country, people in Ireland that I probably would be friends with they wouldn't…or I suppose they would, depending on…you know a lot of my friends are not gonna go to China in the next week or two, or whatever. (I: Yeah. *laughs*) I probably won't go in the next week or two, but ehm…I don't know, it would be nice to…would be nice to share to see what they're doing I suppose. It wouldn't probably doing that much help to those…what other users may be…if it was made for other users they might be helpful, yeah.

I: Okay, so would you have a problem sharing it with other, the public?

P11: Not really, no. Not at all. 'Cause I, I you know, be out there, sharing of course, but you know, I would eh…I wouldn't be eh…I wouldn't have a…no, no, of course. Yeah, whatever. Let people see what you're doing. (I: Yeah.) How exciting your life it. Why not.

I: Yeah. Okay, fair enough, good. Ehm, how about the combination of a tourist application, or Augmented Reality tourism application in combination with other forms of entertainment? For example, you're very interested in music (P11: Music, yeah.) So do you think that could be incorporated somehow?

P11: Absolutely, yeah. Of course, yeah. You know, in it, it's, it's….leisure. It's leisure and people…it's entertainment and it's all linked. (I: Yeah.) So, to make things easier and…to make my life a little bit easier to know where I want to go, yeah…of course it would…and to see what other people said about it. Of course, you know…

I: Okay, you have a lot of music applications already. (P11: Mhmh.) Do you think any of those could be actually incorporated into a certain destination, or like a tourist application per se?

P11: A tourist application? Ehm…

I2: Eh, Irish music, maybe some combination, or some…

I: Maybe some…

P11's phone is ringing

P11: Hello, Duty Manager Andrew speaking. Oh…349, I'm sorry. I'm on my way. Okay. I have to go and open up a safe. 'Cause I'm the only one who has the keys. If that's okay.

I: Alright, eh, it was almost done.

P11: You're nearly finished, but ehm I'll finish it. I'll come back later and …

I: Alright, that's fine. *laughs* Whenever you have time, I mean we don't wanna disturb you while you're working.

P11: Yeah, yeah, I hope I came across…yeah.

I: Definitely. That was so much help already. Thanks a lot again.

P11: Yeah, yeah, what's your name? (I: Danny.) Danny. Andrew.

I2: Yes, yeah, yeah.

P11: I'll try to find someone that's over 40. Over 40.

I: Definitely. *laughs* Thanks a lot for your help.

P11: I'm sorry I can't finish it off…

I: No, no, that's okay. Don't worry about it.

after P11 returns for the second part of the interview

I2: I will send you my paper about Social Media and marketing. It's more marketing side (P11: Oh okay.) but in the UK hotels. (P11: Oh, okay.) So, it's a very high-ranking journal. I published a paper. (P11: Right, right.) So probably…just have a read and see how, because quite social media, you're using that. So it's more from a marketing point of view (P11: Okay.) but it may, yeah.

I: Alright. (P11: Okay.) Okay, well, thanks again for coming back. (P11: No problem.) Eh, there's just, there's just a couple of questions left, actually. (P11: Okay.) Ehm, let's see.

I2: Where were we?

I: Yeah, exactly, I just have to find it…

P11: Yeah, no, I was just thinking while I was away, I was thinking, yeah eh, yeah you were asking a question before, something about how, how could this eh…what's the technology called again? It's called…(I: Augmented Realty. Yeah, this tourism application.) Aug…aug..au…say that word again. (I: Augmented Reality.) Augmented. Can I just ask the meaning of 'augmented'? It's not quite real, but it's…

I: Ehm, it's augmented, or anything augmented means actually that the real environment is enhanced with computerised content. (I2: Enhancing.) (P11: Oh, okay.) And that could be ehm, at the moment, most of it is visual content, like graphics, you know whether it's pictures, or text, whatever. (P11: Oh, okay.) But ehm, can also include for example, sound…ehm… (P11: Okay.) (I2: Multimedia.) Yeah, any, any types of media. (I2: Video animations.)

P11: Yeah, ehm, yeah no, I was just thinking when I, you know, if you're abroad and translation is always diff…you know. (I: Yeah.) Ehm, like you were showing me a sign upstairs. (I: Mhmh.) It's…it's ehm, it's in English you know, and your media, your media content was in English. (I: Yeah.) But what if eh…Chinese person wanted to read the same sign, but they couldn't do so? (I: Yeah.) (I2: Very good point.) You know, or eh it was, it was a media, but they're all speaking in English. You know, it's obviously, when you're in a different country, you're always…especially when it's English, you want to learn the language. (I: Exactly, yeah.) But if I'm a Chinese, I haven't got a clue, you know. (I: Yeah.) So more translation would be a good, good, good… (I: Yeah.) I kinda touched on that when I was saying the translation of, of…I think I was talking about ehm transport I think I was talking and the ehm… (I: Mhmh.) the sign of where to go. It was kinda in my mind, but the more I thought about it, it would be more (I: Yeah.) valuable for the user were saying about the American side of things, about the translation. (I: Yeah.) (I2: Mhmh.)

I: Definitely, yeah. That's a really, really good idea actually.

I2: What do you think, like if you just learn text based, it's more difficult in terms of language problem. But when it comes to visualise, then it may help, yeah? (P11: It may help, yeah exactly.) You know, overcome some of the major issues *P11 agrees* yeah? Maybe, yeah?

P11: Yeah, I hear what you're saying. The more colourful and the more interaction that it has, the more inclined you are to…to pay more attention. (I: Yeah. The more engaging…) The more engaging, exactly.

I2: But do you, do you think the information should be, or application even should be eh…developed according to those different cultural background, or (P11:

Cultural backgrounds…) or…different people, somebody who can speak English, but who cannot speak Chinese, or…do you…

P11: Well, yeah, well cultural is…well language and culture are two completely different things, but if you're in a different culture, you want to learn about other peoples' culture, you know. Ehm, it's I know, I know what you're saying, it's like cultural backgrounds, but it all depends on what, on what kinds of information (I2: Yeah, yeah.) is getting put to you. (I: Mhmh.)

I2: For example American people will come here for a particular interest. Whereas ehm, Chinese people come to Dublin for some other reason. May..maybe, I mean…what do you think about those…

P11: Ehm, you know, I…I…it's ehm I…I don't know actually. (I2: Yeah.)

I2: But maybe, yeah? There are some kind of room for the explore those…(I: Yeah.) That is one of those, which I think are quite important.

P11: *agrees*

I: Ehm, just coming back to this ehm…tourism application. If you could actually go and not only access information, but if you could also bring it you know further, and actually purchase things, for example theatre tickets, for example a room in the hotel, and things like that. Would you be interested in doing this?

P11: Yes, of course. (I2: As a tourist.) As a tourist. Yes, of course, of course, because as I said to you. You know it's very easy with the, the…Like yesterday ehm…I was, as a Duty Manager, you know, I'm expected to work in all different parts of the hotel. (I: Mhmh.) Which I enjoy doing. It's like working in…if I have to work in the kitchen because it's busy, I will do this, whereas some managers they would say, 'No, this is not my job.' (I: Yeah.) But I feel that, it's more, when the staff see you doing this, it's good for morale, and all this stuff. *I, I2 agree* With…I'm sorry, that was just going off and off your question, or off…but anyway, yesterday, a…a man from Northern Ireland was, there were four guests staying in the hotel, and I was at the concierge desk. You know the concierge? (I: Yeah.) And yesterday, when I was…we normally have a guy who works up there. Thomas is up there now. (I: Mhmh.) Ehm, he works in the morning, and then there is a guy who start at 3 o'clock to 9 o'clock. (I: Uhuh.) But yesterday, there was no person in from 3-9, because he had to go to…there was a meeting in a different hotel (I: Okay.) from all these concierges. Anyways, beyond the point, but anyway, a guest approached me and he was asking me, ehm, 'How much is the Guinness Storehouse?' You know the famous (I: Mhmh, yeah.) the storehouse, you've probably been there. And I said, ehm, I said ehm, I said ehm, eh… 'I can book it for you here, if you have a credit card. And you know, you get a discount.' 'Cause I know they give a 10 percent discount (I: Yeah.) so he goes, 'Oh yeah, that would be great.' So straight away, I went on, booked it…and you know booked 4 people, he got his discount and he was happy. He was happy with the hotel and… (I: Yeah.) straight away he goes up with his number and he's straight away, he's in. (I: Yeah.) On smartphones, you know straight away you wouldn't need to write the number down. The confirmation gets to send on his phone (I: Exactly, yeah.) He has it, done. And Guinness is…is..is…it's saving money, you know on staff and transaction. (I: Mhmh, yeah.) So, it's done. It's easy. I can see, I can see yeah…the Augmented Reality aspect of that. (I: Okay.) When you're entering the Guinness Store house, you're on your way up there (I: Yeah.) you don't have to cue. You just flash it on, on the building and you press 'pay' and 'how many people' and any 'extras', 'would you like a meal extra?' and you could, there is…you could implement, ehm…(I2: Mhmh.) within the storehouse, you have the

tour (I: Uhuh.) but you also have the, the…prop…the shop (I2: Mhmh.) you know, but you walk around. But you also have the dinner. (I: Okay.) You know you could just, if you have the option 'Oh would you like to dinner?', pay, pay, pay to, to entice people that you give the discount (I: Yeah.) you know…(I: Through this application, yeah.) through, through the app you know. And it makes it well over easy, it's easily done. (I: Mhmh.) And the people you're with, they're all happy because they don't have to cue. (I: Yeah, they don't…) Everybody is just all happy. And it just keeps flowing. (I: Yeah.) So yeah, so and then you're maybe on a Dublin bus tour. You're on a tour and you're going with this Augmented Reality thing and you know, when you're on a tour bus for example, you know the Dublin City Tour bus, (I: Yeah.) as you're going around, you have…you know the way on the bus, you have…they have a person talking (I: Yeah, exactly.) so you have a…*motions headphones* you're connected to your phone, your headphones on, and you're going around and you stop and you get information and then this and that. (I: Oh yeah, that's very interesting.) It's a…it's another good thing that you could do, you know, 'cause you're travelling on the bus, (I: Yeah.) and you're going to all the top sites. Whether it's…just information about the site, or whether it's a top hotel, you know, (I: Mhmh.) or it's a top restaurant. But yeah, there is lots and lots and lots of applications there that you could use with this.

I: Yeah. Definitely. Do you think you would be interested in ehm…actually you know doing this, the example with the tour bus and actually listening to the information, rather than having, you know, to read information?

P11: Well, it, it…obviously, it's better if it's interactive. People like interaction. People like to…to interact. (I: Uhuh.) You know 'cause if they're, they're interested in something or they want to know more, they will interact. If they're just doing, if…(I2: Listening, yeah.) listening is fine, you know, but if you want to…the bus stops for 5 minutes, you know while they let getting people on and off. And you know 'Oh, what's this, what's this?' you know, (I: Mhmh.) would we get off here, because it stopped. (I: Yeah.) You have time to interact, you have time to …and then maybe it could be a Bluetooth with other people and they could interact with each other while they're on the bus (I: Mhmh.) you know, and you know, they're saying, 'Oh…' you know, they…you know they take a 'Like' straight away. (I: Yeah.) or you know 'Yes, we will come back here later.' And 'Do you want to join us?' and they're looking back to…and 'Yes!' you know…

I: Yeah, why not and share with each other, okay. Yeah, that's very good, okay. So, do you in general buy a lot of things on your mobile phone?

P11: Ehm, I…ehm, on the phone…I, I purchase apps. Ehm, not so many, but every, every now and then I purchase music apps. (I: Okay.) And hm…I do buy some stuff online and you know…some things you just can't get. You have to get online. (I: Okay.) Ehm, I don't…I don't purchase a lot on the phone, really. Ehm, credit, phone credit (I: Okay, yeah.) to top up the phone. I don't have a deal (I: Yeah.) I just buy 20 Euros per month, and that does me, and if I need, I buy extra. So I have like less bills (I2: Yeah, yeah.) (I: That's true.) I know what I'm paying for. And always on the bank to see, 'Maybe somebody put a million pounds on my bank account.' *laughs* You know, hopefully this day will happen, you know. But eh, no…I just check, check my balance (I: Yeah.) and see. I don't make that many purchases. (I: Okay.) I can see, if I had more money, maybe I would make more purchases. (I: Okay.) If I was on holidays, you know…and I would have to purchase something, and it was cheaper, (I2: Mhmh.) if I'm online and I need to book a flight, it's quickly done, yeah.

I: Yeah, eh…would you be interested in buying actually tourist applications? Or paying money for tourist applications?

P11: Ehm, that's, that's…ehm…depending…looking for eh if they're popular, and if people are…people they are using them, and, and…you know there's a lot of hype about them, people are going to be interested, 'Oh, why…' you know, why will it, will it be…will it have benefits for me? (I: Yeah.) You know, I wouldn't say so, because if, you know as I was saying there is places, there is so many places you can go while you're a tourist (I: Mhmh.) that are going to take your money. You know and this, just helps...helps incorporate, helps advertise these places. (I: Yeah.) So, there obviously would be…there…the…you know, if them places would pay a certain amount to the app, or whatever, you know (I: Mhmh.) I don't know, maybe…maybe there would be, depending on if it's giving some free, if it's giving some discounts. (I: Some benefits, yeah.) Yeah, if it had some discounts, people are always looking for what benefit has it for me. (I: Yeah, exactly.) You know what…if it's gonna save me money, yes, or if it's in Europe…and 100.000 people have this app here you know (I: Yeah, exactly.) once the app is there, it's you know… it's you know to build the app or everything else, but you know, once it's there it's you know, obviously you have to update and everything else (I: Mhmh.) or maintenance, but once it's there it's not going…you know a lot of research in the background has to go into it, and getting to that point. (I: Yeah.) Yeah, but once it's there what are you paying for something actually…that is, it's convenient…(I: You just use it, okay.) yeah.

I: Alright, ehm, let's see. Could you…eh just a last question think of any functions, or anything that you would think would be cool to have on this app that would make it more attractive for people on a tourist application?

P11: Anything cool…I think it's pretty cool what I've seen so far. You know I've seen something, maybe on a TV advert, with…this, with this, with this…technology. (I: Yeah.) I've seen it.

I2: Not in tourism, but other…

P11: Yeah, yeah, maybe…I can't remember exactly where I've seen it. (I2: Yeah, mhmh.) But I have seen this on a TV advert, or maybe online. I've seen this before. (I: Mhmh.) And…how to make it cool…

I2: Especially in Dublin context.

P11: In Dublin context, ehm, just making it more…like you know that app speaks for itself. It…if it was good, and if it was simple and if it was…did what it said. (I: Mhmh.) you wouldn't really need to make it much more cooler than it is. Ehm, you know, it…it'd have to…you know if you're…truth is, it's a wide variety of ages, you know everyone from…from, what's the profile of people that have smartphones? (I2: Mhmh.) I know, it's generally people from 20-30, and then from 30-40, I guess, and then, you have the teenage population and you have the over 50s…(I: Yeah, yeah.) So, yeah, depending on what age group and what your preferences are, really. Ehm, to make it cool, I don't know…(I2: Okay.) I can't…I can't really think of much, much else.

I: Alright, that's fine, no problem.

I2: Do you, do you see some application in hotel, restaurant, bar or you know, or castle, do you…

P11: Restaurant, restaurant, bar, ehm…eh I suppose, I suppose to see what other people…who have, who else is using it besides…if there is someone else…if you're in a location and someone else is on, connected, you know, I suppose it's a way of, way of communicating, you know with people. (I2: Mhmh.) What around

you, you know, the more people around you 'Oh, this person is online.' They're right beside me, you know. (I: Yeah.) A way of bringing people maybe…(I: Bring them together.) you know… 'Oh we're going on that bus trip.' 'Oh, so are we.', you know. Something like that. (I: Okay.) You know…

I2: More social element.

P11: Yeah, social element. Just bring a more social element. Yeah, more social element, I suppose. (I2: Mhmh.)

I: Alright, that's very good. Okay. Ehm, just maybe, eh, since it's just an initial stage of the research could you maybe give me…

I2: I think, I think he already gave…(I: An E-Mail address?) oh E-Mail.

I2: Give me yours and I will send the paper to you.

I: So ehm, we can stay in contact.

I2: And also, I want, are you still have time, 'cause I want to ask some other discuss, say outside this interview. I think you can finish that, Danny, yeah.

after getting up, talking a bit more about the impact of music and wine on tourism

I2: …some potential of using this app, like music, mixture, all this together?

P11: No, no, separate. That would be separate. Wine tourism would be completely separate. Wine tourism it, it, it's…depend…you know depending on…(I2: Mhmh.) wine tourism it…it…it's and music like…you know it's what can I say, they're two different social kinda ehm…(I2: Mhmh.) social, kinda social areas, say leisure activities. (I2: Yeah, yeah, yeah.) But I know when people drink wine, they'll probably listen to music. I know, I know, it's kinda…they're linked in a way, but wine tourism, you want to…you want to go and see what vineyards are around and…

I2: Yeah, there is so many different types of wine as well. (P11: Exactly, you know.) Food is…food and wine

P11: Wine is, obviously, they're together. (I2: Obviously.) There is a link there. Yeah, and Dublin, and Dublin, there wouldn't be so many…there's not so much wine. (I2: No, no, no.) No, but you do have the Guinness and you do have the Jameson and stuff like that (I2: Yeah.) Ehm, yeah…what was the question?

I2: What about like this providing further, further information about how it is made, you know, where it comes from…(P11: Mhmh.) you know like a…food side, or, or wine side, what sort of a…where it comes from or what is good for your health. That sort of information. (P11: Yeah, yeah, yeah.) Ehm, do you see the potential in…using these kind of visual…

P11: Absolutely, absolutely. The more information, the more information you get, you know. (I2: Mhmh.) People are hungry for information. They are just…you know…(I2: But, they don't want to read, no.) They don't want to read. But if it's easy and it's something they're looking to get and it's quick and it's…it's easy to understand and it's, it's…it helps them to…you know to understand what their, what their, what their…about their purchase and what they want to do…eh yeah, it can be helpful.

I2: And another question is eh…what is impact of music in the…the tourism app? What do you see?

P11: What do I think about that?

I2: Yeah, is it benefit, or beneficial to understand the culture of tourism…

P11: Yeah, ehm…the…

I2: Emotional…'cause music sometimes, it can touch…

P11: It can touch oneself. Yeah, very much so, very much so. Ehm, yeah you know in Ireland in general, you know, for such a small country, we have eh…(I2: Yeah.) a great reputation for dancing, eh…(I2: Yeah, like Irish dancing.) Irish dancing, Irish music, and then you have of course Youtube…(I2: Yeah, yeah.) you know lots…lots and lots…for such a small country we have…(I2: Mhmh.) It is great to see we…we..we're known throughout the world for that and singing and dancing and the social life in the pubs and the atmosphere and everything else. (I2: Mhmh.) But ehm…yeah ehm…how could you incorporate into apps…I you know…it's again, a lot of people are…are already doing a lot of things, you know…online. (I2: Mhmh.) You know, giving cheap tickets to people (I2: Yeah.) You'll have, you'll have, you make a 'Like' and so on, and…yeah, yeah…to get to see how many tickets…how many tickets are left and to see exactly how many…how many tickets are left and stuff like that that would be handy. If it's sold out, if you get to the gate and it's sold out…(I2: Mhmh.) yeah…

I2: Yeah, yeah, I was just interested because you know. What sort of music you're in…are you actually in…

P11: As a, as a, as a DJ…electronic music (I2: DJ.) and trying to be…I'm trying to be a producer. I'm trying to get there. (I2: Mhmh.) You need to keep an open mind. (I2: Okay.) You need… 'cause if you…(I2: But do you think tourism…tourism…yeah) you can hear something that might be popmusic…(I2: Uhuh.) that might be completely commercial, but you may not like where these people are coming from. (I2: Yeah.) If the sound is something new, and it's something different. (I2: Mhmh.) You, you can take and you can learn from that, you know.

I2: What kind of music will be very useful for tourism? For tourists then? More traditional music, or…popmusic…

P11: Ehm, in Ireland, it's people, you know…it's traditional isn't it. The people, they wanna go and listen to the Irish dancing music. (I2: Yeah, yeah.) In the pub and stuff like that. (I2: Mhmh.) Ehm, it's, it's, it's…really you can…can…it's so…it's so, it's so…variety…

I2: Yeah, end of the day, you want to try and…you know from the tourist board point of view, from the touristm business point of view, you want to enhance the tourist experience, yeah? (P11: Mhmh.) They want to get right information, they enjoy. (P11: Yeah, yeah, exactly.) Yeah? So, in order to do that, you need to…lots of stimu…stimulus. It can be music (P11: Mhmh.) it can be people, it can be food…yeah? All those…ehm…yeah. (P11: Yeah.) I think you're very…kind of knowledgeable and you understand the concept very well.

P11: Yeah, I know. I do understand the concept. I do understand what is…what…how, how helpful it could be and how (I2: Yeah.) people, you can make money doing it…how…it's just a matter of getting people to ehm… 'cause I know I have a couple of friends (I2: Okay.) who, who started up their own, their own business, and ehm…yeah I know it's hard to get…to get a start (I2: Yeah.) but at least when you're out there, trying to make…do something for yourself, you have your heart in heart… because you know that, if you believe in something heart in heart, it will make a difference, you know, for yourself in the end of the day. At least you tried, but you're learning from your experiences. (I2: Mhmh.) But ehm, yeah no, but technology is, is the way to go really, isn't it. *I2 laughs* You can't go wrong going with technology. But, you know people are always, at the end of the day, technology is technology and people are people, so… (I2: Yes.) You know

all people…people have demands, people have to eat, people want to drink…(I2: People is more important…) people want to have a good time. (I: Exactly.)

I2: Technology should support, yeah? Not…

P11: Yeah, it should support eh…eh..it can interactive. It can interact. So…you know, support…I don't know, but definitely interact. Yeah support and help…ehm I don't know, yeah support, yeah I suppose. *I2 laughs* Well, good luck with a with….(I: Thank you very much.) (I2: You're very helpful, yeah…) I hope it's successful, but I guaran…I…I feel that it will be successful.

I2: Yeah, we, we got long-term plan with Dublin City Council. Luckily, the Steven, helps us to, to…to provide these facilities, and try to help to recruit eh…guests. And ehm, I think this is one of the very interesting kind of first step for something is gonna happen in the near future…

P11: You two, how do you think about Ireland, or Dublin in technology terms, how do you think we fair internationally? Compare…compared to…say to… (I2: Manchester.) Manchester, or…

I2: Well, I think Dublin is quite modern and infrastructure is better than the other cities, yeah? So the council, they are aware of that. They try to do something. Innovative things. So they consider the city as test bed for innovative product and services. (I2: Mhmh.) So that's why eh…eh…it's good to have work with this…this…Dublin City Council. Otherwise you know, yeah it's a good idea, but we're not really want to do it. Then I think it's very difficult. Okay? Especially when university and council work together. But Dublin is one of the city who's got infrastructure in a way, and all the European head…IT headquarters are here. (P11: Yeah.) And people have some more open-minded and ehm…so I think I consider Dublin as really good city (P11: Yeah, yeah.) to test this sort of a…technology (P11: No, I see.)

I: I totally agree, I mean eh as Dr. Jung said already ehm just this openness is really important I think and ehm, yes I mean they're doing this WiFi for example, you know they wanna connect the whole city. Ehm…at the moment personally I think it's eh…maybe the WiFi is not the strongest, maybe it's not the…you can't do everything with this WiFi, but at least you have a start…a starting point with that. And once it's there, to improve it, it's not a huge step anymore, so you know I think that's really important that they keep on keep…

P11: No, no, that's good, I can see what you're saying there. The Dublin, the multinationals being here…(I2: Yeah, yeah.) and all those, and the government being…(I2: Supportive.) supportive, which is very good. (I2: Yeah.) And it can only be a good thing, because (I2: Yeah, not all are doing this…) if you're not gonna get involved it's just gonna pash… (I: Exactly.) you know, it's better that the government is coming…do come on board I think, because it's…as I say in an interactive way or other services rather than just being independent…but ehm…(I2: Yeah.) hopefully things flow from there. (I: Yeah, definitely.)

I2: N…next things we want to get a hold from the views from hoteliers. From the restaurant business.

P11: That's what I, that's what I approached you today. You know I thought, maybe I (I2: Yeah.) learn something, and…(I2: Yeah, so hopefully you learned something or good idea, what is gonna happen…) No, you know it's good to know what's going on and I can you know..to see, to see the technology and I will be looking for it myself. So…(I2: Yeah.) I'm gonna shoot guys, so…

I: Alright. Thank you very much, thank you.

I2: Yeah, yeah…but keep in touch, you know we're gonna come back again for…for…

P11: Yeah, if I see you in the lobby and you need somebody else, I'll help you again. (I2: Yes, yes.) (I: Thanks a lot.) The first person…the first person I approached today…Timothy…(I2: Yes.) didn't they come straight away? The lady…(I2: Yeah, yeah…the lady.) the first one. (I2: Professional. You know how to deal with people.)

Interview Transcript: TP12

I: Okay, would you like to see yourself, or…should I just black it out? (P12: No…) Okay. *laughs* Alright, no problem. Okay. So before we start, ehm, would you be so kind and fill this form out. (P12: Yes.) That's basically just like a profile. (P12: Of my person.) Exactly, yeah.

P12: Country is France.

I: Would you like a glass of water?

P12: Eh, if you, if you have…

I: Yeah, of course.

P12: Eh, first time, no. It is the second time. I went in eh…2010. (I: Oh.) Three years ago.

I: For the first time 2010.

P12: Purpose of visit, it is leisure. It is not business. Eh…number of trip per year, it depends. *laughs* So…

I: Just in…in average maybe.

P12: Yeah, yes. It depends, sometimes, two…twice, or (I: Uhuh.) Eh, in April for example I run the marathon in Poland. (I: Oh yeah?) Yes.

I: Oh, so you're very sport active.

P12: Yes, I'm a marathon runner.

I: Oh really. (P12: Yes.) Wow, that's interesting. See I can't do that. I don't have that much condition. *laughing* I really love sports, but marathon is too much.

P12: So, running is the most important…

I: Yeah, exactly. Continuously training.

P12: Method, means of travel…I don't understand.

I: That's like by car, by plane, by train…

P12: Ah, plane. Male…age, eh 41-50. *laughs* Education level…eh…it's…not the same as eh…high school, college…eh…I don't know, BA/BS?

I: It's eh bachelor. Like university degree.

P12: Yes, I..I do eh…I work in a design office. (I: Okay.) Eh…after Bachelor, you say? (I: Yes, bachelor, university degree.) And two years after…it…

I: It's probably BA then…BA/BS.

P11: BA/BS. Occupation eh…employed. This is…dollars..

I: Yeah, *laughing* so you have to think a bit.

P12: Eh, I think in dollar…this one.

I: Alright, thank you very much. Okay. So…(P12: Yes?) yes, that's fine. That's perfect. Are you ehm, currently using a smartphone? Or a tablet or anything like that?

P12: Yes, a smartphone, a tablet…

I: Oh both? You have both? (P12: Yes I have.) Oh, okay. That's perfect. (P12: Yes.) And ehm, what do you use your smartphone for?

P12: It…the type of a…it is not Apple…

I: No, no. That doesn't matter.

P12: It is a Samsung S…eh…(I: S trois.) yeah…*laughing*

I: And what do you use it for, usually?

P12: What sort of application, or…

I: Yeah, exactly.

P12: Eh, with GPS application, (I: Okay.) I use…for driving. (I: Oh, I see.) When you want to reach from one point to the other point…

I: Yeah. So for navigation?

P12: Yes. Eh…when I run, I have an application. I put my smartphone on my…eh…eh…

I: On your arm? Like attach?

P12: Yes, yes. Eh…during my training (I: Uhuh.) Eh…I have a… I have the… total time. (I: Mhmh.) I have the maximum speed, (I: Oh, okay.) the average speed. (I: Yeah.) I have the…eh…of the ground you have the different level. (I: Yeah.) and the other stuff…

I: Yeah, different degree of…

P12: Yes, yes. I obtain, I have a source of the…the road I use. Through the…all the…(I2: The circuits.)

I: Yeah, it records the way, you're…

P12: Yes. Record my eh…(I: Your road, your track, yeah.) yes. For example, (I: Uhuh.) I use eh, for my smartphone, eh… I have many application about eh…from a newspaper. (I: Okay.) Sports information, politics, general information eh..of friends for example. (I: Mhmh.) I'm interested…in many different subjects. (I: Okay.) Ehm…photography, with camera.

I: Alright. Do you also use different applications for camera?

P12: Eh, no, it's the…(I: Just the standard?) the basic. (I: Okay.) Just, because my smartphone in my pocket (I: Uhuh.) it is easy to…to take.

I: Yeah, exactly. Very quickly.

P12: Yes, eh…which application…eh…I have many applications with GPS for example. (I: Okay.) Eh…when I…I am at home, if I want to…to search, where I can buy eh…for, for my car eh…gasoline. (I: Yeah.) Do you understand? (I: Yeah.) You have application, where all the eh…distributors and the different price (I: Yeah.) you have. In a…in a…(I: In the surrounding.) yes. (I: In your area.) You…put 5 km, 10, 20… (I: Yeah.) You have all the possibility, and all the price. (I: Mhmh.) You can pay.

I: Okay. Of all the gas stations?

P12: Yes. (I: Okay.) Yes. Eh…sometimes for the cinema programme. (I: Okay.) Eh, but also to go to Internet to search (I: Mhmh.) to search…I use very often Wikipedia. (I: Okay.) So it's easy to…to check some information, I want to know.

I: Yeah. Absolutely. Okay. (P12: And to phone. *laughs*) Yeah.

P12: To phone for Skype with my daughter. (I: Yeah, exactly.) From France to Dublin, or…

I: Yeah, but it's perfect. So you make a lot of…like different use, actually, on your smartphone. Almost everything. *laughs*

P12: Yes, but I don't think it is many, many application. It's eh…I don't use all the possibility of the smartphone.

I: Okay, alright. Ehm, how about the tablet then? Do you use the tablet differently?

P12: Eh…t…tablet, it is only at home. Eh…it is very quick (I: Uhuh.) to eh…to obtain…I eh…each morning I read the local, local information, newspaper. (I: Yeah.) Eh, this is the last…the last news from everywhere. (I: Uhuh.) But I don't use all the application. (I: Okay.) Only to…for, for my information.

I: Yeah, yeah. So the tablet, you most of the time, just use at home?

P12: Eh, most time at home, yes.

I: Okay. And only your smartphone then (P12: Yes.) when you're outside. (P12: Yes, everywhere.) Okay, alright. That's interesting. Ehm, why do you think it's useful for people to have a smartphone? Or why did you buy a smartphone?

P12: Why I buy a smartphone? (I: Yeah.) Because you have a computer…eh…you have always a computer with you. (I: Mhmh.) You can send…eh…smartphone, it is also my eh…Gmail, I use…(I2: E-Mail.) (I: Gmail.) Gmail, you understand to send mail. (I: Yeah.) To receive, it is very easy to…to communicate with different people everywhere. (I: Yeah.) Eh…

I: So you...do you use your smartphone also for business purposes?

P12: Eh, not really for business. Only for personal (I: Okay.) yes. Eh, for my business, I have in my office all I need (I: Yeah.) to communicate, but my smartphone is my personal to…yes.

I: Okay. Yeah, okay. Very good. Ehm, so how would you…have you seen Augmented Reality technology before? Before I showed you the examples?

P12: Eh similar…*pointing at the laptop* (I: Yes.) Yes, in a restaurant in France. (I: Oh, okay.) Now, eh…instead of giving the menu (I: Mhmh.) they give you the tablet (I: Okay.) and you…you choose your menu, *I laughs* you have information about…you choose a wine, you tap eh…(I: You tap it.) choose a wine, eh you have information about the person who produce the wine, (I: Okay.) the area, the region, (I: Yeah.) and everywhere about the product of the menu. (I: Okay, alright, interesting.) It's a…yes.

I: And ehm…if you…if there was your friend would ask you, 'What is Augmented Reality? What is this technology?' How would you describe it form what you've seen?

P12: Eh…it's very easy to use. (I: Uhuh.) Eh, I think tablets, smartphone is…each people can use easily, without eh…long years of…(I: Okay, alright.) studies. It is for all people.

I: Okay. For all of them. No, no age difference. Everyone can use it.

P12: Yes, eh…the old people I don't know if they use easily, (I: Uhuh.) but eh…it is for all people.

I: Okay, alright, very good. Ehm…do you use the WiFi often when you're travelling? For example, ehm…when you came to Dublin, (P12: Yes.) do you need the Internet often? Or do you use Internet often?

P12: Eh, no I don't.

I: Okay. Do you, when you go travel somewhere else, do you usually feel like 'Oh, I need Internet.' Or 'it would be nice, if I had Internet.'

P12: S…Sometimes, it depends. You speak about WiFi? (I: Yeah. Exactly. Yeah.) Yes…it depends of eh…but you have WiFi spot everywhere. (I: Mhmh.) In hotel, eh restaurant, airport. Yes…sometimes, but not eh…always.

I: Not all the time. Okay. Do you know that Dublin at the moment is making a free WiFi network in the city?

P12: I don't know. No.

I: They're actually…they're still working on it. But what they do is, they want to provide WiFi throughout the whole city for free.

P12: Yeah, I don't know it. But good news. *laughing*

I: But ehm, would you be interested, for example, ehm you know, to pay for WiFi, if you would need it. While you travel, do you think you would pay, for example for one day, or for one hour, or anything like that to use WiFi?

P12: Eh…to pay is okay. Just a question of the price. It depends on the level (I: Yeah.) of the price. (I: Definitely.) It's very interesting to have…eh you said, all the city is equipped (I: Mhmh.) with WiFi. (I: Yeah.) Pay some Euros…for one day, one weekend, or a week. (I: Mhmh.) Eh…I think it's a good idea. (I: Okay.) It depends on the level of the…(I: Definitely.) yes.

I: How much would you pay, if…yourself for let's say, one day of WiFi?

P12: Eh, in the hotel, the price is very expensive. (I: Uhuh.) It's 10 Euros for one day. (I: Yeah.) So, at the hotel, I just spend the night, because I am in Dublin to visit.

I: Yeah, exactly, very good. Okay. But do you think, for example in the city, you could pay for one day. Ehm, how much would you pay for the Internet and say, 'Okay, I'm happy to pay this much.' To use the Internet?

P12: Mh…3…eh…til…til 5 Euros, I think. (I: Okay.) But not more.

I: Yeah, yeah. So, 5 Euros per day, you would say you would pay maximum?

P12: Yes, for example, eh…in France, with my smartphone (I: Uhuh.) with my operator...I think in France the prices are very low for…call, Internet. Eh…I have all include (I: Mhmh.) only for 18 Euros per month. (I: Oh, really?) It is not expensive. (I: Mhmh.) And I have 3 GB of data, (I: Yeah.) eh call all mobiles in France, (I: Okay.) I can call in States, in Canada on mobile phone (I: Oh, wow.) eh…ehm SMS, you say SMS, (I: Yeah.) MMS…

I: All for free, unlimited? (P12: Yes.) Okay, so you don't need Internet over there. *laughing* obviously…

P12: So, you understand, I…I'm not ready for paying 10 or 15 Euros (I: Yeah.) for one day if I'm in Dublin (I: Yeah, exactly.) for the WiFi. (I: Makes sense.) Because I think we don't pay expensive usually in France (I: Yeah.) and we have…okay.

I: Yeah, definitely, I agree. (P12: You understand what…) Yeah, I totally understand, no problem. Ehm, why do you think…or coming back to the examples, I showed you, like the menu, the video, or here the Tuscany, which one do you think is the most useful for you? Or which one do you like the best?

P12: Eh…you can repeat? Video…

I: Yeah, like the examples that I showed you…you know outside the menu, I showed you, the video in the hotel… (P12: Yes.) and here the third one, the Tuscany application. (P12: Yes.) Which one of those three do you like the best?

P12: Eh…all are different, but all have…are interesting. Eh, when you…we go in the road, and you scan the, the…the shop (I: The menu.) yes, the menu. It's very interesting, because eh…the video of the hotel is interesting to discover something, to understand the history of the city. (I: Mhmh.) The last application is interesting, because it's everywhere in where you are located. (I: Yeah.) Eh, all are different, and all are interesting, so… (I: Okay.) I am not able to say, this one is more interesting… (I: Okay.) It is complementary.

I: Yeah, yeah. Okay, that's good. Alright. Ehm, do you think, or how…how long have you used your smartphone now? Your Samsung, when did you buy it?

P12: Eh…last year, (I: Okay.) for…eh…for six months. (I: Okay.) But I had always a smartphone before. (I: Oh, I see, okay.) It was not as good as S…eh three. (I: Yeah, of course, Samsung. *laughing*)

I: But ehm…so you have a lot of experience with application…you know, programs, stuff like that? (P12: Yes.) Do you, ehm…do you sometimes pay for applications as well?

P12: Eh…no, I find very interesting application (I: Uhuh.) eh…information, sports application (I: Yeah.) eh…navigation with GPS (I: Uhuh.) eh…free application.

I: Okay, so you look for free applications.

P12: I…I never taste eh…application where I pay.

I: Okay, alright. Ehm…why do you think until now, you have never tried an Augmented Reality application? *P12 thinks* Until now, since you use a

smartphone for a long time already (P12: Yes.) but ehm, if you, for example you put in, in the application store (P12: Yes.) 'Augmented Reality' like this technology (P12: Yes.) eh, there is a lot of applications already. Although this technology is really new. But why do you think you have never used this application?

P12: Eh, it depends, some application needs…eh, to discover, to…eh for example, I…you know Shazam? (I: Yeah, yeah.) The application, it's very eh…strange. I showed to my colleague (I: Uhuh.) My colleague doesn't know this application, and I show, he 'Wow' *I laughs* so the same thing for application. (I: Yeah.) The application exists, you don't eh…know what you can do with this application. (I: Mhmh.) Just a little idea, and one person explain, or show you the, the…maximum of this application. (I: Yeah.) And so you, you use often, because you think it is a good application. (I: Yeah, okay.) Some, sometimes, eh…you see this application, this application, you don't know inside, what you can do. (I: Yeah, that's true.) It's a yes, just some words, eh, you have a resume what you do, but it is not eh, enough.

I: Yeah, exactly, to explain the whole function of the application. (P12: Yes, whole possibilities.) Okay, good. Ehm, so, if you would design your own application for travelling, for example or for holiday. What would you need in the application? What would you put in there?

P12: Eh, the local information, (I: Uhuh.) when you arrive in Dublin or everywhere, (I: Yeah.) when you eh…the word. Each nationality with the money, you have the…eh…eh…all in difference. When I compare France eh…Ireland (I: Mhmh.) eh…you have all shopping open eh, Saturday, Sunday. In France it's very rare Saturday. (I: Yeah.) Eh, about the….the history. The history of the I…I speak about the pub. (I: Uhuh.) It is a culture, eh…Irish culture. (I: Yeah.) Eh, pubs, music (I: Uhuh.) eh…some very important people of Ireland. (I: Yeah.) It is…local information (I: Local information, okay.) yes, but eh…money. (I: Okay.) We have chance. It is the same. It is Euro, but eh…we can use eh…Pounds in England.

I: Yeah, exactly. For example from other countries, if they come.

P12: Yes. *thinks* Eh…very difficult. *laughs*

I: Yeah, I know. *laughing*

P12: Eh, the most important place, when eh…you arrive for a short weekend. (I: Okay.) The most important place in Dublin (I: Uhuh.) to visit. (I: Yeah.) For example, you have two days, you have three days, (I: Okay.) What do you…what you must do to see the most important, for example. (I: Okay, yeah.) And some address of restaurant, of eh…hotels (I: Okay.) or something, to eh…possibility of eh…of staying. (I: Yeah, definitely.) But for my example, I book by Internet on mobile in Dublin. (I: Yeah.) Airport, I go directly to hotel, because I booked before.

I: Yeah, exactly. Okay. Yeah, that's already very good. Yeah, definitely. Ehm, do you see any, maybe, problems that might happen, when they use a…you know, travel application? What would be maybe some problems? Or when you use Augmented Reality application?

P12: Eh, what can be the problems? (I: Yeah.) *thinks* Eh…I don't see, but if information is recent information (I: Uhuh.) eh, you must act…actualise, how do you say… (I: Yeah, update.) update every…eh everyday, or…(I: Regularly.) regularly to have eh…to have good information. (I: Yeah, definitely.) I think people are interested (I: Mhmh.) if the information is true. (I: Exactly, yeah.) Not the information of the last year, of last month. (I: Yeah, exactly, yeah.) I don't know for the…for the other.

I: Okay. Yeah, that's really good.

P12: I'm…I think the technology with smartphone or application (I: Yeah.) is very…this is the technology of now.

I: Yeah, definitely. Okay, ehm…tell me about your application that you use regularly. Which application do you use regularly?

P12: Eh, information…I, I…

I: Any application, whatever.

P12: Yes, but everyday (I: Mhmh.) morning and evening, I need to be informed. (I: Okay.) What happened around me, (I: Uhuh.) in my city, (I: Okay.) in my country, and in the world, and so. But I need information to be informed, eh yes.

I: Okay, so do you, or why do you think you want this information every, every time? Do you…are you a person who wants to be up to date every time, or…

P12: Yes. (I: Okay.) Yes, I use application where eh…each half hour (I: Mhmh.) you have new subject, (I: Yeah.) new information.

I: Okay, alright. Okay, that's interesting. Ehm, has it ever happened, that you liked an application before, any application and you were using it (P12: Yes.) and after a while, like later you thought, 'Nah, this application is not good.' And you stopped using it?

P12: Eh, yes. That happens. *laughing*

I: Why does it happen to you?

P12: Because you find a similar application (I: Okay.) eh…similar, but best.

I: Better, better than the old one.

P12: Better, yes. So you choose one application, but it is not interesting to have three similar application. (I: Yeah, uhuh.) So you take the best.

I: Yeah, okay. Very good. Fair enough.

P12: Eh, the application you think is the best for…for (I: For yourself.) for yourself.

I: Yeah, exactly. Very good. Okay. Ehm, do you do a lot of Social Networking? Eh…'a lot of' it is not right. *laughing* but eh sometimes, Facebook. (I: Yeah, yeah, for example.) Yes, I only use Facebook. Eh, I think I tried Twitter (I: Uhuh.) but on Facebook, yes. I can with some of my friends…up information, see what they do (I: Yeah.) and eh…they can see, what I, I do. (I: Okay.) But I don't use…it is not a big useful of Facebook. (I: Okay.) Sometimes, just sometimes. (I: Just sometimes, every now and then.) But I…I think you…some people use a lot of Facebook and you can see all the day what they do (I: Yeah.) where…where they are, what they eat, what they…I think it is a…

I: You don't like it? It's too much?

P12: Too much is not good for…for my opinion. (I: Okay, yeah.) A little, yes. But eh…yes.

I: Okay. What do you think if in a travel application, you could also share things? For example ehm, you know you can make your own content, you can make your own information. You go somewhere, and then you think, 'Oh, this is really cool.' And then you make a picture of yourself, maybe, or about this, and then share it with other people. Do you think that would be something interesting?

P12: I…I have a similar, with Google you have the same. (I: Uhuh.) Eh, eh…I don't use, because when you take a photography, with your camera. I think it is personal. You can share, yes. (I: Yeah.) but…*hesitates* I think it is your private life. (I: Okay.) I am in Dublin, eh…last week, I don't know…where. *I laughs* But I think it's my life, so just a little, but I don't want to eh share all my life with my friends.

I: Okay, yeah, that's fair enough. Alright, what do you think about information that is given to you by, for example, tourist office, or other companies compared to information that you can read from other tourists?

P12: Eh, you speak about when a person put a message… (I: Yeah, like a review.) Yes, to say, 'I like this hotel, because…' (I: Exactly, yeah.) Yes, when, when I book a hotel (I: Mhmh.) I see all comments of people (I: Oh, okay.) and if they are good, I think it's a good eh…good way, a good eh…I'm sure to have a good eh…(I: Yeah, make a good decision, or…) yes, yes. (I: Okay.) But if you have 10 comments, and 8 are bad, I don't choose. (I: Yeah, yeah.) I…I think peoples' comments are representative of the shop, of the restaurant, of the hotel. (I: Yeah, of the quality…) of the quality you can find. (I: Yeah.) But sometimes, all people are satisfied, just one is unsatisfied (I: Yeah.) because little problem, but when a person have a problem, you don't have the same level (I: Yeah.) you…*motions drop with his hands* (I: Exactly, it drops straight away.) I think it is a human eh…*laughs*

I: Yeah, definitely. Okay, ehm do you think those kind of reviews would be very useful in ehm travelling, travel applications? (P12: Yes.) Would you make use of it, if there is like reviews from other users, like their experience about this place, this hotel, this restaurant…

P12: Eh…I don't use, but I…I'd like to. (I: Okay, alright. You would be very interested in it?) Yes, for example we buy, we bought cupcakes (I: Uhuh.) in a shop in Dublin (I: Uhuh.) and very delicious, so I decided to put on Facebook (I: Oh, really?) on the profile of the shop (I: Uhuh.) on the comments, to say eh… 'I find delicious cupcakes'. (I: Oh yeah? That's very interesting.) Yes, I think it's my opinion, (I: Yeah.) but it's good for the little shop of…(I: Yeah.)

I: To support them a bit. (P12: Yes.) Okay.

P12: This is the comment of one person (I: Yeah.) and I appreciate, so I eh…yes.

I: Alright, very good. Okay ehm, what do you think about…you, you have a lot of sports applications, you said, right? You train, you're interested in marathon (P12: Yeah.) Ehm, do you think this could be somehow combined with tourism as well? With travelling?

P12: Combine sports with tourism? (I: Yeah, yeah.) Why not? (I: Uhuh.) Because eh, next April, I run the marathon in Poland. (I: Uhuh.) near Cracovie, or Krak…it is a city, it's in Poland. (I: Uhuh.) And but the marathon is one…one day. (I: Okay.) Or less *laughs* but I go with friends for 1 week. (I: Oh, I see.) So it is…it is travel, to visit, to discover this country (I: Yeah.) and with eh…the main, the main…(I: Event, yeah.) Yeah, is the marathon.

I: Okay, how do you think ehm…it could be combined, it could be made together with sports? Now with marathon, for example eh…in your case, it's eh…actually separate, isn't it? 'Cause you have sports/event and then you have 5-6 days only leisure for you. (P12: Yes.) So you have actually two separate things, right? *P12 nodds* Do you think it's possible to combine it together? Or do you have an idea, maybe when you do the marathon, do you think, 'Oh, actually if I would have an application like this, it would be very helpful.'

P12: It, it is always, we speak, eh…it is the most important things to see, to…to do (I: Uhuh, okay.) in the place, but it is always the same eh active things to do (I: Yeah.) I think in my case. (I: Okay.) Difficult to have eh sports and travel (I: Mhmh.) Some people don't like sports. (I: Yeah *laughing* Fair enough, yeah.) It can be dangerous, the sports and the travel (I: Yeah.) I don't know well eh…

I: Or for example like ehm…in case of a marathon for example, how about if this application could ehm plan a route for you and could recommend, 'Oh, this route is very nice to run a marathon. You should try.' (P12: Yes.) Do you think this would be interesting for you? (P12: Yes, in this case, yes.) Okay, so then ehm, you would just use the application to see, 'Oh what is it like, where do I go…' like that. (P12: Yes.) Okay. Alright, very interesting. Ehm, see, oh how about if…we talked a lot about information, right? *P12 nodds* Ehm, what can be done in the destination or where are the attractions, how do I go, but ehm how about if you could actually use this application to buy things as well, for example, 'Oh, where is the opera house, or where is the theathre?' 'Oh it's over there.' 'I want to book a ticket' or 'I want to buy a ticket for the theatre.' Or 'Where is this restaurant? I want to book a table.' Okay, do you think this would be something you are interested in?

P12: Yes. If we have a good, secure of…of the website. (I: Yeah.) But eh…I buy something…eh by Internet. (I: Mhmh.) Yes, so…

I: You use the Internet already to buy?

P12: Yes. And I think in the future, in the next future (I: Yeah.) eh…the smartphone sometimes replace the credit card, the…you have to put your phone to pay, I don't know. (I: Yeah, yeah.) Eh, to pay it, or to book. (I: Yeah, definitely.) Yes, so for myself, it is a good…good idea because the smartphone is always, always around the people.

I: Yeah, exactly. Okay. So you would be very open to…to those things? (P12: Yes, I am.) Okay. Alright, good.

P12: I…I think it is a good eh…technology and eh…I don't believe that like some years ago…now with the GPS you can…(I: Yeah.) it's very attractive. (I: Yeah, yeah, definitely, okay.) Yes.

I: Eh, just a final question, do you have maybe any suggestions about, you know travel application or for an Augmented Reality travel application? Where you think, 'Oh actually, if you have this one, it would be very nice.'

P12: Eh…I remember the short video (I: Yeah.) eh…of a presentation (I: Uhuh.) where…of the city, (I: Okay.) the hotel you have booked. I think it is a plus. (I: Okay.) It is a most attractive thing. (I: Okay.) Because eh…before arriving to the place, you…you know eh the house, the hotel (I: Yeah.) and you can…you, you…eh…I don't…you…you can eh…(I: You have a first, like…taste.) you have a repair, no?...No, no repair. You can easily locate (I: Yeah.) locate of the…this eh this monument, (I: Uhuh.) of eh…this shop (I: Yeah.) of this river, or this…you understand? (I: Yeah, yeah, you have orientation.) Yes, orientation.

I: Okay, this would be a plus for you, if this…

P12: I, I…think I like use eh…maps (I: Uhuh.) and you have eh…street view application. (I: Yeah.) It's very interesting because you don't know the…the place, and you can discover, where is the area and eh…after it is very easy. (I: Yeah, definitely, very good. Okay.) You see colours, you see shape, you see…things and eh…(I: Yeah.)

I: Okay, very good. Well thank you very much for your time. *P12 is laughing* It was very interesting.

P12: Welcome. I'm sorry for my English, but eh…(I: No, no. I understand everything perfectly.) It's good for me to speak but…

I: I hope it was also interesting for you a little bit. Ehm, maybe just ehm…do you have maybe an E-Mail address (P12: Yeah, yes I have.) that you could provide, because right now actually this one is the first interview session (P12: Yes?) but

this research is actually much longer. So later when we develop this application (P12: Yes.) maybe there is like one or two more questions I want to ask.

P12: Okay, by mail?

I: Yeah, by mail, that'd be fine.

P12: Where, at the end of the…

I: Yeah, just at the end, I think that's fine, yeah.

P12 writes his E-Mail address on the profile sheet

I: Alright, thank you very much.

P12 spells out his E-Mail address

I: Perfect. Thank you very much. Did you get the drink voucher already? (P12: No.) No? Okay. Let me just give that to you. How many are you? (P12: 3 people. This is my daughters.) Oh, okay. It's a drink voucher you can use in the hotel. (P12: Ok.) It gives you a free drink. (P12: Thank you very much.) There you go. Thank you very much.

P12: Thank you, it is very interesting, and I hope some new application, interesting application… (I: Yeah, I hope so.)

I: Thank you very much for your time.

P12: Thank you.

I: Thank you.

Interview Transcript: TP13

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(P13: Yeah?) Ehm, would it be possible to just fill out the profile sheet for me? (P13: Yeah.) Just a little bit of information. Would you like a glass of water?

P13: Yeah, please thanks. Germany…*filling out the form* Method of travel? Ist das so jetzt…(I: That's like by train, car, or…) train…okay. Okay, I'm doing my Masters, so…it's Bachelors.

I: Alright. Thank you very much. (P13: You're welcome.) Once again, thank you very much for your time. Ehm, once again all the information or all the answers that you provide are only gonna be used for the research her Bachelors, for my PhD, and eh nothing else. (P13: Mhmh. *nodding*) It's really just for that. Ehm, just to start off, are you currently using a smartphone or a tablet?

P13: Yes, I do. I am.

I: Both, or…

P13: Eh, only smartphone. (I: Okay.) Yeah.

I: And when did you eh start using a smartphone?

P13: Eh…four or five months ago...five.

I: Oh, so it's just recent.

P13: Yeah. (I: Okay.) I think I like…bought my first smartphone I think in October? (I: Oh, I see. And eh…) I mean I had an iPod before, but it's not considered a smartphone, right?

I: Eh, it works with applications as well, so… (P13: Yeah.) yeah, that's like the principle that we're looking for.

P13: Then like 2 years ago. Okay, I had my iPod…

I: Okay. Then why did you in the end decide to purchase a smartphone?

P13: Eh, because I think it's important to use it. Like I'm often going by train (I: Okay.) and I have to do some research for school, university. (I: Alright.) Of course like apps, Facebook, social network. (I: Okay.) That's why.

I: And so would you say or…how are you currently using your smartphone in general?

P13: Everyday, every hour. *laughing* (I: Addicted. Totally addicted.) Yeah, I have to use it. I have to admit, yeah. Like it's eh…yeah. I need it. (I: Yeah.) I couldn't live without it anymore.

I: And what kind of things do you do on your smartphone? What kind of applications do you use?

P13: Yeah, like Facebook, social network stuff of course. (I: Mhmh.) Then also Xing…(I: Xing? What is that?) The…if you are looking for jobs… (I: Oh, okay.) or internships or whatever. It's like more…it's like Facebook for your professional life I would say.

I: Oh, is it like LinkedIn, or something like that?

P13: Probably yeah. But I think it's kind of the same. (I: Yeah.) Then of course Google Maps sometimes for travel around. (I: Okay.) And yes, what else…games, yeah, but I would say Facebook and that's probably it. (I: Okay.) And of course like news or something to look for, or something…

I: Okay, information, news (P13: Yeah.) okay. Alright.

P13: Mhmh, I think that's basically like most of my time I would use.

I: Okay, ehm…are you currently, or have you ever used any tourism applications, yet? And travel applications?

P13: Ehm, yeah I used, like just for booking this trip (I: Okay.) we used booking.com.

I: Oh, they have their own application as well? (P13: Mhmh. *nodding*) How is that?

P13: It was quite good, like you can choose which hotel, like stars and how much you wanna pay (I: Mhmh.) and…yeah, that was quite good. And other stuff…no, I think just booking.com.

I: Okay. Is it the same principle as the booking.com website? (P13: Yeah, I guess.) With all the customer reviews and stuff like that? (P13: Yeah, yeah, same.) Alright. (P13: Same structure, same.) Oh, I see. Okay, very interesting. Ehm, why do you think personally that eh…a smartphone is a good idea for people?

P13: It is. (I: Can you explain a bit why?) Yeah, yeah. I mean it's just helping you. I mean it's…it's just a way…like get information like within one minute. (I: Okay.) So, I don't know if I'm going by train, I have to check if my train is coming, if it's delayed. (I: Mhmh.) It's just making your life quicker, easier I would say. (I: Okay.) Yeah, of course you're always connected to the world. That has advantages, and of course disadvantages like all your data. I don't know Facebook or whatever. (I: Yeah.) I mean if you're posting everything, of course you know the world knows where you are, what you do. (I: Yeah, exactly.) Yes, of course disadvantages, but in the end I would say…it's making my life easier, and more useful… (I: Uhuh.)

I: Okay, so eh…a very like…striking point would be instant access to information. (P13: Yeah, definitely.) Alright, very good. Ehm, now that I've shown you some Augmented Reality examples, the two upstairs and the one here (P13: Mhmh. *nodding*) eh, what do you think of them in general?

P13: I think it's a very good idea. Like, I mean…as I'm thinking about it now, it would be very good if we would have it like, on our trip, I mean 'cause we had some trouble, 'Oh, where are we going now?' and 'Which restaurant are we going?' and whatever. (I: Uhuh.) So I think it's very helpful, just…I mean you can just put it there, and it gives you information. (I: Mhmh.) It's perfect, I think like…

I: Alright, would you be, you know interested to download this app, those kind of applications?

P13: Yeah, yeah, definitely. I think it's very helpful. (I: Okay.) I mean if it works, I mean sometimes you think, maybe there is some…it's just not working, I mean you need obviously Internet connection. (I: Yeah.) But if it works, I think and it really gives you helpful information…*nodding*

I: Okay, what do you think, why…or where are some problems, where you think it could not work? Which areas?

P13: Ehm, I mean just like the phone itself, the smartphone has to work, like sometimes…like your phone has to work. (I: Alright, okay.) It's just…and then of course you need Internet access. (I: Uhuh.) But…and I mean it needs to be updated

like…I mean there is no point if it says, the menu costs 10 Euros, when it's like 20. (I: Yeah, exactly.) So it must be updated. (I: Yeah, that's a good point.) That would be int…or helpful, or…yeah. But I think it's a good idea.

I: Okay, ehm, do you know that, or have you heard that Dublin is providing free WiFi here in the city?

P13: Yes, I've seen some areas. I mean when you go to restaurants or public spaces, or whatever (I: Yeah.) often you have free WiFi connection I guess…it's very good. We don't have that in Germany I would say. (I: Yeah, right?) I mean in McDonalds probably for an hour or whatever, but… (I: Yeah, I guess, yeah.) yeah, that's very good.

I: Okay, ehm say when you travel, do you use your phone a lot? (P13: Yes.) For example, when you just came to Dublin. Are you using your phone a lot here?

P13: Yeah. I mean also not just for like Internet and apps, (I: Uhuh.) but also like camera and all these applications. (I: Okay, I see, alright.) So, I don't need another camera, I just have my phone. So I have Internet…or access to the Internet (I: Mhmh.) camera, I can skype or phone or whatever…(I: Yeah, yeah.) So it's like…everything all in all.

I: Okay, ehm would you say eh…if you wouldn't know that there is free WiFi, or there is WiFi, but you would have to pay for it, how much do you think you would pay and be happy to use the Internet?

I: Ehm, I would say, I would pay…how much would I pay…like per day…or whatever, I don't know…per hour I would say…I mean, now that Internet is quite cheap, (I: Mhmh.) so I wouldn't pay more than…I don't know, 2 Euros a day, or whatever? (I: Yeah, that's fine.) Yeah…I don't know, not that much.

I: Yeah, okay. Sounds reasonable…do you, have you ever paid for applications? (P13: Eh, yes. *nodding*) What kind of applications have you paid for?

P13: I purchased once…one application for news…I don't know what it was actually…it was a news application (I: Uhuh.) and then for a game…(I: It must have been a pretty good game. *laughing*) It was just…or you could eh I cannot remember actually. I mean most of them are for free (I: Uhuh, yeah, that's true.) and then maybe music…I would pay for music (I: Alright.) like iTunes, or whatever. (I: Mhmh.)

I: Do you think ehm, before you…you pay for an application that eh…what influences you to be like ehm…convinced to pay for the application?

P13: Yeah, I mean if I see reviews from others of course. (I: Okay, has a big, big influence…) or if my friends are telling me, 'That's a very good app.' Then…(I: Yeah.) and I think people like…60% of peoples' decision is just because of friends are telling them it's good or bad or whatever. (I: Okay.) So advice from my friends…and of course like reviews…I mean I just, just checked our hotel, and there are very good reviews. (I: Uhuh.) We decided, 'Ok, we take this one.' (I: Alright.) It was good so…

I: Okay, so would you say that a lot of your decisions to buy or to book anything is dependent on the other users' reviews?

P13: Yeah, definitely. (I: Okay.) Yeah, definitely, I would think so. I mean if there is just one or two bad…or negative (I: Yeah.) information about it you would say, 'Okay, I'm not sure…' or whatever. I think it really influences your decisions. (I: Okay.) I mean either if it's from your friends, or just from other people, (I: Mhmh.) yeah, it definitely does…

I: Okay, what do you think about ehm…or when you compare information from your friends or other people compared to information from a tourist office or a company, what do you think when you compare them?

P13: I mean more…convenient? Is that convenient?

I: Yeah, from which part though?

P13: Ehm, would be of course like official tourists (I: Okay.) reviews or whatever. (I: Yeah.) Yeah…then I would probably…or…I don't know, I'm not sure. I think if my friends would tell me, 'Oh no, don't do that.' I would probably listen to them. (I: Uhuh.) 'Cause you never know, okay, it says like 'Yeah, it's official, and…' hm…not sure, actually. Depends like on…which apps or which…product… (I: Uhuh.) Yeah, sorry that's not that useful.

I: No, no, that's fine, that's fine. That's totally, that's totally alright. *laughing* So ehm, what's your like…travel behaviour? When you, when you go and you wanna plan a holiday, and you wanna go somewhere…to travel (P13: Uhuh.) ehm, how do you go about it? What do you do?

P13: Ehm…basically I would just type in, in Google (I: Okay.) my goal, like my…my destination (I: Mhmh.) just have some reviews, I mean it depends, if I go by plane, or…by however, by car… (I: Yeah.) and then depends, if I book a flight and accommodation like separately, (I: Mhmh.) or like…if I do, or if I go on summer vacation, I probably book flights and everything, like all inclusive stuff (I: Okay.) or just type it in…in Google, have a look, some reviews…maybe ask some friends if they have been there, or whatever… (I: Okay.) or I would check also on Youtube like some videos (I: Oh, I see, okay.) about the hotel, like I often do that, if I go to…whatever, whichever hotel or hostel. I just type it in on Youtube, if I see any videos of them. (I: Yeah. Oh, that's interesting, yeah.) Yeah…that's how I would do it.

I: So do you usually do all the planning before you actually go, or do you do some planning at the destination as well?

P13: Well, I would say that I prepare everything before the trip, like a German. (I: Okay, typical German. Typical.) *laughing* Yeah, that's bad, I mean yeah of course I am…I need to know what I have to expect, so… (I: Yeah, yeah, alright.) Definitely beforehand…yeah.

I: Okay, alright, that's good. Ehm, do you use…I mean you use a lot of Facebook you told me earlier. (P13: Yeah.) Do you also make a lot of use of eh…like sharing content and stuff like that?

P13: *hesitates* Yeah, yeah, I do, I mean of course you post like, 'Yeah, I'm here in Dublin.' *I laughs* or posting a photo or whatever. But now, I mean…I mean it's not important for your research I guess, but they have stolen our car (I: What?) on New Years Eve, and I've heard that like really tricky persons, they can see, 'Okay, they're now in Dublin.' or whatever. (I: Really?) They can really see it on Facebook, or hack it, or whatever (I: Uhuh.) so they see, 'Ah, the people, they are not at home.' (I: Uhuh.) So maybe that's a problem. If they would see now I'm here other people would know, 'Okay, she is not home.' (I: Yeah.) and…

I: Go and take out the house.

P13: Yeah, or whatever…(I: Oh, wow.) so I think it's…you have to be…be careful, so… (I: Yeah, yeah.) But I do, yeah, I do post that I'm here in the Newsfeed and stuff…

I: Uhuh, and you also read a lot of other peoples' like sh…content? (I: Yeah.) Okay.

P13: Yeah, of course…I do.

I: You're very curious…*laughing* *P13 nodds* Alright. How about if that thing was available on a tourist application that you could pretty much, you know…use this application, ehm…to share things with other people. Would you be interested in something like that?

P13: You mean like I could post videos or photos? (I: Yeah, exactly. Yeah.) *nodds* I think I would do that.

I: And you would also see other peoples' videos or photos or whatever.

P13: Yeah, I mean especially if it's about…tourist stuff. (I: Uhuh.) I mean then you can see, 'Oh that's a nice place.' And I can go there. (I: Okay.) Maybe next year, or whenever. So…I mean if you're interested in tourism and…then I think it's very helpful in tourism I suppose.

I: Yeah? (P13: Mhmh. *nodds*) Okay. Ehm, what kind of…like I mean you told me, you..you use iTunes for example for some music, you play some games on your, on your smartphone. *P13 nodds* Ehm, can you imagine that it would be possible to connect games, or combine games with tourist applications?

P13: Yeah, of course, I mean you could combine games with tourist stuff, like asking questions about the destination or whatever. (I: Okay.) Yeah, I can imagine that. I mean there are some games…I think we just played one. I…not combined, but yeah…to practice geographical knowledge and stuff. (I: Uhuh.) Where have you been, and blablabla… (I: Oh, really?) Yeah.

I: What kind of game was that?

P13: It's just called 'Wo liegt was' [Where is what] (I: Okay.) you just need to put the needle of whatever… (I: Uhuh.) 'Where is this city?' and you put it there. (I: Oh, I see.) Like…something like that. (I: Okay.) Maybe you could combine it like that, I don't know. (I: Yeah, that's interesting.) Or have you been there, in this hotel, or do you know that logo…whatever, I don't know. (I: Yeah, yeah.) Just…

I: So would you, if that's available, would you actually make use of it?

P13: It depends. If it looks attractive or interesting, I mean…yeah, why not. (I: Okay.) I would definitely try, or look. (I: Alright.) And if it's boring then I would say… (I: Yeah, fair enough.)

I: And ehm, how would you think or when would you think something is interesting, or looks interesting to you?

P13: Ehm, yeah, well if it's well designed…and…if it looks not cheap, or whatever. (I: Mhmh, okay.) so it really looks…real, or authentic, or…(I: Okay, yeah.) something, yeah.

I: Alright, so design issue is a very important…(P13: Yeah, I would say.) alright. Okay, ehm…just ehm, one more question, do you think after like you know…hearing what we do or try to do actually, do you have any like suggestions or any idea, for example imagine, you would…you would be the one developing a tourist application, what do you think you would personally want to have in there?

P13: Ehm, I think like, it's definitely important that all the information is always updated. (I: Mhmh.) Like…it's really eh…correct information. (I: Yeah.) That would be important. And that…that it works, apparently *laughing* that the Internet connection and everything works (I: Yeah.) fluently like…(I: Okay.) I think, sorry for the word, but it would like piss me off if it wouldn't load (I: Yeah, definitely.) then I would be like, 'Ah, leave it.' (I: Yeah, be annoyed.) Yeah, I would be annoyed. And yeah, what else I mean updated data…hm…*thinks* yeah and that it's…I mean it depends on your smartphone, but that you can really read and see everything. That it's readable. (I: Okay.) And maybe that you can change

any languages, or whatever. (I: Oh, okay.) It's not just in English, because (I: Yeah.) of course, not everybody speaks English apparently. (I: Yeah, exactly.) So, you can choose like languages, and choose categories, or…I mean it depends…we will see, but that would be it (I: Okay.) of important…I would say.

I: And then you would actually be interested in that application? If it could do all that?

P13: Mhmh. *nodding* Yeah, I think, yeah, yeah. Sounds interesting, I have to say.

I: Okay, alright. Sounds very good. Well, thank you very much for all the information, for your time. (P13: You're welcome.) Definitely. (P13: No problem, you're welcome.) Just eh, one more thing. Is it…would it be possible to give me an E-Mail address (P13: Mhmh. *nodding*) it's just because what I'm doing right now, the interviews is actually just the beginning of the whole process. (P13: I think it's very interesting, so…) Yeah, later when we do the prototype, maybe there is one more, or two more questions that I'd like to ask the first participants about the…you know what they think, so… (P13: Yeah, of course.) If we could just contact you by E-mail, that would be great. (P13: No problem. Just under…) Yeah, just underneath is fine. (P13: Can you read that?) *I is spelling out the E-Mail address* Yeah. That's perfect. Thank you very much. Did you get the vouchers already? (P13: Yeah.) Okay, great. (P13: Oh my water…*laughs*)

Interview Transcript: TP14

I: Alright, first of all, thank you very much for coming, thank you very much for your time. Eh, can I just ask you to…before we start to fill out this profile sheet? (P14: Mhmh.) Just for us to have a little bit of information about the participant. (P14: Okay.) Would you like some water? (P14: Yeah.) I'll get some more from upstairs. *pouring water* Would you get some water from upstairs? (I2: Yes, sure.) Just ask Andrew from before…Andrew would be probably the best guess. (I2: Okay.) Just let me know if there is something unclear. Alright, thank you very much. Ehm, so before we start, are you currently using a smartphone, or a tablet, or…

P14: Yeah, iPad and iPhone.

I: Okay, so both. Can you just explain, or tell me, what are you using the iPhone for at the moment?

P14: Eh, for some presentations, especially with the…with the eBook. (I: Okay.) Yeah, and…eh…yeah first only for the presentations at work, yeah. (I: Okay.) I use the iPhone, eh no…the iPad especially.

I: Okay, the iPad, now for presentations? (P14: Yeah. *nodding*) How about the iPhone?

P14: And the iPhone ehm…for…for the E-Mails, especially. (I: Uhuh, E-Mails, yeah.) E-Mails…ehm, yeah…that is it, yeah. For the Internet, yeah.

I: Okay, alright. To surf the web? (P14: Of course, yeah.) Alright, and then I guess the basic functions, like calling someone or SMS, or whatever. (P14: Yeah.) Okay *laughing* Alright good. Ehm, why do you think personally why it is useful to have a smartphone, or a tablet? Why is it useful for you?

P14: Ehm because ehm…as an example with the E-Mails (I: Uhuh.) it's easier…with the iPhone. And ehm…with the notebook I can… how do you say that, that's hard. (I: Yeah, you can talk in German if you like. That's no problem) Ehm, well you have on the iPhone, or smartphones in general, ehm, it's just saving time. (I: Okay.) Saving time in general (I: Yeah.) and once you have a flatrate, you just go…I have four E-Mail accounts on my smartphone. (I: Yeah.) Two from work, two private ones. (I: Okay.) You can just do it on the train, on the plane. (I: Yeah, yeah.) While driving a car. (I: Yeah. *laughing*), Well it's relative. Saving time is thereby the decisive factor. Yes…that this becomes the main purpose of it. (I: Yeah, yeah.) When you open your notebook in the hotel finally. You can do everything on the run already. (I: Yeah, that makes sense, okay.) That's the advantage.

I: And eh…how about the tablet?

P14: Ehm, well I honestly have to say, after buying it at the beginning, it was quite useless. (I: Okay.) Actually only for the presentation. Ehm, and that's not the main reason for buying the tablet, as I have imagined before.

I: Okay. What did you have in mind when you bought it?

P14: Well, that I could use it in many facets regarding the presentations. (I: Mhmh.) Just until now, I haven't yet made full use of it. (I: Okay.) I still worked…with pen and paper. (I: Okay. *laughing*) There, the step has not yet been as far as I have imagined.

I: Yeah, yeah, is that because of you, or due to the functions of the tablet not being sufficient?

P14: Hm, that's difficult. Maybe it also had to do with the company software. Of our company.

I: Ah, okay. That it wouldn't run on the tablet?

P14: Exactly. (I: Okay.) It probably was a reason as well.

I: Yeah, definitely, yeah. Ehm, after you, or after I showed you some examples, two upstairs and the Tuscany one here, ehm…which example was the most attention grabbing for you?

P14: Ehm, well actually the location based one, isn't it? (I: Which one?) The one with the location determining function. (I: Ah, okay.) That ehm…actually provided the most information. (I: Okay.) Yeah…

I: Would you say that this kind would be the most interesting for you as well, or…(P14: Yeah, I think so…) what you would use as well?

P14: Definitely. The first, in the first you can see everything…I don't really see the usefulness in that. (I: Okay. Okay, yeah.) I wouldn't know what…well, I don't really know what else is possible to project in it. Video, or ehm…in general. (I: Yeah. Yeah.)It's difficult…what of other examples are out there…

I: Yeah, that's why yeah…well…in general the questions are probably a bit hard to answer, since most of the people that I ask have never seen this. That's why they can't imagine what other possibilities it could provide. I just wanted to ask…

P14: Maybe it would be good, if you could simply, well, that you can look what's going on in the back of house. (I: Okay.) In this restaurant, or something…(I: Yeah.) Yeah, that you could design everything a bit more visual. (I: Uhuh.) Yeah, if you don't know it, yet.

I: Uhuh, do you mean graphics, and…(P14: Yeah, yeah.) Okay.

P14: For example, in terms of hotel, you also look at Youtube, you have a look at some videos (I: Exactly.) what does the hotel look like from the inside. Yeah, when you look around here, and maybe you want to come back a second time, then you will take a look at these. (I: Yeah.) Ehm, look at different facilities. (I: Mhmh.) You can do it like this. If I would do it myself, I could probably just watch it on Youtube directly. (I: Okay. *laughing* Yeah, makes sense.) In this example.

I: Ehm, for you…how do you say that, in the applications…ehm, an application to travel, have you ever used one of those? Travel applications or something like that?

P14: Ehm, actually only the ones from the iPhone, actually only the map. (I: Okay.) To get from A to B. (I: Yeah.) Ehm, then the typical things, if you say, you want to look up a restaurant. (I: Yeah) Yeah, that you just type it in and have a look how many there are…in your surrounding and…where they are. (I: Okay.) Besides that, actually…no other applications, no. (I: Not yet…) *denies*

I: Hm…what would be for you, or how could we design travel applications to make it more authen…authentic, or more attractive?

P14: Ehm…(I: Personally…) well definitely, if you ehm…if you could directly for example on an attraction ehm…project the iPhone, and you really see, what's behind it. Yeah, when was it constructed and…(I: Yeah.) What kind of history is behind it, yeah…those things are already pretty good and maybe it could be connected with other destinations (I: Okay.) which you could visit afterwards (I: Yeah.) in regards to the tourism factor. That would be nice, yeah, because we had the, the problem yesterday. We were in Belfast for example and had one hour to spare. (I: Mhmh.) But you didn't know where to go. (I: Okay.) It's not really shown anywhere either and this kind of thing could be put in connection nicely. (I: Yeah, definitely, yeah.) Yeah.

I: Okay, ehm…do you think there would be any problems in those kind of things, or applications as well? What would be typical problems that you can think about?

P14: *thinks* I can't think of any spontaneously.

I: Okay, no problem. Ehm, has it ever happened to you, that you ehm, used an application, and then after awhile stopped using it due to any reason?

P14: Hm, yes, there were some…because…

I: And can you, can you still remember why you stopped using them all of sudden?

P14: Hm…*thinks*

hotel personnel brings water

I: Thank you very much.

P14: The one or other application was just not updated anymore.

I: Ah okay. (P14: Yeah.) That was because the information was not up to date anymore. *P14 nodds* Okay. (P14: Yeah.) Okay, yeah. Definitely yeah a valid reason. Ehm, how about…if you travel, how you to plan? What do you normally do before you travel somewhere?

P14: The planning…with HRS Hotel. (I: Where?) HRS everywhere. (I: Ah, okay, okay.) HRS…yeah the question is what you want to do. Do you want to lay on the beach, or experience something cultural? (I: Yeah.) You go according to that. (I: Okay.) Well, do you mean the planning before, or planning a holiday? Okay. What kind of travel? Pure, pure beach holiday, or…

I: Is it very different from how you go about it? (P14: Yeah. *nodds*) Eh, both. Beach for once and on the other hand…city or…

P14: Yeah if you're going for a beach holiday, you look what kind of relaxing places are available. (I: Okay.) Ehm, that is done quite fast. Then you know about the region already, if not you can look up some information over the Internet (I: uhuh.) on particular websites. Most of the time, you browse Google (I: Okay.) If not, in the example where you want to look at things, ehm you would also browse over Google to get some backgroundinformation. (I: Mhmh.) Ehm, then book the hotel, on HRS and the flight and…that would be it. (I: Okay.) Yeah so…there isn't anything else really.

I: Yeah, then just relax…

P14: Well, you would look at some comments on the hotel. That is actually an important point. You compare various portals. Ehm, to filter it for yourself what's good and bad and where it has been manipulated. (I: Yeah, yeah.) Yeah, You also have your own…criteria in the hotel that you consider. (I: Mhmh.) Yeah, in the filters of the according providers.

I: How many, how many portals are you normally looking at? In average?

P14: Ehm, I would say 3-4 (I: Oh yeah? Okay.) And just out of experience I would say that HRS has always been the best choice so far.

I: Okay. Very good. Ehm, do you also look up any...if you go to a city for example, any tourist office, tourist information, do you also go there?

P14: Ehm, well I have to admit, due to…the network with the Internet, yeah…I don't do that at all anymore. (I: Okay.) Since you can also get all the information in the hotel (I: Yeah.) through the flyers, ehm…you don't really need the service (I: Mhmh) I have to say.

I: Okay, yeah, that makes sense. How about any information that you got from other people on the Internet, if you compare that information with the one from the hotel, or the tourist office or wherever, ehm…how would you put it in comparison?

P14: Well ehm…in general…I don't really value the website hotels. (I: Okay) They are all done separately anyways…(I: Uhuh.) they all have no…no...how to say individual touch anymore. (I: Yeah.) That is basically all the same everywhere. (I: Yeah, yeah.) You would try to position yourself as the best, of course. (I: Yeah. *laughs*) Well, ehm…I can't really judge it from that. They are really the…the…how do I differentiate them, honestly, the hotel website, or facility are not that significant. I would rather value the comments. (I: Okay.) In each individual page you can filter it accordingly.

I: Yeah, yeah. Okay, ehm do you also write comments yourself? Or are you more the observer?

P14: *denies* I don't write comments…

I: Okay, so you just look what other people wrote about. (P14: Yeah.) Ehm, How about Facebook or something like that for example? Are you someone, someone that 'checks-into places' or something, or pictures…

P14: Ne, Ich have to say honestly, well ehm…in the beginning you probably did it, but honestly, it has lost it's spark, the whole thing. (I: Okay.) Well, if I see other people doing it, it annoys me by now. (I: Okay. *laughs*) Well, really some people…they publicly talk about it, they share really everything. (I: Yeah, they overdo it a bit...) I think a point has been reached, even on Facebook which makes the whole thing uninteresting. (I: Okay.) Well, I noticed that, I visit facebook more seldomly.

I: Okay, and is it, or what would be an aspect for you to make the whole thing back interesting? Can you think of something?

P14: That's difficult. Hm, well…*thinks* generally I haven't thought about it. What could, what could it be that makes the whole thing interesting again? It's hard to say, if you think about how long the iPhone has existed already. *I laughs* That probably exists already since 2006-7 (I: Yeah, approximately.) more or less. How fast that…how much it developed, you really couldn't imagine. (I: Definitely, yeah.) Ehm, it's hard to say, yeah, what could be done? (I: Exactly, yeah.) So…yeah, there is some information available, communicate, but nowadays, it's all not that…not great anymore…it has lost its touch. (I: Okay.) The purpose is lost.

I: Yeah, okay. Ehm, if there are…how to say, yeah, like reviews, or pictures of other people or anything like that, like content, information of other people, if you could look at those on another new application, apart from whether it's connected to Facebook or not, but it is a feature in the application, would you also look at reviews or comments on other people there?

P14: In addition to Facebook? (I: Exactly, yeah.) Just like for example Google is doing as well. Like an App site…

I: Eh, apart from Facebook, or Google or whatever. (P14: Mhmh.) If you had the possibility on this tourist applic…application, eh…that you could either comment yourself, or upload a picture of…an attraction that you visited, or if you could look at photos of other people at the attraction, or other reviews, comments of people. Would you bee interested in something like that?

P14: Yes, because it is all focused on that topic. (I: Uhuh.) And that makes sense, yes.

I: Okay, (P14: Mhmh.) then you would have a look at it. (P14: Yes.) Okay.

P14: It has the advantage of course, if you are currently in Dublin, and it is focused on Dublin then it makes sense, yes.

I: Okay, perfect. Ehm, how about other possibilities, that…that you could connect with the tourist application, for example games, for example music, ehm…movie clips as you saw in the example upstairs. How is it, do you think the application could be improved or made more attractive?

P14: Yes, well in general, the one with the video, what can you show? Yes, in the case of the hotel, you could show rooms. (I: Mhmh, yes.) Ehm, die menu outside, maybe if you could flick through the pages. (I: Uhuh, okay.) Yeah, ehm…what else could be done? Like…maybe a…yes, the history of the hotel, you could include. (I: Okay.) But in general…I wouldn't be interested in anything else. You can't really make a huge event out of it.

I: *laughs* You are not interested in games at all?

P14: Well, you have two or three games, yes, but it's not like…I don't know how you would put it together. Like how would it be…

I: Well, for example, yeah, for example you could do it like…what do you call that 'scavenger hunt' (P14: Mhmh, Good, you could do that…yes.) Something like this, which you can do throughout the whole destination. (P14: That is…) Would you be interested in something like this?

P14: That makes sense in my opinion, yes. Well…you would connect the reality with…with the graphical. That's not bad, yeah, yeah.

I: Uhuh, would you also…after hearing about it…

P14: Try it out.

I: Exactly, yeah. So you would try it.

P14: Mhmh, that would be a possibility, yes. For example…

I: Okay, ehm do you also use your phone, or smartphone for…eh…to buy things?

P14: iTunes, yes…hm…what else do you buy on it? Of course, HRS, you book the hotels, hm…(I: Yeah.) Ehm, apart from that, actually not, no. Only iTunes…

I: Have you ever had any problems to buy things using your phone? (P14: *denies* Not at all, no. Until now…) Okay. That means, ehm, you would consider to buy things using other applications as well.

P14: If it's working, no, yes. That wouldn't be a problem.

I: Okay, and where would be some uncertainties? Or what could be some uncertainties?

P14: Ehm…yeah, that's hard, well yeah, basically you are the transparent person nowadays (I: Mhmh. Yeah.) you can't assess it any more. Of course, I've heard that someone has hacked into a friend's account, on Facebook or…(I: Yeah.) Yeah, of course such things happen here and there, but if it works multiple times, and there haven't been any problems…it's fine. Well, there needs to be trust, seeing that 'Yes, it works.' (I: Okay.) 'It works.' (I: Yeah.) Then it's…it's okay.

I: Okay. Very good. Ehm, just one last question. Ehm, if you would imagine now, you would be the one that…could design the application out of the blue. Whatever it is, you could put anything in there and design it for your purpose, what would be some things that you would include? Which functions?

P14: Within the functions, yeah…you need examples, don't you? What do you use…for example.

I: Well, for example here in the Tuscany one, they put in directions. Ehm, how to get to places, background information, information of buildings, restaurants, where they are, yeah maybe, what you personally, when you travel, miss a bit.

P14: Well, the main purpose is to get from A to B. (I: Okay.) That you know…that you maybe have a particular rating for the individual attractions (I: Mhmh.) which ones are the most visited, which ones are the top rated. (I: Okay.) In addition, what

certain attractions would cost eventually (I: Okay.) ehm, that those things are considered and then maybe a guite within an attraction that shortly explains things while moving from A to B (I: Uhuh.) Yeah, in 10 steps, or something, whatever. Ehm…maybe a, maybe a calendar in the application, that you can say, 'I'm here for 6 days.' 'and I want to do this, than this, than that.' (I: Oh, okay, yeah.) Ehm, that you can make a plan if you are…only at the place temporarily. (I: Mhmh.) Like a planer. That maybe it can also tell you what other things you can do for example in the surrounding of Dublin. (I: Okay.) Or that you can input your profile. Your hobbies, interests, and then it would show you tendencies of fitting attractions. (I: Oh, okay, yes.) Yeah, that's often like in the HRS, individually fitting…filtered (I: Mhmh.) for each individual personality. (I: Okay.) Yes, that all attractions are chosen for the individual…

I: Yeah, definitely. That sounds great, yeah. Yes, thank you very much for the interview. Thank you very much for your time. (P14: No problem.) It was really…really good, top. (P14: Well.) And eh…I hope yeah…you will enjoy your remaining time in Dublin.

P14: Yeah, today is the last day.

I: *laughs* I heard you guys are leaving tomorrow?

P14: Yeah, tomorrow we're going again.

I2: Thank you.

P14: Okay. Bye.

I: You got the vouchers?

P14:What? (I: The vouchers…) Yes, yes.

I: Okay, good.

Interview Transcript: TP15

I: So, before I start asking questions, (P15: Okay.) Just another example of Augmented Reality. (P15: Yeah.) Have you heard about the application Tuscany+? (P15: No.) Alright, so this one, same technology (P15: Okay.) but ehm, works pretty much on GPS. *P15 nodds*
playing Tuscany+ videoclip
 I: Okay, so it can just pinpoint your location. (P15: Okay.) And you can see what's in your surrounding. (P15: It's really great. It's really great, yeah.) Okay, ehm, before we start (P15: Yeah?) Can I just ask you to fill out one of those…profile forms? (P15: Yeah, of course. Yeah, sure.) That'd be great, thank you. (P15: Yeah, thank you.) *p15 fills out the profile form*
P15: Eh, it's not leisure, it's not business, so…it's my city, so…whatever, yeah okay. Yeah, leisure.
I: Eh, you have more fun right? You don't work. *laughing*
P15: Okay. (I: Aright, thank you very much.) You're welcome.
I: Okay, so before we start (P15: Yeah?) Are you currently using a smartphone, or a tablet…
P15: Yeah, yeah. I use an iPhone. Yeah. (I: Okay, no tablet?) Yeah, sometimes, but I don't have tablet, but…my friends, so…sometimes I use tablet, yeah.
I: Okay. Ehm…do you wanna see yourself, or…
P15: Oh, no, I prefer not. *laughs* Thank you.
I: Alright, and ehm, what are you currently using your smartphone for?
P15: Ehm, I use for a lot of apps, especially for net…social networking as Facebook, or…(I: Okay.) Twitter, Instagram. (I: Okay.) I use also for ehm…check cinema apps you know, to check hours (I: Yeah.) eh, topics of movies. (I: Yeah.) I use also maps. Apps…apps about maps, you know (I: Uhuh.) when you are in a city you don't know, you can easily check where you are (I: Yeah.) and it's really convenient. (I: Mhmh.) Ehm, I use a lot of games apps (I: Okay.) yeah, eh…
I: During class…*laughs*
P15: When you're waiting for the bus, it's…
I: Yeah, definitely.
P15: Ehm, I don't know, yeah, I use also ehm…photos apps, you know. You can store photos (I: Okay.) yeah, and…you can add effects on the photos (I: Oh, okay.) yeah it's…it's really playful you know. (I: Yeah, definitely.) So I like it. Ehm, yeah…yeah I also use News apps (I: Okay.) to check eh…news yeah, of course. (I: Yeah.) Yeah…I think that it…that's it. Yeah.
I: That's the majority anyways. (P15: Yeah.) Okay.
P15: But I really, really use smartphone for…for social network apps. (I: Okay, alright. Very good.) Yeah, widely use of…this kind of stuff, yeah. (I: Yeah.) And of course write message…yeah.
phone talks
I: What was that?
I2: It's his phone.
I: Oh okay. I was like…Joanna. *laughing* Be quiet. Alright cool. Are you one of them…these people who shares a lot on Facebook and stuff like that?
P15: Yeah, yeah. (I: Okay.) I like to post photos, to write text and photos…(I: Exactly, yeah.) and to write comments on other photos of my friends. Especially on the moment, at the moment I have a lot of friends all over the world. (I: Uhuh.)

But they do travel for business crew you know. (I: Oh, I see.) So I have friend in China, in Mexico, in Moscow…so everyone put photo on Facebook, share photos and you can exchange about that (I: Oh, that's great.) and see, and seeing lives of others (I: Yeah.) yeah, that's really, really good. (I: That's awesome.) Yeah, yeah, that's amazing. I saw photos with sun, I saw photos with snow, so…(I: Yeah, exactly.) with rain in Dublin. *laughs* Yeah, no, no. That's really, really good.

I: Okay, ehm and why do you think, ehm for you it's probably more the sharing, the social networking, but why do you think it's useful to have a smartphone?

P15: Ah, ehm…it's just because it's really, really playful you know. You can ehm…you can check a lot of things, you have Internet. It's a usef…an easy way to…to check information, like everything, you have to…to know. (I: Uhuh.) Ehm, you can do a lot of…everything you can do with that. And it's only one device and you can do a lot of things, you know…ehm it's not…it's not as convenient as a laptop, because it has a small screen, but you can check a lot of things. I think it's a really, really convenient device (I: Okay.) yeah, yeah…

I: Alright, that's good. Ehm, you've…you've told me that you…oh just give me a second. Before we continue, I have to shut this off. That's really annoying me. *laughing and reaching for the talking phone*

I: Of course I don't have his pin…what..

I2: Maybe you can put it on silent.

I: What are you saying. Alright. Sign out. There you go. Ehm, tell me about the Augmented Reality that you know about. How did you come to know about that?

P15: Eh, I heard about that at school. (I: Okay. You wrote about it?) No, I heard. (I: Oh, okay, yeah.) Yeah, I heard about that at school because I have a course, digital marketing, you know (I: Uhuh, okay.) so one of my teacher showed me an example of apps who use…which use this kind of concept. And we saw videos…yeah and ehm…explain how's…what is the aim of these kind of apps. (I: Okay.) It was really interesting, yeah. Ehm, yeah, it's really, really interactive, you know. You…you can walk on the street and just take a photo and you have an explanation of…it's like Flashcodes, you know. (I: Mhmh.) It's ehm…less developed than Augmented Reality, but it's the first step. I think it's the first step for Augmented Rea…Augmented Reality. (I: Yeah.) Just after taking photos, a…a code, and then you have the webpage of I don't know, a product, or a movie or…yeah.

I: Yeah, just background information about the thing you have there.

P15: Yeah, yeah, because in my…in my business school I'm a member of the student office, you know. (I: Mhmh.) We organise the party and a lot of events for the school. (I: Mhmh.) And we do ehm…ehm…I don't know the word. Just a paper for the promotion of the event. (I: Yeah, like posters.) Yeah, poster! You know… (I: Yeah…) we put, put flashcode (I: Okay.) and students are really, really likely…to taking photos (I: Oh, yeah?) yeah, and we have more explanation about this event. Hours, eh the place, eh..the price, yeah.

I: Oh, that's awesome. (P15: Yeah, yeah.) Okay. And ehm…can you tell me about the applications that you used? (P15: Eh, it's ehm…) Do you remember what they are?

P15: It's an application called…I don't know I can't remember the name, but you just have to upload…on the App Store or Android…Android store. (I: Okay, yeah.) and it's free. And you just have to take a photo of the code and yeah. (I: Mhmh.) It's really convenient. You have, you have…I think you have several. You have several apps for that. (I: Yeah, you have several.) Yeah.

I: Like one of those barcodes…QR…like Qrafter or whatever it's called.

P15: Yeah, Barcodes. Yeah, it's the one that we…that we use. Barcodes, yeah.

I: Alright, have you used any other Augmented Reality applications?

P15: No, it's…for my use it's the only one that I used, yeah.

I: Okay. Alright, ehm…(P15: Yeah.) so when someone would ask you, 'what's Augmented Reality?' (P15: Yeah.) How do you explain it to that person?

P15:I think it's really…complicated. *laughs* How do I explain that? I…I think that it's an interactive way to have…further information about place, about product, about…I don't know. About events, and yeah…and it's ehm…it's a way to have further information about something. (I: Okay.) And an interactive way between the place and the user of this smartphone…of this smartphone, so…(I: Okay.) Yeah, I don't really know how to explain it.

I: No, that's fine. That's great, yeah. (P15: Yeah. *laughs*) Alright ehm, do you use your mobile phone a lot or smartphone a lot when you go travelling?

P15: Yeah, yeah. Not for Internet, parce que…because eh…yeah most of the time, it's really really expensive. (I: Yeah.) But I use for take photos and…(I: Okay.) yeah. Here I have Internet on my smartphone, I study here. (I: Okay.) So yeah. I use my phone…I use my phone for…everytime. (I: Yeah.) When…Whenever I have to check something. I don't know, ehm…the time of the bus ehm…the weather…(I: Okay.) I don't know, yeah. But when I travel, yeah…when I travel to another country just for tourism (I: Mhmh.) I don't have Internet on my phone. (I: Yeah.) I just use my phone to mail, to text my family, my friends and to take photos. (I: Okay.) Yeah, it's really….really small use…(I: Very limited.) yeah, very limited use of it.

I: Yeah, okay. Eh, did you know that Dublin is providing free WiFi around the city? (P15: Eh, no. No, I don't know that.) Ehm, at the moment they're actually still working on it. (P15: Yeah.) I think it's not working on O'Connell…on this street (P15: Yeah.) But on many other streets, like…where there's a lot of people. (P15: Okay.) They did it already, so there is like free WiFi for everyone. (P15: Ah, okay.) But ehm, let's say you travel somewhere (P15: Yeah.) and you don't have Internet (P15: Yeah.) would you be ready to pay for Internet?

P15: Yeah, of course. If it's free…not free, but if it's really cheap. (I: Uhuh.) I'm willing to pay for that.

I: And how much would you pay maxim…or how much would you pay…to be happy to use the Internet?

P15: Eh, depend on my…of the long of stay (I: Okay.) of the duration of stay. Ehm I don't know, ehm…maybe for one week…10 Euros for one week. (I: Okay.) If it's unlimited use. (I: Yeah.) Yeah, 10 Euros for one week.

I: Okay, alright. That's interesting.

P15: Yeah, the maximum of…

I: Yeah, that's fine. Okay. Ehm, what aspects would be interesting for you, or what applications would be interesting for you while you travel?

P15: Ehm, the application about museum, about…about good place, eh…restaurants (I: Okay.) eh…café…yeah ehm…when you can give your opinion about a place. Ehm, the place that you…you have to visit. And yeah, it's…I think it's really interesting when you have an apps (I: Uhuh.) where you can share idea…ideas about your…your visit. (I: Okay.) Yeah, you can give a…a mark for the place that you…that you visit. So, eh…ehm an apps about…I don't know…
phone talks

I: Oh my god…power off.

P15: Ehm maybe…(I: Sorry.) an apps, an apps about different places that you can…visit. Yeah, with marks and…(I: Okay.) opinion of others how have visited, could be good. Ehm…eh…meteo apps. (I: Meteo apps?) Yeah. (I: For the weather?) Yeah, for the weather. (I: Okay.) Ehm…hm…yeah, that's it, yeah.

I: Okay, alright. Ehm, do you see maybe any…potential problems of this…Augmented Reality?

P15: Yeah, I think it's not adapted to all the targets, you know. Ehm, when you are…it's…it's easy to use. (I: Mhmh.) I think it's really easy to use. But everybody who is not used to…to…use…smartphones, to use photos (I: Yeah.) especially for elder…elder people, some people don't really like to…always use smartphone to have information. They prefer to ask directly to…to a person (I: Yeah, yeah.) you know. Ehm…maybe it could be a problem, ehm…I don't know, ehm maybe, I think it's not possible to use everywhere. (I: Okay.) As you can…I think it's impossible to have all places in the…in the application (I: Mhmh.) so, it could be a problems if you want to have information about the menu of this special restaurant and you can't have it. Ehm, yeah…I don't know…I think it's…it has a really, really huge potential, so… (I: Okay.) I think there are issues, but not really, really huge issues. (I: Yeah.) It can be, it can be really, really interesting for lots of people. (I: Mhmh.) Who loves using…high-tech technologies, and…high-tech products, you know, yeah.

I: Okay, good. Ehm, do you…let's see…or which eh…you use a lot of Social Network applications, right? (P15: Yeah, yeah.) Let's say the Social Network, you could actually combine with the tourist application. (P15: Okay.) or this tourist AR application. (P15: Yeah, yeah.) Let's say for example you could ehm make your own content, or make your own…like photos, or video or whatever. (P15: Yeah.) And you could share it with other people. (P15: Yeah.) Would you be interested in something like that?

P15: Oh yeah, really. Yeah, as I said ehm..or yeah. I have a lot of friends all over the world so, (I: Yeah.) it's really, really funny to share photos of a place, or of a tourist place (I: Uhuh.) to see the lives of others…yeah so…I think…I think it's really, really interesting to yeah…to share this kind of information. You can…yeah you can put your…the location…put your location on the map and put that on Facebook. (I: Uhuh, yeah.) It's yeah…I think yeah…it's yeah…really, really interesting.

I: Alright. Ehm, have you ever…like downloaded an app and eh…first you were using it, and then you stopped using something?

P15: Ehm, actually, yeah. Ehm, I often, I always use free apps. (I: Okay.) I…I didn't buy apps because I think it's really, really expensive, yeah. You have really, really good apps, which are free, so…(I: Yeah.) I don't…don't want to pay for that. (I: Okay.) But yeah, even for free apps, I have downloaded…I bought ehm the apps, and I think that…the design of the apps was not good, or it doesn't work well. (I: Okay.) I decided to…just to cut… (I: Just deleted it?) Yeah, to…not to use it. (I: Okay.)

I: What do you mean with, 'It didn't work well?'

P15: It eh…it takes a long time to upload. (I: Okay.) You have something like bugs…(I: Oh, okay.) You, you know. It's eh…it's really, really annoying when you have to check information on…it takes a long time, yeah. (I: Mhmh.) Eh, no. Just forget it. (Yeah, just don't even bother.) Yeah, next.

I: *laughs* Exactly, yeah. Okay, ehm do you think, let's see…ehm when you…when you travel somewhere, do you pay a lot of attention to what other

people say about the place, or (P15: Yeah. *nodding*) do you rather pay attention to tourist information or tourist office or…

P15: Yeah, both, but I think it's better to have tourist opinions. Ehm, I'm here for…for studies, you know. (I: Mhmh.) But I do also touristm, or course. (I: Yeah.) So…I love, love to visit some places, and I check a lot on Internet. Eh…opinions of tourists about a restaurant, about a museum, what they think about that. (I: Okay, uhuh.) Yeah, I think an office, eh tourism office is also a good way to have information. Eh…correct information about how to go eh…there. (I: Yeah.) But it's not the same. And I think…that…most of the time, when tourists say, 'This is a good place.' I was not disappointed, so…(I: Okay.) Yeah, I…I trust them, and it's really relia…rel…re…reliable. (I: Reliable.) Yeah, reliable. *laughs* (I: Okay.) So, yeah, yeah I think the best way to…for me, to have information, ehm…to have advices, is to check…opinions of…other visit…tourists. (I: Of other tourists, yeah.) Yeah. Yeah, yeah.

I: Okay, ehm…do you also write reviews or comments, or anything like that?

P15: Yeah, yeah…sometimes, but…actually, I don't take time to do that. But yeah, maybe I should (I: Okay.) I should! I should do that, yeah. *I laughs* But yeah, yeah sometimes, when I was really, really satisfied, or really, really unsatisfied (I: Uhuh.) I wrote, I write a comment. (I: Yeah.) But most of the time, no. (I: Okay.) Yeah, because, because I don't take time, but yeah. But once I was really, really satisfied, or really, really unsatisfied, I want to say that.

I: *laughing* Alright. Okay, alright, that's good. Okay. (P15: Yeah.) Ehm, what do you think ehm…I mean you've told me you're also using a lot of gaming applications (P15: Yeah.) eh can you imagine some tourist application could be combined with gaming?

P15:Oh yeah. It could be a good idea. Yeah, maybe, maybe we can go to a museum (I: Uhuh.) and sometimes, some museum I'm really, really boring. (I: Yeah.) So, I love museum, but it's really, really boring and…and you can add an…I don't know, an interactive touch, you know. (I: Yeah.) An apps, and maybe you can propose an apps an interactive way to (I: Mhmh.) visit museum and to have a game, I don't know a questionnaire, that…this kind, this exhibition… (I: Yeah.) What do you have…what do you think about this exhibition, (I: Mhmh.) what you have learned. Yeah, with a quiz, I don't know. (I: Yeah.) It could be a good way to…to give a…playful dimension (I: Yeah.) of some boring museums…(I: Uhuh.) ehm yeah it…yeah it could be a good idea. Ehm…I don't know, yeah ehm…yeah you can…yeah…even for children, you know (I: Yeah.) I s…I see a lot of children use…their parent's smartphone or tablet you know. (I: Mhmh, yeah.) And they can use…the smartphone of their parents (I: Yeah.) and to have ehm, ehm a cartoon (I: Uhuh.) that explains with…a less difficult vocabulary the ehm…the aim of the museum (I: Mhmh.) What you see in the museum…eh the history of this subject with simple words you know. Ehm, maybe with an audio…an audio explanation (I: Yeah.) or with eh…really playful images…(I: Uhuh.) I don't know, but it could be a good idea, yeah.

I: Alright, a lot of good ideas, yeah. (P15: Yeah.) Okay, so…are you ever eh…buying things on your mobile phone?

P15: Ehm, no, I didn't. I didn't buy any apps. (I: Okay.) And when I…when I buy something on Internet (I: Mhmh.) I use my laptop. But not my smartphone, (I: Okay.) because I prefer to have a…large screen (I: Okay.) to check that it's really eh…safe. (I: Oh, I see.) The website…and…it's more convenient to tab your code, and yeah…(I: Mhmh.) so I prefer to do it for…from a laptop, yeah.

I: Yeah. You've never done it with your mobile phone, actually? (P15: No, no.) So, would you be…if you could purchase something on your tourism application, for example concert tickets, movie tickets, whatever (P15: Yeah.) book a table in a restaurant, or book what not… (P15: Yeah.) Ehm, would you be interested in doing that? (P15: Yeah, yeah, but…) Or open to do that?

P15: Yeah, but I always do that from my laptop, you know. (I: Oh, okay.) Maybe if you're in the city, and you don't have access to your laptop, it would be…it would be really, really convenient to…to buy I don't know a train ticket, yeah. (I: Mhmh.) But most of the time, you plan that…yeah…you know, it's not like, 'Oh tonight I will go to Beyonce concert.' No. (I: Yeah. *laughs*) Yeah, you have to…you know, to anticipate that, so…actually I prefer to do that through a laptop, yeah. (I: Okay. Yeah, it makes sense, yeah.) I think it's really, really convenient when you are really…yeah you buy a train…a train ticket, you are really in a hurry, yeah. But most of the time, I think it's better to…for my home use…to…use a laptop.

I: Yeah. Okay, alright. That's interesting. Ehm…do you think…let's say you would design an application, I mean you…said so much information already. But let's say (P15: Yeah.) you would…could design a tourist application, just however you want. It doesn't matter how you put it in there. (P15: Yeah.) What would be some things that you would put in there?

P15: Eh, I don't know, we can take…we can make a different ehm parts. (I: Uhuh.) Maybe a part with museum, a part with restaurants, a part with…eh…good work. (I: Uhuh.) You know the best work. Eh, itiner…itineraries (I: Uhuh.) in the city. Ehm, a part with…yeah restaurants…and in Ireland pubs could be a good idea. Ehm…and a huge part for opinions of tourists. (I: Okay.) Yeah, ehm…yeah, yeah that's it. Yeah, bar, restaurants, ehm museums, rest…yeah and maybe some advice to visit the city with the best ways (I: Oh, okay.) yeah, the best shops, something like that. (I: Yeah, yeah.) Yeah, an advice of tourists, something like that, yeah.

I: Okay, (P15: Yeah.) alright very good. So, like a…like a planer almost. (P15: Yeah, yeah.) Okay.

P15: Yeah you dif…you make a different parts (I: Uhuh.) in apps (I: Yeah.) in order that it…it could be easy to use of all kind of…tourist, you know (I: Yeah, of people, yeah.) and you can easily check an information about yeah…you are in the city and you have a lot of restaurants. You don't know which one is the better…the best. (I: Mhmh.) So you can just check on the app, the app…to check the opinion of other tourists, yeah. (I: Yeah.) It could be…it could be really, really useful (I: Yeah.) because…in Dublin for example you have a street with a lot of restaurants. (I: Mhmh.) It's really, really hard to choose. Maybe it…it will be helpful with app.

I: Yeah, definitely. That's a really good idea, yeah. (P15: Yeah, so yeah.) Okay, alright. Thank you very much. Thank you for your information, your time. (P15: You're welcome.) Ehm, maybe just in the end, would it be possible to give me your E-mail address? (P15: Yeah, of course, no problem, yeah.) Because ehm there might be some questions that I would like to ask the interviewees. Like later, when we actually do a prototype of the application. (P15: Okay. Thank you.) Thank you very much.

P15: No, you're welcome. Good luck for your project.

I: Thank you.

Interview Transcript: TP16

I: Alright, and this one is just gonna be a third example. This is an application actually they developed in Tuscany already, like a couple of years ago. And this is…the same technology again, but from a different approach. (P16: Mhmh.) *playing Tuscany movie clip*

I: So, this application is GPS based. Like the example that I showed you before was with a picture (P16: Yeah.) whereas this one, it pinpoints your location and it shows you whatever is in your surrounding. Okay, let's see…so before we start, can I just ask you to fill out this profile sheet? It's just some demographics. (P16: Mhmh.)

P16: In dollars?...Eh, I don't know how that works. The income, is it meant to be in dollars, or…

I: Yeah, I think compared to Euros it's about…

P16: I'll live in Pounds as well.

I: Oh that's right. It's about 1.5 in Pounds. Alright, thank you very much. Okay, well thank you very much for your time, first of all. (P16: It's okay.) Ehm, before we start can I just ask you if you're currently using a smartphone, a tablet or any mobile device?

P16: I have an iPhone, and I have an iPad mini.

I: Okay, and how do you consider the usefulness of the iPhone and iPad?

P16: I love it. *laughs* Ehm, I use it for everything, for work, for E-Mails. (I: Okay.) Eh…books, everything.

I: Oh, okay. So is it mainly then entertainment, or is it work-related?

P16: I use it for both but ehm…I use it today to get in touch for work…but then use it for my own entertainment afterwards.

I: Oh, okay. Alright, very good. Ehm and can you tell me a little bit about the applications that you use the most? Or for the iPhone for example.

P16: Ehm iPhone…sometimes I use such things liks Vouchercloud (I: Okay.) eh…Candycrush the game (I: Oh, yeah.) ehm Angry Birds…Facebook, Skype (I: Uhuh.) Ehm…Twitter (I: Oh yeah?) I've got other games and things but most of them I won't really use a lot I suppose (I: Mhmh.) but then I use a lot of posted notes and those sort of things on my iPad (I: Okay.) you know organising things. (I: Yeah.)

I: Oh, so would you say the iPad is more work related?

P16: Yeah, I use that more.

I: Oh, I see. That's interesting. Alright. So have you ever experienced any Augmented Reality technology with…in connection with your mobile devices?

P16: Ehm, I've used that one where you scan the barcodes (I: Oh, okay.) and they link you to other things. (I: Alight.) And we did one where you could photocopy your wine, and it would tell you where you can buy your bottle of wine. (I: Oh, okay.) and things like that. (I: Yeah, exactly.) and ehm…sort of like maps and things to find routes.

I: Okay, very good. And what did you think about that technology?

P16: Google…well we struggled with the maps a bit. (I: Okay, why is that?) Well, sometimes it didn't move, when you were moving, so we got a bit confused. (I: Okay.) But it's fine.

I: Okay, and with the QR code, was that like a 'wow' factor, or was it more like "Okay, that's like information and that's about it…"

P16: Yeah, it's so…it's just accepted technology, isn't it. (I: Okay.) Also it's just…I'll use it, and here we go. *laughs*

I: Oh, alright. Very good. Ehm so how do you think, I mean in your case, you've experienced it already, the technology. How did you get to this? Or how did you find out about it?

P16: I've got no idea. Just with apps, really. The one with the wine was on the menu. (I: Okay.) Eh…the…I don't know just searching for apps, if you go on holiday, like where would be good to go and like for tourism things (I: Oh, I see.) and then games and just general things. I just generally find. I don't go out of the way to find them.

I: Okay. So you just looked at the app store and it was more random that you found them, or…

P16: Yeah, I was looking for free ones. *laughs* (I: Okay.) Eh…I was searching for free apps and then go through…for example coming to Dublin, put the Dublin one on, and things like that (I: Okay.) and the website and that.

I: Oh, I see. Alight, interesting. Ehm, so for the tourism app now that you used. May I ask which city it was, or which location, destination it was?

P16: For Dublin. (I: Oh, it was for Dublin.) Yeah, for this, this little trip. (I: Okay.) And ehm, it is called iGuide Dublin. (I: Oh, I see.) And then yeah.

I: Okay, alright. Ehm, but with that you had some problems with the map, that it didn't move?

P16: That was on Google maps. That was on M's…M's phone.

I: Oh, okay.

P16: And that's actually the only map that's actually part of the phone.

I: It's connected with Google Maps.

P16: I think it's cause we couldn't have the Internet with it…roaming charges and…

I: Yeah. Exactly. That's true. Alright, ehm so after seeing those three examples that I've shown you, which one did you enjoy the most, or did you think was the most useful?

P16: I thought the one downstairs with the…with the menu (I: Uhuh.) that was very useful when you go out and then the one you showed me here was very useful. Like if you were out and about to see where things were, and how to get there.

I: And ehm for you now, having experienced this Augmented Reality technology already was the thing, or any one of those things that I showed you a 'wow' factor, or was that like a normality?

P16: I thought the one was very cool, with eh…the film clip coming out of the…(I: Okay.) and they all got a little bit of a 'woo' that's why we keep buying all the different things…but yeah.

I: Alright. So ehm, have you…okay, you obviously have used some other tourism applications already. Could you tell me about, maybe what you enjoyed about the tourism application that you've used? (P16:Ehm…) What did you think in general? It was a good thing, or…

P16: They're very useful. They're helpful. And they're very true to reality, if it makes sense. If that's not a particular great place, they tell you (I: Okay.) They get quite accurate readings. (I: Mhmh.) For choosing where to go to have drinks and (I: Okay.) and things like that, yeah.

I: And ehm, what, what kind of information do you usually look for in those applications?

P16: Ehm, value for money, entertainment. I don't know, things that we'd be interested in.

I: Uhuh, okay. So, sorta like restaurants, bars, entertainment, and stuff like that?

P16: Yeah. *nodds*

I: Ehm, was there anything in those applications where you thought, "Oh, this is annoying that this happens to the application." Or it's really a no go.

P16: Sometimes, when you enter the same thing each time you go. Each time you book something through it, you have to keep entering your details. (I: Uhuh.) Every single time. That could get quite frustrating.

I: Oh I see. Okay, it's not saved anywhere…

P16: Especially on an iPhone, cause you have to keep going and you have to press 'Done' and you have to go to the next box and you have to press 'Done'. (I: Yeah.) So for each of those little boxes, sometimes it could be quite frustrating.

I: Okay, alright. Ehm, and eh…well, which aspects in a tourism application per se would you consider most valuable?

P16: Ehm, I don't know value for money I suppose. Really, especially if it's like booking hotels and stuff like that. (I :Okay. So you mean…) Central points and all that, yes. So…

I: Okay, so would you be looking for any special deals with this application or…

P16: Sometimes, yes. (I: Alright, okay.)

I: Ehm, do you see any possibilities, or you know, just let your imagination go wild…do you see any possibilities to implement this augmented reality technology into tourism applications?

P16: Oh yeah, I think it would work really well. It would work well with all the different sites that are there as well.

I: Uhuh, can you like imagine, how it could work, for example?

P16: Well, I suppose with your hotel, it would when you see the hotel, the clip would automatically show up and it would show you all they have and have not, vs. to have to go through their individual website. It would just all be with a click of a button (I: Mhmh.) It's the lazy way.

I: Yeah. *laughs* to get information. Easy, fast access. Okay. *P16 nodds* So if you would design, you would be the designer of the application and you could design it any way you want with anything, information, whatever possibilities it can do, ehm how would you design it for your own interest?

P16: I'd just make it simple, so that everybody can use it. (I: Okay.) And so that it takes you to exactly what you're looking for and not to what it thinks you're looking for.

I: How could that work?

P16: I don't know. I don't understand all that. (I: Okay.) *laughs*

I: Alright, no problem.

P16:Ehm *noise in the back*

I: What was that?

P16: Just a game. Eh…just, I don't know, just really straight forward with steps. Step one, step two… (I: Okay.) and step three, Done. As supposed to. Then you going…time.

I: Okay, so saving time is a very important issue for you?

P16: Yeah, I think it's these days isn't it? (I: Yeah.) I think that's why we have all of these stuff.

I: Yeah, exactly. That's true. Okay, how about like eh, specific functions that it should do…for you?

P16: Ehm, it should be secure, if it's gotta be working, it has to be secure. (I: Okay.) Ehm, maybe if it's…if it would be able to sync to other devices that you have, so you have all the details everywhere. I don't know those kind of things (I: Okay, very good.) Ehm, just clear, you know instructions need to be…multilingual I suppose that if you are in a different country, would it come up in English for you, or would it still give you all the details, it'd have to…(I: Yeah, yeah.) it could work properly.

I: Okay, yeah that's a very interesting factor. Okay. Ehm, so do you see any potential problems that especially Augmented Reality technology with tourism or without tourism could have?

P16: Well, they could give you the wrong place. (I: Like in what terms?) Like if you put a picture up like that, what if it got meddled up? So if you end up in something that's not right? (I: Okay, yeah.) Ehm, so there is that possibility, cause things can go wrong. Or that it blocks, or that you're booking something and you think you booked it, but it doesn't book. That happened to me before. (I: Yeah.) When you turn up and there is no room for you. (I: Yeah.) Ehm, that's frustrating. (I: Definitely.) Ehm, so things like that can always go wrong, can't they, so. (I: Uhuh.)

I: And eh, in terms of the technology per se, do you see any problems?

P16: No, I think they'll just keep it growing, they're all apps, it's all new. It just keeps editing itself as things go on by other people but it will just continue to change.

I: Okay, alright. Very good. Ehm, so what do you think about any information in general that you get from like a tourist office or any company, or anything like that, compared to information that other tourists tell you, for example in reviews and stuff like that? (P16: Ehm…) Which information do you think is more valuable?

P16: *hesitates* I don't know, I think it's all relative. I think you can get…I always check Trip…Tripadvisor. Always, before we go away, and yet sometimes you think what are people actually wanting…do you know what I mean, because they complain about the tiniest things (I: Yeah.) that really didn't need. So I…but then if you go…I think it's just a compromise isn't it, you got to take the bits from everything and you still got to make your own decision about it. Ehm, we went to the tourist information yesterday to find a route. They were very, very helpful. Just got on the right way, like that. (I: Okay.) And needn't to go on anything else to find it. (I: Mhmh.) And it's nice speaking to people again every now and again. (I: Yeah.) *laughs* So ehm, I think they…I think they all serve their merits. I think on Tripadvisor and things like that, people are more…more they don't shy away from what they want to say because there is nobody there to question them about it. Just sometimes it can be really a bit over dramatised. (I: Mhmh.) I don't know.

I: Okay, so you would say that you…depending on the information that you need you know pick out the…

P16: Yeah, you just pick out the good and the bad.

I: Filter the good ones…okay. Alright good. Ehm, so you told me you do a lot of like Twitter, Facebook and stuff like that as well. (P16: Yeah.) So would you, if this like social networking is available on a tourist application that you could for example generate your own content let's say images, let's say the video clip for example you could make it on your own and then share it with other people. (P16: Mhmh.) Would you be interested in doing that?

P16: I think people could do that. I think if you had like the option to put a little comment, like 'This was good.' 'This was bad.' You know that sort of thing. Maybe people would do that. You know like on eBay when they say you have to review your seller and you just do 4, or 5 star (I: Yeah.) that kind of thing. That would give you your without having to go into lots of detail, it's quick and easy and universal for everyone to use.

I: Okay, so just a rating? (P16: Mhmh.) Okay. How about generating your content? For example on Facebook there is always people who, you know check in to places, they share pictures and stuff like that.

P16: Well, I've checked in because I've been on holiday and doing that kind of stuff. (I: Yeah.) I've shared a couple of photos when I had WiFi access, but other than that, I generally do not do a lot of that, 'cause it's quite nice to have some private time. (I: Yeah.) But ehm, every now and then we'd do the check-in thing, but I won't do anything else. It's literally just press the button 'Check-In', I wouldn't share any ehm clips or films or anything like that. I'm not really want for that.

I: Okay, alright. But are you interested in other peoples' like images or stuff like that?

P16: Ehm, sort of, I'd be lying if I said no, it depends, depends who it is.

I: Okay, like from your friends you…

P16: Yeah, it depends who it would be.

I: Okay, alright good. Ehm, let's see, are you aware that Dublin is currently, or is still working on implementing a free WiFi system throughout the whole city?

P16: Only because I saw it on the building. (I: Oh, okay.) Eh, near city hall yesterday. We were walking past, it had the little digital person saying, "free Wifi" (I: Oh, yeah?) so yeah, that's the only reason. I'm aware of it.

I: You haven't heard about it before your trip? (P16: No.) Okay. Have you tried the Wifi? Did you try it out? (P16: No.) No, not yet.

P16: No, does it work?

I: Ehm, well at the moment they have it at the main tourist regions I think. They have established that network already. But ehm, it's…there is like shared opinions. You know some people say it works really well, other people say it doesn't, it disconnects all the time, so…I don't know. I'm always curious about you know, what the tourists think about that. Ok. Ehm, let's say you could ehm use the Wifi especially when you're on holiday, you know as you mentioned before, you have like the roaming fees, which is really expensive.

P16: I know, I didn't…it was always on before and it charged me a fortune. (I: Oh, really?) Yeah. (I: Oh, okay.) Never mind.

I: Ehm, so especially like for tourists, I think it's very interesting to have Wifi in a foreign city. (P16: Yeah.) Ehm, would you, or how much would you pay per day or per week, or per hour or whatever, for Wifi and be happy to pay this amount?

P16: In a hotel is what you're talking about?

I: Oh, no, in the city.

P16: What, so it'd be combined into your holiday package or that you would pay in an area to access it?

I: For example, here in Dublin you could use it in the whole city, wherever you are. Just ehm, you would pay a certain amount and you could use it the whole day.

P16: And who would you, who do you pay?

I: Ehm, just the…city council?

P16: Right, I don't know. For my part, I suppose if I was working with my iPad that'd be great, because it doesn't have 3G. (I: Uhuh.) Ehm, I don't know. I don't know what would be acceptable. I think it's expensive in hotels, isn't it? (I: Yeah.) When you go like for an hour for 2Pounds or something. (I: Yeah. Yeah, exactly.) I don't know they'd have to come up with some kind of cost…I don't know. Depends on what their cost are to enable it to happen. If lots of people paying it, then shouldn't it just be free, I don't know. If you're gonna have that, I don't know. (I: Yeah, yeah.)

I: But ehm, just from your, your experience I mean with the roaming charge or when you compare with the hotels and stuff how much do you think you would be willing to pay and say, 'Okay, this much is my maximum, anything after that and I don't really bother with Wifi'.

P16: I don't know, a couple of Pound a day, I don't know.

I: Okay, alright. Ehm, let's see, ehm you told me before that you're also interested in a lot of gaming? *laughs*

P16: Yeah *laughs* games…

I: Ehm, what do you think about the possibility of combining gaming or entertainment, with this Augmented Reality technology and tourism?

P16: I like having it separate (I: Okay.) but I'm not sure other people want that…I like having separate things. (I: Yeah.) They come and fade don't they those kinda games, you get a little bit addicted and then you don't want anything to do with them. (I: Yeah. *laughs*) You want an app that you want people to keep on using…that's what I was getting…I don't know. (I: Yeah, exactly.)

I: Okay, so let's say for example there would be an app, where you would explore the city and ehm, in each like attraction or destination it would tell you, 'Okay, you have to solve this quiz, or there's this thing going on…

P16: No, that's quite for kids, but no…

I: You wouldn't be interested in that? (P16: No.) Okay, alright. So for you it's important that tourist applications…

P16: I mean, I just didn't want to spend all this time if I was there to look at this building (I: Yeah.) I wouldn't play a game. I suppose if you would have children and you're taking them around, then it's ideal cause they can then be in charge of that while you're doing…I don't know.

I: Yeah, okay, good. Ehm, so let's say you could through this tourism application you could not only access information but you could go one step further and like actually book things, you could buy things, ehm, would you be willing to do that as well?

P16: The booking things…I attempt that, you tend to get online discounts for attractions and certain things (I: Mhmh.) if all that comes through quickly enough for you to do all that then it makes, makes sense. Ehm, and the purchase, the purchase tickets, that kinda stuff, yes. When you go on like Trivago and all that anyway to book hotels online so…so I think yeah, it would be almost a necessity to have some form of that on there, but ehm, there are other ones around so, it's not compulsory.

I: Uhuh, okay. Very good, but you don't have any trust issues, anything, putting your credit card details in for example on your phone…

P16: I've never had any problems with it. Ehm, I bought things and there are things when they're not sure if it's you and they contact you, I've never had any issues with that. (I: Okay.) I know people that have, so…

I: Okay, so it's a personal thing.

P16: I think if you lose your phone I think everything is on there, that's when you have your problems. So there needs to be something to stop that, but ehm, yeah.

I: Okay, very good. Thank you, ehm, just one more question actually ehm, can you think of any other suggestions or ideas to make this AR or Augmented Reality tourist application more user-friendly or more attractive for people?

P16: No…oh, you could maybe like when people make their own photos and they can make their own little film you know that we've seen before, that they…it doesn't have to get shared, but that they could do…I don't know.

I: Okay. (P16: That'd be one thing.) Like make like a photobook or something of this holiday trip or whatever? *P16 nodds* Okay, that's very good.

P16: If it would allow them…but with the routes as well, that'd be quite good. But other than that, no. *laughs* (I: Okay.) Just keep it simple.

I: Alright, and a little bit more personalised maybe, for them.

P16: Yeah, maybe.

I: Okay, alright that was very good. Okay, thank you very much for all this information. That was great, and hopefully not too long.

P16: That's alright, no problem.

I: Thank you.

Interview Transcript: TP17

I: So, okay. So, that's eh, the third example I want to show you. (P17: Right.) And this one is a GPS-based Augmented Reality application. It was developed in Tuscany like 2-3 years ago. (P17: Mhmh.) Ehm, just a different approach from the ones that I showed you downstairs.

playing Tuscany movie clip

I: Alright, okay, so let's see. Alright, ehm okay before we start just ask you, are you currently using a smartphone or tablet?

P17: I have an iPhone 4 and I have a second generation iPad.

I: Okay, and eh, do you think it's like very useful to have it?

P17: I like it. Ehm, I have to have it for work, where…the school I work in we all have one. All the staff have an iPad. We were all given one at the start of the year. (I: Oh, I see.) So we have to have one and we have to use it in our lessons and we have to organise our planning, so I have to use it everyday. (I: Oh, I see, okay.) So, no choice.

I: So ehm how do you, how do you use the iPad at work?

P17: Well, we use…other people use it far more than I do, like I said we have iPad Ambassadors. (I: Mhmh.) But we all need to use Onenote to put our lesson plans on and our term plans. (I: Okay.) Eh, track the student's progress on there, information about the student. Ehm, I've got timetables on there, timetables of other staff, due dates, so it's like a diary. And you need to have it. And then your boss can track, they can show your Onenote to someone else and then they track to see if you're actually doing the job. (I: Okay, alright.) So that's how I use it everyday.

I: So are you actually enjoying the use of the iPad, or is it more like eh…(P17: No. *laughs*) more like forced onto me.

P17: No, I prefer to have everything on my laptop on word, so I put everything on word (I: Okay.) and then I copy it on my Onenote on my laptop, so then on my iPad. (I: Oh, I see.) That's how I use it. So I go around longer…(I: Yeah. You're cheating a little bit. *laughs*) Yeah, you're meant to use your iPad, but I can't, yeah.

I: Okay, ehm how about your iPhone?

P17: Well, my iPhone, the reason I've got an iPhone in my job, I was given one and then I changed my job, so I had to give it back. (I: Okay.) So I reverted back to my Blackberry and I hate Blackberries. After having used my iPhone I couldn't go back to Blackberry. (I: Really?) So I took my Blackberry in and I upgraded it to an iPhone, just cause I'm used to use the touchscreen whereas my Blackberry wasn't touchscreen. It had a keypad. (I: Okay.) So I use my iPhone basically just for phoning. But I use the eBay app, Facebook app and my games. I don't use it for anything else. *laughs* Like ehm, sometimes I'd do the area planner on it. If I haven't got my TomTom with me. (I: Uhuh.) And then the map, which way to drive in and then I can get the route. (I: The navigation.) Yeah, but other than that, I don't use it that much.

I: Okay, alright. So iPad is strictly for…because of the work reason…

P17: Well, yeah. When I use…if I'm at home and I'm doing anything on the Internet, researching or shopping…I usually do that. (I: Yeah. *laughs*) It's a bigger screen than on the phone, so that's why I'd use that. (I: Oh, I see, alright.) Yeah, and for photographs. I don't use my digital camera anymore.

I: Oh, you just use the iPad now?

P17: Yeah, iPad or my iPhone.

I: Oh okay. So I guess the pixels are good enough nowadays, right?

P17: Yeah, yeah.

I: Very good, okay. Ehm so on the iPad now, which applications would you use on a regular basis?

P17: Ehm, the ones that are always open are Facebook, eBay…and then Safari is always open because if I find something I like on the Internet, I keep the page open because it's mine, I don't have to cancel it. (I: Oh, I see, yeah.) I do textiles in work, so a lot of knitting and sowing. So if I need to find patterns and things I find them on my iPad and just keep the tab open and if I get to work it's there. (I: Oh, okay.) So that's why it's there…so Safari is always open.

I: And eh, for the phone?

P17: Eh I just use my Facebook on the phone. (I: Facebook?) Yeah, Facebook and Candycrush. (I: Okay.) *laughs*

I: So do you only play Candycrush or do you play lots of other games as well?

P17: One other game. Bubblewitch. (I: What's that about?) It's a mindblast. You tap the little bubble and it shoots up and when you have three then they disappear. (I: Oh, yeah.) You know the modern version of Tetris, so that's all that easy as well. I would play Tetris as well. If I had that app, I might have to get that, yeah. It's not very intelligent, but…that's what games are for.

I: No, that's fine. Okay, ehm before today have you ever heard about the Augmented Reality technology?

P17: I think so, because of the app that I was taught. 'Cause like I said (I: Uhuh.) we have those sessions where our iPad ambassadors have to teach the rest of the staff, and I've seen how you take the photograph and the photograph turns into something else. (I: Mhmh, okay.) 'Cause one of my colleagues does it in her lessons, so it's very similar. (I: Oh, I see.) So, I think so. (I: Yeah.) But I can't remember the app.

I: That's fine. No problem. Ehm, so I'm assuming that you at the moment are not using any Augmented Reality applications? (*P17 denies*) Okay, that's alright. Ehm and why do you think was it that you've never used these kinds of applications before?

P17: I'm…it's not that I'm anti-technology. It's just that I don't really understand it and it just doesn't interest me in all fairness because we're forced to use it, because our school are using them but I'm a technology teacher and I know it sounds really weird that a technology teacher doesn't like technology. But I'm about craft and sowing and (I: Okay.) and I teach the kids how to design clothes and stuff, and I do it all by hand I'm old fashioned, so I don't necessarily use it in my lessons. (I: Uhuh, yeah.) Whereas the other staff do. (I: Okay.) So it's a bit strange, but…

I: No that's okay. That's fine. Ehm so do you think, or how do you think this technology could be promoted or could be made more interesting for you?

P17: I don't know if it would ever be made more interesting for me. Because I'm gonna have to learn. Because obviously with my job I have to teach…a lot of the kids know more than me (I: Okay.) so ehm sometimes I search for apps…and I've had an app put onto this 'cause we have iPads enough for two classes in each department. The most iPads in the UK are in our school (I: Oh wow, okay.) Eh so every kid has access to one, every staff member. So I found an app where you can learn how to sow instead of using a sowing machine and using your hands, it's

about navigating. (I: Oh, really?) So I found that app and then I had that put onto my app…eh..iPad, so sometimes I search an easy app that I can incorporate into a lesson for instance but ehm, I think it's just something you have to learn. (I: Yeah.) I don't think anything would make it more interesting for me (I: Okay.) 'cause I'm so anti-tech…*laughs* strangely, 'cause I like playing games, but I'd rather teach and do things face to face rather than through a computer, but obviously I don't have a choice. (I: Yeah.)

I: Okay, just because of the burden to learn something new again?

P17: Yeah, I'd rather not, but I don't have a choice.

I: *laughs* Alright, fair enough, okay. Ehm, so after you've seen the three examples that I've shown you, ehm which one was most attractive to you?

P17: I like the Tuscany one. (I: Okay.) Ehm, because it had more going on. But I do think that it'd be complicated for someone like me, or someone who doesn't use technology. The one downstairs, very simple, just one image changing to another, finished. (I: Yeah.) I think that was the easiest one, and that'd be one that I would use as opposed to the fancy one. (I: Okay.)

I: Alright, but you'd be actually more interested in the one Tuscany…

P17: That is more interesting, yeah. But I feel like I'd probably get it wrong. (I: Okay, okay.) So, or I wouldn't be able to navigate through all the different things, so…

I: Alright, okay. Ehm do you think it could be made easier for…(P17: Me.) yeah, for your character or…

P17: Yeah, maybe, 'cause I know it was categories, into four different categories (I: Yeah.) and colour-coded, so that was easy. (I: Mhmh.) It looked easy, but there was a lot of words on there. A lot of information and I'd just probably be able to…click (I: click whatever you like.) yeah, push the icon as opposed to…you'd have to learn the icons obviously.

I: Yeah, oh, that's very interesting, okay.

P17: 'Cause when I play a game, like the Candycrush, and I'm going back to that. But there is like three little icons. (I: Yeah.) And you just have to know what those icons are. You don't have to read. Now I'm ant-reading, it's coming off so bad. (I: No. *laughs* I know what you mean.) Yeah, if it just has an icon to touch an icon as opposed to…and just touch as opposed to swipe. 'Cause that gives me a headache. I don't like swiping. (I: Oh, I see.) I'd rather just click.

I: Okay. Alright good. Very interesting. Okay. Ehm, have you ever used any tourism applications on your mobile phone?

P17: Well, I tried to upload one of the Irish ones that I'd seen that was advertised on a bus or something (I: Uhuh.) but the connection wasn't fast enough, so I gave up and Sherryl loaded on hers instead.

I: Alright. That was the iTourist, or iDublin app?

P17: Yeah, 'cause we share an iTunes account you see. (I: Oh, alright.) I don't even know how to log onto iTunes. Really bad. So I've, we've synced all the devices, so yeah.

I: Alright, and eh have you also played around with that application a bit, or…

P17: No. (I: Okay.) I don't need to, 'cause Michelle does it all.

I: Okay, very good. Alright, no worries. Ehm, which aspects do you think would be important to have in a tourism application?

P17: Maps that work. (I: Okay.) Because some, like sometimes the streets are different on the map as supposed to on the signs. I've noticed that. (I: Oh, really?) Yeah. And ehm, when I use Google Maps back home, when you walk, you're

walking in…when you move, 'cause I was driving, the pin was moving in the opposite direction, do you know what I mean? (I: Yeah.) As opposed to a TomTom and I found that really frustrating…(I: It's confusing.) It's really confusing and frustrating. 'Cause I was using Google Maps yesterday and the pin where I was, was there, and the pin where I wanted to go was there and I moved and the pin didn't move at all. So I was just randomly walking around Dublin (I: Yeah.) lost yesterday.

I: So it's like having a picture of a map, but it doesn't do anything.

P17: Yeah, there's no point. So I think the tourist one, if they had a map that worked, it would be really good as well. (I: Okay.) Ehm, that had the right streets on, like I said. Yeah, that would be good in using that.

I: Okay, and are you looking for any other like content within those applications?

P17: I think ehm, for me just pubs, bars, shops (I: Okay.) Yeah, maybe theatre as well. So entertainment as well, not just boosing. (I: Alright.) So there's need. 'Cause these, I've noticed those theatre when we were walking yesterday. We didn't know what was going on in the theatre, you know that would be really good. Something a bit more cultural than just drinking.

I: Yeah, okay. Which is also cultural in Ireland. *laugh* You can't really complain.

P17: No, everyone is doing it, yeah, so yeah.

I: Alright, okay very good. Ehm, let's see, do you see any potential or possibility of implementing Augmented Reality technology into tourism applications or can you like imagine how it could be implemented?

P17: Well, the fact that we already use it in school in lessons. (I: Uhuh.) The kids are already up to date with that kind of technology and obviously they're our future and they already know how to use that kind of things, so (I: Mhmh.) I think not only in tourism, it'd just be everywhere. (I: Yeah.) I think as apps develop and the use of apps, 'cause I mean I don't know a child that doesn't have a smartphone. (I: Mhmh.) So yes.

I: Okay, ehm let's say you would design, or you would have the possibility to design your own tourist Augmented Reality application ehm for your own interest only for you personally (P17: Right.) ehm, what are some things that you would, you know make the application do? Or what could the application do for you? Let's say you're here in Dublin now on a trip (P17: Yeah.) what do you think should be put on there?

P17: What information to hold you mean?

I: Information or possibility, anything that you like.

P17: Well, I like the fact that downstairs, when you took the image of the sign and it gave you the information of what was available to eat at a particular place (I: Okay.) but things like what time do they open, what time do they close (I: Okay.) ehm, if there are special events going on (I: Mhmh.) ehm because we found something we wanted to do yesterday but it's not on until the 25th of this month, but we're not here, so that's not good to us. (I: Oh I see, yeah.) So information about what's on that particular day or after, 'cause we are just travelling, you're just here for a set amount of days, you're not gonna be here in a months time. (I: Mhmh.) So things that are happening now are more important as opposed to whats going on 4-5 weeks down the line. (I: Exactly, yeah.) Ehm, I don't know anything else. (I: Okay.) Is that alright? (I: Very good, yeah.)

I: Definitely, so ehm, do you see any potential problems that those AR applications might have?

P17: If it freezes. (I: Okay.) If you got something that shares the same name, so if you got two bars that have the same name. (I: Uhuh.) You don't want the information of one bar tracked all the way down to find out you're at the wrong place. (I: Yeah.) 'Cause obviously bars and pubs share names and things. (I: Yeah.) No, but affecting…just freeze that annoys me.

I: Yeah, yeah. Has it happened with any other application before?

P17: The Candycrush game.

I: Oh no, just as you're about to move up a level?

P17: No it's ehm…my iPad and my iPhone they are meant to be talking to each other. But my iPad tells me I'm on level 92, and my iPhone tells me I'm on level 65. So I had to cancel the app on my phone and hoped that my iPad saved it. (I: Oh, uhuh.) Which it did. And then reload it to my phone. And when they're talking together, then the information is the same. (I: Oh, I see, yeah.) But sometimes even though the devices are hooked up one freezes (I: Yeah, they're not the same) and one carries on, so that would be a potential problem if you're using two devices with the same account. (I: Yeah.) If it…I don't know if people do that. I know I do, because I have two devices, but. (I: Yeah, obviously.) Yeah, that's a problem.

I: Okay, alright. So it would be like a software problem then, rather than…

P17: Yeah, 'cause then you'd have to take the app off, and the you'd have to put the app back on, and you're always thinking, is it…are things gonna be saved? (I: Yeah, yeah.) 'Cause with this tourism app, if it's gonna be yours, and you're adding things as you went, and you had to delete it all…

I: Exaclty, is it saved now?

P17: Yeah, if I took it off my iPad, iPhone, hoping that it saved on my iPad and I open my iPad and it's gone, 'cause at that moment the devices didn't talk, then you've lost everything. (I: Okay, yeah exactly.) So, for that reason, yeah. That'd be a problem.

I: Okay. Yeah, that's good, okay. Alright, ehm so what do you think about information that you get from a tourist office, or an official company compared to from other tourists?

P17: Well, we went to the tourist office yesterday (I: Uhuh.) and I was just looking at the pamphlets about the information that I wanted for myself. Michelle was asking for directions whereas I was quite happy looking for myself at the information, because they have everything there. (I: Yeah.) Ehm, it was quite good that there was a…I didn't know where the tourism information was though, we just stumbled across the office (I: Okay.) when we were going for a walk two days ago. So I think you can get everything you need and then you can ask somebody and they can give you the information ehm much more than what's on the leaflet (I: Yeah.) but I suppose with an app, if it was linked with everything you wouldn't need to speak to anybody (I: Yeah.) if appropriate links came up.

I: Yeah, yeah. Definitely. Would you prefer that though?

P17: Ehm, I'm a bit lazy, so yeah, probably would be. (I: Okay.) 'Cause in my hotel I might be able to find everything I needed, before coming to the tourism office to find that I've come the wrong way to start again. (I: Okay.) I probably would, yeah. (I: Okay.) But not on my iPhone it's too small, on my iPad. (I: Yeah.) I would prefer it on.

I: Yeah, definitely. How about any other information form other tourists, like reviews and stuff like that, do you look at those at all?

P17: I don't, no. I don't.

I: No? You're not interested in other peoples' opinions?

P17: I just hope for the best. *laughs* I know, Michelle does reviews and I don't. We went on holiday once to Tenerife and I don't ehm read any of the reviews and we just booked a hotel (I: Uhuh.) and then Michelle read the reviews and ended up switching the hotels (I: Oh, really?) which I…I was totally fine with, but then when we passed the original hotel we went after, I was really glad Michelle read the reviews. *laughs* But I was just hoping for the best, so…

I: Okay, so after that experience, you still don't read the reviews?

P17: Yeah, I still don't. *laughs*

I: You just rely on Michelle?

P17: Yeah. *laughs* It's worked so far. Like where we are in town is lovely, so. Yeah, so yeah.

I: Alright, very good. Ehm, so you would consider, or do you do like any Facebook and stuff like that at all, social networking?

P17: I'm always on Facebook. Yeah, I use it a lot. (I: Okay.) 'Cause I'm from Wales, but I live in the Lakes. (I: Okay.) So all my friends are a six hour drive away, so I don't see any of my friends or my family anymore (I: Oh, I see.) and I have a nephew, so…I don't. I go home three times, I've been home three times in twelve months. So I use it all the time. (I: Okay.) To talk to my friends, talk to my family, like I said I have a little nephew, so upload photos so I can see him. (I: Yeah, yeah.) And so that's how I use it. (I: Okay.) Ehm, and I do talk to people from work as well, because the job is so busy, you don't see anybody at work 'cause you're in your classrooms. So I talk to people who I live with I mean in the town and back home.

I: Yeah, alright. And ehm, let's say those…this social network would be available on a tourist application, say you could generate your own content in a specific location, you could take pictures, you could make a video or whatever (P17: Yeah.) and then you could share it with other people. Would you be interested in that?

P17: Probably. Because I upload a lot of photos. I uploaded photos of our holiday already (I: Okay.) on Facebook. (I: Okay.) And I've told people already where I am on Facebook just updating my status, not anything else. But I probably would, yeah. (I: Okay.)

I: And you're also interested to use…

P17: If it's easy to use. (I: Oh yeah.) If it's not easy then no. I can do Facebook and I can do eBay, but that's about it on my skills.

I: Oh, I see. So simplicity is very important? (P17: Yes, yeah.) Okay, alright good. Ehm, are you also interested in other peoples' content and whatever they share?

P17: Yeah, I'm really nosy. *laughs* I read other people's walls all the time, yeah.

I: Alright. Would you read, like for example on Twitter you can read other stranger's things.

P17: I don't really use Twitter a lot. (I: Okay.) But ehm, I do, if a friend of a friend, so for instance something comes up on Facebook on somebody's wall about a friend of someone I don't really know (I: Yeah.) sometimes I do read that depending on what it is. (I: Okay, yeah.) If it's interesting I read it, if not, then no.

I: Okay, so in general you're only interested in your friend's stuff?

P17: Yeah, normally, yeah. (I: Okay.) But if they'd put something up, say one of them had already been to Dublin then I would read to see. I mean my cousin has been to Dublin, he didn't put it on Facebook, so I phoned him where to go, what to do and things (I: Oh, I see, okay.) but if it was on his wall, I probably wouldn't have phoned him. It'd probably would have been best for him. (I: Yeah.) I chewed him off for about 45 minutes. So it'd be quicker. But yes, I would, yeah.

I: Yeah. *laughs* Okay, good. Ehm so are you aware that Dublin is providing this free Wifi in the city?

P17: I didn't know, no. I didn't until you said it. I had no clue.

I: Oh, okay. So you just found out here in Dublin as well?

P17: Yes, through you. (I: Oh, okay.) I didn't know.

I: So you've never tried it then?

P17: No, no. Because I've just been using my Internet.

I: Oh, you can use your Internet here?

P17: Yeah, I have not received a message that I can't, whereas Michelle has received a message saying she's gone over her limit. I haven't got one, so I kept on using it.

I: Oh, with the roaming fee then?

P17: No, I switched my roaming off, and I'm still…like I'm using my Internet now. (I: Oh, okay.) I don't really know what happened. I hooked it up on my iPad, so I don't know what I'm using if I'm using mine or the iPad, because I don't pay the fee on my iPad, the school do. (I: Oh, there you go.) Yeah, because I got 3G on my iPad. Because I got the second generation iPad, so I don't know whose Internet I'm using.

I: Oh, they're gonna be very happy to see you.

P17: Well, somebody took the iPad to America and used it, so they weren't happy with that. But they went for a fortnight. But I'm only here for three days.

I: Yeah, okay. Fair enough.

P17: No, they probably won't notice anyway. Okay, ehm, so let's say you could actually ehm, for example here in the city. You could pay a certain amount for WiFi, let's say for a day, for an hour or for a week depending on how long you stay. (P17: Yeah.) And ehm they'd provide you WiFi unlimited. How much would you say you would be willing to spend on that?

P17: Well, when they say unlimited, if you pay for 24 hours, does it mean from 12 that day to 12 the next day, or does it mean for 24 hours of you using it? Do you know what I mean?

I: Yeah, 24 hours of you using it.

P17: Well that's different then, because you could pay for 24 hours, use it over two or three days. (I: Exactly.) Right, so…I mean I don't pay a lot for my phone, I pay 40 a month for mine and I've never gone over. Probably because I'm using the school's. (I: Yeah.) Ehm, so for a day, probably about, for 24 hours maybe 5-6 Pounds?

I: Okay. Would it be different if it would be only from 12 to 12?

P17: Yes, because I wouldn't use it. I wouldn't be on my phone for the 24 hours, would I? (I: Yeah, exactly.) So probably less then, 'cause I'm not using it when we have to pay. It's totally random, but when Michelle and I were in Austria (Michelle: No.) I'm gonna say it anyway, because you had to book, you had to pay a fee to use the TV (I: Okay.) but once you put your card in, it only lasted for 12 hours, not for 12 hours of viewing, do you know what I mean? (I: Oh, I see. Yeah.) So I'd probably pay less, because I wouldn't be on my phone for 24 hours. I mean I was on this morning on Facebook and I was probably on for about 20 minutes. I've been on on Candycrush, when I was sitting there, and I probably won't go on until lunchtime. (I: Okay.) Or when I go out for dinner, so I wouldn't use it that much. (I: Yeah, okay) So it'd be less than.

I: Yeah, definitely, sounds reasonable. Ehm, what do you think about combining the gaming part with a tourism application, or Augmented Reality tourism application?

P17: I would play it. (I: Yeah?) I think so yeah. I love playing games and…like this Candycrush, I've been playing it for like 2 months now, but as soon as I get passed level 100, I'm gonna quit and I play Bubblewitch…(I: Whatever…) I will, I will *laughs* My friend is on 101, I just need to get there. And so then I pick another game. Because I don't think games last very long. (I: Okay.) They're just trends. Or I think they're just trends anyways. I kinda trend my game, so it'd be cute to have a game on the tourist app, but you'd have to have different game. You'd have to keep adding games to it. (I: Yeah, okay.)

I: In order to keep it interesting? (P17: Yeah.) Otherwise you'd just use it once and then forget about it.

P17: I'd probably get a certain distance and then stop playing. (I: Yeah, exactly.) Or maybe have a different game based on the different cities, or (I: Okay.) things…

I: Yeah, that's interesting.

P17: Yeah, because obviously there is different things in different cities and countries and we go away quite a lot an we stay in the UK quite a bit as well, so I think if it had different information in different games, if you're going to York in England as opposed to Dublin in Ireland or Cardiff if you're going to Wales, but different, based on the culture around you. (I: Mhmh, yeah.)

I: Yeah, yeah. Are you in general more interested in games, like for example Candycrush, where you just upgrade your levels, or in games which have like a story?

P17: Oh, I don't like the story games. (I: Okay.) It's just the competitive element. I didn't play Candycrush until Michelle did and my friend plays it now because we do. So we just trying to get above each level, eh…beat each other (I: Oh, I see, yeah.) It's a competitive thing as opposed to a story or learning anything. (Michelle: It's for you.) Yeah, it is for me. I'm beating you anyway. Yeah, so no story element for me. Just the gaming. I mean you don't really have to think a lot in these games. It's just…we don't.

I: Okay, so it'll be in general the social element in the game that makes it so interesting?

P17: Yeah, 'cause you obviously got…you can send lives and things when you know who else is playing it and you can track other peoples' progress, so it is the social element yeah. Because it's through Facebook that it started the Candycrush thing.

I: Yeah, exactly okay. Alright very good. Ehm, so if you could through this application you know buy things, book tables in a restaurant for example, buy theatre tickets and stuff like that, would you be willing to do that stuff as well?

P17: Yeah, it would be easier than cueing up, so yeah, I would. (I: Okay.) I mean we went to the Guinness place yesterday, and we booked our tickets online. We paid in the shop online before we arrived, it's far quicker and we got 10% discount because it was online as well. (I: Yeah.) So as soon as we got in, we got our ticket, and then we didn't have to cue with our ticket, we went straight in, and I prefer to do things online. It's quicker.

I: Yeah, but ehm but what would…say bring you to use this mobile application as compared to the Internet? If you could do it on the computer, just like you did until now, why would you use the mobile application to do it?

P17: 'Cause we would do it while we're walking around. In all fairness. Because the whole idea would be to do it when we're around. (I: Oh, okay. Yeah.) I mean I don't. I've got a computer at home we've got laptops I never sit with the laptop on my lap anymore. I use my laptop to plan my lessons in school I don't bring my laptop home every night and I never switch it on. I only use my iPad at home, so.

I: Oh okay, alright so this mobility is…

P17: Yeah, I think laptops have become obsolete. Because you can't maneuver with it obviously, whereas with an iPad you can walk around and do stuff (I: Yeah, exactly.) I mean we booked tickets yesterday, whilst we were walking from our hotel room downstairs, so I mean you couldn't do that if you had your laptop. (I: Yeah, yeah exactly.) So it's far easier with an app.

I: Okay, alright very good. Ehm just one more question, (P17: Okay.) can you think about any other suggestions or ideas that would make the application more user-friendly? Or more like improve the tourist experience?

P17: Ehm, I did think about one when you asked Michelle, and now I forgot what it was.

I: *laughs* Switch places.

P17: Ehm, I…I had thought of one, I can't remember what it was now. Ehm *thinks* no, I know I said about logos earlier on, icons if places use this app, advertise the fact that they use this app, like that menu downstairs, if I took a photograph of that and it worked, how would I know if I went to a bar down the street, they actually had that app on there. I wouldn't know, would I. So you need to advertise it. Places in use. So there is that I suppose. Ehm, it was being linked to something. I can't remember what it was now. I thought of a really good one. No sorry. (I: That's okay.) Sorry.

I: No problem at all. Well, thank you very much. (P17: No problem.) That was great information already. Let's see ehm, what I forgot actually to ask, is it possible to give me an E-Mail address? Because the thing is that this what I'm…like this interview that I'm doing at this moment is actually a very beginning part of the whole research and later when we develop the actual prototype there might be one or two more questions that I'd like to ask the first participants of the interview. (P17: Yeah, okay.) And if I could then just contact you via E-Mail that'd be great.

P17: I will give you my work E-Mail. Because I don't use the other one so…

I: Thank you.

P17: to P17: you could use the app then when you take the kids to London.

P16: I could, that would be good. No I was gonna say, you know that part when you said about the tourist office you know sometimes it's quite handy to help, if you've got that, if you could video call somebody now that there is a link that takes you to somebody at the tourist office, if you were stranded, completely lost but wanted to speak to somebody that you could actually facetime those people that'd be quite good.

I: Oh I see. Yeah, that'd be very interesting.

P17: Like IT support.

P16: Yeah, like an IT support. Sometimes it's just reassuring to see somebody at the other line of your phone (I: Yeah exactly.) so that'd be quite handy. Or a live chat kind of thing.

I: Yeah.

P17: And you're crying lost. *laughs*

I: Thank you guys.

Interview Transcript: TP18

I: Alright, Okay, there you go. Alright, so, before we start, are you currently using a smartphone or a tablet or anything?

P18: Yes, yeah.

I: What are you using?

P18: iPhone 4S.

I: iPhone 4S. Do you have a tablet as well? (P18: No.) Okay. So just the iPhone? (P18: Yeah.) Alright, are you currently happy with it? How you use it, or…

P18: Yeah, yeah. It's fine.

I: Yeah? And ehm, why did you consider getting an iPhone?

P18: Ehm, I've had an iPhone before and I just like the way of using it. It's very simple. Ehm, that's why I got the new one then. (I: Okay.) Yeah.

I: Are you also thinking about getting the iPhone 5 then, or…

P18: Ehm, I thought about it because my contraction ended. But eh, I didn't, because I didn't even have it for a year or something, so I…

I: Uhuh, okay. Yeah, it's still working fine. (P18: Yeah.) Alright, fair enough. Okay, and ehm, how useful do you think the iPhone is? Do you use if on a regular basis?

P18: It's pretty useful, especially when you have to find a way somewhere. If you don't know where you are, you have to go somewhere, then it's really useful. Just the thing they design here…

I: Yeah, with the maps and stuff? The navigation...

P18: Yeah, yeah.

I: Alright. Do you use it for anything else as well?

P18: Yeah, social networking of course, contacting friends, ehm E-Mails and stuff, Internet.

I: Okay, and ehm, can you tell me a bit more about the applications that you use regularly?

P18: Yeah, it's pretty much Google Maps, if I have to go somewhere, like Facebook and Whatsapp ehm…yeah, these are pretty much what I use most, yeah.

I: Alright. You don't play any games or anything like that?

P18: Not that much. *laughs*

I: Okay, alright okay. And ehm, you said downstairs you heard about Augmented Reality already right? (P18: Yeah.) What's the context?

P18: Ehm, I studying Environmental Engineering and we have some modules called Information Systems, and that's where we do such stuff, too.

I: Oh, okay. So ehm in which regard did you use that technology, can you tell me?

P18: Ehm, Yeah, we used a software, I don't know if you know it, it's called SGlee, it's pretty famous, it's doing geographical….stuff, images and maps and stuff…

I: Just like similar to Google?

P18: Yeah, but it's for experts more. Because it's very expensive to get it, and we only have it at the university, I don't have it for myself because it's very expensive, yeah. It's more for people who really do information systems like I don't know, if a flood is coming, they can do the images and…

I: Oh, I see. What's it called, the software?

P18: Esglee…

I: Eslee?

P18: ESRI…E-S-I-R…eh…E-S-R-I.

I: E-S-R-I. Esri, (P18: Yeah.) Oh, okay. Wow. Okay, I've never heard of that, okay.

P18: Yeah…probably because it's more specific.

I: Yeah, for pros…exactly. Ehm, are you currently actually using any Augmented Reality applications?

P18: No.

I: No, like work or anything? It was really just university related? (P18: Yeah.) And ehm, why do you think you, even after hearing about it, you haven't used any applications so far?

P18: Ehm, don't know. Probably because I haven't had the time to inform myself about something, or so? Yeah.

I: Okay, alright. Is it like lack of interest, or…

P18: Ehm, no not that much. Probably because at the end of my studying…it's pretty stressful at the moment and stuff…not much time to do anything else, yeah.

I: Okay. Just focused on university stuff? (P18: Yeah, had to.) Yeah, I understand, alright. Ehm, if you could promote an application like this, or this technology? How do you think it could be promoted, or where could it be promoted?

P18: Hm…I don't know if you maybe can get a partner like Apple or something. I don't know the TV advertisement they do. I could imagine that this pretty much fits in it, because they do, they have a new service cards, as former they had the Google Maps and now they have their own cards for example, and ehm so I think this could be a way if you have a partner, a strong partner. Television advertisement I think is always, is always good yeah.

I: Mhmh, okay. So with another business pretty much linked together? (P18: Yeah, I think so yeah.) Okay. Ehm, is there a reason why you specifically chose TV and not like Facebook or anything like that?

P18: Yeah, because I don't know…I think it's pretty important that you see moving images. Because if you only have one image like this one, I don't know yeah, you can see that there is some writing down, but yeah.

I: Uhuh, okay. You don't really know what's going on.

P18: Yeah, I think, I think it's better if you're really imagine it. If it's moving and you see it, it's better, yeah.

I: Yeah, definitely. Ehm, what do you think about advertisement on Youtube? Or advertising on Youtube?

P18: Me, personally, I always click it away. And it always says you can jump the video in four seconds and I always skip it, yeah. And if it's like 25 seconds or something and if I really have to watch it, I just switch off the tone and go to another tab or something. I don't ever watch advertisements on Youtube.

I: Oh, okay, yeah. How about if you like make a video clip and you upload it on Youtube? And people 'Like' it or 'Subscribe' it or whatever and that it's advertised this way. (P18: Yeah, yeah.) Do you do that a lot, like subscribing or something like that?

P18: No, never.

I: Or sharing Youtube clips?

P18: No, never. *laughs* I don't do that.

I: Alright, okay. That's alright, no problem okay. Ehm let's see. Ehm, after seeing those examples that I've shown you is there a specific one where you thought, 'Wow, it's really cool.' Or 'It's really useful.'?

P18: Yeah, the last one that you showed me. I thought this is great, especially if you doing some tourist stuff I think that's really useful for people in another city or stuff, yeah.

I: Mhmh, okay, alright. And the other ones were not really a 'Wow' Factor, or…

P18: I don't know. Because you usually book your hotel at home, and you do your research on the Internet or something and when you're here you already got your hotel, so I don't know if you still need it then, yeah. I mean the restaurant thing is okay, that's great. But the hotel one, I don't know if you can really use it. If you really need it, yeah.

I: Okay, yeah, yeah. Fair enough, good. Ehm, have you ever used any other tourist applications on your phone?

P18: *laughs* I got the Oktoberfest app, of course.

I: *laughs* What does that do?

P18: Eh it says if the tents are full. Yeah, that's pretty cool because if you're going there in the evening or in the afternoon, you can see this one there, it's open you can go there, or no it's full, yeah.

I: Oh, really? I see. So it works over the Internet, they update always the status? (P18: Yeah, sure, exactly, yeah.) Alright, is that all that does, or can it do other things?

P18: Ehm, yeah, I use ehm for public transport. This is what I use a lot, yeah, but that's it pretty much, yeah.

I: Mhmh, alright. And for the Oktoberfest one, how did you, or why did you download it? How did you download it? How did you get to it?

P18: Ehm, how or why?

I: I mean ehm, how did you hear about it? How did you find out about it?

P18: Ehm, I just thought why not…there must be an app for this, you're hearing it everywhere and it…it's just famous and I went to the iTune…iStore..

I: i…i….Applestore!

P18: Applestore. Yeah, I just entered 'Oktoberfest' and I got it, yeah.

I: Oh I see. Okay good. So you didn't hear anything from other people or whatever?

P18: No, no.

I: Alright, just out of your own…randomly if you want.

P18: Yeah, yeah.

I: Okay. So how did you like the application after using it? Did you thought like 'wow, that's cool' straight away, or did you have to get used to it or…what's your experience?

P18: It's eh…if you're a tourist I think you use it even more, because there is some souvenirs and stuff you can get and some background information. But because I live in Munich I know all this stuff, and I just use it for current information.

I: Oh, okay. I see okay. But it was still helpful for you?

P18: Yeah, sure definitely.

I: Alright, so would you say this status update information what they do is like the most important factor of the application, or is there anything else?

P18: Yeah, I think so. Yeah, because eh, I don't know if you've ever been there before, but because it's eh you don't have to go there on the weekends, like everyone is going there on weekends.

I: Yeah, I know, there is no chance.

P18: No, or you come at 8 in the morning or something, so.

I: Yeah, exactly. Yeah, I've been there as well and then you're stuck in the tent. You can't go out anymore.

P18: Yeah, you can't go out. *laughs*

I: Yeah, okay, good. Ehm, so which aspects do you think are important that tourism applications have, or have included? If you're a tourist for example here in Dublin now, what would you think…?

P18: Yeah, it's a…pretty much information I think but I think also images are pretty important, yeah.

I: Images about the attraction and stuff, or what kind of images are you talking about?

P18: Yeah, images about the attractions, yeah, and I don't know I think it's easier to find something because when you have a map or something and you see a building you're thinking, what is this now? And if you have, that's pretty…if you could hold up your iPhone or something, your tablet and then it's saying there, it would be pretty useful, yeah.

I: Yeah, yeah definitely. Okay alright. Ehm, so do you think, or if you imagine this Augmented Reality technology to be combined with tourism applications, can you imagine how it could work? Besides those like three examples I showed you now. Do you have any ideas maybe?

P18: I don't know you could do something like guided tours or so that you say, you can book your guided tour here, or we are starting a guided tour in one and a half hours or something like that. Or you could perhaps even do interactive guided tours, that you do your guided tour with your tablet or something. Could be a way, yeah.

I: Yeah, alright very good. Yeah, definitely. And you would be interested in those kind of applications or…

P18: Yeah sure why not because it's often like you're doing a guided tour and you're getting so much information and most of them…you can't keep them all, or you're not interested in everything, so…if you have a guided tour with your tablet, you can skip something, or you can go to another point, or continue the next day or something, I think that would be good, yeah.

I: Yeah, yeah definitely. So do you think this personal approach is a very important part?

P18: Yeah, I think so yeah.

I: Okay, alright. Ehm, if you could, let's say you're a designer, and you could design your own tourism application for whatever interest you want, with whatever it can do, okay, with no restrictions. How would you design it, or what would you include in there?

P18: Hm…I don't know it should be…what is always important for me is that I don't have to read something first before I get it. I have to see it and I have to use it, just interactive, you know. So, don't know…

I: So, maybe it shouldn't be too complicated to use it. (P18: Yeah.) So even with no instructions everyone knows…

P18: Even for me, yeah. I don't like that, yeah.

I: Okay, ehm how about any function that the application should do?

P18: Hm…*thinks* I don't know. Yeah, showing ways is important I think because of how to get to the next site or something. Ehm yeah and background information like you have here with the name of the building or site or something and like two or three phrases under it would be great I think, yeah.

I: Mhmh, okay. But not too much to read?

P18: No, no. Because you can't keep like 'This building was built in 891 or something and it's just too much, yeah.

I: Yeah, exactly. Yeah okay alright. So, ehm do you see any potential problems that those applications might have?

P18: Yeah, perhaps that I don't know, ehm…I don't..how do you imagine it, do you pay for an app once or how do you imagine that app to work?

I: Ehm, at the moment, there is no specification, yet, but me personally I think that if you charge for an application straight away, it doesn't work because no one knows about it. (P18: Yeah.) So, me personally, I wouldn't download it, because why would I, I don't even know how to use it, so…(P18: Yeah.) I would imagine it would be free first and let's see how the response is of the people and then go from there, but…

P18: Yeah, yeah. I think it might…I don't know maybe you can make a Light version or something saying, you can make the tour if you pay 4 Euros or something. That might be possible.

I: Yeah, okay alright. So money restrictions would be one point.

P18: Yeah. But otherwise…

I: Okay, do you see any restriction in the function of the application?

P18: I mean I'm sure that it recognises a lot so that's good, but with buildings and stuff eh, if you're standing right in front of it, and you're only seeing a little piece of it or if you have to go like 50 metres back to see the whole image, yeah that might be something.

I: Mhmh, alright yeah definitely. So ehm, image recognition of buildings and stuff. Yeah definitely. That's a good point. Okay. How about when you used other applications? (P18: Mhmh.) Have you ever used an application and then thought that's a no go, because it had so many problems or…(P18: Yeah.) What kind of problems did you encounter?

P18: Eh often it's like you start an app and it doesn't do anything and then it just goes back to your menu. It's going down…It's just going down.

I: Oh okay. Just freezing.

P18: Yeah, that's pretty much. But otherwise if I don't need it of course I delete it, but, yeah.

I: So how, do you know how you could design the application so that you would use it all the time, or regularly even after a long time?

P18: Yeah, eh yeah it just has to be easy. I just have to use it, and do like three or four pushes and then I have to be where I want to be.

I: Yeah, definitely, okay.

P18: So yeah, you have a menu that's like I know where I have to go. It must be built up good, just yeah…

I: Easy to navigatable.

P18: Yeah. Exactly yeah.

I: Very good okay. Ehm what do you think in general about information from a tourist office or any official company compared to information from tourists like for example reviews and stuff like that?

P18: I know…I don't know you often think that if a company does it then…yeah official not that much. But they are influenced and they want to sell stuff and tourists just say, "We like this and that, because of this and that." And this is more like the way you experience it too. So this is more authentic if you want to say, yeah.

I: Yeah, okay. So do you think you would value tourists' opinions more?

P18: *thinks* Yeah, might be. But it's always like people always got their own way of seeing things too. If it's like raining the whole day and you are running outside…eh, "Don't like it." *laughs*

I: *laughs* Exactly yeah. It's very personal feelings, yeah. (P18: Yeah.) Okay. So do you also make use of the tourist office here in Dublin for example?

P18: No because we are visiting a friend actually and she's here since September and she knows pretty much.

I: Yeah, she knows her way around and she can show you.

P18: Yeah, she is showing us around pretty much yeah.

I: Okay, fair enough alright. Ehm, do you, when you do Facebook, do you do a lot of sharing photos, check-in and stuff like that?

P18: Not that much, no. Wouldn't say so.

I: Not that much? Let's say in this application you could generate your own content (P18: Yeah.) let's say pictures or videos of the destination and you could share it with other people. Would you do that? Or would you be interested in doing that?

P18: I think so. Sometimes, yeah.

I: Yeah? Also with the public or only with your friends?

P18: Only with my friends yeah, mostly yeah.

I: Okay, alright. And would you also be interested in other people, ehm other peoples' content?

P18: Yeah, it's always interesting to see where other people are. Because you know on Facebook you have a lot of friends you haven't seen for a very long time and you still know where they are and what they are doing because they're sharing…yeah, I think it's good yeah.

I: Okay, alright. Ehm, so are you aware that Dublin is currently working on providing free WiFi throughout the whole city? Have you heard about it?

P18: Yeah, I've seen it on my own phone but it doesn't work that well.

I: Okay, it doesn't work well? (P18: No.) Okay. Do you remember where you were when you used it?

P18: Yeah, it has been just like 15 minutes ago or something. We went down the river. We came from Jameson Old Distillery and just went through the river down here.

I: Okay, down here to the city centre. (P18: Yeah.) Okay, and then it connected to the WiFi but it didn't work?

P18: Yeah, it wanted to connect but it didn't.

I: Oh, it didn't connect at all? (P18: No, not at all.) Oh, I see. Okay, ehm let's say you're from Germany right? (P18: Yeah.) And you're now in Dublin and since roaming fees and stuff like that are expensive, you wouldn't use your 3G here in Dublin. (P18: No.) So eh let's say you could pay a certain amount to have WiFi available for let's say 24 hours or a week, however long you stay. (P18: Yeah.) How much would you be willing to pay and say, "Okay, I'm happy to pay this much to have the WiFi." ?

P18: I don't know for a few days maybe 5 Euros or something?

I: Okay, for like ehm, how many days?

P18: Two or three days, yeah.

I: Two or three days, 5 Euros? Okay. You would be happy to pay and use the WiFi how ever much you want.

P18: Yeah I don't need…I don't know how much is…I think it's he…I would be…I would be happy if I pay 5 Euros for 3 hours let's say. I can use those three hours counting down.

I: Yeah, counting down. Exactly So you can log on and off again.

P18: Yeah, yeah.

I: Okay, alright. So obviously like that you would pay more?

P18: Yeah, yeah definitely. Because you're not using it all the time. You want to look something up and then you use it, and you put it back into your pocket, so…

I: Yeah, exactly. Okay alright. Ehm, so with this gaming now, I know you're not really into that gaming part, but ehm could you imagine that gaming could be combined with Augmented Reality and tourism?

P18: I don't know perhaps you have a little figure running around the city or something. Yeah, why not.

I: Yeah something. Okay, would you be willing to try it out?

P18: Yeah sure, sure if it's funny, I don't know.

I: Or is it a total no go? Okay. But would you also be willing to download an application, a tourism application because of this?

P18: Because of the game, no. No.

I: No? Alright, that's fine. Ehm, how about any other types of entertainment? Could you imagine it to be combined with for example music or sports activities or anything like that?

P18: I don't know if you ehm let's say in Dublin they're always advertising the typical Irish music or something, then you could…yeah sure, yeah.

I: Exactly, okay. Do you know, or how would you incorporate that? Do you have an idea?

P18: I don't know if you have like the menu stuff in restaurants? And pubs often have live music or something, then you can show the menu and in the background you hear the music, or saying "They have live music tonight."

I: Oh, okay. Very good. Okay very good idea. So ehm if you could through this application not only access information but also purchase tickets, or book tables in a restaurant or something. Would you be willing to do this through the application?

P18: Mhmh, yeah sure, yeah definitely.

I: You don't have any like trust issues or anything like that?

P18: Yeah, that's the thing you know, if it works I would use it. And why shouldn't it work. You can book a lot of stuff on the Internet so yeah.

I: Okay, have you ever purchased on your mobile phone? (P18: No, not yet, no.) Okay and how do you define that it works?

P18: Yeah, if I come there and it says there is a reservation for like 7 or something and they say 'No.' then obviously it didn't work.

I: Yeah, obviously you wouldn't do that again. (P18: Yeah.) Would it help if you get like an E-Mail or a confirmation?

P18: Yeah, definitely. Definitely. Confirmation E-Mail is always great.

I: Yeah have something to prove. Okay, alright. Ehm, just a last question actually, can you think of any other ideas of suggestions to make this tourism AR application more attractive for you or more user-friendly or to give like a better tourist experience?

P18: Yeah, perhaps you can distinguish between tourist here for the first time, or you want…because there are those typical sites you have to see when you're here for like three days or something. And when you're coming back or anything else, you don't want to see all those things again. So you can distinguish perhaps in between.

I: Okay, so that you can personally take out stuff and stuff like that? (P18: Yeah, yeah.) Okay. And make your own schedule if you want.

P18: Yeah, that would be great.

I: Alright very good yeah. Okay, very good idea. Alright, that was it already. Ehm thank you very much for your time and for your answers. I appreciate that.

Interview Transcript: TP19

I: Okay, so before we start with the actual question, are you currently using a smartphone, a tablet or anything like that?

P19: Yeah, a Galaxy S2.

I: Okay, do you have a tablet as well?

P19: Eh, no.

I: Just a smartphone? (P19: Yeah.) Okay. And how do you perceive the usefulness of a smartphone? Do you think it's a very useful thing, or…

P19: Yeah, I think…first I had a….I bought it one year ago. And first I had a small handy with no…(I: Like a Nokia?) Yeah, something like that. And I thought all the people are just looking around in their phone all the time and it's all 'Woo'. *laughs* But then I got one for myself and I thought, 'yeah, it's really useful.' Just to look up little things off it, yeah.

I: Okay, why did you decide to get one for yourself?

P19: Ehm yeah I think my contract ran all off, and I got a new one so… I got a…Samsung and I think yeah…it's good.

I: Yeah, mhmh, okay so just because of the contract you happened to get one, so why not.

P19: Yeah, yeah it was 1 Euro and the contract goes on and use that phone.

I: Yeah, yeah exactly. Okay very good. And ehm, can you tell me about the applications that you use regularly? What do you use?

P19: Ehm most of the time I use Whatsapp or Facebook to communicate with others and stuff like that, but also like Entertaiming…eh Entertaining apps like 9Gag or games and E-Mails I also check on it, so you don't need a notebook anymore to do it. That's it basically.

I: Okay, so do you feel very comfortable with using your mobile phone? With everything or?

P19: Yeah, yeah.

I: Is there things where you say, 'I can only do that on my laptop'?

P19: No, no. I didn't think about it before, but I think I don't really need a laptop anymore for…just for the college, for typing things, that's a bit…*laughs*

I: Yeah…you'd have a whole essay to write, yeah. *laughs*

P19: But so…eh…before I….before I got this smartphone, I had my laptop on everyday. Every…I don't know, every two hours or something. But now it's only…every three days because I…little small things I can look on my iPhone like on the Internet search something or yeah.

I: Okay, very good. Ehm, before you came here today, have you ever heard about Augmented Reality?

P19: Ehm yeah I saw a documentation about Google Glasses, I think it was on TV, but I just saw the ending, so I didn't know about all that stuff.

I: Oh I see. Yeah, fair enough, or you just knew that it was a new technology.

P19: Yeah new, but I didn't really have heard of it, so.

I: Oh, okay. So you have also not used any Augmented Reality application and stuff like that?

P19: No, no. But it seems very great, very useful. For example because we were just walking along the river, and we saw the building, 'Yeah, what's that house?' We don't know yet, we'd have to look at the planner. But if you just put your smartphone, 'yeah, it's this and that.' So that's better.

I: Yeah, yeah. So would you say…

P19: It's really useful I think for tourists and…I think it's good yeah.

I: Okay, so would you say after seeing what it can do, would you download an application like that?

P19: Yeah, definitely. Definitely.

I: Yeah? Okay, so the reason you haven't used it until now is simply because you didn't know about this technology?

P19: Yeah, I didn't know about this technology or what you can do with it. But now I think I would definitely download it.

I: Yeah, okay. Where do you think those things could be promoted? Or how could it be promoted? Because obviously you're not the only one who didn't hear about that. There is a lot of people who still don't know.

P19: Eh yeah, I think eh most of the people you reach with TV commercials and stuff like that, because I think…or the Internet, because I think the younger people are the aimgroup of this. So yeah, Internet or…I don't know.

I: Okay, yeah. TV, Internet very good. So after seeing those three examples that I've shown you, did you have like a 'Wow' factor or something, or which one of those did you think was most useful?

P19: Ehm I think the most useful was the tourist…when you walk around and you can see, 'Here in this restaurant you have this' and you can just click on it, I think it was very…

I: The Tuscany one?

P19: Yeah, yeah. That was very useful I think, when you're just walking around and it pops up. That's very impressive.

I: Okay, how about the other two? Did you just think, 'Eh, it's okay, but not really…'?

P19: Yeah, I think it's okay. Because when you're…when you're in the hotel and you see a movie, it's okay. It's a funny thing or it's a gadget, but I think it's not that useful like when you're outside on the street. But I think when you're downstairs and you saw the menu card of the…of the plate I think that was also very useful before…then you can see what restaurant there is, what menu, what you can eat and if it's expensive or cheap or…yeah.

I: Okay very good. Alright ehm so have you ever used any other tourist applications so far on your mobile phone?

P19: No, no. Just maps, just Google Maps and then…on the Samsung.

I: Never? Okay. What do you think would be…yeah…how is your experience with Google Maps or with using the maps?

P19: Eh, I think it's, it's really useful. I don't have Internet around here, just the Hotspots and eh just in McDonalds or in Starbucks, exactly. You can just look shortly in what kind of place you are right now and where to go but, yeah but I think it's good to see, but not perfect.

I: Okay, why is it not perfect?

P19: Ehm, difficult to say, it…yeah it just don't impresses me that much or…yeah, I don't know how to say it.

I: Yeah, no, no that's fine no problem. Like this Google Maps, your experience with Google Maps, was it always easy to use, like was it very clear and stuff like that or…was there any difficulties?

P19: Clear, very clear was it. You just enter the name where you want to go and then it just pops up and you have to route where to…where to go there and yeah. I think it was good.

I: Okay. So you were very satisfied with that?

P19: Yeah, yeah. It was good.

I: Okay, ehm so which aspects do you think should be included in a tourism application?

P19: Ehm…what the…what the sightseeing, what the buildings are called and what was there. A bit, a bit history, information maybe, or for restaurants the menu card, or and recentions…where you can upload something 'Yeah, here it was good'

I: Oh like reviews and stuff?

P19: Yeah yeah. Something like that. Or…yeah. I don't know anymore.

I: Okay, and you said like 'History only a bit'. Why only a bit?

P19: Yeah, just like…yeah you can, but if it's too much information and you have to scroll down to see what it really is, it's…I think it's not that useful. Just a short information about what it's really about and so.

I: Okay alright very good. Alright ehm do you see any possibilities of implementation of Augmented Reality, the technology with tourism applications? Apart from the examples that I've shown you.

P19: Ehm I think…maybe something about buses, because we had a huge problem here to find out what bus we had to take because there were no…we didn't find any maps where the bus lanes are so…

I: So, about public transportation.

P19: Yeah, that was a big problem how to get there and there, so that was our major problem in the last two days.

I: Yeah, I can imagine. Ehm like if you could design your own application, like Augmented Reality, tourism. What would be things that you would include in there? For you personally. Doesn't have to be for anyone else, only for you.

P19: Oh, ehm you mean like what buildings or…

I: No, what should the application do for you?

P19: Ah, okay. Ehm it should pass information to me. Ehm what to do, where to go, something like that. Ehm yeah, it's difficult.

I: Is there a specific way you want the application to organise things?

P19: Oh, no, maybe it should be sorted like 'hotels, restaurants and…'

I: Categories?

P19: Yeah, yeah. But I don't think that I have…

I: Any particular interests that you have when you go on holidays for example?

P19: Yeah, ehm maybe there should be something like gas stations, where you can pump your car, or something like beaches, or entertainment parks, or something like that maybe. I don't know.

I: Okay, yeah that's fine. Okay good. Ehm do you see any potential problems that might arise when you use those applications?

P19: Ehm, no I don't think there would be any, or I can't imagine there could be any problems because I think it's a useful gadget to have, or application to have. And there is just…or I can't recognise any difficulties yet, so.

I: Think about the necessities of any application, not only this one. But what would you expect in general from any application in order for you to use it? Because most people just say, 'yeah, it should work' but what does it mean 'it should work' for you?

P19: What…ah, it eh…that it gives me the information or the pleasure, I don't know that I want. It's useful for me. For me it can be expensive, it can cost something, it doesn't have to be about paying.

I: Yeah, it doesn't have to be free.

P19: Yeah, yeah. But if it's good, I would get it, so.

I: Okay. So money is not an issue?

P19: No, no. Because often when you have free applications, they are really shitty and…

I: Exactly. It's hard to find good applications

P19: Yeah, for commercials. So if you just have to pay a bit for it. What is a bit, I don't know…

I: What about those commercials? Are you…Do you get annoyed by them quickly or…

P19: Yeah, yeah. It's often so, when you push something, it pops up and you have to find the 'X' where to close it and so yeah. I think I'm annoyed very fast.

I: Okay, so the less possible.

P19: Yeah, I think. Just maybe on the side. Mostly it's eh…like Facebook for example that you have in the middle you have the normal things and on the side you have the commercials.

I: Exactly, that you have a column.

P19: Yeah. That's not a problem. It's when it's the whole screen is commercial. Then you have to close it and that's annoying.

I: Yeah, exactly. Especially for mobile phones I think. Okay alright. How about things like ehm, or have you ever used an application which you deleted in the end because it was not good? And why was that?

P19: Yeah. Ehm I think it was…it was a sports app. Ehm it didn't pass the right information to me, it was just like I wanted serious information. It just was unserious little information. Not really good and so I changed to another.

I: Yeah okay. So the information was not the one you were looking for.

P19: Yeah yeah. It was more like a different sports or…I just wanted to particular on football. So it wasn't that…what I was looking for. But it wasn't clear in that…the description, yeah.

I: Okay, alright good. Ehm so what do you think in general about information from a tourist office or a company compared to information from other tourists? Which one is more valuable for you?

P19: Ehm, I think eh other tourists. There should be…yeah there should be a lot. Mostly positive, mostly negative, so if there is only one, I think it's not good. There should be a lot. We were in a hotel last year and some people said, 'yeah, it was really bad and we will never get there' and then we went there and so yeah. It was great. It was the best hotel that I've ever been and so it's different. But I think ehm from other users it's the better way than the commercials from the…from the creators…tourist office for example. Because they say the positive things and not really the negative.

I: Yeah, definitely ehm do you also rate like other tourists on hotels and stuff like that?

P19: Yeah yeah. Sometimes, when it's especially good or especially bad. But not when it's normal. I don't.

I: Yeah yeah. Then you don't bother. Okay, you share the main opinion.

P19: Yeah. *laughs*

I: Okay good. How about things like on Facebook, like you can share, and you can check-in to places and stuff like that, would you also be interested in sharing your own content with other tourists on a tourism application?

P19: Ehm personally not really interested in that. I also don't do it on Facebook. I'm there for being in connection with other people. But I don't really, 'Yeah, I'm going there and drinking a coffee and share that'. Ehm no. That's not how I do it.

I: Yeah. *laughs* Alright but are you looking at other…your friends what they're sharing. Are you looking at that at all?

P19: Eh, sometimes, but not really often. I don't…mostly there is not ehm very important information on there when they're going somewhere. So maybe I'm just looking at it quickly or..

I: Yeah, just browsing through.

P19: Yeah yeah. But not really into that.

I: Okay, you're not really into sharing stuff, okay. So like this social network when you're doing Facebook you're only doing it as a status that you're connected to the people and then when you need it you contact them, or…do you do something like regularly on Facebook?

P19: Yeah….no, it just mostly it's just ehm…to be connected with other people at the moment. When I was younger it was like, 'yeah, you can play games' and stuff like that, but…or see what the others make, but at the moment it's just to be connected with them. Because it's easier to write them because it's free. When you have to send text messages with the handy, or with the cellphone, it's expensive yeah. You have to pay for it.

I: Yeah exactly. Okay ehm have you heard about the WiFi that they implement in Dublin at the moment? The free Wifi network?

P19: At the whole city or…

I: Yeah, at the whole city.

P19: Ah okay. Ehm I was studying in Salzburg, in Austria ehm for one…two years. And they also had it there in the inner city. I think it was very useful. So you…I have a German cellphone and it would cost me extra.

I: Definitely for roaming and stuff.

P19: Yeah, so I just had to…would have to go to Starbucks or McDonalds or…to have Internet. And so, you can just sit there at any place and have Internet in the city so…

I: Yeah definitely. Was it also free in Salzburg?

P19: Yeah, it was also free.

I: Okay. Did it work well like the speed and stuff, or…

P19: Yeah, yeah. I think it was. I didn't upload something or download something just to check so I don't know. But I think I had no problem with the…

I: Alright, so for the basic functions it was fine.

P19: Yeah, yeah. It was good.

I: Alright, so how about if you could go somewhere to the city let's say here in Dublin. If there wasn't any WiFi, you would have to use your roaming to use WiFi right? And ehm, let's say you could come here and then for a day, or for an hour or for a week you would pay a certain amount and then use WiFi wherever you are. How much do you think you would be happy to pay?

P19: Ehm, for a day or…

I: Let's say for a day.

P19: For a day, ehm I think 2 Euros, I think.

I: 2 Euros. And then you would be happy to use the WiFi?

P19: Yeah yeah. If it's okay and the Internet is fast, or not dead slow. It's okay I think. 2 Euros I would pay.

I: Okay. Okay good. Ehm, let's see. What do you think about combining tourist applications, or Augmented Reality tourist applications with gaming? Do you see there potential, or do you think it should be separated, or…

P19: Yeah. No I think, I think there is potential. Because if you just have something like glasses, you can just turn around and walk and…yeah I think it's…I think there is potential. Just to…there are I think from Nintendo, a friend of mine has it. On the Nintendo there is a camera on the backside just to hold. And there are those cards and out of those cards, if you look at the screen, there come like….figures, yeah. I think yeah, there is potential to…

I: Exactly yeah. Okay, but would you be interested in downloading this application just for this purpose or do you think it's just an extra?

P19: Ehm I think I would download it. It's just an extra, but I think I would download it. Yeah, because I'm interested in something like that.

I: Okay, alright good. Ehm, what do you think about, if this tourist application could be used to buy things online? Would you be able to, or would you be willing to use it?

P19: Yeah. That would be…I think that would be great yeah. Yeah, I would use it, if you have your…I don't know…then you hold it there and just book it. You know where to buy it or where it's cheaper than anywhere else, or like that. That would be…yeah I think that would be great.

I: And you don't have any trust issues with putting in your credit card details or anything like that?

P19: Eh…no, I don't think. Maybe you'd have to be careful with this information, but if you don't just put it on some places, or don't give it to anyone I think it's fine. If you keep it carefully.

I: Yeah, okay alright. Yeah, definitely. Have you ever bought anything on your mobile phone?

P19: Ehm yeah, ehm…what was it. I don't know, but I have entered the cell phone…eh credit card details, but I don't know exactly what I bought.

I: Yeah that's okay no problem. But everything worked fine? No problems at all?

P19: Yeah, yeah. It was perfect.

I: Okay, alright good. So just a last question. Do you have any like ideas or suggestions for this AR tourist application to make it more user-friendly maybe, or more attractive for people or enhance the tourist experience? Let's say to make it more user-friendly.

P19: Hm…more user-friendly. I don't know. It looked really fine in the movie I saw. I don't know. How to make it better…ehm…I don't know.

I: Okay, or actually when you see this Tuscany app for example right now because it's a commercial you see everything how it should work perfectly right. (P19: Yeah, yeah.) But where do you think there could be some problems maybe?

P19: Ehm, maybe in just recognizing things because I think it's a lot of information to have. Be paused, to just walk around with your cellphone to recognise where it is, and what…what it sees and…so I think that could be one of the major problems that…that it can't recognise the…the place or…I think for example.

I: Okay, alright. Okay good. Very good. Thank you very much. Ehm, is it possible to get an E-mail from you as well? Just for later if we have one or two more questions to just pop an E-Mail. That would be great.

Interview Transcript: TP20

I: Okay, I'll just screen it out. So, before we start, are you currently using a smartphone, a tablet or anything like that?

P20: Mhmh yes. A smartphone.

I: A smartphone? A tablet as well, or just a smartphone?

P20: Just a smartphone.

I: Okay, eh which smartphone are you using at the moment?

P20: Android. Galaxy Blaze.

I: Android? Okay. How is that going for you?

P20: It's good. It works well. It gets the job done.

I: Yeah? Okay. But are you using…are you using it any often?

P20: Ehm, not here. Not that much only because we can only use it when we have WiFi. So it's not…I wouldn't use it as much as I use it in the United States where I get like…like…4G.

I: Yeah, 4G exactly. Yeah fair enough. Ehm, have you used any other smartphone before, or was that your first smartphone?

P20: That's my first one, mhmh.

I: Okay, and eh why did you decide to change to a smartphone?

P20: Ehm, just because I was studying abroad, so I wanted to have the…'cause like when we went on a 2 week vacation, I needed something to like check-in with my family and stuff. So I needed that when we were abroad.

I: Yeah, yeah. And it's for free with WiFi then anyways.

P20: Yeah, yeah. With the WiFi it's fine.

I: Okay yeah good. Ehm, how useful do you consider having a smartphone? For you?

P20: Very useful, very useful.

I: Yeah? Do you use it all the time on a regular basis, or…

P20: At home, yes. And then for here especially, anytime we can get WiFi we use it. And like it helps a lot when we get lost travelling and stuff.

I: Okay, yeah. Yeah definitely okay. Can you tell me some of the applications that you use regularly?

P20: What…well here I use like a currency converter and like Whatsapp and Viber to message everyone, Facebook, E-Mail, maps, eh…my bank account one. That's probably the only ones that I use most often yeah.

I: Okay, and ehm…have you ever like before today heard about Augmented Reality technology?

P20: No. I've not.

I: Never. And ehm why do you think you've never heard of it?

P20: Maybe because it's a new technology? I don't know, because it's not that popular yet. And it seems like not many people know about it. Because if they knew about it…it seems pretty cool.

I: Yeah, yeah okay. Do you…or how do you think it could be promoted then? For…for you or…

P20: Ehm well things like that, even if you had like more people out who show us…like show it more, just to get out and about. Because I don't think like something like that. It doesn't seem like it needs that much like advertisement. It seems like novel technology that people would need it. And people would want to use it without like having to wheel them in the other way.

I: Okay alright. So you think that a lot of people would be actually interested once it's…it's known.

P20: If they, if they know about it, yeah.

I: Okay, how do you usually look for new applications? Do you hear from friends, or do you…

P20: Ehm, I hear from friends usually I like…I usually just do like the popular ones or recommended ones or something.

I: Oh, in the AppStore?

P20: Yeah, in the AppStore.

I: Alright, so you just browse through the popular ones…

P20: Just browse through them or get it from my friends.

I: Okay alright ehm. So after you've seen those examples that I've shown you, which one do you think was most useful or most valuable to you?

P20: Well here, I would say the GPS one definitely. I think that's really cool. Especially like, we're our travelling and that would be really cool instead of like having to look at a map like through a map and trying to figure out where you are. That would be really cool just to point it and then it would point you in the right direction. 'Cause that's even easier than like the Map app, or whatever.

I: Yeah yeah okay. Was that…I mean after you've seen the technology was that like a 'Wow' factor, or was it just like. 'Oh yeah, that's kind of nice, but…'

P20: Yeah. It was like, 'Wow, that would make everything so much easier' yeah.

I: Okay alright. Ehm have you ever used any tourism applications on your phone?

P20: Ehm no…I like used some Easyjet, or Skyscanner, that plane, airline app, but I think that's it. Yeah, I don't think I've ever used anything else.

I: Uhuh, alright and eh how was your experience with those applications, with Easyjet or Skyscanner?

P20: Pretty good. But like usually I like, yeah…usually I would look at ehm…I prefer when I look at on a computer 'cause it's not as 'easy' or it doesn't give you enough options to buy it over the phone, over the app.

I: Okay, yeah yeah. Ehm do you…or…which aspects would you consider, would be important in tourism applications? What would you like to see?

P20: Something, something with…I mean that one that you showed me looked super easy to use, but like also what they offered with the different categories and stuff, 'cause like I know we're here travelling and we'd like to see the nightlife. I really like that kind of aspect, whereas my friend likes to look at landmarks and cathedrals and stuff like that, so I think that would be super easy, if you just had an app and then it would like, I don't know if that one did, but like ratings and something like…if you could include the prices of the drinks and stuff like that, prices for entry for like the landmarks and stuff, that would be easy, or simple to have everything in…in one place.

I: Mhmh, yeah definitely yeah. So definitely like categories. So you can like a personal touch to it. Ehm like prices, the social aspect with like the previous and stuff? Okay, very good. Ehm, Do you think, or do you have an idea of how Augmented Reality, this technology could be implemented into tourism applications? Maybe besides the ones that I've shown you until now. Maybe do you have a different idea of how it could also work? When you think about your trip in Dublin for examples and your attractions

P20: Ehm, I'm not sure. I don't think so. Not that I could think of right now.

I: Okay, that's fine. No problem at all. (P20: Sorry.) No, no that's okay. Ehm so imagine you would be the one to design the application, the tourism application.

How would you design it for yourself? What would you include? It doesn't matter whatever is possible. You could design it on your own.

P20: I would include…let's see like I said the ratings and all that, the categories, then I would include like the different modes of transportation to get there. Like how long it would take you to get there by walking, or if you'd take a taxi or whatever. Ehm, let's see what else, what else would I want to know…hm. Like the menu and that kind of thing for like restaurants and stuff or like if there are any discounts. Or maybe even if you use like a tours app and you work with local businesses and you could maybe get like a discount or something like that. That would be cool. Hm…that's all I can think of, I guess.

I: Okay, very good. Ehm, do you see any potential problems when designing an application or this technology, Augmented Reality?

P20: The only thing that I see is like with me being here…like it would work in the states where I have 4G, but here it wouldn't help that much because..with the obvious fact that I couldn't get connected with it, but besides that I think that would be…I don't see any other potential problems.

I: Okay, did you ever have like the experience that you downloaded an application and then you tried it and it didn't work properly so you deleted it again? (P20: Yes.) So why was that? What did you…what was the problem?

P20: It was…what app was it…it was one where it said it would download and work offline, but it didn't…it was like…it didn't offer like the full features. 'Cause I…'cause it…it was something that was gonna work and I was going to bring it here and it would work fine when I would be off WiFi but that was…and it didn't have the full features. It wouldn't like…it would let me see the basic features, but then if I wanted to go further into it, you would…it'd have to connect to load more. I can't think…I don't know what, so it was…

I: Oh I see. So was it an Internet problem then that it didn't load.

P20: Yeah it was. It didn't have all the features available.

I: Okay alright. Eh, did you know ehm that Dublin is currently working on providing free WiFi throughout the whole city?

P20: *denies*

I: So that's something they're working on at the moment. I think at the moment they still only have it in the main tourist areas, so they don't have it everywhere yet but the goal is ultimately to provide the free WiFi everywhere in the whole city.

P20: Yeah. We had that in Paris when we went there.

I: Oh okay. Did you try it?

P20: Yeah, and that actually…that worked out really well. Because again we were…we didn't have to go to a McDonalds to always like…

I: Yeah, exactly. Like a Starbucks or anything like that…

P20: Yeah exactly. That was very convenient for us.

I: Okay. And how was the Internet speed over there in Paris? Was that okay?

P20: In some places it was a little hard, but usually it wasn't too bad. I think it was slower than I would like, but it still got the job done.

I: Yeah, yeah. Just for the basics, like E-Mail check and stuff like that.

P20: Yeah yeah. E-Mail checking and like enough to load a map and load directions.

I: Okay, alright good. Ehm let's say you could pay for a certain amount of WiFi, let's say for an hour or a day or a week, however long you're here or any other

holiday destination. How much would you be willing to pay let's say for a day and be happy to pay it for the WiFi or would you be willing to pay at all or…

P20: I don't know, yeah 'cause they do that in the airport and stuff too, you'd have to pay for the WiFi and I've never paid. Hm, I guess it kind of depends on my stay here. Like if we were here for a day or two, I don't think I would bother with it at all, but maybe something like 1 Euro or 2 for like a day. A day's worth of it. And depending like if it was like you said all over the city I think that would be worthwhile. But if it was like again just like one block or one neighbourhood then I wouldn't bother with it.

I: Yeah yeah. Just live with it. Okay good. Ehm, what do you think in general about any information that you get in a tourist office or any other company compared to information that you get from other tourists?

P20: I think they are…like you said 'other tourists'. I think that's like our new thing. We like to talk more to other people because it gives you another…like you get to know them…like you get to see reviews online and stuff but like you get to know them and they recommend like…so then we go there. But with the tourist office they tell you, they can tell you like the popular places and where to go and what to see, but it's less personal than rather like really getting to know people and getting what they think of the places and stuff.

I: Mhmh, yeah for sure. So do you think you would…you make more use of other tourists' stuff, or…

P20: For sure, absolutely, yeah.

I: Yeah? You…do you usually go to a tourist office as well, when you go to a new destination or…

P20: Only if we get lost *laughs*

I: Oh alright fair enough. Just to get the map. (P20: Yeah, exactly.) *laughs* Okay alright.

P20: Because usually, well we get most of the information from the hostels. They usually have like the bars to go to and the places to see, so we don't have to go there. 'Cause like the hostels that we go to, we're staying in are like a little tourist office.

I: Yeah, exactly. They have like all the maps usually.

P20: Yeah, they have everything you need.

I: Yeah, exactly. Okay very good. You said before that you also use Facebook and stuff like that as well. Do you also share photos, check-in to places and stuff like that as well?

P20: Yes.

I: Okay, so let's say this option would be available on a tourist application that you could generate your own content whatever picture or movie clip, whatever it is and you could share it with your friends or with other people. Would you be willing to…or would you be interested in something like that?

P20: Yeah, definitely.

I: Yeah? And also to share it with strangers like in public, or…

P20: Ehm, well it would depend on like what kind of photos. Like if it was pictures with me, like on Facebook I'd share it with my friends, but if it was pictures of…or like a video of some attraction or something, I wouldn't mind sharing it.

I: Okay, and you would also be interested in other peoples' stuff?

P20: Yeah.

I: Okay, and also from like other people, not your friends?

P20: Yeah.

I: Okay, alright ehm what do you think about…or do you see any potential in combining tourism applications, specifically AR, Augmented Reality tourism applications with gaming? Do you have an idea how it could work, or if it could work?

P20: Hm…not really. Well, are you kind of talking about like the Foursquare app? Do you know that one, where you like check-in and you're king or whatever.

I: Yeah, exactly exactly.

P20: Something like that, that would be kind of cool. Like we have an app on Facebook like one of…yeah, I guess it's an app, where you like go to this many places, you check-in to those many places, you get like a new medal or something. Something like that would be cool. But if you're talking about like video games, I don't know.

I: Yeah…no okay. Yeah fair enough, good. So if a tourism application would be promoted for those kind of gaming combination. Would you download it only for that purpose or would you rather think that gaming is just like an extra bonus in the application and the application should actually just provide information and stuff.

P20: I…I would, I would see it as an added bonus. Just because something more fun to do with it, I wouldn't download it.

I: Yeah, okay. Alright very good. So if you could do more than just access information, but you could also let's say ehm you go into a hotel and then you could book a room or buy a theatre ticket and stuff like that. Would you be willing to do that through the application?

P20: Yeah, yeah. If it was a secure application, yeah.

I: Okay. And how would you define secure?

P20: I don't know. Like with my banking application it'll have like…or the bank said it'll make sure that your WiFi that you're using is secure and it would securely lock it so no other person can see it and stuff. But other than that…yeah, if it was like that I would do it for sure.

I: Okay. Have you ever bought anything on your mobile phone?

P20: I think, I think we booked hostels I think on my phone, probably.

I: Okay, uhuh and you didn't have any problems with it? Also with putting in your data and stuff like that through your mobile phone?

P20: No, I don't think so.

I: Okay, so you're really comfortable with using your mobile phone?

P20: Yeah, at this point, yeah.

I: Okay, very good. Ehm, just a last question actually. Do you have maybe any ideas or suggestions to make…or how we can make this application more user-friendly?

P20: Ehm…well obviously not have too many things. 'Cause if…I don't know. 'Cause with too many things, too many gadgets…I like it simple and clean kind of stuff. So if you could like with the categories, and it only shows you that or something. Or with the categories it only lets you have 'only this higher reviews' or 'only this price range' or something like that. That would be cool, too.

I: Yeah, yeah. Okay, so you could filter pretty much the information.

P20: Yeah, yeah filter things so you can get down to just what you want. Or like, 'Open Now' those kind of…that kind of deal. But other than that, I don't think I have anything else.

I: Okay, with this 'Open Now' you mean only show like current…

P20: Like open hours, if the store is currently open.

I: Yeah exactly. If it's not open, then don't even bother showing me that.

P20: Correct.

I: Okay good. Very good. Well thank you very much. That was great. A lot of great information. Let me just stop that one.

Interview Transcript: TP21

I: Okay, alright. I'm just going to put it right here. Ehm, before we start are you currently using any smartphone or tablet or anything like that?

P21: Yeah, I have an iPhone.

I: An iPhone? Do you have a tablet as well?

P21: No, just the iPhone.

I: Just the iPhone, okay. And how do you perceive the usefulness of the iPhone?

P21: Ehm, it's actually pretty good, yeah. I got loads of apps for everything I do, so it's pretty good.

I: Yeah? Okay. Ehm, when did you actually decide to get an iphone?

P21: Ehm, about a year ago, I went from Blackberry to iPhone because an iPhone is a lot easier to use. With the touchscreen and everything like that. There is a lot more you can do.

I: Oh okay. You didn't enjoy the Blackberry?

P21: No, not at all. I found it absolutely horrendous.

I: Oh really? Okay good. And ehm, can you tell me a little bit about the applications that you are using? On a regular basis, what do you use?

P21: Ehm, to be honest with you, what I use on a regular basis are Facebook and just the social apps. Just because I have family all over the world, so it's easier to communicate through that. And ehm a lot of bank apps as well, because you can track your money, which is quite handy and also SatNav app, because it's so much easier…

I: Sorry, which one?

P21: SatNav. The navigation. It's so much easier to use that on your phone than to use the actual devices that you can buy.

I: Oh, I see with the GPS you mean? (P21: Yeah.) With the navigation. Is that much better than the Google Maps or what the iPhone provides?

P21: Yeah, yeah. I don't get very well with the Google Maps or iMaps. I find them a bit confusing and it doesn't really route, whereas with your SatNavigation apps that you do, you're actually moving, so you see the streets as you are driving. I think you can focus less on the phone then, so you can concentrate on driving. That's a lot better.

I: Oh okay. Definitely. Ehm alright, so they also do it with the GPS then, just like a car navigation.

P21: Yeah, yeah. And they can also tell you how long it's going to take you to get there and what time you're going to get there, which is quite handy.

I: Oh okay. Is it accurate though?

P21: Ehm yeah, it is actually really good. I moved to a new one now, because they upgraded it and they made it a lot worse. I found that I was going to places and it was not where I wanted to be so I use a different one now, and it's really good.

I: Oh I see. Alright good. Very good, so have you ever heard about Augmented Reality technology before today?

P21: No, no.

I: Never? So I'm guessing you also don't know anyone who has been using Augmented Reality applications right?

P21: No, I have never heard of it.

I: Okay, alright. Ehm so why do you think you have never…well, I guess you have never heard of it, but how do you think it could be promoted in order for like people like you to get a hold of it?

P21: I think it's the sort of thing that you would spot if you went to a restaurant and you were looking on a menu or something. They had some sort of notice that said that you could scan your iPhone over it, and then tell you everything you need to know. I think that would be a good way of starting it, because then people would try it everywhere they go. It's the same with the ehm…scanners that you can get you know with the barcodes? So that's a pretty good way of doing it. That's the only way I knew about those.

I: Yeah yeah. Oh, I see okay. So the scanner you know, with the barcode, right? The QR Codes. That's exactly the kind of technology as well.

P21: Yeah exactly. Yeah, I've heard of that. That's quite good.

I: Okay, ehm do you remember which context you heard of it? Was it with a menu or…

P21: Ehm, no I think it was an advert from when I was in university and I had a Blackberry. And you could scan a QR Code then to enter into a uni competition.

I: Oh I see, okay very good. So would you actually be willing to…when you see it in a bar or a restaurant on a notice saying you can look at the menu and scan it, would you be willing to download it then on the spot, or would you…

P21: It depends on how long it takes to download. For a lot of them you need WiFi to download the app, so…if it was a quick thing, then yeah, definitely. But I think Facebook is quite a good way of doing it as well. There is so much stuff that comes through through Facebook, that you didn't know existed that you just download in seconds. That makes life so much easier.

I: Yeah that's true. Okay, so out of the examples that I've shown you, which one did you think was the most valuable for you?

P21: Ehm, I actually thought the one downstairs with the menu was really good. Ehm, the one on the laptop was actually really blurry, so you can't see what he's doing on the phone, so you don't really get, what the app does. But that was quite good as well with the menu and things like that and with the video as well.

I: Yeah okay. And eh would you also, was it like a 'Wow' factor, or was it more like, 'oh yeah, it's nice, but nothing really special.'

P21: Which one, the downstairs, or that one?

I: Anything.

P21: Ehm that's quite cool. I was really impressed with the video. Because just to scan it and then to get this abundance of information, which you normally don't get, that's quite cool. But the menu thing is quite handy.

I: Yeah, so it's more practical, but it's not really that amazing.

P21: Yeah, I think nowadays it's quite hard to 'wow' people.

I: Yeah, exactly. That's true. Alright, ehm have you ever used any tourist applications on your mobile phone?

P21: Yes, I have used Tripadvisor for a while, which just shows you the places where you can go and rate places to see for other people.

I: Okay. How did that go for you?

P21: Ehm, I found it quite complicated to use. Not that…I could use it, but it's too much of an effort. Yeah, it's going to a lot of different things, and it just kind of put me off of it. I don't have time to do stuff like that.

I: Oh really? Okay. Yeah, yeah so was it because it was hard to navigate, or there was too much information, or…

P21: Yeah, it was like there was too many tabs. Too many links to different places and what they gave you didn't quite fit on the screen. Because what I think is quite handy with the iPhone is everything is optimised. So what you want to read is right there. You don't have to do anything extra to see it. With the Tripadvisor app, I found that you had to scroll through so much information that it just…

I: Oh I see that it's just like a downturn, when you always have to scroll to see what's coming up. Yeah fair enough, okay. How about the…the Tripadvisor experience in general. Did you use it for a long time, or did you…

P21: No, not really. I used it a few times. I mean it's quite good, because I like to go to different places and see different things, but I don't like to…not enjoy it, so I quite like Tripadvisor to see what other people thought of it before I went, so if I had an idea on the spot, then I would just look on it on Tripadvisor and see what everyone else thought, and whether or not it was worth of me going. So that's quite good.

I: Yeah okay. Alright, ehm how could you make this Tripadvisor application better in your point of view?

P21: Make it more simpler. And if there was like a requirement for more information, maybe just link it to a website, rather than having to scroll through the app and all this information. Rather just what you want there in a short paragraph.

I: Yeah yeah. And for any additional information just link to another site, okay.

P21: Yeah, yeah just simple. Whereas that was so many different links of so many different things.

I: Okay, alright good. So which aspects would you consider important in a tourist application?

P21: Ehm, where it is. Because what I found with a lot of apps is that it tells you how amazing it it, but then it tells you like 7 or 6 different pages to work out where the place actually is and the address of it. So things like that I think are quite important just to know where it is, what it is and whether or not it's worth going to see.

I: Oh okay, and how do you find out whether or not it's worth going?

P21: Just from different peoples' opinions.

I: Oh okay, so reviews are an important part?

P21: Yeah, yeah. I think they are quite a good way of judging. Like even just to get an 'excellent, poor, average'. Just from looking at those figures, it's quite useful.

I: Yeah, definitely. Like having a rating would be very helpful.

P21: Yeah, yeah, because you could see what the majority of people think about places and whether or not it's worth going to see it.

I: Yeah definitely. Ehm, do you see any possibilities of…like I've shown you three examples of how it could be used in tourism, like this app…eh technology. Do you have any idea of how else it could be implemented? When you think about your trips for example.

P21: Ehm I think it would be quite good, like with a lot of websites you see that you look at something, they tell you, 'well if you enjoyed this, you would also maybe enjoy this.' So to have an app, where it shows you things and say, 'well if you liked this, then maybe go and have a look at this as well'. Because I think a lot of tourist places you don't know they exist, until you actually go and you miss out on a lot if you don't go and see them. So that would be like a way of doing it.

I: Yeah exactly. Very good, like to have suggestions.

P21: Yeah, certainly. And even if it's just a list that you have a quick look at, it's still more than you need before you looked at it.

I: Yeah, yeah definitely. That's very interesting. So let's imagine, you would be the designer of the application, and you could design your own application with whatever is possible, with no matter…just let your imagination go wild. What would you put into this application? For you personally from a tourism perspective.

P21: Eh, if on a tourism perspective? Ehm I think I'd quite like an app, where your front screen is different categories of what sort of thing you want to look at. So whether it's museum, art, anything like that, pubs. Ehm, and just be able to click on the tabs and get a list of all the different places. What sounds interesting to use, so if you had a list of things with a rating of the site or what in average different people thought you could choose from the list and get the information you need and where it is and how far from where you are to get to this.

I: Yeah, definitely. Alright very good. Ehm, how about like you mentioned before, simplicity is very important for you. (P21: Yeah.) What other characteristics are important for you?

P21: I guess accessibility if anything. Because I know with some apps, you get like an address or contact number to click on it and you can call it. But with other things it's like…to be able to pick that information up and put it on your phone to be able to use it again, or to just contact that person, or just a link with more information would be really good.

I: Yeah, yeah alright. Very interesting okay. Ehm, do you see any potential problems that this technology, Augmented Reality or tourism applications might have?

P21: With the videos definitely. Because you see the Youtube apps and things like that, and it sticks and I think people get bored once it starts sticking on the phone and it stops. So if you got a video of a hotel and how amazing it sticks half way through, you're like, 'I'm bored now, I don't really want to wait around for it to work.' You know.

I: Yeah, yeah I see. Okay, so the speed should be up to date.

P21: Yeah, I think it's just sort of a continuality type of thing.

I: Yeah definitely very good. So what do you think in general about information that you get from a tourist office or any other company compared to information provided by other tourists?

P21: I think with the tourist office, depending on whether they are council based or company based. Ehm, with the apps, you get peoples' actual view and what they think of it, because they're not making anything out of it. They're just telling you what you think. Whereas you go into a tourist office they say, 'Oh yeah. It's fantastic. Go do it and spend some money' but it's actually really crap, but they've made some money. Do you know what I mean, so…I think it's definitely better to see what other people think and it's more like a valuable opinion as well, because they're like-minded.

I: Yeah, yeah definitely. Okay, but do you also value the information of a tourist office, or do you ignore it completely?

P21: Oh absolutely. No, no, I mean we went to the tourist office earlier to find out where the Guinness Storehouse was. It was really good, I mean.

I: Oh okay, so for like general information.

P21: Yeah, yeah, I mean to just be able to walk in there and just ask for directions or which bus route to take, you don't get that from a phone unless they got a detailed website with all the different bus routes and stuff like that, so…

I: Yeah. Do you think those kind of information would be valuable in a tourist application?

P21: Definitely. I think a lot of the touristy applications focus on where you want to go, not on how you're going to get there. So it'd be very good to see, this bus route is going to take you there, and how long it's going to take and how many stops ehm along the way, so that's going to take you that long. It would be really good.

I: Mhmh, definitely. Alright good. Ehm, you use Facebook you said, right before. Do you do a lot of like sharing photos and videos and stuff like that?

P21: Yeah, yes.

I: Then let's say this option would be available on a tourist application that you could make…or generate your own content of places and attractions and putting up and sharing it with people.

P21: Yeah, definitely. I mean it's one thing to get someone's opinion, but to get a first hand view of what it is you want to go and see would be a brilliant idea. Because you know what you're going to look at before you go and whether or not it's worth it. Definitely.

I: Okay. Would you also be willing to share it with the public, or just with friends?

P21: On Facebook you do that pretty much anyways, so yeah. I mean it depends what you're filming and what you're taking photos of. If it was just a scenery, then yeah, definitely.

I: Yeah, okay. Then you're also interested obviously in your friend's contents or other peoples' content?

P21: Yeah, yeah.

I: Alright good. Ehm, are you aware that in Dublin at the moment, they're working on a free WiFi network?

P21: Ehm, well actually I saw a sign earlier saying, 'free WiFi'. I thought it was just a specific place. I didn't know that the entire city of Dublin wanted free WiFi.

I: Oh yeah? Okay, yeah. They're actually ehm, they're still working on it, but for now I think the main tourist regions they have covered with the WiFi.

P21: That's a really good idea. Because things like coaches, we didn't know we have to book in advance. So just be able to jump on it wherever you are, it's a brilliant idea.

I: Oh yeah, yeah exactly. Okay. Ehm, let's say you could, especially when you're on holidays or something, the roaming fees are usually really expensive. So let's say you could pay a certain amount and use the Internet for a day. How much would you be willing to pay for the Internet and be happy with it?

P21: It depends on whether you're staying in, or going out somewhere. I mean if you're in all day, then you'd probably be willing to pay a 5er for the Internet all day, but if you're out and about then it just wouldn't be worth it.

I: I mean in the whole city you could use it anywhere.

P21: Oh, yeah something like that.

I: Like 5…5 Euros? Okay good. Ehm, let's see. How do you, or what do you think about the potential of putting gaming into tourism augmented reality applications? To combine it?

P21: What do you mean?

I: Say for example you could play a game, where you explore the city, and while you explore the city you could play a game, which is like a quiz for example ehm you go to this one destination and you have to solve a quiz or whatever or find out things about this destination in order to move to the next attraction.

P21: I think it would be quite good for big groups of people. 'Cause I know a lot of people come over on…whatever, so I think it would be quite attractive to them, but I don't think as startling tourist, it would be quite appealing. Like the fun factor and stuff like that is that you do it with other people.

I: Okay, yeah okay. So you think the social aspect would be very important. (P21: Yeah, definitely.) If this game would exist. (P21: Yeah.) Okay good alright. Ehm, would you download this game just for the sole purpose, if the game with the social aspect and stuff like that exists? Would you be interested in downloading this application, or would it be more like a bonus for you in the application?

P21: I think it would be more like a bonus, but again it depends who you're travelling with and how many. To do something like that would be quite a laugh to do with a massive amount of friends who are doing it and competing. I know in England we do a lot of gamble rallies where you do competitions and you go all over the country and do a lot of different things. And that is great fun. So if you'd have that on an app, where you could do it wherever you went, would be brilliant. And I'd imagine, big groups of people would definitely download that. But again, small groups I don't really see that it'd be valuable.

I: Yeah, yeah definitely. And if you could go one step further and not just access information, but also buy things on the tourist application, like for example concert tickets, or book hotel rooms…

P21: That would be really good. On things like Groupon you can get offers for different places, and then you got the code and QR code thing on your phone, would be so good. To be able to do that would be so handy for example with the coaches. If we could have bought tickets, download them and showed it to them, we'd probably be on a coach to Court by now.

I: Yeah, definitely. And I'd probably be unlucky. *laughs*

Friend: Sorry, are you almost finished, because there is actually a coach in 5 minutes

I: Yeah, it's almost finished. Ehm, so you would be willing to do that, no problem. No problem in putting your credit card details in…

P21: Yeah definitely. Yeah, as long as it's done through a safegate I mean if you could do it through PayPal or something like that, just because you know it's a safe payment.

I: Yeah, definitely, okay. Ehm, so just a last question. Do you have maybe any ideas or suggestions to make this AR tourist application more user-friendly?

P21: Ehm, probably to make it simpler and have the tabs. And be able to click on the tab that says, this is what the tourist attraction looks like, so you can see what you're looking at. And maybe different points of it, information about it. Things like that, that would make it easier, 'cause it's just a few clicks and not bulking information.

I: Yeah definitely. Alright, thank you very much. I hope I'm not stressing you to get your coach now. (P21: Oh no, that's okay.) Thank you, that was great. Oh could you…sorry, could you maybe just provide an E-Mail address? Because this is actually just the initial stage of the interview so later after I develop a prototype there might be one or two more questions that I would like to ask the initial

participants, maybe just contact you by E-mail to make it quick. That would be great. Alright, thank you very much.

Interview Transcript: TP22

I: Okay, so…and then later you can have a free drink in the bar. *laughs* just kidding. Okay, ehm let's see. Can I just ask you to sign this first. That paper, it basically says that this research is solely for the purpose of my PhD and that the data, or information that you provide is not going anywhere else, like to any third party of anything like that. And ehm, if you just fill out this sheet for me. That's basically like a profile of the tourist, so I have some information who I am talking to.

P22: Just circle?

I: Yeah, you can just circle here, business or leisure or here, first time or…purpose of visit? Business or Leisure? I think it's leisure, yeah. Just an average, average number. Income? More than 100.000? *laughs* I think the first one. Less than 19.999. Alright, thank you very much. Okay, so before we actually start, are you currently using a smartphone or a tablet or anything like that? What are you using?

P22: A smartphone.

I: Eh, may I ask which model you are using?

P22: Samsung Galaxy S.

I: Okay, and are you happy with it?

P22: Yeah.

I: Alright, ehm, do you think it's very useful to have a smartphone in general?

P22: Ehm, yeah.

I: Okay. Why is that?

P22: You can use it while you're walking and stuff like that. Because some things you can't use like…they're not very good. You can only use them at home and stuff. So having a smartphone you can go walking and using while you're doing stuff.

I: Okay. So it's like very time-saving? (P22: Yeah.) Okay, very good. Ehm, can you tell me about the applications that you are using? What are you using regularly?

P22: Ehm, some games and stuff like that.

I: Okay. What kind of games are you using?

P22: *laughs* Like puzzle games and stuff like that. And ehm I mostly use Internet and stuff on my phone. And I also use apps that customise the themes and stuff on the phone.

I: The sorry?

P22: Themes…of my phone.

I: The theme of your phone, to change your theme and stuff, okay.

P22: Yeah, and like the background and stuff.

I: Oh okay. So you like to personalise your phone?

P22: Yeah.

I: Okay, what kind of theme do you prefer?

P22: Ehm, just something that's not too bright. Just very simple.

I: Okay, very simple theme. Very good. Alright. Ehm, have you heard about Augmented Reality, this technology before? Before today?

P22: Ehm, my dad showed me videos and like different things about it on the Internet. Yeah, and we were also playing around with the app that he's got downloaded on his phone. So we took pictures and had like different things move around when you look at it.

I: Oh, alright. How did you like it, the application?

P22: It was very fun, yeah.

I: Yeah? Did you…when you first saw the application, was that like a 'wow' factor, or was it just like nice, but nothing special?

P22: Yeah, it was really cool.

I: Okay, ehm are you currently actually using any augmented reality applications on your phone?

P22: No. I did have QR droid? But then I didn't have too much space, so I had to delete it.

I: Okay, not enough for games, which are more important *laughs* And ehm, why did you have this QR droid? What did you use it for?

P22: Ehm, because everytime I saw like a leaflet or something, it said to scan here, so I decided to try and see what all the different things are on posters and stuff.

I: Oh okay, and what did you find?

P22: Ehm, some like different sites you could go on to see more about like if it was a poster about a restaurant or something, you could like see more on like the website about it, so…

I: Oh okay. So a direct link to the website all the time. Have you ever, you know, experienced another QR Code which did something else?

P22: Ehm, no.

I: No? It's always a website link?

P22: Ehm, sometimes you have pictures. Ehm, I think sometimes there were videos as well. I'm not sure, because I think I saw one, but I can't remember.

I: Oh alright. Okay, alright. Ehm, so after hearing about this, augmented reality application, you said, you thought that was really cool. How come you didn't download any augmented reality application?

P22: I couldn't. No, it wasn't on my AppStore thing, so I couldn't download it.

I: Oh, so the Samsung AppStore you don't have it?

P22: No, it's just that my phone is an older version, so you don't have most of the applications. So I couldn't download it.

I: Oh, that's too bad. Alright. Ehm, if you would look for an application like that, or how do you think those applications could be promoted that people know about it more? Where do you think it could be promoted?

P22: Ehm, just put it on the front of like stands and boards to scan and see what they wanted. So on like shops you could put a poster on a side saying, 'scan with your phone' to see something…so they could see a bit more about the shop or something.

I: Yeah, okay. But do you think you personally, when you see something like that, you would want to try it out?

P22: Yeah, probably.

I: Okay, even if it's just one restaurant? (P22: Yeah.) Okay, very good. Ehm, so after you've seen those three examples that I've shown you, which one of those three did you think was the most useful for you or most valuable for you?

P22: Ehm, probably the video. Because it shows a lot of information about the things we're seeing and it's very detailed. And I think people would want to see a video instead of pictures, because they don't tell much about the thing.

I: Alright, and the video is moving and stuff like that, so it's more entertaining? Okay, alright. So have you ever used any tourist applications before in general on your phone?

P22: Eh, yeah on my old phone I think.

I: And what did you use?

P22: Ehm I think it was VisitDublin, yeah I think so, I'm not so…

I: Oh really? No, that's okay. Tell me about the experience. How was it?

P22: Ehm, it was very useful, because I could search for like different things, me and my sister wanted to go, and we could just find it on maps and go there and stuff, so…

I: Oh, okay. Was that connected to Google Maps, or…

P22: Yeah, it was, so we could just look on the maps and stuff and just go there.

I: Oh, alright. Was it easy to find the places?

P22: Ehm, most of them were, some of them were a bit hard.

I: Alright, why is that?

P22: Ehm, because you had to type in the exact one that you wanted, and there was like loads and you had to go through all of them and stuff.

I: Oh okay. So in general did you enjoy the application? Did you think it was good?

P22: Yeah, it was really good.

I: So from a rating from 1-10, how good was the application?

P22: Ehm, 8.

I: Okay, alright. How come it was not a 10? What didn't you like about the application?

P22: Ehm the…because you had to put in the exact thing, you didn't have any 'near' what you typed in, so you had to go through loads to find the one you had to…you wanted exactly. That was a bit of a down…

I: Okay, yeah, you couldn't just narrow it down and then just go to the spot? Okay, alright. So that was a bit of a hassle I guess, right? Okay, very good. So which aspects do you think would be important for tourism applications?

P22: Ehm probably like famous landmarks and stuff yeah. So people could know what they are about and like so they know which famous landmarks are in Ireland or anywhere else in the world and ehm, tours maybe?

I: Tours? Okay, how would you implement that?

P22: Ehm so like, ehm…so they like clicked…

I: That's okay, it doesn't have to be like a proper idea, just from your fantasy, how would you do it?

P22: Hm…I'm not exactly sure, because I haven't been on many tours, so…

I: That's alright, no problem. Yeah. That's alright, no problem at all. Ehm, do you think, or how do you see the potential or implementing Augmented Reality, this technology into tourism applications?

P22: Ehm, I think it's really good.

I: Do you think it can be made very attractive for tourists?

P22: Yeah, I think so.

I: Okay, can you imagine why, or can you imagine how it could be implemented?

P22: Ehm, because it's like very new technology. So people, most people would want that compared to old stuff, so I think they would like to use it very much.

I: Mhmh, okay alright. Ehm, so if you would imagine you design your own Augmented Reality tourism application, just for you, it doesn't have to be for anyone else. What would you put in there? Or how would you design it?

P22: I would probably like put things that people would want to see, like statues of museums and take a picture and make a video about the museum or things they are seeing and different information about it probably. Yeah, and like different pictures and stuff about it.

I: Yeah, okay. And what should the application do for you?

P22: Ehm probably help me choose where to go, what to look…ehm, what places to see and stuff and make the trip memorable.

I: Okay, so, what to do, what place to see, so like only information? Or do you want more?

P22: Ehm, probably a bit more.

I: Like in what terms? Can you imagine?

P22: Like…it could have like different activities that you could do about it, so like you can remember it more. Little games and stuff.

I: Oh okay. So you want pretty much the application to build an experience for you? Enhance the tourism experience. Very good. For example games, how could games be implemented?

P22: Like you could do, pictures and words and connect them, so people could remember the picture and what's called…

I: Oh okay. Like a puzzle, and match it? And then?

P22: And then you could search it on a map that could be on the app.

I: Okay very good. Yeah, that's a good idea. Ehm so do you think there are maybe some problems when you develop the application? Or with this technology especially.

P22: Maybe if you need like a Wifi or 3G to use it and for like some people it could be expensive or they could not have 3G around, or with them, so it might take a long while to do it, or it might not work at all for them, so…

I: Yeah, definitely. Okay, so WiFi is a problem. Ehm, time, if it takes too long to load. Okay then after a while you just can't be bothered anymore. Definitely, yeah. Or it doesn't work at all. Has that ever happened to you for any other application that didn't work?

P22: Ehm, sometimes it takes like too much megabytes to download, it doesn't work at all, so I just have to delete it. That's a bit time consuming.

I: Oh yeah, definitely. You take all the time to download it for nothing. Yeah, definitely. Okay very good. Ehm, so what would you expect in general from an AR application?

P22: Ehm, probably like pictures, or something that people can actually see about the building or landmark or something like that.

I: Okay, alright. So you would prefer to have actually images rather than text?

P22: Yeah, or videos or…because sometimes text can be a bit boring for people.. ehm sometimes it takes a really long time to read than having pictures of that.

I: Okay, very good. Pictures and videos are better. Okay very good. Okay ehm what do you think about information in general that you get from a tourist office compared to information that you get from other tourists?

P22: I think ehm, the information that you get from other tourists are probably better because you get peoples' point of view about the thing. And in tourist offices it just gives a general information about it, so I think from other people is better. Because some people might not like it, and if you get both views and stuff like that, then you know what to….like if you should go or not and stuff like that.

I: Alright. Do you think those…like for you the opinion of other people is very important?

P22: Ehm, yeah I think so.

I: Okay, when you like judge the tourist attraction or something. Okay. Have you ever used anything else where you can see other peoples' opinions? Or where you can read other peoples' opinions?

P22: Ehm probably when I go to websites where they have like restaurants, they put like review on..and stuff like that about websites and stuff like that so it's very useful for that.

I: Yeah okay. Very good. And they give you like a rating like stars and stuff like that. Do you think something like that would be interesting in a tourist application? Would you use it?

P22: Ehm probably yeah.

I: Okay, then you certainly would consider using it as well, like looking at, okay very good. Ehm, would you consider…do you do Facebook at all?

P22: Ehm, no, I look at my mum's sometimes to look at other people and stuff…

I: You do what sorry?

P22: Ehm, my mum's because she has a lot of friends that I know as well. So I sometimes go on her's and look for people and stuff like that.

I: Okay, ehm do you like look at pictures of other people and stuff like that as well? And like the Newsfeed and stuff?

P22: Yeah.

I: Okay, so ehm, would you say in general you're interested in other peoples' stories, or what other people do?

P22: Mostly, yes.

I: Okay, do you also generate your own photos and share it with other people and stuff?

P22: Yeah. I like doing that stuff.

I: Oh really? Do you also like check-in places and stuff?

P22: Ehm…*laughs* sometimes.

I: A bit? Okay. Ehm, if those kind of things would be available in a tourist application that you would for example go somewhere and could take a picture or video or whatever and then share it with other people, would you be interested in doing that? Or would you use it?

P22: Ehm, maybe because sometimes I don't really like my picture being up on like…but I think that would be really good to see other people enjoying it and stuff like if they liked it or if they didn't.

I: Okay, yeah very good. So you would definitely look at it as well?

P22: Yeah, I'd probably look at it and see.

I: Okay. Alright good. Ehm do you know that Dublin is currently doing this free WiFi network throughout the whole city?

P22: *laughs* Really?

I: So you didn't know I guess. Yeah, Dublin is actually at the moment working on a free WiFi to spread through the whole city, and for now I think they only have the main tourist areas, they have covered. And the opinions vary, some people say it works really well, other say, it doesn't. So they're still working on it. But say, you would especially if you're going somewhere on holidays, for example here in Dublin, you would need the Internet outside the hotel. Because here in the hotel you have a hotspot or whatever, but once you go outside you either have to pay a lot because your phone is from England, or you don't have Internet, right. So let's say you'd have the possibility to pay a certain amount of price and use the Internet let's say for a day. How much would you be willing to pay for the Internet?

P22: Ehm, I'm not sure, because I don't pay for my contract and stuff.

I: *laughs* Yeah, the parents pay. But ehm how valuable is the Internet for you to have on a regular basis?

P22: Very valuable. Because like most of the time I'm on the Internet on my phone and stuff like that. So I can look at different stuff and like send messages to my friends and stuff like that, so it's quite valuable.

I: Yeah, okay. So would you be willing to pay money for it at all?

P22: Probably not.

I: No? It's still valuable, but not even 1 Pound or 50 cents or nothing?

P22: No.

I: Okay, alright. Very interesting. Okay. So before you said you like gaming a lot right? What kind of games do you play? Like puzzles you said before. What kind of puzzles are those?

P22: Yeah, like sometimes you put blocks into like a set shape, or sometimes it's like where you have to join the dots to make a full…it's like a game where you have to join the dots, but if you go over the same line again, then you have to start all over again. Yeah, I'm alright at it, but still it's a bit hard.

I: Yeah, I can imagine. *laughs* Okay, ehm what do you think about the idea of combining gaming with tourist applications?

P22: I think it's really good, for like children that are pretty young, because they might find walking or riding to different places quite boring but like, if you put different games about it, they might want to go there…

I: Yeah, yeah exactly. Could you imagine what kind of game would be…or what this game would be about, for example?

P22: Ehm, maybe you could like join different names where the landmarks are and stuff like that and you could do things that I've said before you could join like the names to the pictures of the actual landmark and things like that.

I: Yeah, okay very good. So also like puzzle like games, okay. So let's say you would have that application available on the Internet here in Dublin let's say would you download the application just for the game, or do you think a tourist application should be about information and the game is just an option?

P22: I'd probably do about tourists first, and game as an option.

I: Okay, you wouldn't just download the game, because of the game? Okay, alright very interesting. Good. Ehm, alright so, okay this question is a bit tricky maybe let's say you could also use this application to not only look at things and information, but also buy things, for example let's say you're at eh…where did you go yesterday?

P22: Ehm, McDonalds?

I: McDonalds…no not that, let's say on a city tour bus, right. You went on a tour bus, so let's say you could point the device at the tour bus and you could buy the ticket straight away for the bus, okay on your phone, alright? Would you be interested in doing that?

P22: Yeah, 'cause it's much quicker than going into the tourist centre. Or like waiting to buy your tickets.

I: Yeah, exactly. So yesterday, did you go to the tourist centre to buy the bus tickets?

P22: Yeah, we went to the tourist centre.

I: Alright, so you had to wait in line and stuff like that?

P22: Ehm, no there wasn't many people there. But I remember last time there was quite a long queue when we wanted to buy them on the bus, so…that was a bit time consuming to need to go out to buy the tickets.

I: Yeah, definitely. Okay, do you think that could be interesting for other areas, too? Not only for the bus, but maybe for other places.

P22: Ehm, maybe for souvenirs something about Ireland and stuff like that.

I: Oh, okay. How would that work?

P22: Ehm, so that you take a picture of the logo or the shop and you can click on the things to buy and you go to the counter or something and say you want to buy because you purchased it, or something like that.

I: Oh, okay. Good, good. Yeah, alright. Ehm, just a final question. Do you have, or can you think of any other suggestions or ideas of how we could make this tourist application, or Augmented Reality tourist application more user-friendly?

P22: Ehm, well you could have like set instructions of how to use it, so people have like that don't know how to use it, could look at the instructions and they immediately know how to use like the app and stuff.

I: Okay, so like a training course on how to do it, okay.

P22: Yeah, that kind of thing, ehm…and…

I: How could we make it easier to use for people? Or more attractive that they want to use it.

P22: Ehm, you could have like different colours to choose from, like set the background and stuff like that.

I: Okay, yeah, so to personalise it for them, yeah.

P22: Ehm…*thinks*

I: That's it? You can't think of anything else? (P22: No.) That's alright. Very nice interview. Thank you very much for your time, alright and ehm I hope you have a nice trip in Dublin, okay.

Interview Transcript: TP23

I: Okay, I'll just screen it out, alright. And just ask you to sign this for me. Ehm, it's just saying that this research is purely for my PhD, and any information you provide is solely for the purpose of this research and doesn't go out to any other third party or organisation. It's really just for the purpose of this research and any answers or…you provide is totally voluntary so if there is any question you don't fell comfortable answering, just let me know and we can skip this question. That's fine. No problem at all.

P23: Alright.

I: Thank you very much. Can I just ask you to fill out this profile sheet, so I have a little bit of information about the tourist.

P23: Oh that's in dollars…right.

I: Yeah, I think that's about 1.2 in Euros.

P23: Okay.

I: Alright, thank you very much. So before we start, are you currently using a smartphone or any other mobile device?

P23: Yeah, I'm using a smartphone.

I: Which one do you use?

P23: The Sony.

I: Okay, are you happy with it?

P23: Oh yeah.

I: Alright, and ehm, do you think it's very useful to have a smartphone?

P23: When we were in London a couple of years ago, we went to Starshow, so we got lost down the trip and someone took…the whole line went out and then there was delays everywhere, so we had to get up on level ground again. So we didn't have a clue what bus to get, where to go. So I used the smartphone and got it to say the bus stop, the bus number, what time the bus was coming and everything, so…ah, it was very useful, so yeah. Even for things like directions, restaurants, I use it quite a bit.

I: Oh yeah definitely. So would you say it's more useful for getting around or…

P23: I'm here today. I don't know Dublin too well, I know it a bit but not that well and you know, the apps are good now. Definitely would use them.

I: Yeah okay, very good okay. Ehm, can you tell me a little bit about the applications that you are using on a regular basis?

P23: Not very much. The only time I was using apps would be ehm to find a way somewhere out of town and I don't know the area, I use the apps then. Transport apps maybe just directions, that sort of thing.

I: Okay, so are you talking about Google Maps, or are you using any other application?

P23: Google Maps, yeah. A London app, when we were in London there was a London app I can't remember what the name of it was, I just googled it before I went and I put it on the phone. Yeah, they were like very useful.

I: Okay, so it's basically all apps for public transportation and…

P23: Transport and yeah…just you know, that was Tripadvisor, I used that. Actually that was quite good. Because it gives you directions, restaurants…I used that quite a bit actually. That was quite good.

I: Yeah okay. Good interesting. So, have you ever heard about this technology Augmented Reality before?

P23: No.

I: Before today? No. So and ehm…why do you think…or how do you think it could be promoted that people hear about it more? Because most people haven't heard about it to be honest.

P23: Probably if you go to booking.com or some website or something…probably because booking.com or expedia.com…people look at, they get prices for. They go there usually people book a hotel because they're usually cheaper.

I: Alright, so you think in connection with like intermediaries…

P23: Yeah, because through booking.com…we book through booking.com to get here because it's cheaper than to book on the hotel website itself. Yeah, so for something on that site, or Tripadvisor, I normally check Tripadvisor too before a trip.

I: Yeah, true. I do the same thing. Yeah, that's interesting okay. Ehm do you…like do you use the Internet for like to get new ideas for new things whatever it is?

P23: Not really, no.

I: Or does like Internet promotion influence you a lot?

P23: No, absolutely not, no.

I: No not at all. But just to create awareness?

P23: Yeah, it's good to know what's…you know what's…what can help. But I wouldn't be really…if I need to go somewhere do something, I'd find out you know what can help me at that time, but I wouldn't be up to date with technology, or what's going on.

I: Okay, yeah that's alright. Alright good. So, after I've shown you the three examples of what's possible, which one was most valuable for you, or would be the most useful for you between the three I've shown you.

P23: Ehm they're all quite useful in their own way, you know. I wouldn't be…

I: Was there anyone in particular where you thought it was a 'wow' factor?

P23: No. No, not really.

I: It's like, 'It's nice technology, but not really…' Nothing special.

P23: Yeah, yeah.

I: Okay, which one of those three would you use personally?

P23: I'm not sure really if I'd use any. Directions for me is the most useful really. I wouldn't be into…you know it's really as an aide to get from A to B. Or where is what available, so I really wouldn't be. You know…something wouldn't be…I'm not on the smartphone all the time just to amuse myself. I use it literally for a purpose to find out where I'm going or something, if I'm lost. In doing something what people are doing…I wouldn't be doing it. You know, it's really just serving a purpose to me.

I: Mhmh, would you say this Tuscany app for example, since it also shows you directions and stuff like that or gives you information on what the building is and stuff like that, ehm…would be helpful for you?

P23: Yeah, that probably would be...

I: Or would be an alternative to Google Maps?

P23: Yeah, that probably would be most useful. Google Maps is pretty good. It's pretty hard to compete with that. But Tripadvisor is quite good as well, you know. Because it gives you directions, what's near, restaurants…everything really. Everything a tourist is looking for.

I: So, how is your experience so far with Google Maps for example. You have a very positive image, but was it always very easy to find the location, or did you have any difficulties at all?

P23: No it was fine. Never really had any problems.

I: Okay, never had any problems…

P23: Even down in London, you know we were lost and I put Google Maps up and it was quite easy, because even the direction to go just by looking at the map and how it was oriented. It was quite good, very good yeah.

I: Okay, alright ehm so you told me that you have used public transportation apps and maps, and even Tripadvisor, which all kind of relate to tourism, so was there any particular app where you thought it was really good, or any other map where you thought it was really bad?

P23: The Tripadvisor one was very good. That was very useful. Ehm even where you were…you're looking where you are, what's near, if there's a restaurant near here and you know, it gives you directions how to get there then. It's very easy to use, very user friendly.

I: Okay, was there any negative part about Tripadvisor? Where you thought, if this is improved, it would be perfect.

P23: No. This app is very good. It's the app I'd use most in fact. I'd go to it first.

I: Alright, which ehm aspects besides being practical and easy to use do you think was like an additional bonus point on the Tripadvisor. Was there anything?

P23: Nothing really on the practical sense, really.

I: Okay, alright. Do you ehm look at reviews and stuff like that at all?

P23: I don't pay that much attention to them. I do look at them, but I don't pay too much attention to them. But for instance the hotel we stay here has some really bad reviews, so if you would listen to everything on Tripadvisor you wouldn't come here. That was generally positive, but there is some negative ones, so you know I don't pay much detail to those. It's really the area.

I: Okay yeah definitely. Alright, so I'm guessing you yourself are also not that interested in writing reviews and stuff?

P23: No, no…even if there was something negative, I wouldn't write a review, because that's just…you know…maybe a bad day, you know.

I: Yeah, time consuming…yeah. Okay, alright. Ehm, so which aspects do you think if you would…or in a tourism application in general are important to have?

P23: The ones I use. Map, directions…whether there is anything near that is interesting really. Because it literally is how to get from A to B because you're out in a strange city. You have no idea…taxis, where to get the taxi, where to get the bus, really is for me…direction.

I: Yeah, that's the primary reason. Okay, very good. Ehm do you see any potential for implementing Augmented Reality technology into tourism apps, for directions for example?

P23: Oh yeah, definitely, for directions yeah.

I: Yeah? And ehm would you also be willing to use it then, from Google Maps, whether it's linked to Google Maps or not, to go actually the next step going with your phone like this and get directions like that, through this technology? Or would you say, it's a bit confusing?

P23: Yeah, no, it's not confusing. No it wouldn't be confusing, but Google Maps is reasonably pretty quick. It's quick and once you…it just uses your GPS and knows exactly where you are. So, that…I would say that's quite hard to beat to be honest. Or on Tripadvisor, I'd open it…on a map, it pinpoints exactly where you are. When you're looking for directions, the GPS will tell you, it will bring it up, so.

I: Okay so this speed and quickness is a really important point for you?

P23: Yeah, because down there when we were in London we had to get to the flower show for example and the trips weren't open that day, and we were wasting time down on the trip station it was an hour delay. No it's important because when you're a tourist, we are only here for a day, so time is really important.

I: Yeah definitely. Very good. So imagine you could design your own tourist application. What kind of aspects would you put in there?

P23: What's on Tripadvisor. *laughs*

I: You would design Tripadvisor all over again? *laughs*

P23: Yeah, what's on Tripadvisor, because that's really good.

I: Is there any…like additional option for you personally, that you would put on Tripadvisor then?

P23: Honestly, I can't think of anything. I really can't.

I: Okay, alright. Okay, that's alright. Ehm, do you see any potential problems in using this technology with tourism applications?

P23: No I wouldn't think so, no, can't think of anything.

I: Like ehm, say…I don't know ehm…say you would use this, for example this Tuscany application with the GPS and you would use it on the street. Do you think there could be any difficulty with that?

P23: I don't know, I don't know enough about it to be honest. I know, what I use, works and that works well, so…you know.

I: Alright, fair enough, no problem. What do you think in general about information that you get from a tourist office compared to information that you read from other tourists?

P23: Ehm, I think they…they have their own agenda. And they promote what they're paid to promote. And that's it really in a nutshell. Yeah, because there are lots of parts in Ireland that are not promoted in tourist…and they really should be. Probably it's because economically not a good option for them. So no, I would say that they have an agenda, definitely.

I: Okay. So which kind do you prefer?

P23: Local, word of mouth. Yeah definitely. In a different area, just ask a local and I might find out better. Even a boss of mine, she travels all over the world, she doesn't do the tourist bit. She doesn't want the tourist site, she doesn't want to do any of the tourist thing. She goes there, she finds local people. She talks to them and that's how she gets…she finds a far better holiday. She goes and talks to people that live there. So yeah…you occasionally gets sometimes lost, you know with all those social networks and everything. You lose the personal touch definitely. So that's why I think I don't own too much.

I: Yeah definitely. Yeah that's true. There should always be a balance between technology and people.

P23: Yeah we used to do that bit…but I think word of mouth…really.

I: Yeah, okay very good. So do you actually use social network at all?

P23: I do, yeah. I use Facebook, Twitter, but it's really just to keep in touch with people I'm not directly in contact with from day to day just to keep in touch with the latest nephews and family overseas and what not…so really it's good for me that way. I'm a very practical person, so it really is…it has to serve a purpose you know.

I: Yeah definitely, okay. So do you actually also like share pictures and videos and stuff like that with friends?

P23: I would yeah. I share pictures. We were at Pink last night, so couple of us put up pictures of that, several people. So stuff like that, I would use it…yeah.

I: Okay, are you also interested in other peoples' like photos and stuff like that?

P23: Ehm, I'm into photography. I would be interested…I'd go to other sites that I know people go with the same hobbies but I wouldn't be looking at other peoples' pages to be looking at their photographs, the person photographed just for the sake of it. I'd be on to look at the photography stuff…that you know…

I: Yeah more the technical side of it.

P23: Yeah, again, practical use.

I: Yeah definitely, okay. Let's say this…you could generate and share your own content on a tourist application, would you be interested in using that?

P23: I suppose you could do that…ehm…Google Maps. *laughs* They already do that, so…but I wouldn't, no.

I: Okay, you're not interested in sharing your photos and…

P23: No, no.

I: Alright, ehm, are you aware that Dublin is currently working on implementing a free WiFi throughout the whole city?

P23: No, I wasn't, no.

I: Okay, ehm that's actually something they're working on at the moment. And for now I was informed that only the main tourist areas are covered, but they want to spread it out over the whole year. Ehm, let's say…

P23: What are the main tourist areas? Obviously Temple Bar…Steven's Greens and Graffton Street?

I: Ehm, here Temple Bar…exactly, yeah.

P23: What about north?

I: Ehm, north I think like O'Connell Street is not yet.

P23: Not on O'Connell Street, really?

I: No, not on O'Connell Street, I tried it like 2 months ago, but there was nothing…yeah just in the southern part actually.

P23: Oh, so it's just over here.

I: Yeah, but let's say ehm you would…you know be able to use WiFi, but have to pay a certain amount to use it. How much would you be willing to pay…

P23: I wouldn't use it. Just wouldn't use it.

I: Not at all? Just doesn't have that much value, the internet, okay.

P23: No. 'Cause I know, they tell you, the first 30miles is free and after that a Euro, wouldn't use it if I had to pay for it.

I: Alright, okay. Also like eh throughout the whole city?

P23: You know, I'd research a place before I wanted to go anyways. So I would know a fair deal before I come here.

I: How about if some…last time you went to London, how could you use the Internet or the GPS?

P23: Oh we used the GPS, when we were stuck with the application, the transport application, it's really useful. But other than that…the Tripadvisor one. Like we were right in…I can't remember the name of the area, but we needed something to eat and we didn't have a clue of where to go, so we used it then. We used Tripadvisor for that.

I: Yeah, so did you use roaming, or…how did you use your phone in London?

P23: Eh, I use UK's cell, so that was in the UK anyway…I don't use roaming, so…

I: Oh, okay. So you're…I see, okay.

P23: Whereas down here, it's roaming. Yeah, and the charges are what, 2 Pounds a day. Here you can't access data, so no data, because we're on O2 Ireland.

I: Oh okay, so here you don't use it.

P23: No, not often, I used it last night, so…

I: Alright, alright. So does that mean from Northern Ireland you can use it through the whole UK?

P23: You can use it through the whole UK because…because it's…we're part of the UK, so…Northern Ireland, whereas down here we're going to a different tariff…I use roaming to come down here, because we come down here by bus, and we have WiFi in the bus but eh…when we go over the border, we lost it. Yeah, so no I definitely wouldn't…

I: Wouldn't pay for it, because there is so many alternatives to get free WiFi nowadays…okay. Very good. Ehm, are you interested in any forms of gaming at all?

P23: No, not at all, no.

I: Okay *laughs* So then, next question. Ehm, how about if you could ehm use the tourist application actually to not only access information but also to purchase things online, say for example here for the bus tour, you could just point the device on the bus and it would give you the option to just purchase the ticket and you could do it straight away and then hop on the bus, would you be interested…

P23: Not on the WiFi, I don't think it's secure enough. Absolutely not. Because a few times I had problems. It was even a home PC and it was hacking and that sort of thing, so I really don't trust that enough to be honest.

I: Oh I see, so you don't purchase anything online.

P23: I do purchase online, but on a very secure site, and I would do a virus check before because I am very security conscious like that, because I've had problems with that sort of stuff, so I wouldn't trust, I definitely wouldn't trust the WiFi and never make a transaction on it. Absolutely not.

I: Okay, alright. Very good. Very interesting, so only with trusted sites you would, but with mobile…

P23: A bit at home, on a secure site, not outside, and not on…definitely not on mobile, no.

I: Okay, alright. Ehm, just a last question actually, do you have any other like suggestions or ideas on how we could design this tourist application more user-friendly?

P23: No for…I probably wouldn't use it because I mean I told you what I do use, and for very practical reasons so I wouldn't really have much thought in that.

I: Okay, alright. Ehm okay, that's no problem. That's perfect. Thank you very much for your time. And let me just provide you a voucher…how many are you guys…thank you very much for your time, alright. Have a nice day.

P23: Thank you very much. That's okay. Very kind of you. And you.

Interview Transcript: TP24

I: Alright, screen it out. There you go. And if I may just ask you to sign this sheet for me. Ehm, what it's saying is that this research is solely for my PhD and any information is not going to any third party or…ehm, it's solely for this research and any information you provide is on a voluntary basis, if there is any question you feel uncomfortable with. I'm not going to ask you any personal questions, but just in case that ehm…

P24: No, no that's okay. It's not going to go on Youtube or anything.

I: *laughs* No, no. "Oh check out this guy." Thank you very much. And ehm, just one more thing. This is like a profile sheet, so I have a little bit of information of who the tourist is. Alright thank you very much. Okay, so before we start, are you currently using…you're obviously using a smartphone, are you using a tablet as well?

P24: Yeah, yeah.

I: Okay, and ehm how or for what purposes are you using it?

P24: For everything really. Web, web browsing, apps, games. I'm using my phone mainly…when I come here, I'm using my phone for tourism. But for my tablet it's purely for leisure…I…web browsing and games.

I: Alright, do you use the tablet only at home or do you take it out as well?

P24: Yeah, pretty much. Occasionally I take it to a café, when I'm booking flights or anything like that, so comfort, but that's it.

I: Yeah alright okay. Ehm, do you think in general it's very useful for people to have a smartphone or a tablet?

P24: Oh yeah.

I: The tablet as well?

P24: Well, yeah and no. The smartphone these days is the same as the tablet, isn't it. Potentially no, but then at the same time, people like to be greedy and have both, like me.

I: Yeah. *laughs* So for the tablet, what kind of advantages do you see compared to the smartphone? Is it just the screen size or is there anything else?

 P24: Potentially the screen size, and what sort of apps you can have because of the screen size. With the smartphone it's quite difficult to use certain apps. Yeah, I'd say it's the screen size more.

I: Okay. Good. So, could you tell me a bit more about the applications that you use on a regular basis, let's say for your phone.

P24: For my phone…Trip advisor…I cannot…here I'm using that. Ehm…yeah, Snapguide.

I: Snapguide? What's that?

P24: It's a…basically a huge community, where people post their own guide on how to…make things, like cook. Or make things up from almost nothing. So you go there every couple of days like on Youtube and there are new things being constantly updated. You just learn new things from it, so…yeah. Things like that really. I'm so fussy I just download a new app, use it for a day and put it down most of the time. There is apps, I continue to use like Tripadvisor and stuff like that.

I: Oh I see, yeah, yeah. With those apps that you use for a day, do you just download them randomly, or is there like a specific category.

P24: Ehm, a lot of them I download, I look on the featured…the featured apps on the App Store and go and give it a try. I always look at the reviews as well, beforehand as well and what suits me. And also through friends, who say, try this app, and blabla…I usually never lasts more than a couple of times.

I: Oh okay. And ehm how come you decide not to use them? Do they get boring or what's the problem?

P24: Yeah, potentially it's not…they're not very in depth. There is not a lot to them. I mean, like games…Angry Birds and stuff like that. There is only so much flicking you can do, whereas apps that are constantly being updated. They are apps that I potentially continuously use. There is many apps that look so good, and then you go down for 6 months and nothing has changed, that's what pisses me off.

I: Yeah, okay fair enough. Ehm how about on your tablet? Which apps do you repeatedly use there?

P24: Just Safari. Just web browsing, really in all fairness, yeah. Youtube, ehm and games really. I don't really use it that much, the tablet. Well for web browsing.

I: Okay. Ehm, can you tell me a bit more about the games that you use?

P24: Ehm, at the moment, I'm playing Fifa, Football. Yeah, games…what else…I could take a look. At the moment, I'm playing a community game called Clash of the Clans.

I: Oh, I play that as well.

P24: Really? Oh, it's amazing. It's so good. It's a problem, because of the purchases, and I'm like constantly constantly…

I: Yeah, it's amazing. You're not one of those who buys gems and all, are you…

P24: Yeah, unfortunately yeah. It's so good. Too easy.

I: Yeah, exactly. I was thinking about it a couple of times and was like, "Oh no…"

P24: It's like 4 days until my Townhall…oh no. I just upgrade it. I upgraded it to like level 6 for 1.2 million coins.

I: Are you serious? Oh wow.

P24: Yeah…it's pretty good. I enjoy games like that, that bring you back. Although the notifications can be quite annoying.

I: Yeah definitely. Like your village was raided, so you're shaking…

P24: Yeah, yeah. Like 3 o'clock in the morning, I get a notification, like "Come on…attack!"

I: *laughs* Yeah exactly. Level 17 again.

P24: *laughs* revenge come on. Yeah, so that's a lot of fun.

I: Okay, alright. Ehm, so update is a very important part of any application you think.

P24: Oh yeah. Definitely. Any professional app should I think every month or so have a quite a reasonable update to bring me back into it. That's what I find.

I: Yeah, exactly. Ehm, on this Fifa game, is there a social aspect as well?

P24: Yeah. There is a multiplayer aspect. And you can…swap players with people. There is quite a big community behind it. And there is also…I believe it's actually integrated with your Playstation and your Xbox as well, so any rates that you get on your Playstation or your Xbox is transferred to your phone yeah, so that's quite a big aspect really, quite a big community there, so that brings me back a lot.

I: Oh really? Yeah…wow. Do you think Fifa would be just as interesting without this social aspect?

P24: No.

I: You wouldn't play that?

P24: Well, I probably still would because it's certainly a game that you play when you're bored or travelling a lot. And it's quite a good game to…flicking a ball across the screen. Yeah, so…I'd probably still play it, but I like the fact that they're constantly updating it, constantly updating the new rosters, new squats, if a player is injured they update it…yeah, it's interesting.

I: Okay, wow that's interesting. So like real-life almost.

P24: Yeah, yeah.

I: Okay. Ehm, so you told me downstairs, you've used Augmented Reality before with this McLarren app. How did you come to that?

P24: Ehm I saw that on…on the web site, I believe. Yeah, advertised on the website, and I thought, I'd try that and it was really impressive. I mean the graphics, zooming in and out of the car, and even the car fibre aspects of the car it is really…really in good detail.

I: Oh I see. Is there like any pixel problems at all?

P24: Yeah, I mean it's anti…it's quite jagged when you get close to it, so yeah you get that, but obviously they have to build it for many different levels of phone. Hardware, so I'm guessing that's possibly the reason why. It's still a pretty impressive app to show your friends. That's all it is really. Just look at this.

I: Yeah definitely, okay. Definitely. Yeah exactly. Ehm where do you think could it be promoted better, so more and more people know about it? How could it be promoted?

P24: Eh, well in terms of…

I: Like this McLarren app, or any Augmented Reality app, really…

P24: *thinks* Just sites that particularly interest people, like car sites and stuff like that. If you…if you got a racecar and a thing that says, 'Look at this.' And you put your phone up to it and it brings up the car and stuff like that.

I: Okay, so do you think for tourism Augmented Reality apps, you would go to tourism sites, or…

P24: Oh yeah, definitely.

I: Alright good okay. Ehm so have you ever bothered downloading any other Augmented Reality apps after you saw this McLarren application?

P24: I have looked into it, but I haven't really found any good ones, no. They were not as detailed as that one, perhaps that's why. Yeah, I quite like good graphics, I quite like things accurate. You know I find many of them are quite…quite all over the place, you know.

I: Yeah, yeah. Definitely. Okay, fair enough, so after I've shown you those three examples, which one do you think was most useful?

P24: I liked the video. Yeah, I did like that.

I: The video? Why is that?

P24: Just because it's something to look into…in something, so it's quite interesting how it can…in a newspaper. But the menu I found it's quite blunt, perhaps because…I don't know, it was just blunt, but I think the video was quite good.

I: Okay, good. And how about the Tuscany one?

P24: Eh…oh yeah, that was pretty damn good. I think that would be of interest to me. Definitely.

I: Okay, would you say the Tuscany one would be the one that you would use for your…

P24: Out and about, yeah.

I: Okay, how about the video one? Would you care about scanning random things and check out the video and stuff?

P24: Ehm, yeah I would, definitely. If obviously the video, the content was of interest. If I looked at it, and it was an advert, then no. But if it's something that interests me, then definitely.

I: Okay, alright. So content is also a very important point. Okay, ehm have you ever used…well you obviously have used Tripadvisor, but besides Tripadvisor have you used any other tourism applications?

P24: Ehm, do you mind if I have a look? I've just got so many things that are…

I: If you have to upgrade something, you can do that as well…like your canon or something *laughs*

P24: Yeah I've got…no Tripadvisor is the one that I always go to, when it comes to reviews of hotels and stuff like that, I always go to Tripadvisor, because I find them quite reliable.

I: Okay, so how is your like general experience of Tripadvisor? Was there like ever a downturn?

P24: No, it's been pretty good. It's been pretty useful actually. Booking hotels, looking into restaurants, I found it pretty useful actually.

I: Oh okay. So which like aspects of Tripadvisor do you enjoy the most?

P24: Just maybe read…again the community aspect. Maybe reading into reviews that I want to visit, say what to do, what not to do, what to avoid, etc. So yeah, the community aspect.

I: Okay, alright. So without the social aspect, would you still use Tripadvisor?

P24: Yeah, just …perhaps more brief, but then again obviously the honest reviews of the potentially places that you wanted to go what they want you to see, so I much prefer the social aspect.

I: Yeah okay. Definitely very good. Ehm, so how do you in general see information of a tourist office or any company compared to information provided by other tourists?

P24: Clumsy. If you go to like a tourist office I don't really interact with anyone in there. We just go in there, take a look at a couple of brochures, if something is in particularly…you know if you fancy something in particular, you read it and take the leaflet. But I much prefer to search for it, and search for what I want to see and narrow it down that way. So I want to avoid places like that. I find it's just money making…

I: Okay, so you just look for something interesting…okay, yeah and ehm so tourist reviews you read a lot as well?

P24: Yes.

I: Okay. Do you also decide, or are you influenced by those reviews?

P24: I am, yeah. I find them very useful.

I: Okay, how about…do you also write reviews?

P24: I have done, yeah. Yeah.

I: Only like on special occasions, or on a regular basis?

P24: If something is really bothered…normally they are negative. So if something is really bothering me, I'd like to share it. But when there is…if there is nothing that's so special about that place, I just don't bother. So it's more so on a negative side.

I: Okay, so it's just like complaining about the place…

P24: A little bit, yeah. It sounds bad but…

I: *laughs* No that's alright. That's okay. Ehm, so let's say you could actually generate and share your own content on those applications. Would you also be interested in doing those things?

P24: Yes.

I: Do you do it on Facebook already, or…

P24: Well, do you mean like check-in somewhere…

I: Yeah, those kind of things.

P24: Oh yeah.

I: Okay, so you would definitely make use of that as well on a separate tourist application besides Facebook. Okay. Very good.

P24: Yeah, yes I would. Perhaps would that…with that app, would that be able to integrate into Facebook?

I: Ehm, well at this point there is no specific plan yet, whether it's going to be integrated into Facebook and Twitter or whether it's going to be its own thing but…

P24: I mean, Facebook it is…the market isn't it. That's the problem.

I: Yeah, yeah definitely. Ehm, how about if it's not connected with Facebook, what's your criteria to use it?

P24: It's again, it's again the social aspect like Facebook. Everyone is using Facebook, like Instagram, you put things on there, and you have random people liking it and stuff like that. But with Facebook, you got your friends coming, saying, "Oh, I've been there, try this place" and stuff. I find the social aspect is what brings me to that.

I: Yeah, yeah. Definitely, so the community would have to be big enough for you to be using that.

P24: Yeah, exactly. I mean to see the community grow and grow, I mean I've had like Instagram for 2 months, and I had one friend on there. But now it's like 20-30-40 friends on there, so…I mean I like that and I'm trying to get more people into it, so…if I like it, I will recommend it.

I: Yeah very good. Definitely, so imagine the community is smaller, would you still be interested in looking at other peoples' stuff?

P24: Oh yeah. I mean it depends what sort of content is on there, but if it interests me, of course, yeah.

I: Okay alright. Ehm, so how do you see the possibility or potential in implementing Augmented Reality into the tourism aspect?

P24: Highly. It'd be interesting to see, if it was done properly. If the content is right and accurate and everything works properly, very, very high.

I: Uhuh, what kind of content are you looking for?

P24: I mean like the….what do I want to see…I don't know, that's a difficult question. Ehm, perhaps somebody's video review of what you're looking at. Perhaps somebody is keeping a review of what you're going to see, or maybe a look around before you get there, so that you know…that maybe if you're going to look at a castle and photographs, perhaps the best spots to photograph the castle etc. photograph locations and stuff like that. That'd be quite interesting.

I: Yeah, yeah. Very good okay. Ehm, so if you could imagine that you would design your own Augmented Reality tourism application, what kind of things would you put in there?

P24: Things that I've just stated I guess…a big community aspect, ehm a niche, which is…which is yet to be found. Ehm, I find it a bit difficult to compare now.

Yeah, like video reviews and stuff like that, like photo points, etc. I'd quite love it.

I: Okay, any particular functions that the application should do for you?

P24: Ehm just keep me interested, I don't know.

I: And how would that happen? Like I mean what could the application do, so you would use it repeatedly, over and over again?

P24: Maybe when you're walking around, find you the closest point of interest perhaps like that, so if you…if you turn your app on, when you're in a tourist destination if you're just walking around and you're quite in a close within a certain proximity of something that's interesting perhaps quite out of the way, that normally you wouldn't know about and it informs you, "Oh you're only 500 metres from so and so, how about you check it out?" Yeah, something like that would be definitely…like we're aimlessly walking around to find places, so if you suddenly get a notification you're close to that and that…

I: Oh yeah that's a very good idea. Maybe with a deal even, which is just 200 metres around.

P24: Yeah exactly, something like that you know. Then obviously not too intense with the advertisement. It just turns off the application.

I: Yeah exactly, and there is no more time for Clash of Clans…

P24: Exactly, I'd be down at the bottom of the list…*laughs*

I: *laughs* Alright very good. Do you see any potential problems maybe that the application could also…

P24: I see, I think the advertisement aspect is a problem.

I: Okay, in what terms? Could you explain a bit more?

P24: Yeah, I mean as I said a second ago, if you're going somewhere and it tells you, "Try this, try this, try that…" there is too much notification.

I: Yeah, it's annoying.

P24: You're avoiding what you actually came to see. You avoided what you wanted to do, to get through all the other places that you didn't want to go, so maybe the higher rate points of interest would be the ones that get recommended on your application.

I: Yeah okay. Maybe that there is like a filter that you could filter what recommendations you wanted.

P24: Yeah. So what reviews and what to avoid perhaps.

I: Yeah very good, very interesting. Ehm, are you aware that in Dublin they're currently working on a free WiFi around the city?

P24: No.

I: Okay, so that's actually what they're doing at the moment and up to this point they actually only did it in the main tourist regions, ehm so I guess throughout the year the whole city should be covered. Ehm if you'd have the possibility to pay a certain amount for the WiFi, let's say for a day and you could use it throughout the city, how much would you be willing to pay and be happy to use the WiFi?

P24: A Euro.

I: A Euro per day. Okay.

P24: Yeah, because of the competition you get now from the price plans from your provider, you know I pay now 3 Pounds per day and I can use the price plan I use for the UK. Yeah, I mean I use my 3G, my phone, Facetime everything for 3 Pounds per day, so it'd have to be quite competitive. Yeah, and if the WiFi is ultra fast as well, then that's another pretty good aspect.

I: Oh really? Alright good okay. Would you also expect a certain speed of the WiFi, or…

P24: Yeah, I expect it to be fast and uninterrupted.

I: Okay. So you could actually watch Youtube videos and stuff..

P24: Yeah, I mean if I just sit there and wait for something to buffer then…that would put me off and I would never use it.

I: Okay. So ehm, the speed, like time, is that an important issue for you?

P24: Yeah. With things like that I mean you want it to be…you want to be accessible instantly, so yeah.

I: Okay, alright very good. Ehm, coming back to this gaming part. Do you think there is a potential of combining gaming with tourism?

P24: Yes. Yeah, but I wouldn't….know what sort of games you implement where, but yeah, potentially yeah.

I: Okay, say eh there would be a game, say here in Dublin you would see an application that has a game, like a tourism game. Would you download it, or be willing to download it just for the sake of the game, or…

P24: I'd give it a try, yeah.

I: Okay, or do you think a tourism application should be a tourism application.

P24: Mostly, yeah. I mean if you download a tourism application, you want to travel around the city, not play a game on it. But if there was like a gaming side to it, like an achievement for things, say you've visited that place and you get points for that, you get points for that. You checked-in and used a voucher, you get points for that, but then you end up in corporate and advertising again.

I: Yeah very good. And then have like a social aspect to compete like with others, okay. Yeah, very good.

P24: Yeah, how many miles you can walk around the city, how many points of interest you could see in one day, so.

I: Yeah, definitely, definitely. Very good. Ehm, do you actually buy things online as well? Do you buy things on your mobile phone? So let's say you could use the tourism application or the Augmented Reality application to buy things, say you want to get on a tour bus, and you don't have a ticket, you could just point it on the bus and you could straight away just hop on.

P24: Yeah, if it was nothing to do with my network provider and it was through a third party, like companies such as Paypal, then yet, but I wouldn't want that to run through my network provider. I wouldn't want a huge bill after a month, I like it…

I: Oh yeah, I see. You like to keep things separately, although it's the same price, it doesn't matter.

P24: Yeah, I mean I wouldn't…if that account was joint to my network provider, I wouldn't use it. If that account was separate, perhaps through Paypal and instantly was joint to my bank account I would use it.

I: Yeah, yeah. Okay. Does it have like a psychology…psychological reason that you have…

P24: Yeah you know with an unlimited price band you get these days, you're billed as you're billed and you expect that every month. But then if you could…then again you got your money for travelling, etc. But then if you suddenly get bills of like, say 80, 90 Pounds a month from 40 Pounds a month, it's a bit like…it's a bit daunting, do you know what I mean. Yeah having a bigger bill after a month…rather than having a little 2 Pounds coming out of your account or 3 Euros or…

I: Yeah, yeah definitely. Okay very good. So you don't have any trust issues or anything to purchase things on your mobile phone?

P24: Ehm not…obviously not from like the App Store or something like that, no.

I: How about for like eh…

P24: For a reputable company, no.

I: Exactly, because you haven't used it yet.

P24: Yeah, but if that app was on the App Store, available through Apple, then I would trust that app anyway. Because then I believe the app has quite a good filter system all of the applications, so…

I: Yeah okay. Definitely, very good. Ehm just a last question actually. Ehm do you have any ideas or suggestions of how you could make this Augmented Reality tourist application more user-friendly?

P24: Just make it as simple as possible, but as in depth as possible. So simple to use, but at the same time you can go into it more and more. A bit like eh…I don't know…a bit like the way Youtube draws you in. You watch one video and then you're drawn in in something else, something else…it's like a chain reaction. So something if you go on one tourism point and then you realise there is something not too far away, how about I try that one as well with a discount rate. I'd potentially go, "Yeah, I would." Definitely.

I: Alright, yeah. That's a very good idea. So you think this maybe recommending certain things would be…

P24: Yeah potentially within the affinity of this place that you've gone and seen and then offering something to go in there. But not too in your face again, obviously not.

I: Yeah definitely. Alright very good. Thank you very much. Thank you very much for your time that was great.

P24: Alright, no problem.

I: Ehm, just give you some vouchers that you can enjoy later on just around the corner. That's for your time. And I hope you guys enjoy your time in Dublin. Thank you.

P24: Cheers.

Interview Transcript: TP25

I: Okay, alright. Just screen it out. Okay, before we start this interview, I'm just going to have you sign this for me. It's saying that this interview is only for the purpose of my PhD and is not going to any other third party or organisations. All the information is only for me actually for this research. And whatever answers you provide is totally 100% voluntary, so if there is any question that you feel uncomfortable with…I'm not going to ask you any personal questions, so there shouldn't be any case, but just in case, just let me know and we can skip this question. Alright. Thank you very much. Can you just fill this out for me? It's just a profile of the tourist to see what kind of tourist I'm actually talking to.

P25: Eh this…BA/BS…what is that?

I: Eh, bachelor, bachelor of science, yeah. (P25: Oh okay.) Alright, thank you very much. Okay, so before we start, are you currently using a smartphone or a tablet, or anything like that?

P25: I'm using a smartphone, yes.

I: Okay, which one are you using?

P25: H…HTC.

I: HTC? Yeah. A little tricky, huh? *laughs* Are you happy with using it?

P25: Yeah.

I: Yeah? And do you think it's like useful that people have a smartphone, or do you think it's necessary that people have a smartphone?

P25: Not necessary, but it's making things easier and smart.

I: Okay, in what terms, can you give like some examples maybe?

P25: Eh…the GPS and navigation for example and the Internet, yeah.

I: Alright very good. Ehm, can you tell me a little bit about the applications that you use on a regular basis?

P25: Eh…not much really.

I: Like ehm, do you have some applications that are open all the time, for example?

P25: No…*thinks* I'm not using that much applications, sorry.

I: That's alright. So what are you using your smartphone for?

P25: Eh mostly SMS and some music and yeah…

I: Okay, and what…like just as MP3 player, or…

P25: No eh I'm using Wimp, it's kind of like Spotify.

I: Oh, I see. So it's like online radio kind of thing. Alright, very good. And how does that actually work? Is that local radio or is it Internet radio?

P25: No, it's more like…you can stream pretty much every artist you want.

I: Oh, I see. It's just like Youtube then isn't it?

P25: Yes, a bit.

I: Alright, very good. So have you ever experienced this Augmented Reality technology before, before today?

P25: No.

I: You've never heard of it?

P25: Eh, no.

I: Okay, that's alright. Ehm do you…or where do you think this technology could be promoted or how could it be promoted so that more people hear about it?

P25: Yeah, that's a good question. I don't know, Internet, TV…

I: Okay. Do you have like an idea how the Internet for example for tourism applications?

P25: No, not right now.

I: Okay that's fine. No problem. Would you be like, after seeing what it can do, would you be interested in using those applications?

P25: It depends on the…where it can be used.

I: Okay. Ehm so where would be interesting for you for example, if you imagine yourself maybe travelling.

P25: Mostly in the Nordic countries for example. Greece…

I: Okay, alright. So do you have an idea of how you could use those applications like while you are travelling?

P25: Just find like restaurants and other stuff.

I: Okay alright. Ehm, so after seeing those examples that I've shown you, which one do you think was most useful for you, or would be most useful for you?

P25: Ehm the restaurant and the menu, yeah.

I: Okay, and why is that?

P25: Something like…I would know what they serve before I enter.

I: Okay, and eh let's say those application would be available for you to use in restaurants would you regularly make use of it?

P25: Well yeah, maybe. When I'm out, I'd use it.

I: Okay alright. Ehm so have you ever used any tourist applications on your mobile phone?

P25: Just navigation and maps.

I: Just navigation? And how was your experience with that?

P25: Good.

I: Yeah? Were you like happy with how it worked?

P25: Yeah, very useful.

I: Was it also accurate?

P25: Yeah.

I: Okay, so you didn't have any problems with finding things. (P25: No.) Okay. What kind of navigation did you use?

P25: Google.

I: Oh just the Google one? The main…

P25: Yeah the simple one.

I: That's alright, yeah. Alright, ehm so which aspects do you think would you consider important when you have a tourist application?

P25: Well, in general location and what's to see.

I: Okay good yeah. Maybe any more information? (P25: Yeah.) Okay, and what's…what information is in particular of interest to you?

P25: Just what it is…some…yeah opening hours and stuff like that…prices.

I: Yeah, prices very good. How about here in Dublin? Did you guys plan your trip here in Dublin like what you're going to see what you're going to do and stuff like that, or are you just going to see for a day?

P25: No, just look around. Beers…

I: Okay that's fine…beers *laughs* okay that's cool. Ehm, so how do you think this application or this tourist application in general could help you for your trip in Dublin?

P25: That it's eh…it's good for planning.

I: So would you use an application to actually make a plan for a day?

P25: Maybe not a plan, but to know where we are going. And navigation of course.

I: Okay, yeah, so what's available and how to get there basically, okay good. Ehm, do you see any, or if you could design your own tourism…tourist augmented

reality application for you personally, without considering anyone else, just for you. How would you design it?

P25: This is a good question. I don't know.

I: Just think about when you travel, what do you usually look for? Or what do you think would be nice that you have while you're travelling?

P25: I'm pretty much happy with just navigation and…what's to see.

I: Okay, so what to see and navigation, alright ehm…are you in general looking for like any recommendations or anything from people?

P25: Yeah that…that would be good, too.

I: Okay, but like when you book the hotel for example, do you like look at reviews at all?

P25: Eh…*pointing at his partner* she has been there before, so she did the booking.

I: Oh okay, fair enough. Okay very good alright. Ehm let's see. Do you see any problems that arise when using those…this technology?

P25: Eh…if the satellites go offline or something like that.

I: Yeah, very good. So when the GPS doesn't work. Very good.

P25: And that is pretty much all.

I: Okay, how is your experience with applications in general? Did you ever have like an application that you downloaded, you used it and you thought it was crap so you deleted it again, or…

P25: No, usually not.

I: Usually not? Do you download applications regularly?

P25: Ehm not much but some.

I: Okay, which applications have you downloaded for example?

P25: Eh…*thinks* converters of different kinds.

I: Okay, like ehm miles or whatever, money…

P25: Yeah, for instance. Eh…everything was already on the phone when I bought it, so…it had exactly the…

I: Yeah so it was not necessary to download many extra applications.

P25: No, only the music player and some games.

I: Okay. What kind of games did you download?

P25: Strategy…shooting…

I: Oh I see. Yeah, ego shooter. Okay, ehm with the…let's see ehm..oh with the converter, the currency converter, if that would be included in the tourism application…

P25: Yeah that would be great.

I: Do you think that would be helpful for you to use it?

P25: Yes.

I: Okay, alright. Ehm how do you see the connection with games and tourism? Do you think that could be connected somehow?

P25: Hm…no.

I: No, not at all? Do you think that should be separate, two separate things?

P25: Yeah.

I: Okay, that's alright.

P25: For me, yeah I think so.

I: Yeah, very good. How about any other forms of entertainment for example music. Do you think that could be somehow incorporated?

P25: I would just use my music player. Not like…

I: Uhuh, you wouldn't bother with it in the tourism application.

P25: No I don't think so.

I: Okay alright. Ehm, do you also like ehm, let's say here in Dublin for example, if you want to listen to traditional Irish music, do you also do that through your music player?

P25: Oh that would be…maybe good, yeah.

I: Okay, just like local music maybe…whatever is available there.

P25: Yeah that would work.

I: Okay, would you be interested in that though?

P25: Yeah, maybe.

I: Okay, alright ehm…are you aware that Dublin is currently working on a free WiFi throughout the whole city?

P25: *denies*

I: So that's something that they're currently working on, and in some areas it's working already and in some it doesn't. But the main tourist areas here in the region, like the main tourist spots, they have the WiFi available already. But let's say, you come from Norway for example, and if you use your phone here, obviously you have to pay roaming fees and stuff, which is very expensive. So let's say you could come here and purchase WiFi for a day, or for a week or for however long you stay how much do you think you would be happy to pay to use the WiFi throughout the whole city for a day?

P25: For one day…5 Euros.

I: 5 Euros and you would be happy to pay, or would that be your maximum?

P25: I think that's a fair price.

I: Okay, very good. Ehm, let's see actually…oh yeah, if you'd have the…or have you ever bought anything online? Do you ever buy anything I mean…you've booked the hotel room online for example. Ehm, on your mobile phone as well, or on your laptop?

P25: Eh, just laptop.

I: Okay, have you ever used your mobile phone though?

P25: I don't think so. It's easier to surf on the laptop.

I: Okay, yeah definitely. Okay, ehm…let's say this option would be available, let's say you could take your mobile phone. Ehm, for example you're here in Dublin, you want to take the city bus, and you could just take your mobile phone, screen it on the bus and purchase the ticket straight away on your phone, and then just hop on the bus.

P25: It would be very, very useful.

I: Do you think it you would do it though? I mean because it's your mobile phone and stuff like that.

P25: I think so.

I: Yeah? You don't have any trust issues and stuff?

P25: *denies*

I: Okay. Alright, so you…you think that would be something you're interested in?

P25: Yeah.

I: Okay, very good. Ehm actually just a last question. Do you have any ideas or suggestion of how to make a tourist application more user friendly, or maybe more attractive to you?

P25: Oh, just has to be simple.

I: Okay. Simple is a very good point, yeah.

P25: Not much chaos, and not too much information.

I: Okay, not too much…do you mean like text or…

P25: Yeah. Not too much text. If you want to know more, you can just click it.

I: Okay very good. Alright, so keep it simple, keep it clear is the main criteria.

P25: Yeah, yes.

I: Okay, very good. Alright ehm, well thank you very much. That was it already. Ehm, let me just…I'll just…since you're here for three days, I'm sure you're going to go to a pub…so that's for the O'Sullivan pub around the corner you can get a free drink. Thank you very much. Enjoy your stay.

P25: Thank you.

Interview Transcript: TP26

I: Okay, alright so, before we get started, can I just ask you to fill out this form for me? This one, I just need your signature, and it's just saying basically that the nature of this research, it explains it, and is saying whatever information you provide is only going to be used for my research and for no other purpose. It doesn't go anywhere else. No other organisation, and nothing is involved. And all information is voluntary.

P26: Okay, yeah that's brilliant. Can I have a pen?

I: Eh, yeah. So if there is in any case a question that you feel uncomfortable answering just let me know, and we skip it. That's no problem at all. Thank you. And just one of those. That's basically a profile sheet, which gives me a little bit of information about the tourist, so I know who I'm talking to, and where they came from. Alright, thank you very much. So, to start with, I see you have an iPhone already. That's brilliant. Ehm, are you using a tablet as well, or just the iPhone?

P26: Yeah, I have an iPad.

I: Okay, and how useful do you think…do you think it's useful that people have it?

P26: I…I live on my…like…this year I haven't been using it that much. I've been catching up on the module. So I haven't really being using it as much, but ehm when I'm at uni, like…there is no games on it and nothing. There's literally…my…it got kindle, and like books for my text books that I use, my notes school on it, I use it as a Dictaphone…it's my life basically. The only thing I do use it for is my diary, I used to, but now I use paper.

I: Diary?

P26: The…calendar. So I use the paper file and…because I was late for a few shifts and missed them. And just because I'd entered it, and the wrong time, it had gone in. So I find the paper is slightly more reliable when you're doing shiftwork and stuff, so…

I: Oh okay. Definitely. Good. How about your iPhone? What are you using that for?

P26: I use it all…ehm, I use it for…again I use it for Dictaphone, ehm I use it for music exam revision, I use it for…yeah, I use the iPhone for flashcard revision as well for exams…ehm, my phone has useful apps, yeah. Because I'm a bit in the hollow of getting lost. *laughs* I've gotten a text from my friend going, 'Have you gotten lost, yet?' So I'm like, 'No…Apple's been serving…'

I: *laughs* That's like a given.

P26: Yeah, my boss doesn't even…I work with young people as well, and he doesn't let me go with the kids by myself, because I'm getting lost….and I'm like, "Yeah…". *laughs* Yeah, so pretty much. I'm a heavy smartphone user. I couldn't like…I broke my phone last year, and I couldn't use it for a month because of insurance…'Huh…can't live without it.' So I literally use it for everything apart from the calendar. The calendar is the only thing that I've stopped using. But apart from that, yeah…

I: Yeah, okay. And when did you actually switch to a smartphone or tablet?

P26: Eh…when the iPhone 3 came out.

I: Oh, that early already.

P26: Yeah, I got my tablet…I got my iPad two years ago in September. Yeah because I do…I do photography as well, so I was like, "No I'm not going to get one, before I need it." And I got a bit annoyed by some of my friends that got the latest gadget…and I'm like, "Do you actually need it?" Cause you could always get just the Android one, because that's all that you need, but I use Apple for everything, photography and stuff and music, so I was like, "Yeah…no." *laughs* So I actually waited until I needed one, and I actually use it…I had one game on it. This year, I've had a bit more games on it, but I've had literally one game since I've got it and that's it. And the rest is for like, I genuinely use it for studying, working. I put my work schedule, like I put my plans and E-Mail them to my boss. So yeah…

I: Okay, that's cool. Alright. Good. Ehm, on your iPhone, so your iPad is basically all work and study related. How about on your phone? Which applications do you use on a regular basis?

P26: Ehm…messages. I use Facebook quite often. *laughs* Ehm, Facebook and then there is an app, called Moose, that I really like.

I: Moose?

P26: Moose, it's ehm, it's basically like a pedometer type of thing, but it like uses GPS to figure out how many miles you've walked, so like yesterday, I walked 5.4 miles, ehm I was at work, so it was turned off for awhile. And ehm yeah, it tells you, where you've been, and it tells you like Favourites, so yesterday, I started off at being at my parents, and, so yeah…

I: Uhuh, oh I see. That's pretty cool. So it tracks your whereabouts.

P26: Yeah. So it actually measures how far you've walked and stuff.

I: Yeah, is it similar to the Nike application?

P26: I think so, yeah. I actually got it for free. There is a couple of free apps that I use, and you get like a free app everyday. And that is actually one of my favourites. There is some I get, but I'm like, "Nah, delete it." *laughs* And that, I use my music on, I use my music on iTunes quite a lot, where you can listen to repertoire pieces, or listen to…everyday music. Yeah, I use it quite a lot, so my battery needs to be charged at least once or twice a day.

I: Oh I see. Yeah, exactly. Same here. Ehm, do you…have you ever heard about Augmented Reality before today? So ehm, where do you think, or why do you think…where do you think ehm, it could be promoted, so people like you come in contact with it?

P26: Ehm, for me like I really like the idea of just look on a sign and just see the menu. Or even like…especially like in another country, or even like in a different area for me. To know what's close to me or…I like seeing reviews for food. That would be like amazing. And seeing like prices and stuff, where to go and like…yeah.

I: Yeah, definitely. That's understandable, totally. Ehm, so would you be interested in reviews on specific dishes as well? Like when you just said food, that's what popped into my mind.

P26: Ehm, no, just reviews on the menu itself. And even like…ehm for me, I have celiac disease. So even seeing like, if there is stuff like if it's celiac friendly ehm…stuff like that…like that would be amazing.

I: Yeah, nutritional information. Okay.

P26: Like that would be really like amazing. If you go somewhere, and you're just stuck in there, and it's really like just chips or…I can make that on my own. *laughs*

I: Yeah exactly. *laughs*

P26: Like I can make that salad on my own…but yeah. So I really like, I just like the idea of what's around you, so I can just decide to go there, or drive on a bit further.

I: Yeah, definitely. So you can get more insight into something. Okay, very good.

P26: And make sure you're in the right area as well. I always tell you that…

I: Yeah definitely. Do you…have you ever used the maps on your phone? Do you use the Google on, or do you have a separate application?

P26: Yeah, I actually use the Apple one. I actually just downloaded the Google one today, because the Apple one was being…Apple specs had a lot of bugs, but the bugs don't seem to be completely fixed.

I: Yeah, what was the problem on the Apple one?

P26: Ehm, it was dropping pins, when I didn't ask it to drop pins and then changing direction towards where it dropped pins. So I'm actually going to take my phone to the Apple Store next week. My battery died and I've used it for 1 ½ hours yesterday. Just before the pink concert and I was like…my photos…I wanted to take photos.

I: Just before you got lost…*laughs*

P26: But my friends…some of my friends were like, 'I'm stealing your photos.'

I: *laughs* That's alright. So ehm, with the Google one, you've played around with it a little bit?

P26: Ehm not much. I'm actually not sure what I think of the Google one. I'm quite used to the Apple one, because it changed quite a lot with the last software update. I'm used to it, so I'm very much a person that wants to go with what I know. But ehm, I think I will maybe use it tomorrow to get to the train station.

I: Yeah, that's alright. Ehm, have you ever experienced any downturns with the map that you use? Like the pins dropping you mentioned…

P26: Ehm, just the pins dropping. Not really. I didn't get the whole…one of my friends when the new software of the Apple app came out, they were like directed into the middle of a river, and they were like, 'I'm not going into the river…' so like the bugs in there were like really bad when they just released the app in the iOS, but no, I didn't really have that.

I: Yeah, okay that's fine. Were there any things where you thought, if something like that would be included, it would be better for the app?

P26: I'm like…it's really like, I'm not even sure if the apps do it, but I really like the whole idea of seeing like a visual area. Like on a map you've got obviously just all the lines, and it would be good to see like what part of the street I'm on and to see ehm…maybe my phone does do that.

I: Yeah, like a camera view you mean?

P26: Yeah like, maybe it's the hybrid…but don't know, you know like the Google Maps they do, when you're on the computer, and you can see the buildings around you like where you're going ehm yeah…

I: Okay, alright good. Ehm so which aspects would you consider…or no, no…have you ever used any tourism applications on your phone? Like the maps…

P26: Ehm, no. Just the maps really. Just like…I usually just like search what to do in an area, and then I just use my maps to get to different places. And I'd usually if I'm in…if I'm in, like I was in Mockler a view months ago, and use my maps to find where like the Hardrock Café is, because of the Hurricane glasses and I have to get my glass. *laughs* So there is a few places where I automatically stop off.

And it's good to have the map, and I can try and use the Internet with that and what's around, where I want to go anyway, and yeah…

I: Oh, I see. So do you just use Google? Do you google those things then just on the web browser?

P26: Yeah.

I: Okay, that's fine. So which aspects would you consider important in a tourist application?

P26: Ehm, definitely like being physically able to see what's around you, ehm like the good restaurants, the good shops. Even places that like where not to go. Just for like personal safety when you're like by yourself. Places recommended not to go when you're by yourself. Like that, I find as a woman really important. Personal safety, just like things like that would be really…really good, yeah.

I: Okay, yeah definitely. Ehm, do you see any possibilities or potential to implement this technology into tourism applications?

P26: Definitely. If you look at the review and stuff, even as a tourist like in Dublin, it's like, there is so many places to go, and in the end you walk like donkeys to get to all those different places because you didn't realise…it would even be really good to have something like, you could list a few places where you wanted to go, and it would be like, 'well there is these things in this area as well.' So you're not going there, and then back there which I was like today. *laughs* But ehm yeah, that's because I decided last minute where I wanted to get food. So ehm yeah, it'd be good to have something like that, I like to have a bit of structure, planning your day and…

I: Okay, yeah so like a planner and then maybe where it would show you a map where all the different places are, and you could decide where to go.

P26: So you're not going through the same places constantly wasting your time like and you're stuck with where you're going. Like for me I come to Dublin quite a bit, so it doesn't really matter for me, but like in other places, I think that would be…like that would be really beneficial. Like when I'm most of the time with my friends like drag, drag drag through all the places. And then we went to like an art gallery and I was like, 'Oh let's go and get some food.' And went back to the place we'd just been to get some food. And they were like, 'we've not come to the art gallery to get to these two places all the time.' So I was like, 'yeah, but didn't think.'

I: *laughs* Yeah, that happens to me quite a lot as well actually, so you can get a view, alright. So if you think about ehm…if you'd have the possibility to design your own tourist application for example for your trip in Dublin now. How would you design it, or what would you include in it?

P26: Ehm, like definitely maps and access the menu…

I: Mhmh, like restaurant menus and stuff like that?

P26: Yeah. Like again, places, if you're by yourself not to go, or just like…just like tips for like when you're by yourself. Obviously when I'm in Dublin, it's actually the first time I've been down by myself. And I'm like…everyone is like, "Make sure you watch your handbag." Because you don't have your friends, you're not going to look out for each other and everything. So, I think it's really good to have some things on it like that and, but yeah.

I: Definitely. Tips and considerations when you're away.

P26: And then the whole pinpointing where you are and telling you what's around, around you…

I: Yeah, in your surrounding, what's available. Would you also be interested in recommendations and stuff like that, or…

P26: Yeah. Because usually people do review. Because they either find it really good, or really horrendic. Like to be…I don't write a review unless it's really good or really horrible. If it's alright, I'd be like, "I don't waste my time."

I: Yeah exactly. Okay. So you're interested in a lot of reviews and stuff like that as well. So that'd be helpful to have in the application as well. Ehm, from like this social network aspect, how do you see any information from like the tourist office or any other company compared to information that you can get from other tourists?

P26: Ehm I think sometimes you're a bit like, 'are the tourists paid by the company to say this?' *laughs* Not that I'd be like…I'd be a bit suspicious. Yeah, but I think if someone says it instead of getting it from a website, I think it's more reliable than ehm…than a tourist information, like…but I think a tourist information is alright for like public transportation and stuff like that. That would even be something really good to see. I rarely use any public transport to do any touristy thing because I'm scared of like getting on them and go to a completely random place. 'Cause if I'm at home I never mind…never mind a strange place.

I: Okay, so like just for like general information you would go to a tourist office and for anything else, like comments and anything, go for like the tourists.

P26: Yeah, I usually do end up like putting or show on Facebook, like, 'Has anybody been here?', 'What do you recommend?', 'Do you have any ideas?' Like I actually have good friends who live in Dublin. That's why I actually come…they live up in the north now. They come down together quite a bit and go out for a few drinks and just chat off that night. Ehm, so that's handy, but yeah.

I: Oh that's nice. Alright, ehm so from the social aspect, do you do a lot of like share videos and photos and stuff like that on Facebook? Also like check-in to places and stuff?

P26: Yeah, yeah. *laughs*

I: Alright, so let's say this option is available on a tourist application apart from…let's say for now it's not connected to Facebook but it'd be a separate thing. Would you also be willing to do that on that, on this application or…

P26: Yeah. Ehm, I have…I used to do things like Foursquare and stuff, but I haven't really…I didn't like the change I have, like a couple of years ago.

I: Why? What happened?

P26: I can't remember. I just remember like I disliked it, or I read something about people being able to like…I don't know I thought it was more secure when it…it was when checking-in would start to become in fashion, and it was like people can tell when you're in Hoysnoy, and Burgerly and I'm like, 'Okay…'

I: It was a little bit too much into your privacy?

P26: Yeah, or it was more like, I didn't really…I didn't really check in myself constantly, but I checked myself in at the pink concert, and me and my friends went out for dinner and check themselves in and take a picture of usually the cocktails so yeah, I use it generally, but not hugely. But I think with a touristy one, I would just check myself in and use it regularly.

I: Okay, good. Are you also interested in other peoples' like photos and content and anything?

P26: Yeah. I think there are usually are taking pictures of just food and I'm like, "Yeah, that's just too much." *laughs* But like it's good to see, if people do put

up photos of food. Especially if like it's touristy, and you're like, 'that looks like good quality food.' And yeah…

I: Okay alright very good. Ehm so do you see any potential problems that might arise with this technology in regards to tourism applications?

P26: Ehm, possibly like associated with what I see in the Apple Maps. And they were like random…random…

I: Yeah, like couldn't pinpoint you properly.

P26: Yeah, and possibly, but that'd be just in the beginning, like GPS issues and possibly a bit of stuff like that and having the wrong shop in the wrong street and something, and I'm like…'Where am I?' but apart from that I don't think so.

I: Okay, has it ever happened to you that you were using an application, I mean you've used quite a lot of applications I believe…that you were using an application and then after awhile you decided to delete it for whatever reason. Can you remember some specific examples why it was?

P26: Yeah, ehm…I think some of them I just got bored of…like there is stuff I'd use periodically and I wouldn't delete it, because I know I'd use it generally…ehm, no I don't really delete anything because I got 64Gb. *laughs* So I didn't feel the need. Sometimes, when I had the 16Gb I was like, "Now I have to delete a pile of stuff" and it was more that I'd delete a pile of stuff that I didn't use that often or that I didn't use at all or that I got really annoyed, yeah.

I: Okay, and which of the stuff do you use like…do you use periodically? Which applications?

P26: Ehm, I don't think there is that many at the moment. Ehm actually it's probably like Manchester Pride Up. I'd probably use at like this time of the year, the planner and trip and then…actually it'd probably be the games that I use periodically on my phone rather than anything else. So I use…I use my music apps weekly, I use my photography apps all the time. Ehm, I actually use a lot of food apps, like Nando's, so yeah, it's pretty much my games and sometimes I download a magazine app on my iPad or my iPhone, but I always have them on my iPad. But ehm, sometimes if I'm not bringing my iPad, because my battery died I'll shove it all to my phone and then I would delete it. Ehm, yeah I think that's about it.

I: Alright, okay good. Ehm, with the…are you aware that Dublin is working on a free WiFi throughout the whole city?

P26: No.

I: Okay, so that's what's happening like at the moment. They covered like the main tourist areas already. But throughout the year…

P26: Okay, that's why I get all the pop ups for the WiFi. I got my Euro Pass for like a 5er per day. But I didn't want to risk getting roaming charges. Because '3' are horrible for roaming charges. So I was like a 5er a day, that suits me.

I: Yeah, definitely. Yeah for sure. I mean at the moment they are still working on, or expanding it, but in some areas it's available. Let's say because of the roaming charges, it's very annoying for a lot of tourists. If you could decide to have Internet throughout the whole city for a day, how much would you be willing to pay, if you'd have to pay for that and be happy with it?

P26: Probably a five…probably a 5er.

I: 5 Dollars…eh, 5 Euros, okay, per day then?

P26: Yeah, yeah. And for 24 hours not just for 3…and it's a 5er until midnight. So I didn't realise that and paid for at 6 o'clock last night. And then I got a text, and I was like, "What…my rate"

I: No, no. Oh, so you could only use it for 6 hours then…

P26: Yeah, so I was like practically…this didn't turn off the roaming, because the roaming was still on, on my phone, so I was like rather getting the Euro Pass because I'm worried. Because some of the apps they're running in the background. Especially like Moose and stuff, it's constantly…using the GPS. So I was like…really, so my aunt actually really doesn't bring her smartphone because she's scared of what's...of looking at a huge…she's seen too many episodes of big roaming charges. Like '3' was quite good in the sense of roaming charges as soon as I cross the border the southern…ehm, the southern connection. I got a text then to get the Euro Pass and they explained it all, and I was like, "Great, I do that." So…yeah.

I: Oh that's great. That's very helpful. Okay, ehm do you think or what kind of games are you actually playing on your phone at the moment?

P26: Ehm, what kind of games…not the usual. I got Candy Crush, but I hate that. I must be the only person on the planet that hates Candy Crush. Ehm I really like Wordocs at the moment. It's like…it's a bit like a mixture between Scrabble and Othello? Is it Othello…the one with the black and white dots, where you have to get…

I: Like Dominos?

P26: No you like…you put down your markers and when you get the ones in between, you get like the colour. It's a bit like that, so if you add to the word, you get their word, if you use their tile, you get their tile. Ehm, Lapworld…which is like a Lepracorn version of Super Mario. Ehm, and then Song Pop…it's like you have to get like…you connect with your friends on Facebook and you like select random opponents and you select a song genre and you have to guess the songs and you get points and yeah…a bit…and then Hay Day. *laughs* Yes, it's really addictive.

I: Yeah, I've heard about that. Okay, how do you see the potential of actually combining gaming with tourist applications?

P26: Ehm, I don't know. Never thought about it, no.

I: Let's say for example, especially with those AR applications, that you'd go to a destination and for example let's say…I don't know, the Guinness Store…the Guinness Storehouse. And then you'd have to solve quizzes, or do certain things there to get points or do whatever, in order to get to the next destination or to solve the whole puzzle…

P26: Yeah, that'd actually be really good.

I: And then while you're exploring the destination, while you learn about it, you can…

P26: Yeah, that'd be actually really cool, especially if you're really on like a planned trip, that took you really to all the different areas like only…a bit like mini tour on your iPhone, like a virtual tour, I think that would be…that would be…

I: Yeah exactly. Kind of like a scavenger hunt.

P26: Yeah, that'd be quite awesome actually. I'd be like, 'I'll do that.' I drive my friends…I already drive my friends crazy, like…I'm such a…such a gadget queen, it's like yeah…but I'm not so bad, I don't have to have the latest gadget there and then…I'm sensible.

I: Yeah, okay. Ehm do you also buy things on your mobile phone?

P26: Yeah. *laughs*

I: Okay, where do you buy usually?

P26: eBay and Amazon…yeah they get used quite a lot. I'm actually like… "yeah…I can't afford this….shoes…" Yeah, I usually like buying shoes.

I: Okay, alright. Do you feel like secure buying it through your mobile phone? No problems?

P26: Yeah, because I generally use Pay Pal and I wouldn't use… I wouldn't go on the Safari app and randomly buy stuff. I always make sure it's like secure like eBay which links you to your Pay Pal account and then Amazon, which is generally quite reliable anyways. So I wouldn't really use random websites that I don't know unless they accepted payments through Pay Pal, just…

I: Oh I see, so you only use secure…or when you feel secure using those websites, okay. So if you could buy things through that tourism app as well, even like through Pay Pal or whatever…

P26: Yeah, even like Worldpay or stuff like that. As long as you know it's got like a reputable name and because you do see quite a lot in the news and stuff and watch how people are tapping into the fraud industry through smartphones and stuff, so I feel like, you have to be semi-sensible, ehm yeah.

I: Yeah, okay. Very interesting. Ehm do you…as a last question, do you have any ideas of how we can make this AR application or AR tourist application more user-friendly?

P26: Ehm, the pixel…I sort of really get the idea that you just have to get the camera part right and let it recognise it and to make it like as user-friendly as you can get, maybe like accessible issues, for people that are like blind or whatever to have a loud speaker as well, as to have the option to read…that's my nursing …*laughs* because I do learn disciplinary nursing, so that comes like...and even like to have an option of like the back, to be able to change like the background for like people with dyslexia and stuff so it's easier to read, because you can invert the colours on the iPhone as well but it would be even handy to have an in app accessibility ehm…option, ehm yeah I think that's it.

I: Okay, very good. Yeah that was great. That was a lot of information there already. Well thank you very much. Thank you very much for your time. You got the voucher already right? No problems at all. I hope you enjoy your drink. *laughs*

Interview Transcript: TP27

I: Alright, okay. Alright. Thank you very much for coming first of all. I really appreciate that. Ehm, before we start can I just ask you to…

P27: Are you video taping, or just…

I: I'm video taping, yeah. I just screen it out, because most people prefer not to…not to see themselves. Ehm, if you would just sign this for me. It's basically saying the nature of the research. It's only for my PhD whatever information you provide. And it's not going to any third party of anything like that. It's really for the sole purpose of my research. And all the answers are voluntary. So if you don't feel comfortable with any question, just let me know and we can just skip that and move on to the next question. Thank you very much. If you could just fill out this profile sheet. Just gives me a little bit of an idea of who the tourist was I was asking.

P27: Okay. Do you mean eh…international trips?

I: Ehm, doesn't matter, within Norway, domestic, international…

P27: Ehm, that's a lot.

I: Just an average number.

P27: Yeah, for an entire year…maybe 20.

I: Alright thank you very much. So before we start, are you currently using a smartphone or a tablet or anything?

P27: Yeah, I have a smartphone.

I: Okay, and which model are you currently…is it an iPhone, or..

P27: No, it's a Sony Xperia I think.

I: Okay, how is your experience with that?

P27: Yeah, it's excellent.

I: Okay. Have you ever compared different smartphones, or…

P27: Eh, mostly just the ones that I had myself. I had 3 smartphones and I like this one the best.

I: Okay. Oh, really? Which ones did you have before?

P27: Eh, I had the Xperia Mini, and eh…QOA Idios X5.

I: Okay, that's like a Chinese one or…okay alright.

P27: Yeah.

I: And ehm do you have a tablet or anything as well, or just a smartphone?

P27: I have an Asus transformer tablet.

I: Oh I see. One of the new ones, which you hook on the keyboard and stuff?

P27: Yeah.

I: How is that treating you?

P27: Yeah, it's…I really like it.

I: Yeah? Did you buy it for like a purpose, or was it just because it's interesting or nice to have?

P27: Eh, I just bought it in order to take notes. Because I originally wanted to have a laptop. But if you want to have a decent battery life, then they run really slowly. So it runs really fast and has a long battery life.

I: Okay, so what's your condition for your laptop? Like the most important thing? Battery life…

P27: Yeah, and also the touchscreen. Yeah, I had a…my vision is not 20/20, so it's nice to have a…magnify things.

I: Yeah, definitely. Ehm, how is the screen? Are you happy with the screen? Because obviously compared to a laptop it's much smaller.

P27: Yeah, I'm happy with it.

I: Is it enough to take notes and everything?

P27: Yeah.

I: Okay. Do you also use it for like writing documents, let's say essays and stuff like that for university?

P27: Yeah. But only drafts because the text programs aren't that great on Android so…the Office pack for instance is not very useful to me, because you can't really use small numbers. I study chemistry, so if I decide to use the Planck constant, do you know the number, it's really really small. It'll just say, it's zero. So I can't use it.

I: Yeah, just rounds it up. That's zero, okay. Yeah definitely.

P27: So it's not for physics, or chemistry.

I: Yeah, yeah. So you have to go back to the computer or laptop or something, okay. Ehm so which applications are you currently using on your…I'm not sure how it works with the Acer, are you also using applications?

P27: Yeah. It's a normal…normal Android.

I: Just an Android? Okay. What kind of applications do you use there?

P27: Eh I use the Office pack to write things…the Internet browser, music apps, mostly Skype…that sort of thing.

I: Alright, so and how about for your smartphone?

P27: Well, it's pretty much the same, really. Including a couple of games.

I: Okay, so you would say you play more games on the smartphone, than on the tablet?

P27: Yeah. Because I always carry the phone with me. So if I'm on the bus, or waiting for something…just maybe play a game on it, if I'm bored.

I: Okay, so would you say the tablet stays at home all the time?

P27: Yeah, most of the time. I bring it to university…and I treat it like a normal laptop.

I: Yeah, okay good. Ehm, can you tell me some of the applications that you use on a regular basis, like everyday?

P27: Yeah, on my tablet I like to use Skype a lot. And also…of the games, I like to play Chess for instance. And I use a lot of apps from the local transport companies, so I can know the bus times and everything, and of course the Internet browser.

I: Oh I see, okay. Do you use like any Social Network at all?

P27: Eh, no I don't use the Facebook app on it or anything like that. I use Gmail though.

I: Oh okay. The Gmail app, or just the E-Mail system?

P27: No, the app.

I: Okay, what can you do with that actually?

P27: You can send E-Mails. And it synchronises whenever you use the Internet.

I: Okay. 'Cause I heard it's also a Social Network thing. Isn't it? Does it have any aspects?

P27: Eh, no I don't think so. Google has something called Google Plus, but I don't use it.

I: Oh, okay. Alright. So have you ever heard about this Augmented Reality technology before today?

P27: Well, I've heard people talking about it. But nothing…I have never seen it. It has been more like on a proposed…fantasy kind of type scale.

I: Okay, so just like a rumour almost…

P27: Yeah, just something that may be here in 20 years.

I: Okay good. *laughs* Ehm, and after seeing those examples that I've shown you, what do you think about them in general?

P27: Oh, I think they would be very useful. I'm more like old-fashioned myself, so I'd probably stick to the map so it may…maybe it's not for me, but it looks like a really nice tool for many people.

I: Okay, alright. Was there any of those three examples, where you thought it was like a 'Wow' factor?

P27: Well, I really like the one…where you activate your GPS and you can get Wikipedia on buildings and everything. That was really nice.

I: Yeah okay. Would you…could you imagine yourself using that in the future?

P27: Yeah, maybe.

I: Okay, alright. Ehm so why do you think…or how do you think it could be promoted? Because Augmented Reality actually this technology exists already for like 5-10 years. But it seems that many people, they don't know about it. So how do you think it could be promoted better, so more people know about it. For example this tourism application. Do you have any ideas where it could be promoted?

P27: Eh, I don't know. It could maybe on attractions maybe. Where you could have a post or something, where it said you can read this, or you can just download the app and see it for yourself. I don't know.

I: Okay, yeah. Very good. Have you seen something like that somewhere before?

P27: Yeah, I've seen in some places they use these QR codes.

I: Yeah, exactly. Okay. Very good. It's the same technology actually. Ehm, so have you ever used any tourism applications so far on your phone?

P27: Eh, no.

I: No. Never like Tripadvisor or anything like that?

P27: No.

I: Okay. Ehm, then could you just imagine when you design your own tourism application for your trip in Dublin for example how would you design it? Or what would you put into that? What do you need while you're travelling?

P27: Ehm, I'm not sure really. I don't know much about Dublin to tell you the truth. Maybe some way to guide you to major attractions or something like that.

I: Yeah, very good. Do you have any other things maybe on previous trips where you thought, 'Oh if I had that, it would be really nice'

P27: Well, I tend to see everything I want to see when I go to new places, so…I'm not sure. Maybe give some information about things that most people won't notice so that everybody…if you walk up to the biggest cathedral in the city, then you will definitely find information on it. But there could be just a small inconspicuous building with no markings on it. But it could still be really interesting, which you will never know.

I: Okay, very good. Yeah definitely. Do you…or which aspects do you think are important for tourists to find out or to know when they go travelling?

P27: Eh, maybe local history. If there are some…some things that might be sensitive about the population. For example you don't go to Berlin asking people about Hitler. That sort of thing, I don't know. And I don't know…that you're not supposed to do this *shows his fingers* to British people…they might get violent.

I: *laughs* Yeah, some people might get offended.

P27: I wouldn't get offended by tourists doing it, but maybe something like that.

I: Okay, just any local culture or local information, okay.

P27: Yeah. Any tipping rules.

I: Yeah, very good. I remember I came back from the states, and it's crazy over there with the tipping. They tip by now already like 18-20 percent, wow. That's like half of my bill. Yeah, anyways, okay. Ehm, do you see any potential problems…ehm, it's a really tricky question, because you saw this technology today for the first time, but do you…could you imagine any problems that it could have?

P27: Well, eh…privacy for instance…whether this app would have access to your telephone, location and it would know where you have been, so it could basically track you. I wouldn't have a huge problem with it, but some people might. And maybe if the technology gets developed and you switch out body parts and you could for instance put it right into your glasses or something and somebody hacked it and could show you whatever they wanted. I don't know.

I: Yeah definitely. That's very interesting. Because I know they're working on contact lenses with that technology already. So you implant it right into your eyes. Yeah, that's a very good point, definitely. Ehm, what do you think in general about information that you get from a tourist office here in Dublin or wherever, compared to information that you get from other tourists?

P27: Eh, I prefer getting it from other tourists. Because at a tourist information it'll be too much. It'll just be too general. They don't really go into depths because of course they don't have time for it. If you meet other tourists, and you start talking to them, you…you are like them, and maybe you like the same things that they do. And if they tell you to go some place that is really nice, then you would probably enjoy it, too.

I: Uhuh, alright yeah very good. Ehm, do you also go like to the tourist office for general information, still or…

P27: Eh, no, I just get a map or something.

I: Oh okay. Ehm, you told me you don't really use Facebook or no social network at all. Ehm, are you interested in any social aspect though, for example the Chess…the Chess game that you're playing. Do you play that against a computer, or against someone actually?

P27: Just the computer.

I: Oh, okay. Is there the option to play against someone else? Okay. Would you be interested though to have like a social aspect?

P27: I don't know. Probably not. I'm usually on my phone for like 4-5 minutes. I don't have time to look up other people and…just to pass time.

I: Oh, okay. You're not really a social person? You don't bother about other peoples' opinions?

P27: Eh, not completely. But I'm not the over social kind of guy. I like being with people and I like being alone.

I: Okay, yeah. Fair enough. Ehm, are you interested at all at other peoples' photos, or content that other people put up on the Internet?

P27: No.

I: No, not at all. You don't bother with it? Okay. Ehm, how about like reviews and stuff. Do you read those at all?

P27: Yeah. That I…I do read reviews.

I: Okay, does that influence your decision though?

P27: Eh sometimes…depends on how they…how they phrase their comments. If they're well articulated and they argue their opinion, then I might be persuaded by it.

I: Yeah, okay. Yeah, definitely. Ehm can you tell me about your previous experiences when you read like reviews or comments?

P27: Eh, when eh buying a TV for instance, or buying the computer a couple of years ago, you can't just look at the numbers, or you can't just look at the TV and then see if it's a good buy. You have to ask people who have actually seen images on it.

I: Yeah okay. Yeah definitely very good. Especially those things that you experience, yeah that's very important definitely. Ehm, are you aware of the free WiFi that the Dublin City Council is actually providing?

P27: Oh…where is it…right now?

I: At the moment they're still working on it, but they have it at the main tourist regions already. But there are different opinions whether it's good or not. Some people say it's good, others say, it disconnects all the time, it's useless. But ehm, let's say, especially for tourists like you coming from Norway, if you wanted to use the Internet here with your phone, you'd probably have to pay roaming charges, right?

P27: I think I'd rather go to a coffee shop or something like that.

I: Exactly, so you would just use your home phone to roam…or just use the hotspot in coffee shops like Starbucks or McDonalds, or whatever. Let's say you had the possibility to pay a certain amount of money and be able to use the Internet throughout the whole city wherever you go. Eh, how much…or would you be willing to pay first, and how much would you be willing to pay maximum and be happy to use the WiFi?

P27: I don't think I would pay for it at all. Usually if I really want to go online, it's just for a small thing I need to know and the roaming charges wouldn't be that great. Or I would just go to like a Starbucks and get it for free anyways.

I: Yeah, okay fair enough. Because there are so many other alternatives. Okay, that's alright. Ehm, you told me before that you used a lot of applications like public transport. Do you think those kind of applications could be interesting to include in a tourist application at all or would you use it separately?

P27: Oh yeah definitely. I think that would be a great idea. If you come to a new place it's kind of hard to figure out what kind of…what kind of bus company you should be riding with and what kind of coaches you should…when they leave and everything. Especially when you get to a…maybe it's not that big of a problem when you're in the UK or Ireland, but maybe if you go to like Italy or something, where the computer technology might not be that advanced as we're used to here, and you don't speak their language. It would be a problem I think, so it would be great to have an application for it.

I: Yeah, definitely. Very good. Ehm, how do you see the connection between gaming and tourism applications? Do you think they could be connected or it's a totally separate thing?

P27: Ehm, gaming and tourism applications? How do you mean?

I: Like for example, you could go to a destination or attraction and while exploring the destination you could solve different puzzles or quizzes in the game in order to collect points, or to solve a bigger game or something like that.

P27: I think it would be too much of a hassle.

I: Okay, so you would just ignore the game and just look at the tourist attraction. Okay, that's alright. Ehm do you think the tourist application could be combined with any other forms of entertainment? Let's say music, or anything like that?

P27: I don't know, you tell me.

I: *laughs* I mean there is still nothing, no plans or possibilities. Just asking for if you would be interested in something.

P27: I have no idea, really.

I: Okay, let's say for example if in a destination like Dublin you know, Irish music is very popular or famous and you could check out where Irish live music is playing at the moment, or get like a hint or recommendation where to get Irish music, or what it sounds like or stuff like that. Do you think you would be interested though, or…is that not really your thing?

P27: That could be a good idea. No, I could be interested in that.

I: Okay, alright. Ehm, do you have any ideas or suggestions of how a tourist application for you could be more attractive or you could make…you could use it, or you could imagine yourself using it.

P27: Eh, well, it would be to have a pretty easy to understand user interface. Pretty reliable.

I: What do you mean with reliable?

P27: Eh, for instance, you have to know that it's updated. That there really is a bus that will arrive and transport you, that sort of thing. If they haven't updated it for 6 months, then there could be changes. As long as it doesn't come from the bus company itself, then you have to be able to rely on the developers that they're updating.

I: Yeah, for you yeah. Is there anything else you can think of?

P27: Eh…not really.

I: For you personally, like when you go somewhere on holidays, what do you usually do? Like walk around maybe, look at different things. Do you think an application could actually enhance your experience or make it better?

P27: Eh…I don't think so. When I'm actually there and walk around, I would prefer to actually do it on my own.

I: Okay, without any technology or anything like that? Okay. That's fine. Alright. Well, thank you very much. It was great, a good interview. You got the vouchers already? Alright. Well, I don't want to keep you too long. Thank you very much for your time. I'm just going to bring you downstairs.

Interview Transcript: TP28

I: Okay, I'm just going to screen it out. There you go. Okay, and have you just sign this for me. It's basically saying what the research is about and that any data will only be used for my research. It doesn't go to any other company any other business. No third party is going to see that. It's just for the purpose of my PhD and all the answers are voluntary. So if you don't feel comfortable with any question, just let me know and we can skip it, that's no problem at all.

P28: Okay, so where are you from?

I: Ehm, I'm studying in Manchester, I was born in Germany, my parents are Korean though. I'm actually German per passport. *laughs*

P28: Yeah, alright.

I: Alright, thank you very much. And just this one. It's just a profile sheet about the tourist.

P28: Who am I.

I: Yeah exactly, who I'm actually talking to, to get a better idea.

P28: So you want me to just fill in?

I: Yeah, or just circle if it's available. Is it okay, if we take just one more picture? Alright, thank you very much. That's perfect. Well, thank you very much for your time first of all. I really appreciate that. Ehm, I saw you're using an iPhone?

P28: Yeah.

I: Do you have like a tablet or anything like that as well, or are you just using a smartphone?

P28: I only use this one.

I: Okay, and how do you perceive the usefulness of this? Do you think it's very useful?

P28: Eh, I think it's useful. I use it as a phone, I use the Internet sometimes, yeah.

I: Okay, alright, can you tell me a little bit about the applications that you are using on the phone?

P28: Eh, I use applications for bus tickets, and Facebook and eh…not much more, not much more than that…and my bank account and music, yeah. I think that's the one I use the most. I don't know what you want to hear…

I: No, that's fine, that's perfect. Ehm, have you actually heard about this technology Augmented Reality before you saw the applications today?

P28: No.

I: Okay, and do you think there is any possibility of promoting these applications? Because obviously you're not the only you hasn't heard about, other people haven't. Do you think for Augmented Reality tourism applications there is actually a way to promote it?

P28: Yes, I think so. Because I think it's quite handy if you know about it, because if you want to search for a place to travel, you want to gain more information. So if this is something you can do really quickly, I think it's a good thing.

I: Okay, and where do you usually get your ideas of downloading applications?

P28: Oh…my friends, the things I need. I don't usually use much apps.

I: Oh okay. So whatever you need, you just look up, or from word of mouth from friends, okay. Very good. So after you've seen those examples, which one of those three did you like in particular?

P28: Ehm, well I liked all of them, but the one where you can take the picture of where you are and you can have more information like when you…I saw the church for instance, I think that was a nice one. Yeah, if it's working.

I: Okay, very good. Exactly. What do you think, why shouldn't it work? Where are the problems?

P28: Ehm, well I think the world around us is quite hectic and things move around all the time, so you need to keep it still to…I don't know, it seems difficult, but the technology is good these days, so…*laughs*

I: Yeah, it is still difficult, you're right. So have you ever used any tourist applications on your phone?

P28: No, never.

I: You said you used a bus ticket one? What was that about?

P28: Yeah, yeah. Well, it's a…I pay for my bus tickets, when I'm travelling back home, yeah.

I: Okay, so can you just pay for a bus ticket and then just scan it, or how does it work?

P28: I just show it to the bus driver. Or when I'm in a different city, they have a different company, and if they have controls, they check it out.

I: Oh, okay. That's really handy. Do you think that would be interesting to have in a tourism application as well?

P28: I don't understand what you mean now.

I: To incorporate this bus ticket into a tourist application to use public transport for example.

P28: Yes, I think so. But maybe people won't trust it immediately. Because if you're going to a new city, it's more than enough to have a new application that you come to trust, and that's a new system to get around. I think I would prefer to pay for a ticket in the beginning in a new place.

I: Yeah, okay. Just personally have it done, okay. Ehm, do you…or ehm which aspects do you think you would consider in a tourist application in general if you imagine, you would use a tourist application, or you would download one. What do you think should be in there?

P28: Ehm, what's going on, like right now. If it's weekend, any concerts, any big happenings, I think that's really useful. And eh…map or course, where am I and what's going on here. Yeah, I think that's two good ones.

I: Okay, very good. Yeah, definitely. Ehm, do you see any…well I showed you three examples, but do you see any other possibilities how to implement this technology into tourism applications? Just out of your fantasy.

P28: At the moment I don't know, no. I don't know, sorry.

I: Okay, that's alright, no problem. While your trip in Dublin, you said you've been here for 4 days already. Have you ever encountered something where you thought, 'Oh that'd be nice to have' actually, or 'this information would be nice' or 'if I had this possibility, it would be nice'.

P28: Mhmh, well it was…I was searching concerts and stuff before I came and I couldn't find anything. And then I found a newspaper and I saw information about concerts. So maybe what I already told you, what's happening. Yeah, I think that's…that's about it.

I: Yeah, okay very good. So if you'd design your own application for you…for a trip or holiday, or anything. It doesn't matter. What would be things that you would include in there?

P28: Eh, meals…where to find different restaurants and different prices and transport and eh…exhibitions, different exhibitions and where do the locals hang out and where do the tourists normally hang out. I think that's interesting, yeah. Grocery stores…but you can find them anywhere. Yeah, yeah.

I: Okay, how about with the meals…can you tell me a little bit more? Because you said, where to find good meals and stuff like that. What is important for you? You said price…is there any other aspect in meals that you're looking for?

P28: Yeah, sometimes I would like to have healthy food, like a salad, or small meals, and other times I want to go to a restaurant with beef or that's it, yeah. To see different places, different cafes, different level of restaurants and cafes, maybe…

I: Yeah, yeah that's very good. And ehm…how about the…let's see…how about the…meals…what else did you say, meals…

P28: Ehm, meals and price, and…I don't remember right now.

I: Sorry, there was something I wanted to ask you…I don't remember…I will ask you when I remember. So do you see any problems, any potential problems that could arise? You said before, if it's very hectic, you have to hold it still with the technology. Do you see any other potential problems besides that?

P28: Well, if you implement an app, it should be…it should know where it is, which I…think it's already…

I: So it should pinpoint accurately your location.

P28: Yeah, it should be accurately. No, I don't see any other problems.

I: Have you ever like downloaded an application and then for whatever reason, deleted it?

P28: Yeah.

I: So can you remember what reason it was?

P28: Never used it, yeah.

I: Okay, and how come you downloaded it in the first place?

P28: *laughs* Because a friend said, it was a good one, and I didn't care about it, so I deleted it, yeah.

I: Okay, that's fine. What do you think in general about information from the tourist office compared to information you get from other tourists?

P28: What I…what…can you please repeat?

I: Ehm when you compare information from a tourist office compared to information from other tourists? How do you compare, what's more valuable for you?

P28: Both is valuable, but maybe in a different way. I would say with information of a tourist office, the research is more hard facts, and when you talk to locals, it's more…feelings surrounded? I don't know. Yeah, this is a good place, this is where you get this and that, and then Internet research, I find the maps, I find the prices, I find where…yeah, where the places are maybe…

I: Yeah, very good. Do you read a lot of reviews though?

P28: I read it before I travel, yes. Yeah.

I: Okay. Does that also influence your decision?

P28: Ehm, of where I'm going?

I: Yeah, or how does that influence your decision when you read them?

P28: Hm…*thinks about it* I don't know. Maybe I decide to go there, if it's highlighted, it seems interesting, or maybe it's too highlighted, I don't want to go there, because it's too many tourists. You mean that way?

I: Okay, yeah, very good. Ehm, so do you…you said, you use Facebook as well, right, the application. Do you also use like the share photos, videos and check-in to places and stuff like that?

P28: No, not much, no.

I: Not so much. Are you interested in other peoples' photos though? On the newsfeed, do you look at that a lot?

P28: Yeah, yeah. When it pops up and it seems interesting, yeah.

I: Okay, so let's say this option would be available on like a tourist application, that you could actually see other peoples' content or whatever they do, or like pictures and stuff like that. Would you be interested in looking at those?

P28: Ehm, not so much I think.

I: Okay, where…or what's the different between Facebook and this one then?

P28: Well, Facebook is more personal. While this one…I can find pictures of places on the Internet. And if I was supposed to download an app, I wouldn't be feeding it with too much pictures of other people. Do you understand?

I: Yeah, okay. I understand perfectly.

P28: I think it would be maybe too much information. Rather pure pictures. This is this place…yeah.

I: Okay, yeah that's great. So you think there should be a limitation of information that is provided, or…

P28: Yes, it should be easy to handle. Easy to have information.

I: Yeah, definitely. And how could you maybe design it, to have easy information?

P28: Ehm…put it to…maybe not chapters but…yeah, let's call it chapters.

I: Yeah, or categories, of food, entertainment, or whatever…

P28: Categories, yes. *laughs* yeah.

I: Okay, I actually remembered what I was going to ask you. The difference between locals and tourists. Is that something you're looking for a lot? Or how do you usually look for those things?

P28: Well if I like visit new places, of course I would like to know about the special places of the country or the place to see the symbols or churches, or whatever. But then I would also like to have a feeling about the local culture, and not the fixed culture for all the tourists…yeah.

I: Yeah, definitely. How do you usually find those? Have you found those in Dublin?

P28: Eh, I tried yesterday. Yeah, talked to taxi driver to take us outside of town and talk to…try to talk to locals.

I: Oh I see. Okay, just like on the street, or…

P28: Oh, it's in the pub. *laughs* It's easier there.

I: *laughs* Yeah definitely. Alright, very good. Are you aware that in Dublin they are currently working on providing free WiFi throughout the whole city?

P28: No.

I: Okay, so that's something…I guess it's still very new, but it's something they're working on at the moment, but I was told that they have it in the main tourist spots they have WiFi already, but I guess throughout the year they're going to expand it more and more. As a tourist coming from Norway, coming to Dublin you would probably have to pay roaming charges when using your phone, so do you think you would be willing to pay a certain amount of money for…to be able to use the Internet throughout the whole city?

P28: Eh, yes I think so, but then again I think I would be quite sceptical in the beginning, because I don't know if I would trust it. If it was not working, because

here also, I tried to connect to the Internet, and it was not working, so yeah. But yes, I would, if it was working, definitely.

I: Okay, ehm so you would expect a certain speed then, definitely. How much of a speed would you expect, do you have an idea? Or what should you be able to do with the Internet?

P28: Eh…maybe check mails, surf the newspaper, check Facebook, that's it. Yeah, google something…

I: Oh okay. Not like stream videos or something like that?

P28: No, no. That's not necessary.

I: Okay. How much do you think you would be happy to pay per day to use the Internet throughout the whole city?

P28: Uh…difficult question…I would…each day, maybe…because you don't need it that much. And it shouldn't be over a limit. Maybe 3 Euros?

I: Okay. Per day, or 24 hours, from 12 to 12. Alright. Ehm, can you imagine having games being put in connection with tourism applications?

P28: No. Not for me. Maybe for other people, but not for me.

I: Okay, for you it should be separate?

P28: Yeah, I think so.

I: Alright, okay. How about any other forms of entertainment? Do you think there could be any connection?

P28: No, I don't think so. I think that should be separate.

I: Okay. Not like any music or something like that?

P28: Well, that's more like…do you mean entertainment and games in the city?

I: Yeah.

P28: Okay. What games do you mean then? Then maybe I misunderstood.

I: Ehm, let's say for example that you would go to an attraction and that you had to…while you're exploring the attraction, while you learn about it, you'd solve different questions, you know collect different points or in order to move to the next attraction, you'd have to solve a quiz or to move on or something…kind of like a scavenger hunt.

P28: Yeah, that could be interesting maybe. If you put it that way, yeah.

I: But not like ehm I'm not like talking about Angry Birds or something.

P28: *laughs* No, good.

I: Okay, how about like music or anything like that? Could you imagine like here in Dublin with like Irish music or something like that? To put something in connection, could you imagine something?

P28: Yeah. I think that would be useful.

I: Do you have an idea how it could work?

P28: No. *laughs*

I: That's alright, no problem. Have you ever bought anything online?

P28: No, not except…no…not things. I bought tickets, yes.

I: On your mobile phone as well? With the bus ticket.

P28: No. Yeah, yeah. Bus tickets with the mobile, and most of the time it's with the computer. Over the Internet.

I: Okay, ehm would you ever purchase anything on your mobile phone as well, or would you purchase at the moment on your computer? Would you do the same on your phone?

P28: No, not at the moment.

I: How come?

P28: I don't trust it. Maybe I'm old-fashioned.

I: Okay, no, no that's fine. Ehm, is it because the screen is so small or is it just psychologically, or…

P28: Yeah, I think so. Because this is not…yeah, I think it's psychologically, yeah.

I: Yeah, that the screen is small and you don't know if you're pressing it right…

P28: Yeah, and it's also…work as a phone, I don't know. It's very complex lately.

I: Yeah, definitely, that's alright. Ehm, let's say this bus ticket system would be available on a mobile application, that you could purchase whatever city bus tour for example, while you screen on that you could just purchase the ticket and the just jump on the bus. Would you be willing to do the purchase there, or do you think there is still a trust issue there?

P28: Well, if it's…people gave me enough information, I think I would do that because it's easier.

I: What would prevent you from doing that?

P28: If someone is standing beside and selling me a ticket, yeah.

I: Okay, so only if it would be more convenient, then you would decide to do that, okay. Ehm, just a last question actually, do you have any ideas or suggestions of how tourism applications, or Augmented Reality tourist applications could be made more user friendly?

P28: No. Because I haven't tried any, yet. So I would just keep it…keep it simple maybe. Easy…easy information.

I: Okay, or how could it be made more attractive?

P28: Talk to other tourism company to help them sell…sell it in, like with the Lonely Planet, maybe that would be…

I: Like a fusion kind of…

P28: Yeah, maybe.

I: Yeah, definitely, okay. And offer deals with other restaurants and pubs or whatever. Okay, alright. Very good. Ehm, well thank you very much. That's great. A lot of good answers. The vouchers you got already? No? Oh, sorry about it. You can use it anytime during your trip. I hope you enjoy your drink.

P28: I will, thank you.

Appendix F: Expert Interview Question Codes

AR experience

AR knowledge and experience

AR current and future potential perception

Developer requirements

Identification of developer requirements in AR applications

Content and Functions ratio in AR applications

Problems and Challenges of AR

Identification of Challenges

AR development

Future of AR

Marker-based vs. GPS-based AR

AR platform standardisation

AR advertisement for mass use

Google glass/wearable computing perception

AR in Tourism

AR in tourism experience

AR implementation and development in Tourism

Tourist acceptance of AR technology

Key Tourism stakeholders for AR application development

AR in Dublin context

Identification of potential tourist sites Dublin

Method of AR overlay in Dublin

Considerations for AR development in Dublin

Value creation through AR in Dublin

Appendix G: Industry Professionals Interview Questions

AR experience

1. Can you tell me a bit about your current position and time period of AR experience?

2. Why did you decide to join this industry, what potential do you see in AR?

Developer requirements

3. In your view, what are the main functions and features that AR applications should provide?
4. How do you see the relationship between content and functions when developing AR applications? What's more important to focus on to attract the use of the application by the end-user?

Problems and Challenges of AR

5. What have been the main challenges to overcome when generating AR experiences?

AR development

6. How do you expect AR do develop in the near and long-term future?

7. How do you see the relation between marker-based compared to GPS-based AR? Advantages/Disadvantages

8. Do you think platforms will converge in the future and provide one standardised platform for the end-user?

9. In your view, how can AR be advertised to encourage its use in the market?

10. How do you and your company perceive the Google Glass project and wearable computing?

AR in Tourism

11. Have you worked with the tourism industry for earlier projects? If yes, what are your expectations for AR development in that industry?

12. In your view, how could AR be implemented in the tourism industry?

13. What is your opinion towards tourism acceptance of AR technology?

14. In your view, which key stakeholders should be considered when developing AR tourism applications?

AR in Dublin context

15. In your opinion, which areas in Dublin could AR potentially improve? How?

16. What are considerations that need to be made when developing AR apps in Dublin?

17. Which AR approach do you see most valuable for Dublin?

Appendix H: Industry Professionals Interview Transcripts

Interview Transcript: AR Application Development Company CEO (EP1)

I: Sure, why not. Thanks.

BC: Oops, sorry.

I: That's alright.

BC: Alright.

I: Alright, well, thank you very much for your time first of all. Just to let you know, I don't really have anything like a form or anything prepared. Because it was just…I thought about it and just wrote some questions down that I'd like to ask. It kind of starts straight off. Ehm, in your view what are the main functions and features that AR applications should provide in your opinion?

BC: Ehm well, I don't think there is one…sort of AR app. Well first of all let's talk about the concept of an AR app. You need to get away from that. I think there should be apps that have an AR functionality if they need it. So eh…AR should be a functionality that is used for, for some reason. That's built into the app. And we use AR to allow people to interact in public space. And usually it's for art related purposes, but it could be. It could be more practical, but we do big art installations. We're also interested in people interact with art that is digital. So take a piece of art, and it sits as a 3D object on your phone. Interact with it, move through it, see it from different angles and then maybe AR is a functionality where you see that art generated from different forms in public space. So the premise of the question, maybe is…maybe we shift it to, 'How is AR best served as a functionality' and I think it depends on the app. What are people…why are people using the app? Do they have a need, do they have a reason to see a visual digital overlay? And if it's relevant to the point of the app, then I think it's useful.

I: Alright. How do you see the relationship then in regards to content and functions when developing AR applications?

BC: Well, it's difficult for us, because the content is artistic and the function is aesthetic. So we're creating something, a form of art that is interactive, that you can manipulate. It still always remains the same object. People aren't like changing the code, but they can interact differently than they could with a static painting. So we want people to be aesthetically interested in what we're doing, but also there is this added functionality of interactivity. So we're not…I'm assuming not the only one, but somewhat the only one moving on that aesthetic pace of AR and it's not like a…not like a one-off advertisement, it's meant to be looked at and come back to. And that's sort of difficult to put your finger on. To why do people enjoy art? To large it fills out an aesthetic question. But we're interested into pushing how AR, art into spaces that artists couldn't operate in before. At least not without risking arrest or heavy fines. So that's our art core inch is ideological making art…into public spaces digitally and then the aesthetics should be hopefully something that people are interested in as well.

I: Okay. So ehm, you as a developer what are you focusing more on, is it content or functions?

BC: Well, I think I have already addressed content. Functions is something that we're always building out. Gestural swipes on the phone, moving and dragging pieces around of the object or art object. Ehm, swapping out materials to letting people change textures and colours. Ehm, those things we're still learning. And we're still learning how they're interesting to other people. When you're a developer and you're also creating art objects sometimes you get lost in what you find interesting and maybe you hope that others do as well. But every piece of art has its own UX. Even static pieces of art have its own UX. So I think tech art is an older term, but this type of digital art based on mobile devices. We're still figuring out what's an interesting UX for it.

I: Mhmh okay alright. Can you tell me about the main challenges that you needed to overcome or that you're still experiencing while generating AR experiences?

BC: Can you ask me that one again?

I: Ehm What are like the main challenges, or main problems that you faced when developing AR experiences?

BC: For us it's really…for us it's really working at public spaces outdoors with lighting conditions obstacles in front of the viewer, the building or the mirror. Ehm, weather…so environmental conditions that are sort of beyond our control and providing a consistent experience. We're not there yet. We're okay but it's not as consistent and as reliable as it needs to be.

I: Okay alright. Ehm, how do you see the relation between marker-based AR compared to GPS-based AR? What are the advantages and disadvantages?

BC: So GPS is not precise in terms of its…if you want something on a building you can put it somewhere in the proximity of the building, but it still has like a float. I mean it's coming from space, so…subjects in environmental conditions as well. Ehm, the benefit is you can put it anywhere in the world and you don't have to be there. We have to physically take images of these spaces and sometimes manipulate them to work as functional markers. Downside is…with Geo location it's always going to be there as a positive. With us, we're more sensitive and at the whim of lighting conditions and environmental factors. So, I mean what if they just change the structure of the building? They do remodeling or the mirror is altered or whatever. A tree grows where…that affects us, that doesn't affect Geo location. But when our…when feature tracking works, it's super precise and it moves in perspective location of the viewer and that maintains the attachment to the real world, which is really important in what we do.

I: Uhuh, okay. Do you think that this problem with GPS inaccuracy could be overcome in the near future?

BC: I mean I guess every problem is surmountable. Ehm, the GPS is not like a new technology really. It's been around. So I thought maybe it would've been solved. Then maybe there is not like a huge demand to get it down right to the millimeter. So it's hard for me to answer that question. I would say if I had to take a guess, yes, that would be compelled.

I: Alright. Ehm, how do you expect AR to develop in the near future and in the long-term future in general?

BC: Ehm I think that depends on the hardware. That depends on the wearables. You know there have been others…wearables have been developed over decades. There is a man here, Steve Mann, who has been working on their IT forever. You know Google is just sort of a latecomer into the game. Now they have a high visibility. So it's…now people are aware of it, and that's good. But the aesthetic has to be pleasing. I don't want to wear glasses that don't look good on my face. I

mean I don't care about an ugly phone, it's in my pocket. So until the hardware is cost-effective or people can afford it, it's good to look at, people want to wear them and they don't…people, they don't look like regular glasses, so it's sort of a seem less environment. So once the hardware gets to that point then AR is…will take off. So the hardware really needs to catch up to what the software has been doing for a while.

I: Okay, alright. Do you think platforms will converge in the future to use a standardised platform?

BC: Eh…no. Probably not. There is no standardised platform for mobile right now. I mean you have the developer Android, iOS, Windows, I guess...so no, I think it will resolve themselves down to maybe two or three but that's healthy. It's kind of a pain in the ass for developers, but at the same time I think it's healthy competition for the industry.

I: Okay, is it a big challenge to program your application for different platforms? Or is it usually…you know what to do and…

BC: Kind of…eh…it's not a huge challenge, but it is time consuming and it could be expensive. Is it a technical challenge? I think not generally.

I: Okay, alright. Eh…where do you position yourself and your company in regards to Google glass? How do you see them?

BC: Eh…nowhere. I don't know. We're actually supporting the meta-glasses. Eh, we bought them on…we supported them on kick-starter. I think they sort of…I like them how they've kind of organically evolved. But their…Steve Mann is the CTO and he's been working on these glasses forever before anybody I think knew about them, so I like what they're doing. And I want to support them. And they work with…on the software we work with, so I'm hoping they will do well.

I: Okay, alright. As you know, this conference is more like the AR gurus, they're all here. But when it comes to the public, not many people are aware of it, yet. So how do you think it could be marketed to encourage the use of AR?

BC: Eh…maybe that's where Google plays a role and Microsoft and Apple. They've booked all their patents. So…but they can't be the Google glasses as I've seen them. It can't look like that. I don't want to wear those. Ehm…they just have to look better. So maybe they play a role in helping educating the public to what AR is. I'm hoping that's the case. I think that where they can be valuable. Ehm, and it becomes…well the other thing is, it can't be just a digital environment full of crap. It has to be meaningful or aesthetically pleasing. And filtered material that the user can control and turn on and off. And the privacy rights or at least what's left of them, they're respected. That's my short answer I guess.

I: Alright okay very good. Ehm, have you worked with…within the tourism industry for one of your projects?

BC: Yeah kind of with…and that's down in the UK. I mean that project isn't in form in yet, but it looks like it is on its way.

I: Okay and how do you think the technology, AR, will develop within that industry, in tourism?

BC: I think that's a really big…I think that's a huge industry for AR. I have spent like it has been to this point and I think it will be in the future. So I think tourism, exploring cities and spaces, I think that's a…the city spaces, especially for us but tourism in general is a very viable industry for this technology.

I: Okay. And how do you see the public or tourists in particular and their acceptance towards the technology?

BC: Eh…is it, I mean is it useful? Is it providing a service that is not already provided by some other form of technology? I think that's the…the value. Is it an added value, or is it horizontal? Can it…or are they using something that's already doing the exact thing. So, if they're not, and AR or mixed reality can provide a value that's not already been served, then I think it can be and will be adopted.

I: Okay. Do you think it'll take time, or is it a fast-going process?

BC: Hm…I think the next two years will be ready to tell you. The rest of this year, 2014, 2015 I think we'll know. Shouldn't take longer than that. I hope not.

I: Okay, yeah. Okay. Just a last question actually, what do you think in your opinion, you have worked in the…within the tourism industry what were the key stakeholders that you would consider within the industry?

BC: Eh…I mean it's not really my world. So I guess my answer would be cultural organisations like districts, like city districts, right, that are looking to generate traffic in their districts. Ehm, cities in general, so where to promote cities if there is…but again, if there is content that I can only see through AR that I can't see any other way and I want to see it, people will use it. Alright, so if we're working with a city, or cultural organisation to promote tourism, then it shouldn't in my opinion be images or any sort of material that I can just get online, right. It should be uniquely developed for the AR space. That's a value. If I can go get it just on my phone, if I can google it on my phone, why do I go through the trouble of seeing it…yes, seeing it in the space, so there is a value there but I think it should be…the content should be customised and built and spatially relevant and add value while I'm seeing it connected in AR and its environment. So that's where I think the value comes from.

I: Okay, alright. Sorry, I was just thinking about why do you think that AR is, or has the potential? Why are you in the industry? What do you think it has the potential, or where do you think it has potential?

BC: We got in because we're the idealists and we are sick of ads in public space that we can't control. I can turn off my television of can turn of my computer, I can turn on the radio, whatever, or the DVR…but I can't in my commute get rid of ads. They're in my face. So we see this is a need to undercut the physical way of advertising. I'm okay with digital advertising, because users can opt in or opt out of it. They can see what they want to see or don't want to see. There is a filter. So that's how we sort of got into this. And it also allows artists to make encourages into spaces, because before couldn't so legally, or they couldn't afford it. Billboards are very expensive, especially in urban…public urban areas. Artists can't afford those prices. So it's all commercial messaging. Artistic messaging, or private messaging gets drawn out and it's really just the monotised, commercial messaging that you see. Well, AR provides a mechanism where both commercial and private voice can be heard. And I'm okay with both, as long as I have some sort of control. That's how we got into it. And I think for us that's actually a long-term real value of it is the ability to maneuver through public space and have some sort of content control. Now the…the problem is, or the potential pitfall is you don't want somebody's digital space to become this eco shit they want to see. So maybe there is the…a visual genum project, like Pandorra where I have a certain interest, but I want this genum project to add content to what I'm interested in that maybe I have never thought of before. That's why I like Pandorra, because it adds music or bands that I've never heard of. It's…maybe a long-term but it's important to start thinking about that now and providing basic examples that maybe we or

other people maybe provided to get people to understand and accept that there is other content that can fill or populate this digital space other than ads.

I: Okay, alright.

BC: Does that answer your question?

I: Yeah, definitely. That was perfect.

BC: Oh one more thing. Also, I have to acknowledge other people that move into space like Sandra Vienhoff, who is not here. You should look him up. He's a Dutch artist who has been doing really cool things. And I kind of like Mark Shwork. There has just been a lot of people creating really interesting things. I'm hoping that their hard work pays off and how the public adapts their visual, digital world and that it sort of hits the mainstream, alright.

I: Okay, definitely. Thank you very much.

BC: Of course.

Interview Transcript: AR Marketing and Product Manager (EP2)

I: Okay, ehm just…I'm not going to ask any company regarding questions per se, but if you could just tell me your position at the moment, and your experience with AR.

B: Okay, I'm Borislava Krasteva and I'm the Marketing Manager and Product Manager of ARcode, that is the mobile platform for Augmented Reality experience, so that is pretty much my experie…my position. My experience is that we started with preparing the platform about a year ago, we made a lot of research to try to see, where are our competitors, to understand what's good, what's not and where we can find something to stand out. Because actually to make an application that is exactly like the competitor one, it doesn't make so much sense, because you give something new, or you don't give it at all. And we made a lot of research and after that when we were being comfortable with what we had, we announced the service platform at the beginning of that year. So there are a huge amount of challenges and things that we face through the…through the way, but we're working on it, so…

I: Okay, and how long have you worked with AR so far, or how long has it been…

B: The company has history, because we are one of the pioneers of AR. So we have 10 years of history working with Augmented Reality and Virtual Reality. And we have our tutoring too, where you can make Augmented Reality and Virtual Reality without any programming skills. And we decided to move forward and to make an actual product, because ARcode is the first product that we have. And I'm the product manager following all the development, all the marketing ideas, and how to push it forward, so…

I: Okay, and ehm just out of curiosity, it's actually not part of here, but ehm what do you…or how do you see the relationship between virtual reality and augmented reality? Like do you see any…where do you see the future?

B: Well, it depends, I mean the virtual reality for me it's more related to gaming, okay. Because people have different perceptions and when you're trying to provide them the virtual reality in their own world, to see their kitchen in a virtual way, it's something that from time to time it has a negative impact, because people know that it's fake, okay. And I think by general the virtual reality is the main component for the gaming industry because their editing things are enormous where actually the gaming industry is the industry that is moving forward the technology, because I'm a heavy gamer by general, and I know that every time I must upgrade my computer, the station. I must upgrade it because of a new game that I want to play and so on, so moving forward. The other that virtual reality has a huge impact, it's everything that we're not able to see and weren't able to recreate and everything that is for archaeology, everything that is lost and forgotten can be recreated with that, because people know that we can't build it from ground zero and you know that it's reconstructed in some kind of way and you don't have the expectation to look real. Because the main problem that we're facing, it's the expectation of people because people started having really high expectations, they think that everything is possible and people have a really great imagination of what they want the technology to provide. And we're really really careful about how we sell our platform when we're introducing it, because we don't want to get into the loop where people that say, "Okay, I was expecting something else. I was

expecting more and I don't like it." So that is pretty much how I see the things for the virtual reality. For the augmented reality I think that the possibilities are totally unlimited because you can add it to everything and what we're focusing on it's to add a thing to day by day life or provide services to people that are useful every single day. Not just the 'wow' effect that, "okay, it blinks, okay it moves" it's not enough for us. So pretty much that is…

I: Okay, alright very good. Ehm So why did you go into the AR industry, what potential did you see when you first stepped in there?

B: With the platform what we see there, because at the moment the industry of the AR mobile it's…it's not so huge. People still don't know about it. They…they still don't understand how it works. And it's an open market that's going to grow. But we must take care of it and we must educate people and we must also educate the agencies and big companies to try to push the industry to grow, because what we're facing is that people try to avoid it. I mean the…the best example is the QR code okay. People are using the QR code and my personal opinion, the QR code is something, it's really difficult to put it in a design for a big agency because it's occupying space and it's not visually appealing. And…but they proceed to use it just because they're afraid of the augmented reality technology on that way that they're doubting if it works. And we must teach them that it works and the conditions in which it works, because you can't imagine that everything without any kind of modification is going to be augmented. So we think it's a good thing to help people and to help them with day by day life. And to experience the objects and to see things in a different way. So that's pretty much the idea why we step in.

I: Yeah okay very good. So in your view what are the main features and functions that AR applications should provide? Is there a set of things where you think, "okay these need to be included whatever we design in AR applications"?

B: That is a tricky question because it's just connected to the view of CEO of the company and of the project manager. And what is the drive of the company because our competitors are more focused to create the SDK. We're more focused on working closely with agencies and building the experience together. So we're really open and flexible when an agency comes and says, "Okay, do you think we can do that interaction?" and we're saying, "Yeah, why not." And we're adding it. So we don't have the exact feature in this. We're just making the things over the connections that we have and the contacts we're adding and growing fast. The things that we have of course, I think they're something that is necessary to be, it's the CMS system that you can have your own backhand and you can provide to your partners and of course to yourself, the easy way to create the experiences because we have custom campaigns that are enormous. And they have a huge amount of features and they're really tough to be made, but for a simple one with a medium difficulty, we create it with our own backhand with just a drag and drop so that is one of the things that it's really important to have, because it makes the things easier, faster and less time consuming for the company of course that means less money to pay of course. The other thing that is necessary, or it's nice to have is the SDK so you can provide to people not just your platform but they can integrate your technology in their own applications because what we saw is that most of the companies that are pretty big brands they don't want to just use your platform, your augmented reality browser because I mean they're too huge for that and to provide them your SDK and to integrate the technology is a must, because otherwise you're not interesting for them. And of course in this moment, what is needed is that we're also with the augmented reality community, standards

community. We're trying to find a way to make the things equal, to having some rules and standards. Because in this moment, if you go to all of the companies you can see that everyone is developing in its own way. So we want to think one day you're going to be able just to use the browsers just like you're using Operah, Safari, and…Google Chrome if you want. Because I think it's really important, the user to choose the platform, but the content to be everywhere. So it's important for the future. Otherwise we're gonna grow our own applications and the bigger one is gonna win. Okay, I mean that's the way it works, so…

I: Yeah, okay alright. So what do you…I mean you have some experience now in developing AR applications, what do you find important, I mean you've mentioned some already, but are there some requirements where you think, "The user needs to have that in order to use the application" or in order for us to make it attractive for the user, there needs to be certain elements in the application.

B: Well for the third party applications that we're giving the SDKs and we're implementing the technology, they're the things that we're able to give just suggestions. We don't have the control over the companies, because they have their own idea and they're using that still they're using it as a wow-effect. The only company that…the only organisation that is really taking it serious at the moment is the Fiat group. Because they decided that this is something with which they're going to engage their customer care users. So they're the things that you must be really clear how it works, and what's going to be the benefit for the user because that is the main thing. We made some research and experiments of how the people are looking at things that are augmented. Because by general, we're making most of the prints alive and okay…all the objects of the world, buildings and so on. But when you have a printed paper, we make the experiment, it's really important that you say to the user exactly the steps that he needs to interact with that. He must take out the device, he must open the application, whatever application it is, but after that he must point at and he must download something, and he can interact after. After that you must tell him for sure, what is the benefit, because in general, people are sceptical. They think that you're going to bump them with advertisements, with buy here, and do that and which in the world we're living in, with all the advertisements and they're going from everywhere, the user gets annoyed. It's really important that you give him the clear idea that it's something that you're going to experience things in a new way and it's gonna be fun and it's going to be educational, so you must be really clear what you're providing, otherwise you're going to miss the target. So pretty much that is. The technical requirements, there are no technical requirements of the applications. It's just to have the module inside then the look and view can be whatever it's decided by the company, but not anything else.

I: But isn't there things like for example speed, or simplicity you mentioned earlier, that needs to be included?

B: That are just…requirements that we are giving because our philosophy is that we must keep the campaigns simple, we must keep the things simple with a small size, because we are taking care of the user, and how much he is gonna download, how much time it's going to take because after all time is money and people don't want to lose time. And the point is that we are just suggesting that. If the company decides that its campaign is gonna be 15Mb, and he's good with that, and good with the consequences after, I mean we can do anything. We are just telling, think about that point of view, but if you think that is what you want, you're free to go. Because we can't force anyone to do something specific. And for the requirements,

of course there are some kind of level of devices beyond which we're not supporting, because there is a need of minimum requirements. I mean you can't run it on the first iPhone as an example. You can't run it on some Android devices that are too weak as a performance. But of course that is said when you're downloading that you're just not going to be able to download it, so these are the things…

I: Yeah, exactly. Eh, can you maybe tell me about the suggestions that you give your clients?

B: We're giving the suggestions just to be really, really careful how they're gonna announce it, how they're gonna make the 'how to' pages everywhere inside the application. We're always suggesting that before you start interact with the application you have a page…okay, page or screen depending on how you're going to call it of course, but something that really explains to the user how it's going to be and what he must do inside the application. Because all of us, even our competitors are bombed with reviews and comments on our pages and on our application pages that that doesn't work. The point is that when you go there, I mean it's too late, because that means that you made a mistake and you didn't explain something. And that is the shared responsibility between us and the content providers. Because they're the ones that must put over the things what's exactly going to happen, because people get angry. Definitely, and that's the real problem. The problem is that the users they don't see the full picture. I mean they don't see that there is us, after that there is the content provider and after that two things are going to the user. So the user just hates the application. It doesn't matter what it is, and he doesn't mind which content doesn't work and what is the problem, actually. He just says that he hates it and that's it. So that's the actual suggestions that we're giving them because everything else is pretty much irrelevant, I mean how it's going to look, what kind of design they are going to put, I mean everyone can…everyone can decide whatever they want, because it's just the design trends and it's subjective there.

I: Yeah okay. Alright ehm so what have been the main challenges to overcome for you guys when generating AR experiences? What were like the main problems that you needed to face?

B: The main problems, the first problem was…because we're providing a visual search and we're providing also image recognition and tracking, the first challenge was when we were making research, to test all available solutions about visual search because that's the first thing that you're going with and then you must make the clear decision, do you want to make it by yourself or do you want to take the best one? We made the research and our partner's partner Artist Catchroom, they're our official partner in that and we don't have any kind of wish to change that because they're really cooperative and they're really thinking with the industry that, were going to work together to make the things. Which is a great approach. So the first challenge is to decide and to choose exactly who you're going to work with or you're going to do it by yourself eh…for the visual search. After that it's coming the challenge of the image recognition and the image tracking. There, we tested things, but time to time the companies that are in this moment doesn't have the flexibility for just created platforms, or they can't grant you that kind of flexibility that you can take a breath and go on. And for that reason we decided for that part, we're going to develop ourselves. And we're going to make our own Agree terms and we're going to make these things by ourselves, because it's something that we're going to take care and we're going to manage it

by ourselves for sure. Eh, the other thing is the content. The point is that it must be Cloud-based, otherwise it doesn't make any sense. Because it must be reachable everywhere, it must, you must be sure that you're not going to have problems with the Cloud. We're working with the Acamaia server and we are really happy because we don't have any kind of failure, we don't have any kind of drag down, drop down and so on, so that are the things that are technical and are really important. The rest for the platform is just to design the best logic and what the user is going to need, and what the user is going to need to see inside. And of course here comes the easy part, because when you're not coming first on the market you have pretty much examples of what's wrong and what's good because we make our platform last because we came out that year, and before us was our competitors and we know which experience was the good one, which one was not so much, and we try to avoid their mistakes. And so far I think we're doing really great for that. Of course it's a process that never ends, because you always need to give something more to the user and you must keep him updated and to feel that you're taking care of him. So…

I: Alright, ehm, how do you see the relationship between content and functions when developing those AR applications? What should be focused on in your opinion in order to attract the user?

B: There are a couple of cases about the content and their functionality. The first point is that time to time when the company has a poor content, you must really push in the functionalities on the way that you're going to make engaging the content, because it's so poor that it needs a lot of push. Eh there are other cases where the content is so much that you must just try to keep the things simple and really well accessible so that you can provide the whole overview of the person what he can access. And by general we are trying really to keep a balance between the things. Because if you push one of the things too much it's going to have a negative impact, because if you put too much functionalities that are not connected to any kind of content per se, the user is going to say, "okay, I didn't want to play a game, I just wanted to receive information". If you make that the opposite, you can make it too dry for the person and they're going to be, "okay I'm starting to get bored because it looks like a huge document that I must read." So there are the challenges just to be careful what you have and how you want to show it up. So what we're working on is research about the user experience because we're working with mobile. It's not a webpage anymore. There are rules there and how to make. Here what we are concentrating is that you must design things for the device that you're working with because you must be able to give to the user the experience to reach with the fingers in the way, which he is holding his device. The most important thing is it must be closer to his fingers because otherwise if you just make him, make crossing of the screen with his finger, he's not going to reach that information at all. So it's really important to design the things before and when you start making a campaign, it's to think, "I want that to be augmented" so you must start with that vision because there are requirements of how the print must look, that it must be easy to track and to keep the information over and also the elements inside must be really well made in a way that must be small sized, that must be appealing and it's like a laboratory of things that you must put together and hope to not blow up. It's pretty much that.

I: Okay, alright. Ehm, how do you see the relationship between…because I, for the majority of my research, I've looked at marker-based vs. GPS-based

Augmented Reality, so how do you see the relationship between those two, are there advantages, disadvantages, what's possible actually?

B: In this moment we're probably the only one that is resisting the Geo localisation and all these things that I know on the screen…but when you are using it on feud, you don't have the same experience because I think that the geo localisation and it's going to be for one perfect world in which everything is going to be well adjusted, and you're going to have the great coverage of the networks, I mean of the operators that are providing us the service for the mobile. Because in this moment, what we're experiencing is that actually that can fail. And according to our weather conditions and my GPS is thinking, I'm 300 metres away or 1km away, just because it cannot position me exactly where I'm supposed to be. And that is something that is annoying, because according to that you can see things that are not belonging to the place you're seeing them and our company believes that it's not yet the moment to use that. That's the reason that our city guides that we're making at this moment they're actually not based on a geo localisation. Okay, after that when you have the guide, you can see things that are around your object, but it's not to position the experience according to your actual coordinates because we believe that that's going to fail. One day or another it's going to fail, but it's going to fail for sure. And in this case, we selected to work with visual search because there is no mistake. Because what you're going to point at is exactly what you're going to see. Because there the point is just to be able to have the recognition of the object and you know exactly where you are. And the content is never going to be misplaced or something like that, so we definitely think that it's still not the time for that. And it's not because we're not able to do it, it's because the whole infrastructure in the whole world, it's not able to support it in the best way that the user deserves. And we have it, but we just don't use it.

I: Alright very good. So how do you expect AR to develop in the near future and long-term future?

B: We're seeing a lot of opportunities for that. We think that that is one of the future industries, that is going to be here to stay because it's useful. Of course it has to be made in a way that it's not going to have any problems with it, because we're seeing things with the Google glasses and things that are about the privacy issues, the things that about putting it in the cars, about the responsibility if something happens, so I think these are bummers that are probably going to slow down things at a certain point, because it's going to start having problems. But by generally, if it's pretty much taken care of things, I think that it's pretty much the future that you can give to the people the experience and the opportunity to experience everything around them in a new way, in an easy way and to make the things accessible more easy, just by looking at them, or pointing at them. Not searching on the books, or on the webpages. Of course the information is again web based. We're not avoiding the Internet, but we're just making the connection easier, so I definitely think that there is a good and bright future for that.

I: Okay, alright. Ehm, let's see…do you think that platforms will eventually converge in the future that they will become like standardised and there is only one platform for the user to use?

B: By general, our company wants thinks that sooner or later to grant a better user experience for the end-users, you must give him the choice to select the things, the platform that he wants and to see all the content. The problem in this moment is that we have 5 or 6 platforms and I'm just talking about the big ones, I'm not talking about freelancer applications that are outside, because there is an enormous

amount of them. But the serious players are 5-6 platforms. The problem is that in this moment, the campaigns, the experience that they are providing is that it is not accessible from any other platform. So that means that the user goes around and when the things are going to grow up and you have poster and buildings and everything around you going to be augmented, that means that the user is going to need to switch through the applications and, "Okay, that one, that is from the company, so I must find the application for that, I must do this." And if we don't do something about it, we're going to lose the market. Because one of the things that I'm picking about is that at one certain point, the device provides us…Apple or Google…I mean not Google, Android to be exact. They're going to embed in their devices one platform that's going to give us the plugins, too. That is one of the options for the future. Another option is that we're going to decide how to make things together, which we're hoping that it's going to happen, because we must in this moment, the industry is so small, that we must fight together to make it big, and after that to fight each other if we're going to win. And our company thinks that definitely, it doesn't matter which browser you're going to use, because the content is going to win in the end. And that's the thing that's going to have the benefit for the user. I mean we want to make exactly the same things as the web browsers. We must be able to see of course we have the differences that the Internet explorer, I mean we all know which kind of problem and it's the biggest hell for web designers for things like this one, but you're going to be able to see a base content on every platform. After that, if the content is provided by one platform you're going to be able to see much more because it's the own platform and the own environment, but what we want is all the base functionalities to be able to be seen everywhere. Because that's the way to grant to the user the choice. And people don't like to be restricted.

I: Yeah, exactly. Okay, very good. Ehm, where do you think or what do you think about Google Glass and how does your company perceive Google and the Glass project?

B: Well, what we see, we think, first it's a little bit strange, okay. Because from a privacy point of view, as a person, I don't feel comfortable with it. Because I don't know if that person in this moment that is standing in front of me with that fancy glasses are not taking pictures of me. Okay, and these are things that are bothering me, because it's going in my space and it's violating my space, so from that point of view, I'm not comfortable with it as a person. As a company, when things are going to pass this kind of discussion and problems at this moment, when we see exactly where the things are going. Because at this moment, it's a huge amount of advertisement and push up from Google for the glasses, but we're still not sure how the people are going to take it, because there is two sides at this moment. One is taking purely not, and 'we don't want it. It will violate our space' and so on, other say, 'yeah, this is the future' and so on. We're going to wait to see exactly where it is going to go. Because in this moment, we have plans we have ideas how, what to do, but in this moment the only thing that we're going to do is just more for the industrial rather than for the users, end-users. Because it doesn't make sense at this moment and it's going to need time to wait and to understand what's going to happen, because we don't want to invest into something that the users can kill. Because in general if the community decides that a product is not good enough for them, they're able to take it down. And it's something that is too much innovative and probably it can be the case that it's not ready, yet.

I: Okay, alright. Ehm, so how do you think ehm…AR can be advertised later to the end-user in order to encourage the use of this technology?

B: It must make sense, because if we're giving to the user just advertisements and just things that we're trying to benefit from, it's not going to go through. Because I think that it must be with educational use, so we must give the opportunity to explain them that with Augmented Reality, yes you can see a lot of advertisement, but you actually can learn things, you can interact with things and you can see things that are past and looking at the object that remain. So I think that it's going to be just to give the whole overview that it's useful. And we must provide the coding used cases, because people, I mean by general, people don't like to be pushed in a way. They must go themselves there. Because if somebody wants to buy, he's going to buy. If he doesn't, not, and you can't do anything about it. So what I think really is we need to say that you can use it in your day by day life and you can have personal benefits for your comfortable way of looking at things and selecting things or having more choices over things. Making experiences you can't have in a normal way, or you can't have on the web. So definitely it's going to need education that it's not just advertisement. Because that is important.

I: Okay, alright. Ehm has your company or you worked in the tourism industry with AR?

B: Yes, in this moment, we're launching next week, we're launching the…the first augmented city and it's located in Italy. It's called Vigevano, and there are the major mayor and rotary club decided to make the city augmented. We have 38 sites that we're going to augment and we're starting with 10, because they have a program in which they're going to make it available because they are constructing all the city, so they reconstructed 10 of the buildings and after that they're going to proceed with the others. And the best thing is that it's the first, not one of the few, the first one of the few Smart Cities, because it has the WiFi coverage all around the city, which makes a really nice experience, because you don't have to worry about roaming if you're a tourist, because that is something that really makes the difference of peoples' choices. Because if they have WiFi, of course they will be happy to use whatever is there. And it's really, really important that. And the other thing that we're launching after it's our own city guides and we're starting of course with Turin, because our company is located there, and there we're going to give also the sentiments. So the people are going to be able to access database of social networks that is…what the people say of that building, or what they tweeted about. What the friends of me, that are on the social networks say. Because there is a research that actually people are selecting things according to the recommendation of their own friends. So if you want to make the experience better, you're going to need to include their friends, because we're social animals. We really need that recommendation and to just see if we're doing the right thing. So there we're going to...we're adding the social aspect to the thing, so we can provide that comfort to experience the things with the others and the other thing is that you're going to be able to leave behind content, so it's something that's going to grow itself. Because when you're in front, you're going to say, "I just used that application and I see everything that I need" and after that the next person that's going to come is going to see exactly that message and it's going to say, "I find the love of my life in front of that building." And the person that is coming after you is going to be able to see that. There are the love aspects and the happiness and so on. So we're doing definitely that.

I: Yeah, okay. Alright very good. Yeah I'm just going to come back. I'm taking notes, because I want to talk to you about something after this. Ehm so let's see…which AR system do you think could be of interest in tourism. Or tell me about the experience that you used in…like technology wise in the city that you augmented. Like what have you done there?

B: Eh…the things that we have done there, it's that we created dedicated campaigns for each building. And these campaigns…the nice functionality that we added, and that we, if I'm not wrong, we're the only one that is doing that at this moment, it's the ability that the person must not stay in front of the building to have the content over. Because most of our competitors, when you point at something, you must keep like that, otherwise the content is going to disappear. So we decided that it's not convenient for the people because they're going to point at the building and after that by general, we have the habit to pull our hands down and to look at the phone. So if the experience is going to disappear, I mean there is no sense of that experience at all. So we developed that functionality that when you point, it's going to…all the content is going to stay. And the other thing that we're adding is that the user can choose exactly how to look at the experience and to tune up things what he wants to see. Just something that's going to take him one minute to read, he can have a medium complexity of information or he can have the heavy artillery of information that he can spend probably 20 or 30 minutes on. So and another functionality is that we're putting of course…really really well adjusted layout and interaction, nothing to heavy because it must be really engaging and just a few tabs and you can access everything. Because in general there are researches about on which tab the user gives up, if he didn't reach any information. So we're taking care of these things. If not actually the technology, it's more the research about the behaviour of people and of how they accept things. So it's not so much about technology because we have our platform, everything is there. So it's just more a psychology and researches that are made about the human behaviour and this kind of things to be taken care of. Because technology doesn't have any kind of a failure. You can have a failure in your idea how to represent something. So that we're taking care of.

I: Okay, very good. Ehm, just a couple more question. How do you see the tourism, or the acceptance of tourists of AR applications? Do you think that's something that they're going to adapt to very fast, or do you think that takes time or what's your opinion about that?

B: Everything takes time. Everything new takes time. I think that it can be adopted much more faster, because it has a straight benefit for the user. Of course from the behind it's always going to be the providing of choices for the user to buy or not to buy. I mean that is something that we cannot avoid because we must earn money. But I think that it's going to be adopted much more easier than everything else. Just because it has value for the user and it's easy to be accessed. Because imagine that all these guides that we have as a printed one, it's really nice, I love paper, I love books, but there is something I like to interact with them, when I'm comfortable, when I'm in my chair and I have my coffee next to me when I'm able to spend time. I don't see the benefit of the guide going around and just leading to something, trying to understand what is what reason, how, if…so I think for that reason it's going to be really easily adopted because you just going to be able to focus your attention on the things you see and not searching in books and applications the informations that you need. So I definitely think that it's going to be well adopted by the users. I can't say that for any other idea, of course. Just for

that segment I can say that that's my expectation. But of course people are different.

I: Alright. You have worked with the city in Italy now with the augmentation of the city. What were the key stakeholders that were considered, or that you thought about when developing this application? Because that needs to be beneficial for a lot of…you know different kinds of people.

B: Yes, we…what we started…we started with a meeting because they wanted us. We didn't follow and go humming around them. They chose us as partner and they chose us because they think that with the history that we have with 10 years of experience, and also with the thing that we're going to be here to stay. Because there are a lot of companies that are popping up and they're disappearing really fast. So they decided to go with us, just because they're sure that we're going to last. And we're going to last for a sufficient amount of time, so the city can benefit from that experience and for the citizens there. So the things that started this meeting, everyone goes there, the mayor, all the societies and they started saying, "okay it's really nice, but how are we going to benefit about it?" and the main point which we understood and really important thinking in that kind of cities are small cities that are not exactly the touristic target, is that the main problem is how to make people stay longer in the city, because staying longer means that they're going to spend money there. And that was the first point and the most important one that was in the meeting. How are we going to do that? Of course after that was checking for all the coverage of the WiFi connection, all the technical aspects, making a lot of tests on the field, because creating all those campaigns, we were going there, we were taking pictures, we were trying to understand if everything works, just to tune up things. After that when we were happy with it, we just stopped there. So we were fine, we go to the next object and so on and so on. And after that was the point, who is going to provide the content, how the content is going to be created, because there was a lot of people, a lot of parties that wanted, "I'm going to do that, but I'm not going to be able to do that" and it was supposed to be organised as one machine that is going to work together to create that. And that was a challenge because this kind of organisation is going to their own interest. One wants to shine up this, the other wants with the other and we were there just to try to keep the things together and to make the flow. We made a dedicated backhand for them, so they can easily input all the information and publish the campaign in a couple of minutes, something that is really useful. And everything was just made for one month, so the things goes really fast but there was a lot of enthusiasm there. And that's the reason that it passed so good. So these are the main problems actually, because all the technical parts, it's not so that you're able to fail it. If there is a problem with the WiFi, you're going to adjust the connection. If there is a problem with the technology that we're using, we're going to adjust the technology and it's going to work. The point was just to exactly understand how to make the people stay there more. And of course the nice thing about this city is that it's really close to Milan. And Milan is at 2015, the World Expo, so it's going to be a huge amount of people that are going to go there. And they want to be ready for it. Also the 2014, next year they're going to open the first Leonardo Da Vinci museum, so there are a lot of things that they try to prepare themselves for the wave of tourists that are going to go there. Because by general they say, "They're just staying 20 minutes in the city. They just go into the centre, look at this, look at that, and after that they just take the car and go to another city to eat." And it's not something that works for them, because they need resources, and

they're so small that if they don't do something about it, they're just going to go and be one grey city and everything is going to go away. So that was the biggest and only challenge that was supposed to be considered.

I: Alright, thank you very much. I mean the interview was much longer than I actually expected but ehm…

B: I'm sorry I speak too much.

I: No, no that's great. I mean it's perfect for me…

Interview Transcript: AR Museum and Culture Manager (EP3)

I: Okay, I just put it right here. Ehm, so it's just really most of them are just general questions, a couple of them are in regards to tourism. Ehm, if you feel like uncomfortable answering any questions, there shouldn't be anything too specific or anything, but just want to get a general idea of the technological side of view or the developer's side of view. Ehm, first like, can you tell me a bit of your current position and your AR experience, the period?

J: Sure. Eh, we're in Belgrade based Liveviewstudio. We've been in the business with Augmented Reality like 3-4 years. Ehm, me personally, as I told you I'm not from the developer's side of the studio, I'm more from the management side, and also working with museums and cultural institutions more from the concept and presentation and not the background and code, but for any questions, regarding that I'm sure we can have an answer from the studio.

I: Alright, very good. And why did you go, like 3-4 years ago, why did you decide to step into this AR industry? What kind of potential did you see there?

J: Eh, well again, it was from the heritage, from the museum side because I was involved in the research project about redesigning the museum experience and getting people more involved, and giving more interaction, providing more solutions to people could appreciate what they see and you know like to have the artefact out of the glass cabinet and to have the…there is a big thing called the 'power of touch' in the museum, so how could they actually touch it, and have this. So the research in this area brought me to Augmented Reality.

I: Okay, very good. And in your view what are the main features and functions that AR applications like in this regard with museums should provide for the user?

J: Well, it's an easy question, on one hand it's an easy questions, because you can see something that you can't see with your eyes. For example like a small chart of pottery, with a long text of how this vase looked 100 years ago, cannot compare with the reconstruction of the vase, that you can see, that you can move around, that you can touch, you can touch the virtual thing and then maybe you can fall apart again and you can show the process of decay, of the…or the other way around and things like that. But also what is true that many people do not have the devices capable of that. So I think that museums should actually have a strategy where they're offering a scalable thing. Something let's say for everyone. If the person doesn't have a smartphone to have an Augmented Reality thing, he can have an audio or even like more…more text, more basic information and then for others with more capable devices can be really interactive scenarios where they can have the whole thing like 3D or animated museum guides. The possibilities are really yes…I think so. And depending also like up to the creativity, but also to make it useful and to make sense. Not to have a…I don't know, Hollywood movies in museums. You have to take care about not going too much into some show or something like that.

I: Okay, ehm…so what do you…I mean you told me that you're not a developer, but you've had quite some experience with some clients in museums I believe. So what do you find important when developing AR apps?

J: Eh…especially for museums, the important part is how to get the data from the paperwork in charge of that, and how to, how to communicate to them in order to use the data in the best way. What I mean here is, if you have a bunch of text of how something looked like, you have to really work close to them, with the

archaeologists, with the historians, when making that 3D model, so that you understand the appearance. There are like…there are little things that you never think about, like what kind of material are the concretes be used in the second century, so how do the concretes look like? What colours could be used. So to really have a genuine thing. That doesn't have to be used with AR, but if you're using AR, you want to show a 3D model, then this, this is something that will be important.

I: Okay, ehm, do you usually, or what kind of requirements do you see, AR applications should provide? Do you have some kind of AR minimum requirements or things that you recommend your content…I mean your client to have in the application?

J: It all depends on the specific…the specific situation. So for let's say for this archaeological site, the best thing could be reconstructions, but what if you don't know what was there, what if…then I would say, "okay, let's go with some interactive scenario to get people interested" or "let's have an audio…I'm sorry, an animated virtual guide" again to get people interested. Ehm, there is another project we're working on for the…with the city of Belgrade. They are…it's called, 'city archives'. This is the institution that holds all the images, all the documents that had to do something with Belgrade and the idea was to have the history geographically positioned. It's not the best expression, but ehm, so for example if you're somewhere in the town you could see everything that is connected to that point through time. So it all depends on a specific situation what you want to achieve, who is the audience and what are the challenges, why would AR bring benefits. Some factors you should consider.

I: Yeah, okay. Ehm, how do you see the relationship between the content of an application and the function, what it should do, or what it can do? Ehm, do you think there is a…anything that should be focused on more, or how do you usually approach those things?

J: Well, I think this is…the answer is probably similar to the question, to the previous one. Every situation requires a different, different approach, so…

I: Yeah, but how…I mean is there like a minimum technical requirement that…or technical infrastructure for example that should be there in order to let the application run smoothly?

J: Oh, okay yeah sure. The WiFi connection is something that is always important, or either all the content could be in the application, but that would make the application really big. It…again, it depends…we're working on projects, where the application, it can be downloaded freely, but it is made for the iPad, for the museum. So it's a huge application, like 800Mb. So it's really big, but it makes more sense, because they're using iPads as guides that you can rent. So this was…but this is not the way I would go for making an application that is used by general public. So then WiFi is something that you're gonna need. Also because of GPS and everything so WiFi is a must, and light conditions, if you're going to use feature markers or even 3D markers, light conditions are important and this is also sometimes a problem with museums because they have rules how to use lights on specific objects, and then you have to…you have your technical rules, but that's something to work on.

I: Yeah, okay very good. Ehm, how do you see the relation between, since I, for my research so far, have majority looked at marker based and GPS based Augmented Reality. But now, I come here, and there is like marker-less and what not. *laughs*

J: Yeah, there is so many things that sometimes works and sometimes not. *laughs*

I: Yeah exactly. But for like for example things that are outside for like city tourism how do you see the relation between GPS and marker based Augmented Reality? What are like the advantages, maybe disadvantages of both?

J: Eh…GPS you have some problems with accuracy. You have 10-20 metres issues, so it depends how important that is for you. Especially like within the city, there is like all the high buildings that make an issue with that. Marker, again is an issue with light. So you have to think what you want to do and I know there is that third thing that you mentioned. I think that it has been there for awhile, but I never used it, so I don't know what are the advantages, it's called SLAM, it brings together both, GPS and feature based tracking. So that could be one way to go, because both of these have limitations.

I: Okay, alright. Ehm do you, or how do you expect Augmented Reality to develop in the near future and in the long-term future in your opinion? Which direction is it going to go?

J: Eh, I think a lot it's going to depend on hardware. It seems like glasses and also Augmented Reality optimised or capable devices, because most of the things are quite processor heavy still in terms of rendering and things like that. Also if the GPS accuracy, if that improves, it could bring a lot to AR. So things like…I think a lot of companies here are going in the direction of Augmented Cities, to have all the information layered around you and stuff like that, so this could be definitely one way. I think that maybe because this is something that the studio does, children's stories, education, things like that. From our experience, and also there is some research that's done. The involvement of kids, the speed of learning it's really improved with the use of Augmented Reality. So this could be definitely one other…of course there is advertising and that, for sure. The numbers they're really astonishing. For example the conversion rate on a website when using Augmented Reality, like 70% higher, and stuff like that. Of course, it's marketing, I don't know if it's true. It's numbers that I've read in the report, but if it's true, it's a really…there is also a Juniper research. I don't know the numbers, but you can look it up. The predicted revenue from all sorts of AR apps, it's incredible. It's an industry that will drastically develop.

I: Exactly, yeah. Do you think platforms, like here you have so many platforms already, that will converge in the future, that you will have one standardised platform for the end-user?

J: I hope so. Because at the moment from the developing side it's quite difficult because they're either…they're quite different. There is not so many of them. There are like two or three major ones, but still they all have different developing requirements. But it's the same thing like iOS and Android. Developing for Android it's such a headache, because you have to cover so many different things and all. This is also a challenge from the…from that side and then there are AR browsers, I think that's the useful thing, especially for like again they develop so many of them, and with different frameworks, different rules. A few years…two years ago, on a road mobile convention in Barcelona there was a quite strong initiative to have one universal platform for AR, but not again…but I don't know. I hope so.

I: Okay, alright. Ehm, what do you think about Google Glass and where do you see your company in relation to the Glass project?

J: I think it will be so exciting. I don't know much yet about content development, I don't know much SDKs yet. We just talked to the people from Vuzix and signed as a developer to get an SDK to see what we can do. At the moment I'm not, I think the potential is great, but at the moment there is not much you can actually do. But I look forward to it, to the development of that.

I: Alright, okay. Ehm, where am I…oh yeah. About the AR use for the end-user. Since there are not that many people in public that actually know about AR, it's more like the developers that have more the idea. But how do you think it could be advertised like in general and in regards to tourism?

J: It has to have a benefit for the end-user. The excitement of seeing something new. Basically it's a new medium. I often when we talk in the Studio and when you have long hours and stuff, but it's a good point in time, because you're actually maybe in the same point in time maybe like in the beginning of the Internet. Or even the beginning of movies, when people were hiding when they see a train in the station. So it's a great time, especially when you see the astonishment, especially when you don't have to explain them anything. They just start using and then playing with it. So but this will pass. This excitement and surprised of seeing something integrated in your immediate environment, in your real space. So you have to offer something useful. There are couple of start-ups here working with Augmented Reality multiplayer games, strategies, I think that could be a good way to promote it and to get people involved and so the initiative with coupons. The coupon thing is not very big in Europe, I'm not very familiar with it, but here in the states it is, so you can kind of scan coupons in live view and stuff like that. Again direct benefit for the user, he spends less money. The things…but when you think not many people know about it, when you ask them, 'what is Augmented Reality?' but so many would know about the Disney presentation maybe at Time Square, the National Geographic video which had so many views in just one week, so making things interesting and connect it to big brands I think is another way.

I: Okay, very good. Ehm, so you told me before, that you've worked already in the tourism industry with the AR technology. Which, or how do you think AR will develop within that particular industry? You've mentioned city, Augmented Cities, but do you think there is other ways as well?

J: Yes, I think, just like offering useful information layered over the immediate surrounding of the user is kind of, for me it's a straight forward thing. You're somewhere, get out your phone and you get your information layered in the live view. I mean we can talk about, is it better than in the list? It depends, but yeah, I think that, I don't know, because most of the work I did in tourism, it was connected with culture, and cultural heritage, so I'm not…I'm not very sure at the moment how to…

I: Alright, no that's fine. That's okay. How do you see the general acceptance of AR technology? Do you think that's going to be a fast development, or do you think it's going to be slow?

J: Depends with data roaming charges, it's all very limiting the further development of AR. We have to wait, I mean not we have to wait, but this is something that needs to change in order for like mass use for the tourist…for the breakthrough, yeah definitely. Because if you think, there was a funny thing about just a simple Geo Location of AR, the guy was using it, and it costed him more than the whole trip. He was very angry with this, so this shouldn't happen. So even one blog post about that, it's just like AR…it's not a very good use.

I: Okay alright. When you work with…or within the tourism industry, what were the key stakeholders that you considered? Because you were mentioning, it has to be beneficial, the application. And without the use of it, or seeing the use of it, why would you use it? So which like key stakeholders did you consider?

J: Well, from my experience, it was…it depends on your project. Because if you're developing some tourist guide, like edited like highly selected places in the tourist guide, then it's up to you, it's up to creating the direction of the app, like editing and stuff. The other way would be working with tourist organisations, for example in Belgrade we worked with the tourism organisation in Belgrade, which had a list of places that are approved, that have ratings and stuff like that. So that could be the right place, right places to start, but those institutions are sometimes hard to work with because they are institutions, so it's bureaucratic, it's slow and…the Studio is also working on a tourist app, which has Augmented Reality, but Augmented Reality is not the main feature of the app, it's more about a recommendation system based on social networking, something like that. And then, okay the information, it can also be seen in live view. You can scan places, share them and then the first person who picks up something that you left in AR view. I think like small treasure hunts, and things like that but we'd do the project the same, with or without AR. So that the AR platform is like the additional thing.

I: Okay, alright. Thank you very much for your time. It was very helpful. Ehm, and if I could maybe get a card as well, so if there is like any other question that comes up later, that I can contact you via E-Mail.

J: Sure, yeah.

Interview Transcript: Unity Application Developer (EP4)

MJ: You're not going to sell my soul to the devil, are you?

I: Exactly. *laughs* Alright, well thank you very much for your time first of all. I appreciate that. Can you tell me a bit about your current position and your length of AR experience?

MJ: Absolutely. So I've been working with Augmented Reality…is this loud enough here? I'll lean down a little bit. Eh, I've been working with Augmented Reality for about 5 years now. I was on the International Symposium of Mixed and Augmented Realities committee in 2009. I worked with the Human Interface Laboratory in New Zealand for 18 months doing visualisation of buildings actually and doing some Geo location stuff. I worked for a Civil Defense contractor in New Zealand after the Christchurch earthquake using Augmented Reality to visualise damage basically, which was interesting. And then after New Zealand I came to the states and started working for Metaio, and I've been with Metaio for almost 2 years now. I'm a Unity developer, basically an application developer for our San Francisco office.

I: Okay, yeah very good. Alright, so why was it, or what were the reasons you stepped into this AR field? What was the potential you saw in there?

MJ: The fact that the very first time I was it, it was like seeing magic happen in real life. It was something I didn't even know existed and it changed the way I thought things could happen. I mean it changed the way that I could interact with the world. It changed that way, that…it just changed my thought processes. And as soon as I saw it I was just…I couldn't stop thinking about it, and I couldn't stop showing it to people for like a week and then I just started getting more involved and eventually began you know really big involved in it.

I: Yeah, alright very good. So in your view what are the main functions and features that AR applications should provide?

MJ: I think they need to be either…I think there is kind of two branches here. Either…sorry, I think there is three branches here of Augmented Reality. I think two of them are useful. The first one obviously is useful Augmented Reality. For example maintenance applications, map visualisation, architectural visualisation, things that people need and can do better with Augmented Reality, right. These are things that people are obviously working around right now. Visualising models on a desktop or whatever, but if you actually get to bring out the thing in the real world, you get to see the real size of the model. I think that's a very powerful tool. Next, I have started to see some very amazing art installations, basically things that inspire people or get people talking. I worked on an art installation in Australia actually. And that was about Coral Reefs, and so because of the Augmented Reality experience, it got a lot of extra additional press, which was very powerful because of the message they were trying to get across. And it left people talking about it basically. Because if Augmented Reality is done very well, it's like a magician's trick and it inspires people and people want to share it with their friends, which is a very powerful tool I think. The third branch of Augmented Reality would be "BS AR", where you're taking something, which doesn't have to be in the augmented world, and augmenting it purely for the sake of it. Something that doesn't add to the experience, doesn't add to the practicality. All you do is Augmented Reality for the Augmented Reality sake and that is a very dangerous thing that can harness the view of Augmented Reality. Because if

someone who has never seen Augmented Reality before, goes through all that trouble of installing an application, launching it, creating a new account, logging in, and then they get something that isn't magical, doesn't help them and isn't satisfying, they're going to have a bad opinion about Augmented Reality in general. So it's very important to make sure that it's either necessary or powerful before you do it basically, in my opinion.

I: Yeah, alright. You as a developer, when you develop Augmented Reality applications, what do you think is important to include?

MJ: Well, of course great content is really important. 'Cause right now all of the major Augmented Reality companies, ourselves included, are kick-ass at for example marker-based tracking, right. Everybody is as good as you can get with GPS-based tracking, because the issues there are inherent in for example phone GPS systems. No amount of tracking will give you a perfectly stable amount of tracking, if you're only using GPS. So the Augmented Reality side of things, we're very proficient on. And it's basically in the kins of content creators now to make the…to make that final connection between the user and the experience. Because a couple of years ago, you could have good content and bad Augmented Reality, and that would be a bad experience. Now the actual Augmented Reality is very solid, and it's up to the content creators basically to provide the spark and imagination for the user.

I: Okay alright very good. How do you see the relationship between…oh no, we pretty much covered that. Do you think one of those sides, like content or function should be focused on more to attract more users?

MJ: It depends on what you're trying to achieve. If you're trying to…I mean I think content and function are kind of intertwined, because if you're aiming for function and your content doesn't clearly communicate the message, then your content is being detrimental to your function. At the same time, if you focus on function when you're trying to do an art exhibit and you have too many interactions, or you confuse people with the amount of flexibility that your app offers, then that's going to be detrimental when all they need is really the visual experience. So I think it's really important to find the right blend of what's correct for this sort of application.

I: Okay alright. While you developed some AR applications, what were some challenges or problems that you had to face?

MJ: Let me think about that one for a second. I think the…one of the biggest problems that I've personally faced is, I'm not a very imaginative person. And I can visualise things very well and then the reality of the for example content, that actually gets created and the reality of the actual experience is occasionally underwhelming. And that's difficult to deal with, when you build an application that you would pitch and you developed, and you put it all together, and it's…it isn't as magical than you hoped it would be. But I think that's just a…that's something having unrealistic expectations of what Augmented Reality can do, is the fault.

I: Okay alright. How do you see the relation now…because in my research, I've focused a lot on marker based and GPS based, right, now I come here, and there is like marker-less and I don't know what not. But how do you see the relation between those two, marker-based and GPS based AR? What's the advantage, what's the disadvantage, what would you use?

MJ: Well, there are…I'm just going to include everything into marker-based basically, so if we talk about 3D tracking, if we're talking about for example

Metaio's SLAM technology, marker-less…we're just going to put all that under object recognition. And then you got your GPS data. I think they're basically just two very different tools. And it depends on what you're trying to accomplish. Are they both equally valid? Of course. You wouldn't use image recognition for example if you wanted to detect all the McDonald's around you. And show their location. It's just…a bad way of doing things. At the same time if you wanted to visualise a model on your desktop, you're not going to try and put in GPS coordinates. I think they're kind of separate enough that they don't really fight with each other for territory. In the instance of this tourism application, where you would be maybe augmenting hotspots, I think you can find maybe a blend of the two. Where the GPS could detect the user's location and prompt them with a simple Augmented Reality maybe bubble, right, saying that there is augmented reality content and ask him if the user wishes to load it. And if the user does load it, then you could use for example building tracking to actually crisply overlay the two, the content, so…I think that they can, they're very compatible.

I: Okay alright. Have you worked with the tourism industry before, within the tourism industry?

MJ: Within the tourism industry, no. Not as a developer. I mean I've done work as a college student that would have been related to the tourism industry, but as a…as far as being kind of high level, instead of being tour guide style, no I haven't.

I: Okay, how do you see the development of AR in general in the near future and in the long-term future? Where does it go, which direction do you think?

MJ: I think that's a very hard question. I think that it depends on a lot of things. Overall, I mean it's increasing at a very quick pace. Right now, the technology is very solid and again one of the things that's holding back Augmented Reality to an extend is the fact that content is very expensive and very hard to do well. And so the…only the big players are basically able to truly be able to have great Augmented Reality experiences, because while there is tons of garage developers, they're only able to access free models, or have their college student roommate make something. And that is…again obviously affects the experience. Overall though I've seen a very positive trend in Augmented Reality. Especially with some of the technology that I've seen here today. 3D tracking is very, very good and the AR engine, which is a hardware solution for Augmented Reality would be revolutionary. Because what it does, it decreases the battery usage of Augmented Reality by 60 times. So the battery usage becomes $1/60^{th}$ the traditional amount. And tracking localisation goes up 60%. Because it's all of the stuff is all handled on the hardware level, it basically makes augmented reality something that could be run continuously, which right now it isn't. So hypothetically with hardware acceleration basically, the augmented engine, or the AR engine would do for augmented reality, what chips do for computer graphics, which is basically standardise, and take all the processing intensive stuff and take it right to the hardware level, so the CPU is freed up for important things. But…so something like this would be revolutionary, because then you would be able to run augmentation 24/7, whereas right now you're limited to 5 minute experiences basically.

I: Alright, that's very interesting. Do you think, or do you have an idea where augmented reality in regards to tourism could go to, because we talked about augmented cities…

MJ: Absolutely, actually I'm kind of surprised that the tourism industry hasn't been more aggressive with augmented reality before now, because I believe that

just from the top of my head there is a half dozen things that you could do. For example showing old overlays of photos, from specific perspectives. Obviously it's been tried before, it hasn't been done very well, because most of the people have used GPS technology, which means that the photos don't line up exactly, and then you get a weird sense of depth. If you…there is ways around that, but overlaying photos would be interesting, rebuilding archaeological excavations would be very, very interesting. If you go to the pantheon in Greece and you hold up your camera and it rebuilds itself and you get to see what it was like originally. Or getting to a high point in the city and maybe get an overlay where the city wall was. Before it has been torn down. And having that replaced into the real world. So I think in the tourism space, there is…and these three were all kind of related to building, but there is tons of things that you can do, you could have augmented guidebooks to guide people around the city, you could have points of interest that simply tell them where they should go. There is really almost limitless applications for augmented reality in tourism I think.

I: Alright, do you think those platforms, since there is quite a lot of platforms available nowadays, do you think they will converge sometime in the future, so there is one standardised platform for the end-user?

MJ: We've been talking about that actually, not we, I'm not speaking for Metaio here, but I mean individuals. Especially around at today's conference. It's been something that's been on people's minds. I think we're not going to see anything anytime soon. I think that what is most likely going to happen in the near future is standards. Kind of like web standards because currently augmented reality is kind of like the Internet in the early 90s, where everybody is interpreting content differently. Once you have all the content basically going through the same pipeline and being readable by all kind of different augmented reality browsers, then you're going to have the possibility of having kind of a universal application through which to view augmented reality. Right now however, there is just too much segmentation and fragmentation among the augmented browsers what they can and cannot display. That is going to be several years, before we see any universal adapter.

I: Okay. How do you think is the general acceptance of AR technology going to be for the end-user. Because I mean here there is all pioneers and people who have worked long years with augmented reality already. But I've seen a lot of in public, there it's not known that much yet. Do you think it's going to be adopted very quickly to, or…

MJ: I think that there is a couple of things that are going to influence that. One, the augmented reality that's being developed right now isn't very focused on everyday people, right. There isn't really a Facebook for augmented reality or anything like that. It's all very specific applications, for example the Boeing has a lot of augmented reality. And with that it's all very specific to airplane maintenance people, right. So if you're into airplane maintenance, I'm sure you've heard about Augmented Reality. But if you're a coffee barista, there isn't much content out there right now that could attract them. So until you see kind of enough...until you build a kind of library of interesting stuff for people to start viewing, we're not going to see a wide adoption of the public. But I feel like when it does come about, it's going to be much more seamless than it does right now. Because currently, if you want to view augmented reality, you have to find out about it, and then you have to download an application, and you have to research for your content and then you have to view it. And this takes 3-5 minutes, which most people aren't

going out of their way to do. Whereas if you have a universal browser for example, you only install it once, constantly searching for information and it runs in the background and pops up when necessary, I think that that would also help out with the adoption of augmented reality.

I: Okay, how do you think can it be promoted, this technology in order to attract more users?

MJ: I think having…I actually think that the tourism industry could be very helpful here. Specifically because the content that could be created would be very easily accessible by people. I think that would be very high quality work. I think that's something that basically everybody would be interested in. And I think what it's going to take is high quality content, available to a large amount of people for the word to get out basically.

I: Okay alright. Do you think in the tourism industry to…when you develop an AR application, what would be the main, key stakeholders to consider, like the end-user of course, the tourist, but what are the other people that you would think about?

MJ: I think that businesses that are heavily dependant on tourism are obviously key players, so like hotels or maybe shops around key tourist locations. For example you could have a little shopping square maybe in Italy right. And you could have a kind of shopping, a little augmented reality section for that shopping square, you know. You could have discounts or whatever. So I think the end-users will be the ones benefitting from augmented reality. But I think a lot of the people working with augmented reality would be the ones who stand the profit from tourists going to places and repeat tourism and brand association.

I: Alright, okay. Well thank you very much, that was great. Thank you very much. Do you have maybe a business card?

MJ: Sure.

Interview Transcript: AR Mobile Application Company CEO (EP5)

I: Alright, well thank you very much for your time first of all. Could you tell me a little bit about your current position, like job position and the period of your AR experience, like how long has it been working with AR?

M: Sure, my name is Martin Herdina, I'm the CEO of Wikitude. As a company we are one of the veterans in mobile Augmented Reality, so this means we have started the company already in 2009, and we did the first applications for Google Q One already in 2008. So I think we are quite pioneers and have quite a long history in this space.

I: Okay, and why did you move into this AR field? What kind of potential did you see?

M: Well, so I have a quote of our founder, who founded this company in 2009 and he is the founder, I'm just the CEO, I joined the company a year after the inception of the company. So the vision that our founder had was within the travel and tourism space. So he was just like going through Vienna and thought, "hey it would be fantastic to have some type of application that guides me through the city and tells me retrieving information about specific landmarks" and shortly afterwards, Google released their Google Q One, which was the first cell phone that provided access to the sensors, and to the camera, and these have been the underlying technical components in need to build some Augmented Reality, some basic one. And that's how he built the first application in 2008.

I: Okay, alright very good. So in your view, what are the main functions and features, that AR, or in this regard tourism AR applications should provide?

M: So I think the…I think the good and the bad thing at the same time. So Augmented Reality can be used in pretty much every industry, in so many segments and so it's a technology. And the success of AR will not come from technology, but from the actual use cases. And when you talk about travel and tourism the major use case, or the major value definitely provides in guiding the customers through the city, guiding him to relevant points of interest, retrieving information about certain sites and landmarks and doing all that in a very natural way. Because you can also of course read a travel guide, or like navigate using a map, but there is always a level of obstruction. So and Augmented Reality is just like very natural. You hold up your camera and there is certain information being projected into your natural field of vision. And that's the benefit of Augmented Reality in general.

I: Okay, how about from a technical point of view? Do you see any functions that the application should do, or you think are important that they are included in Augmented Reality applications?

M: Well, that's hard to tell because there are so many types of applications utilising Augmented Reality, using different technologies, if it's like sensor based or if it's computer vision, so how do you like mean that question in particular?

I: Ehm, I mean like from a developer's point of view, since I've looked at some from the tourist perspective and they said, "Oh yeah, we'd like the application to do this and this and this…This is important, that is important, but from a developer's point of view, what do you think is important in the application?

M: Specifically in the travel and tourism use case? Ehm, so one thing that's key is definitely the accuracy and the validity of the data. So it's always good to have

like a perfect AR engine, but if the information being displayed is not accurate, if the objects are not being recognised, the data are not there, so I think this is the key factor of the success of an AR application in this space. Second one, being on a technical level, some level of offline functionality, specifically when you look at the high roaming charges, then using an AR application abroad could get pricy, and that's why offline functionality is a very important feature. Third topic definitely what we see being very popular is the addition of some social component. You need some sharing stuff, meaning some kind of locating other people sharing the same interest, either like as kind of temporary social network, are there other people in my hotel who have similar interests and want to join me to watch this landmark? Or are any of my friends here, or have any of my friends been to this city and can recommend a certain restaurant? So these type of features is something we have seen being tremendously popular.

I: Okay alright. Very good. So what were the main challenges, that you needed, or problems that you were facing when developing AR tourism applications?

M: So one being some hardware limitations, so specifically when you work with sensor based AR and you work with…so when you're bound to the accuracy of the different sensors. And when the compass is 3 degrees off, it's no problem when you're standing in front of the landmark, so these inaccuracies are no issue at all. But when you stand on top of the mountains and look at the mountain peak use case, identifying mountain peaks and the compass is 5 degrees off, so you land at a totally wrong peak there. And finding solutions to kind of work around that and on one hand to optimise it, on the other hand to kind of find the right user experience to manage the user's expectations properly, and telling them, "hey there could be some inaccuracies, or like showing some kind of ranges" so that has been a major challenge in this space. The other major challenge has been, as I mentioned this earlier, the quality of the data, so that's why we connect really really many sources of data to make sure that for all the relevant points of interest we can provide the right quality of the data and accuracy.

I: Okay, alright. How do you see the relationship between content and function in developing tourism AR applications? Do you think one side should be more focused on in order to attract the use, or…

M: No, so I think those are the two pillars of the whole equation. Because technology is good, but if the content is not good, nobody will use it. And the other way around, if there is great content but can't be displayed well, or the performance is bad, the users won't adopt to it either. So I think it's key to really invest in both areas at the same time.

I: Okay, alright. How do you see the relation between marker based and GPS based AR? What are the advantages, maybe disadvantages, and how can they be overcome, maybe?

M: So two different approaches. Every approach has its pros and cons, every approach has certain segments and use cases where one of the other is suited better than the other. When you think of a research topic, that is something we are currently researching a lot in is combining these two. And kind of compensate weaknesses of one technology by the other. But per today, marker based Augmented Reality is specifically relevant for advertising use cases or for kind of manuals and instructions and stuff like that. It's of course…I think it's highly relevant for indoors an tablet use cases, I think when I'm sitting at home and browsing through a magazine, then I think marker based is a perfect use case. Marker-less Augmented Reality is mostly used for location based services, travel

and tourism, and therefore is mostly an outdoor scenario. So that's how I would classify them.

I: Okay, alright. How do you expect AR to develop in the near future and long-term future? Where do you see it's going, in which direction?

M: When you look at like the Hype Cycle, then Augmented Reality has passed the hype, so we are no longer a hype industry, and we're moving towards a phase where less people are talking about AR. The reason being simply…I mean people, less media are talking about AR, which is actually a positive thing, because it's nothing people talk about, they just use it. It's part of like everyday life and this is actually the mid-term stage we're about to enter. So like what we already see right now, most of our location based services apps, of our tourism travel apps, already have an AR view in there, AR function in there. Pretty much all of the major consumer brands have already done one, or multiple marketing campaigns using Augmented Reality and the key thing which already started to happen, already like a few months ago, is simply that it's no longer Augmented Reality, it's more the focus is one the use case per se and on the brand, and AR is just a facilitator and I think that's a very good thing that we're moving away from the hype and the technology focus, to really an end-customer value creation focus.

I: Okay, alright. But when you talk about 'Hype' and this is one of my other questions actually, how do you think…because the public actually, many people don't know about Augmented Reality, yet. Saying, for many people it hasn't reached that hype stage, yet. So do you think it's easy to adapt for the end-user in the end, and they will adapt to it very quickly, or…

M: Well, I think and that's the intro of a hype. It's covered by very few people or like adopted by very few people. It's covered by a lot of media, but it's far off from a mass-market service. And that's what I said, I don't…I don't need that the customers know 'AR' it's enough that they have the app and they switch to 'Live view' or 'Camera view' or whatever. So one project that we do now is …that we integrate with the camera directly. So that means in the camera you have like little note wheel that says, "hey switch to AR mode" so the customer doesn't have to think, it just works. And the customer doesn't realise that there is Augmented Reality behind it. It's just like, "hey it's just like a 'live mode' mode" or whatever. That makes it much easier for the customer to adopt. That it's directly integrated with your hardware features. It's called differently than Augmented Reality. He doesn't have to worry about the technology. It's just there. And yeah.

I: Okay, alright. Do you think the platforms, since at the moment there are quite a view platforms here. Do you think they will converge in the future that there is one standardised platform to use for the end-user?

M: Difficult to say. I don't really believe in an AR platform too much, as a kind of central entry point. So we have seen that and as we had so many millions of users who use Wikitude as a kind of platform or suppose to use it as a platform. But still if you talk to those users 20% of them say, "hey the reason I use Wikitude is because I want a Travel and Tourism application" and we have 6000 different use cases in Wikitude, but still the Top 5 are all related to Travel and Tourism. And this would be the same in other platforms, so it will be either like a 'print magazine platform' or something else must be very specific to a certain set of use cases. And the game will change through AR glasses and wearables, because then this device is your entry point into AR. And then you need to have like one platform sitting on this glass that kind of guides you through that world and augments everything you're interested in. But like the smartphone perspective I

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think it has…so regardless whether the brand is called Wikitude, or Layar or Daqri or whatever, I think these are not strong enough in the mind of the consumer that I start Daqri to use Augmented Reality, but more…I start Wikitude for Travel and Tourism or I start Layar in the magazine. I think this is the kind of perception people go through right now.

I: Okay, alright. So what do you think about the Google Glasses and where do you position yourself in relation to the glass project?

M: Google Glass I think is a very exciting project. It's the first wearable computer that is mass market ready, or almost mass market ready. It's not an AR device, yet. It's like a screen in front of your eyes, which is really ground breaking in my perspective, because it opens up a totally new industry. When you talk about 'Hype' earlier, the AR hype might have passed, but now we are in the early wearable hype and the kind of the AR industry benefits from that hype. How do we position ourselves in there. So Wikitude enables use cases. So either through our platform or through our SDK, and we have like 25.000 developers already, we have more than 1000 projects out there and this is where we enabling, or facilitating the creation of AR use cases. And that's exactly how we see ourselves for the Glass initiative also. That our SDK will work on Google Glass and Google is not the only vendor. There are 10 others who work on similar projects and the Wikitude SDK will work there and will help the developers create easy and exciting applications for that particular device or device class. This is exactly how we position ourselves in that segment.

I: Okay, alright very good. How do you think AR could be advertised in order to encourage its use in the tourism industry?

M: By not being advertised at all. So as I said, it should be part of a tourist application. The implementation should be done very well, so it's really high optimised for that particular use case and the UI, the user interface components, all are really tailored to that particular parts achieving that goal you want to achieve there. Probably like as a travel guide or whatever, and make the access as easy as possible and make a prominent proposition within the application. And I think that's the most important thing it needs.

I: Okay, alright very good. Let's see…how do you see AR to…I mean you have quite a few experiences working in the tourism industry already for Augmented Reality, but how do you see it develop in the future? Do you see anything else than for example Augmented Cities, do you see any other approach in there, or…

M: Yeah, so what I definitely see in the current market, Augmented Reality in Travel and Tourism is mostly this sensor based AR, "hey where is the Eiffel Tower" standing in front of that, giving me information about that. So which is already good, but it's very one-dimensional. I think the future will go to a lot more interactive use cases, meaning could even be through some kind of gamification elements, could also be the case, if I'm standing in front of the museum, and then I'm going in there, that it guides me to the different things that I'm interested in, so I think this goes along with certain semantic concepts and personalisation concepts in there, that based on my preferences it guides me through the things I'm interested in. And when it comes to technology wise, it will incorporate computer vision with things like indoor information or like getting information about certain…I'm not sure…restaurants and stuff like that, so pretty much.

I: Okay, alright. Just a last question actually, having worked with the tourism industry, and having developed AR applications for that particular industry, what

were the key stakeholders that were considered? Or what are the key stakeholders do you think that are important to consider?

M: Well, one being the distributor, like one as I mentioned, we now work with a large manufacturer, so that is key. So there is somebody who needs to bring the application into the heads of the customer. If it's preloaded, then it would be like Google Play, or iTunes, but I think that's key to really get as many eyeballs as possible. Second big stakeholder are of course the provider of the data. How can we insure the right quality and the right quantity of the data. For instance it's really difficult to get good tourism data in China for instance. So that's why we don't promote the application, because we know that our content doesn't meet our standards, when it comes to…or our Chinese content doesn't meet the standards we're looking for. And then third big I wouldn't say stakeholder, but success factor is the UI. So really make it as easy for the customer as possible to really satisfy his needs and guide him. AR is such a new technology, so really take him by the hand and guide him how to optimally use this technology in this application.

I: Alright, okay. Well, thank you very much. Thank you for your time and I hope we stay in touch.

M: That's okay. Yeah definitely.

Interview Transcript: AR Marketer (EP6)

I: Alright, I'm just going to put it right here. Well, thank you very much first of all for your time. Like so spontaneously. If you just tell me about your current position and how much experience you have with AR already in what regards.

D6: Yeah. So, I've been hands-on actually creating and monetise AR campaigns for about a year now. I come from a print publishing background and about two years ago I saw that industry was dying. I read a Mashable article, which pretty much was the first and last time Daqri has been in the media before yesterday. That was talking about this Daqri company that was using QR codes and which was creating 3D content of it, which I was amazed by, but what really made me think was, it said that it's trackable and measurable off-print, and I went, 'well that's what we need in the printing industry' is a good line in print. So I then signed up for the beta testing, and I made the invite and within minutes, I made a 3D thing come off a QR code and it just blew me away. And then I went on the Internet every night since then for like an hour teaching myself about it. And that kind of lead to me coming to ARE last year, I've properly met Daqri and they said you can go and sell our stuff, so I did. But I met some amazing people, Dave Lorenzini who is kind of my mentor, who is the founder of Google Earth and he's here. And he works with Google Glass, so that's kind of what I do now, I've got my hands in many different aspects of Augmented Reality and I just, I don't miss anything in the AR world. I watch everything super closely. I know exactly what Metaio is doing, what Aurasma is doing, what Vuforia is doing. Yeah, know your enemy as good as well.

I: Yeah, exactly. Know your competition. So in your view what are the main functions and features that AR applications should provide? You've seen a lot of different AR companies and approaches. So what do you think is the most important that they have?

D6: The most important thing for AR is it needs to have an intuitive user experience, like intuitive user interface first of all. But that's just a short-term thing really. Because eventually people will be comfortable with AR and it doesn't matter if you have cross hairs or you're loading up on point Cloud or whatever. People will know that something is going to come to life. So that's just a short-term strategy. Beyond that I think it's just really important to tell a good story, a good narrative. I ultimately think we should have people able to make their own imprints upon and AR experience and leave it there, which is like storytelling in real life. People retell stories, there is an aural tradition to it. I'd like that to happen in AR and it is coming, but at the moment, we've got maybe 20-30 seconds with full hardcore, decent polygon 3D with a decent story and to leave an impression to people. So I think that the story telling syncs concise engaging storytelling is everything.

I: Okay, alright very good. So when people develop AR applications, in your opinion, what should be included? Besides the story telling, it's like in terms of content, what about the functions? What should it do?

D6: Eh, in terms of functionality it should have, I think in terms of functionality, in terms of user experience, I think that first of all, there has to be decent call to action at the moment. People have to be told in Bold prints, 'you need to download an app', 'you need to activate it, and scan this page.' And there is a lot of brands that don't advertise it enough. And they really need to tell people at the moment,

right now. It's just a risk management thing that they don't make it apparent at the moment. But then, when people get inside it, when people activate the camera, I think there needs to be from a user experience, I think there needs to be a cross hair thing so you know where you're pointing. I think beyond that it needs to be intuitive about where you're looking at. Are you looking at a replacement part and you're SLAM mapped it and everything. And therefore there was a guy in the conference who had brought up, if you're only looking at one part, when you're meant to be looking at two parts, it brings up the other parts, like in a little frame in the bottom of your screen and it says, 'no you need to go back' so I think there really needs to be a full 360 degree element even in marker-based AR. Whether you go into the full 360, and you're getting a 360 view like I showed you before or you're doing the whole pull away, come back or you do go from a marker-based AR to another type of AR like the 4D virtual overlay that you can, it's just like an alpha channel sort of thing. Yeah, I think you really need to have that as part of user experience. As I said before otherwise people feel that there is a disconnect, you know, it's like, it's a bit like someone telling a story over the phone and the phone cuts out for a second and comes back. And you know, it just ruins the magic. And above all, I do know that everyone says this, but we do need to get away from gimmick. People say gimmick, I actually don't mind gimmick, as long as it's part of a good strategy. As long as it's part of a good story telling. There is a great example from Metaio with the Huggy pull ups campaign with all the Disney characters and all sorts of that kind of thing, which is very gimmicky. But it's all about potty training children, and by potty training, it unlocks credits for games that they can use. And that gamification element in rewards, intuitive rewards and that sort of stuff, I think that's really important as well. And that's if you think about gaming being so powerful, and everyone in the AR space is. The thing about gaming and if you think back to a game and it always started you at the beginning. It didn't remember your High score, it didn't remember to what level you're in last time, games would totally suck. And that's why you need to have a bit of an imprint in AR as well, or people won't come back for a second shot except to show someone looking over their shoulder.

I: Yeah, exactly that's true. I don't know if this question refers to you a lot, but what have been the main challenges to overcome in your point of view when generating AR experiences?

D6: The main challenges to overcome from a development standpoint is, I mean certainly image recognition is a real big problem. If you're dealing with life objects, you have factors like lighting, shadows, but really when you're dealing with markers at the moment AR has to inform how markers are created by some extend and that's a problem you know. Because if brands or instruction manuals or whatever want to have generic graphics on every page and because the image recognition software has to be quite forgiving, it's too forgiving sometimes and what caches in your device, it can have an effect. Like what you're bringing into that cached experience, so that's a bit of a problem. Connectivity is another problem that I encounter, 3G vs. networks vs. 4G vs. Wifi and the load time, if you're loading in a very big experiences, trying to find in an animation environment combined with dev, trying to find as much economy as possible but what happens, what inevitably happens is you get devs and animators, who inevitably want to show off by putting hardcore complex lighting in there, 30-40.000 pixels of polygon counts, and this is stuff when ultimately all you need to do is tell the story. And sometimes you don't need to get hardcore about it like in

terms of CGI quality. I think that's the biggest thing that's happening in the AR world right now, Creatives vs. Devs. And devs just want to push this and push this and take it as far as we go and the creative want to make it as relevant and as something that people will adopt as fast as possible because then over all of that you've got the guys who raise the capital for all those platforms. We've got to have some money in order to raise the capital, and monetisation is a really big problem for people. I mean some people think they're going to, there is all those sorts of argument whether you're going to make money from marketing at the front end whether you want to make your money from the data at the back end, whether you want to make it from SDKs, everyone is trying to figure out what the best way is to make money out of it. Coming back to what the biggest challenges are, I would say it's image recognition and connectivity, most of all.

I: Okay, in your opinion, what is important to include in those AR applications?

D6: What's important to include? Do you mean in the skin type of front end, or the right label sort of front end?

I: Both of them.

D6: Okay, I go out and promote and venturelise AR in one way, saying that we can put a library inside of an existing app because apps have a 12 months drop off rate, so all heavy content apps get deleted off people's phones, or 87%, sorry. So having AR will reinvigorate that. I think you can either say that AR is going to be pure camera, pure computer vision, and as soon as you activate it, you go straight in, or for example what we do with Target is, they have all this content that relates to AR, so for example there is a repository that's back in the content part, where when you activate AR it talks back to the repository and you collect tokens and all that sort of thing. So I personally think that there is such a big market out there for apps, that it is still important to have a bit of content to an AR app, but in the end of the day you still have to do the actual scanning and function prominent. So what's the balance of that, I guess it depends on the campaign but ultimately you want people to switch the camera on, and then user interface wise, I think that keeping the interfaces economise as possible is best, like a little icon at the bottom that brings up the ability to turn on the light, that brings up the terms and conditions to use AR so we don't all get sued. But ultimately just leaving the camera on. I guess the only problem is that AR looks a lot like the basic camera function of any device. There is a lot of confusion about it as well. People when they see me activating AR, I turn around and people are around my shoulder with their iPhone cameras on, 'nothing is happening'. So I think it is important to visually distinguish AR, and that's why you see a lot of platforms recently have started the scan bars coming down and have lit up all the points. Actually I really like Blippar's user interface, I like Daqri's as well. They both light up the points and that's really important, especially if you're working with 4D that's working in 3D, it's going to take a bit of load time. But yeah, ultimately we're trying to get people hang in there until it loads.

I: Okay, yeah. Alright very good. We talked about a little bit about the functions and content, but what do you think should be focused on more in order to attract more users to use the AR technology?

D6: I think it's all content. Or…I don't know actually I think it's got to be, no I think it's content to be honest. Like there are people out there, there are AR companies out there that are bringing out simple PnGs, alphachannel PNGs, touchbutton stuff, you know, road or scope videos that sort of stuff, and that's really simple as far as AR is concerned. To do that it's so simple. What's hard is

to do the full 3D. But in the end of the day if the why it's done, like if the floating PNG is done in a really amazing way like for example it's a floating PNG will activate other PNGs that allow you to use another language over something that you're looking at, then content is everything. I really think until we get to full on movie CGI quality 4D, it's going to be really hard to hold people just through pure spectical line.

I: Yeah, okay. How about the relation between marker based AR, or with the SLAM now, markerless based AR compared to GPS based AR? How do you see the relationship between the two, what are the advantages, disadvantages maybe?

D6: Well I know people that are combining the two and that's really the way to do it. It's actually three technologies that need to combine to really make that work. One is of course the SLAM or some people are doing a snapshot based thing, when they take a picture, it forms a point cloud and then the person manually matches it up. Then it locks in that real time marker and then they can actually, because the problem with Geo is that you have actually a really bad framerate. But if you lock the Geo to the real time marker that you just created, whether you do that through SLAM or snapshop then you get a real smoothness of action. In order to do real time SLAM and completely augment natural environments on the fly for example, and that's what needs to be made for natural environments, it's pretty hard in natural environments with sunlight and shadow and that sort of thing. But in order to do that we need to get into two or eight thousand point Cloud which at the moment the current CPU of most current devices will only allow two thousand. So we are actually quite a way off being able to do real time SLAM. We can do preSLAM map an environment which is kind of great to create all those textures and surfaces for working in Unity and match up to AR and that's what a lot of the industrial stuff you see here is doing but real time SLAM is a lot off that. Everyone is doing the RND one of that though. But until that happens we've just got to do the works, snapshot works around it. I think Geo location AR is all but dead. That's it though, maybe it's just dead around the circle I'm moving, because it's just not exciting for anyone here. Everyone out there is doing it through POIs or Wikitude or whatever. I think Geo fencing actually will play a big part in the future of AR. Geo fencing, pre-fencing the environment around Geographical areas. So that you can actually change the surrounding AR experiences knowing which area someone is in off the same marker. So if someone is carrying a marker with them off a catalogue or whatever, you can actually change the experience when they go from zone to zone as you've predisposed them to. There is an SDK called Gimble from Qualcomm that combines Geofencing with the Vuforia image recognition with an actual audio sensory Shazam style and I think that when you bring all those technologies in, so the Geo fencing of AR, the audio sensing, so maybe listening to audio off a television ad or radio ad unlocks AR but even those Girl in there today, Japanese girl from a company has the little plug-in from a mobile devices that releases a scent. And even to bring an element of that in because augmented reality is all aural as long as you put some sound in there, but some people don't. Aural, visual, kinaesthetic as you've might have seen in the Daqri stand with the brain sensor and then when you bring in olfactory senses and you've got this incredibly immersive environment. And I think as soon as there is a body of work such as the one you're doing more studies about the psychology and the imprinting of having all your senses activated instead of sitting in front of a TV screen where all the money goes at the moment and going into an alpha channel state, where you watch TV for four hours and you go to bed and you go, 'I don't even know

what I watched. I think I watched the Voice.' So you're actually not absorbing anything. In AR it's undoubtfully a memorable experience. We just have to prove it. We just have to prove to people that…when I was doing acting back in the day, I did like six and a half hour plays and that sort of thing. To learn that much script, you used to always walk and learn your script. Because when you're moving kinaesthetically you enter memory more into your body. So in that sense close in Augmented Reality choosing an angle from which you're looking from you are anchoring that experience into yourself so much stronger. There is a lot psychology around that and there is also a lot of psychology around if you put a product in front of someone and it feels like it's in their home, it could be a polaroid experience in their screen and then you take it away then people feel actually intrinsically feel lost. They feel they have built that sense o f ownership when it was in their space, when it was in their home. And then you show them this iPad the latest generation iPad 5, which happens in a few days. You show them the latest gen iPad, and they're looking on the crappy old iPad 2 or whatever, and then you allow them to have some functionality in their space and then you take it away and people go, 'well the only way I can plug this hole in my heart is to buy it down in the Apple Store' so I mean there is actual laws against putting things in the hands of people in actual stores actually placing it in their hands, because the compulsion to buy, once something is in your hands is so powerful you know. And AR does that. Again, we just need more studies and all that stuff.

I: How do you expect AR to develop in the near and long-term future and in what direction do you think AR will go?

D6: I think AR first of all I think there is two tracks of AR. One thing is everyone is going for the brand and advertising dollars because there is so much money there. There is another track that goes into an industrialised direction, into highly monetised mining, golf. There is construction, real estate. So I think I believe that AR really needs only one or two really big well executed campaigns that it given their time in the sun and every market will sit up and tight and notice on that side of the coin. Undoubtedly, it will reach traction with industrial industries. All they're waiting for is the hardware to catch up. That's all. And generally they're waiting for eyewear. But you know as far as marketing, I know that in two months in Australia I've had agencies come to me, where a year ago I showed them AR, and I thought I'm going to become rich within one month but it was just a bit too early. Or a lot of them had dabbled in AR three or four years ago and got burned. Because the technology was not vast, super expensive an absolute nightmare. They weren't creative technologists, they were usually just technologists, and you had brands dealing with devs for the most part and that can sometimes end up in tears, so they didn't take straight away, but in the last two months, a lot of brands came up to me and said, 'hey' every brave we're getting from every market it says, 'we want to do Augmented Reality with this. What's going on?' and I believe what it is, it's all about that Google Glass hype. Glass is not AR. You can crack it and you can run some image recognition, some geo location and that sort of stuff but the fact that Google is calling it augmented reality eyewear is fine with me, is fine with this whole industry, because it's suddenly putting all these words that previously everyone thought sounded like the cruellest name in the world for child type thing, but suddenly it's becoming acceptable. They're putting the name everywhere. I mean I have an app called Zype that calls all the latest articles from the last few days online on this Augmented Reality section that I read every morning. That's why I know everything that's going on. The first five-ten minutes

when I wake up everyday I just read everything there. And it's just expanding, the amount of content on AR, and a lot of it is Glass related at the moment. But it's going to help us. I think even though it's a miscommunication to people it's putting it out there.

I: Okay, do you think that platforms will eventually converge in the future and become one standardised platform for the end-user?

D6: I think that someone will have to become a 'Google' of this space. Someone will have to become the backend of this space I think. And someone will have to curate the content. At the moment everyone is going for image recognition and AR engine. But really what it's going to be about is content. I think that it's a race to see who can make, it's a bit like the Youtube brand. Youtube has turned everyone…Youtube and smartphones have turned everyone into producers. Everyone can produce content now. iMovie that can edit it up, or whatever. Those two factors made suddenly 24hours of content uploaded every minute onto that platform. I think as soon as there is a really good publishing platform, I think things will really start to explode. I think there needs to be tools for creation. There is some great production discount now, 1-2-3D character creation. You can actually create random objects and export them. As soon as everyone joins all the dots, for architecture, joining rivets to an AR engine or whatever. As soon as people can create 3D content easily and then they can put it into the back of an AR engine I think then it's going to explode as far as, I think someone is going to win the race, to be honest though. I think someone will win the race to be that image recognition and that content management system. I think there will be a Google of the AR world. And then there will be hardware wars. It will all come down to hardware, and it will be the usual players, Apple, Samsung.

I: So what do you think about Google Glass in general?

D6: What do I think about it? I think everyone is going to buy it. I think that a hands-free up and out into the world taking people back, stopping people from being focused on those tiny little screens, not giving all the work to car practice, which apparently, they get 5times more work since 2007, since the iPhone came out on net travel, because there is even syndromes with people hunched over. Actual biological conditions, physiological conditions, so I think it will bring people up and out. I think it's very simple at the moment, the whole card based thing is beautiful in its simplicity in many ways. It mat not do everything that your Android, your Samsung Galaxy, your iPad or whatever does but it does a hell of a lot. And I think that as far as being engaged with information on the fly, I think it could change the way people speak. Imagine for example the speech recognition is pretty good but if your whole world revolves around speech recognition and you get some errors, people will start speaking in a more pronounced way, they will. And what does that do to accents, what does that do to…and I think that's an amazing thing to look at. I think that in terms of engagement, interpersonal engagement, where people think that people will be disengaged from each other, because they have a little screen in front of their eyes. You can see when the screen is on, I mean it should have a little red recording light as well, but you can only record, well people are creating apps, you hack apps that you create. But it uses the battery life, but you know I think there is so much possibility to it. I mean in the end of the day you have a bone conduction audio system in it. And you think about that in terms of hearing impairment. That's huge. Think about it in terms of a whole economy building around a concept of a hangout. How much would you pay to spend 5 minutes looking through the POV of Kelly Slider as he surfs in

Hawaii on big waves in real time? How much would you pay for that, or how much would your 13-year old girl pay now to look through Kim Cardashian's eyes? I think there will be a whole economy that will be developed around Glass. I think there is so much functionality in it. It's just a different form of functionality than we're used to. That's why people are going, 'oh cards?' But maybe cards that are limited to only a few words will maybe make you start speaking more sync singly, maybe we'll learn. And hopefully we will not have our language dumbed down to what Google understands. I guess it's going to make a world full of Googlers. And I have a personal problem with that. Only because Google has these IP based algorithms that know what you like. For example, you don't believe that 9/11 happened. You believe it's all a conspiracy. Therefore, you go online and you type to find something about it. It will give you stories to confirm your point of view. These algorithms exist. They're real inside of Google. If I go to your laptop and I type the same search into your Google engine as I do into my own, we'll get different results. Because it knows what you like, and it will tell you what you like, what it thinks you want to hear. It will tell me what it thinks I want to hear. And it will be the same with Glass. So the Google search within that will tell you things that support your own ideology of the world and philosophy. So you're actually narrowing peoples' ability to stumble across new things, and to have certain discoveries. So we may see through Glass, which will be ubiquitous. I think it will be adopted enormously but we may see a world where people actually move into archetypes of their own ideology. Archetypes of whatever information is online. So something like you may see heaps of different communities developing heaps of different versions of fortune, you know. Or the anonymous came from, you may see all those different fractions developing. Anyway, that's quite high in the sky, but it is true that there are all the algorithms there. Because Google wants to pigeonhole you. Don't forget that their user interface inside Google analytics is quite restricted. So they want to be able to pigeonhole you into a certain group. This demography, this sociology. They want to be able to force you into a group that they can then show in a graph. That's their own. They can't show the amount of diversity in the human condition. So and in the end of the day they're just trying to sell you advertisement that might interest you.

I: Yeah, fair enough. Very good. How do you think, or do you think AR should be advertised at all, and how do you think it could be advertised within Tourism maybe even to encourage the use maybe the end-user?

D6: I think that AR…it's really hard to advertise because of traditional advertising mediums. It's very hard to show AR on a TV screen. It's so experiential. I think that it really needs to be something that's put into the hands of people. Incentivise it basically. Give people an incentive to activate it. I think that's the only real way. I mean you can put it out there in the media as much as possible, but media just goes to what is hip and what is cool today so and Augmented Reality is pretty amazing, but maybe it's not amazing enough. It's not the absolute latest thing, so I think the only way to do it is on a campaign to campaign basis. I think to advertise it as a medium I think that's a conversation that needs to be had with media people to justify its place in medium. And all the ROY and the metrics and analytics that come from these campaigns that we had in the early days will help them hugely. But it needs to be viewed as a channel and it needs to be defined and it actually needs to have some standards. Because there is some people doing some really crappy AR out there at the moment, and that really reflects bad on all of us. And it's people doing AR and still associating QR codes with it. There is people here

in this conference with QR codes, and it's just like…we haven't really defined our standards yet. It's hard to promote ourselves as an industry. Everyone is also getting their patents locked in. Everyone is really secretive. Everyone is competitive, but they're also at the same time, well everyone wants each other to do well, as well. It's a funny odd thing. We're all friends and enemies. But in this industry in the end of the day, I don't think there is anybody who is really going to lose. That's here as this event in an exponential growth potential. And if you're here in the early days I think as long as you keep up with things, someone was telling me they saw someone here who was in ARE last year, who was all over it, totally up to date with things and then had a nine month break from AR and they just lost it.

I: Yeah completely disconnected. It goes so fast. I'm also amazed compared to last year when I started to look into AR, like now my understanding is so much more precise. And it's amazing how fast it develops.

D6: Totally. I've just being completely in the day pin. I kind of represent myself as a tech person, but people go, 'oh we don't all have computer engineering degrees like you David' and I go, 'I don't have a computer engineering degree at all. I've actually got an acting degree' which helps. But you just need to move fast, you need to be able to adapt, change, let go of something you fell in love with a few weeks ago, because it's not going to work.

I: Alright just a couple of last questions actually. How do you think AR, like you've told me you were in New Zealand, you were in the Tourism Board a bit, how do you think it will develop within the Tourism industry? Do you see any potential there, or which way do you see there?

D6: Well, first of all Tourism is very geography based on the one hand. So you can think about activating AR through, with geo elements into…but ultimately I think with Tourism it's more about a path to purchase, it's more about giving people a sense, telling people a story about a place you want them to come to through AR and then rewarding them when they've come with another. I think that's it. It think it's got to be. I think tourism is a really hard space to conceptualise AR in, it really is, but for example you can through image recognition you can allow people to go on an amazing race or something like that. You can time them going from place to place, you can also let them, allowing people to make choices about what AR they view in a certain place, what mixed reality they see will be enormously informative for tourism authorities. Knowing how people engage, like how foreigners are engaging with their city. Because at the moment they only get facts and figures from companies that are doing tourism based activities. But even then the metrics aren't great. I know many people came through the gate and had their passport stamped at the airport and then they go and hotels don't have a lot of vacancy at the moment, that's great but really their metrics and analytics otherwise are very poor. So you can actually through image recognition be able to track what people are viewing, when they're viewing it. Then you can actually better accommodate which is obviously natural to people visiting Sydney, and it's very hard for any of us, or Dublin or whatever. It's very hard for a Dubliner to predict because you've walked those streets all your life. You go, well what would I would visit if I was a foreigner, as a tourist. What would I like to see? How the hell do you know? Maybe this nightclub today or whatever, but in the end of the day that's the problem is you've got those people that are too close to it picking what people want to see, or creating experiences that they think what the tourist want to see. Why not ask the tourist what they want to see through Augmented

Reality? Allow them to vote. There was a brilliant campaign done by the Japanese tourism authority that was an app that allowed you to take photos. And the more photos you took and shared, it was after the whole nuclear disaster, and they wanted to bring tourists back. For all the photos you took, for each photo you received, and shared, you received a minute of free Wifi anywhere in Japan. So tourists who always wanting connectivity, they don't want to sit in Internet Cafes. They've all got mobile devices they brought but don't switch on, so it doesn't cost them a million dollars per minute. So something like that was pretty amazing. So if you can basically incentivise tourists with something like that. That's the other big thing when it comes to Augmented Reality it's mobile driven. Tourists don't tend to use mobiles at the moment. So in order to drive Augmented Reality you have to give them access to your network, which is going to be an interesting discussion between the government and Telcos. But you need to give them connectivity, you need to incentivise them and then you need to bring them to crowd source to tourism in the future. I would say that's the biggest phrase that I can give you in relation to that is, AR will allow crowd sourcing of effective tourism.

I: Okay very good. How do you see the acceptance of AR technology once it comes out to the public? Do you think it's going to be fast adapted, or do you think it's actually going to take a while for people to adapt it?

D6: I think that if there is brands that create strategies it'll be adopted fast. The problem at the moment is there is brands that are just doing those flash in a pan campaigns. They're giving it a go and not promoting it well enough. They're giving it a go, and they had a go, and they're going, 'well yeah it's not that great. We didn't get the great metrics and analytics from it.' But in the end of the day, I say to them, I say 'what's your 4D strategy? I'm promising you that you're going to add five pages at the end of your brand and style guide about how your brand looks in 4D, so you better stars in working this out.' And AR is not a spectator sport. You got to get on this bike and ride it, and learn in the hard way a little bit. Because people, users are not like, the way people engage with you and your brand and your story is going to be different on a case-by-case basis. You can't, if you're FNCG drinks company, you can't expect people to engage with your brand the same way that people are engaging with the real estate agency. I guess when brands are making AR into an actual strategy, into a media channel, then you don't have to have people downloading apps all the time. If they like Coca Cola, and Coca Cola is going to do campaign after campaign in AR, then all you need is that one AR browser, and there needs to be a greater frequency of campaigns as well. If you activate one AR campaign and then you don't activate another one for two to three months, people will delete your app, because they will download a new one onto the first four screens of their iPhone. And I have this four-screen policy I think most people stick to. People will keep four screens on their iPhone, and they will fill them. And when they download a new app, it goes to screen five, they will delete the app they like the least and make room for it to keep everything. So that's why you need frequency of campaigns and strategy. Once you do that, we will absolutely hit the mainstream. So if you're talking to for example a tourism authority in Ireland, then you need to keep doing campaigns. You need to keep delivering content and make them more relate to each other as well. Tell the story of a group of tourists, allow tourists to tell their story about Ireland and continue their story. Because you can change up the content on the Cloud. It can be the same brochure, which is actually another amazing form of monetisation. With

fluctuating prices of the foreign exchange rates, you don't need to keep changing the brochures, you don't need to print brochures so much because the pricing comes up in real time. Anyways, that's something different all together. I've forgotten about that idea in my mind. Anyway, but I think telling a story and staying consistent with it.

I: Alright, that actually brings me to my next or last question, which is, when you do create those AR experiences or develop those applications, what are the key stakeholders do you think or the key people who are interested in the application to get a benefit out of it in terms of tourism?

D6: In terms of tourism, actually the owners of current mobile applications who want to reinvigorate their applications on the one hand. On the other hand within the tourism space I recon that hotels could be big players, only in terms of when you're looking like when you want to use AR for social, location mobile, SOLOMO and you allow people to print imprints of themselves of your hotel and it then connects to your social media, so when you're in a city and you're looking around the hotels you can actually see the imprint of people actually left at the hotel. Or most people don't book the hotel when they arrive in the city. Most people book it in advance. So I guess also, I recon even restaurants, when you have dwell time at airports, when people are on their way into a city, if you can actually have an augmented reality piece, I'm actually thinking on the spot, but if you can have a hero, you have plates from each restaurant and choose your price point, you can have all the restaurants join together and match all their funds, and the tourism authority matches them and they all get to put their favourite dish, and you can scroll through the dishes like they're actually in front of you and then from the dishes you can actually book at that restaurant from when you arrive in Dublin. So from restaurants in Dublin in the end of the day, it all comes down to like I just made up, a bit of strategy. Just thinking outside the box. Giving people a sense of the history of the place through augmented reality. I think, if you want to bring older people into the augmented reality space, history is the way to do it. To allow them to in an immersive way relive yesterday. They may have never have got to travel to Dublin in the 1960s and 70s but heard so much about it, so maybe they'll want to see a little bit of what it was like because they missed that time and they've always felt like, 'I missed that.' And they go to Dublin today and go, it's totally different to the old images from what I've seen on how there was a hippy scene here, or whatever. So you allow people to almost feel like they can peek into the past a bit as well. Tie that into their experience. Allow them to network with through using AR allow them to network with locals who are older people who want to tell the stories of the city. And with geo fencing this sort of thing, understand where someone is, and there is actually an old person, a Dubliner who has registered himself in the area will happily just have a conversation with a tourist. Screen them, make sure they haven't got a criminal record or that sort of thing. And how amazing of an experience would that be, if you'd actually have a Dubliner, who is retired, who is bored, who just love to tell stories about the city. Who is happy to link with someone and meet them in a café and sit and have a discussion and activate that through the image recognition of that. Do you want to speak to, like imagine so you're activating a place that used to be a dancehall or something. Again I come back to Templebar in the area, I don't know my location very well. In any case, you have an old dancehall or whatever and you point at it, would you like to speak to a local who is, who went to this dancehall, so go, 'Bang, yes.' And it brings up a phonenumber, and you can actually phone up that person

and go, 'Hi, I'm from Australia, I'm David, I'm just here in Dublin for the day and the dancehall looked absolutely amazing. You used to go there? I'd love to..' And all they're asking in return is you buy them a cup of tea or something. I think that would be a powerful proposition. And there is so many bored retirees out there with so many, or widows or whatever. They just want someone to chat with. Maybe there is a location. Maybe you can make it to some kind of event thing where you use one of the squares, so it's safer. Yeah a public space, it's the meeting space for Dubliners to talk to people about tourists.

I: I don't want to take too much of your time to be honest. It's just too interesting. It's almost an hour.

Interview Transcript: Dublin Tourism Consultant (EP7)

A: The idea in the Dubline is the zones, that zone is green and the next zone is blue and then sort of characteral areas. And in Dublin while these are known they're not really used on the streets, so we're trying to get the idea of those characteral areas and what we're hoping to do then is, in Dublin there is those way finding signs and on each sign there is a little cap.

I: What are your thoughts about AR, you have worked with many businesses mainly in the print, but where do you think AR could fit in in what you provide at the moment generally?

A: I think the big thing is the layering of information in street zones back to the consumer. At the moment we're looking at those routes, and what we have is various monuments and buildings and various attractions on one level and most of the information on these is inside them. Sometimes you're trying to work with the city council or other organisation that takes care of these. What they're trying to do is remove closure from the streets. The traditional type of interventions to explain to tourists what the things are have always involved putting closure onto the streets, which is in complete reverse of what the strategy is. When you're working with busy streets, even the practicality of bringing furniture onto them it's very difficult because they have services underneath them, and there is also a lot of things that are already there. We have walked those streets recently and we're trying to do a Dubline sign which would be kind of long, slim sign with a logo at the top and some outside key points, maybe some photographs, some information maybe a text, and a QR code. That we put these with our logo along various things. How transparent is that, we only found around 10 locations we could possibly do this because either when we got to it, there was a way finding system, sign was there or there were bus stops, there were bins, bicycles, bicycle racks. So you have a challenge here that you have this rich history and layered history of Vikings through, and all, or a lot of it is hidden here below the round, how would you bring it to life, and how would you bring it to the tourist? What everybody is interested in is bringing some sort of Augmented Reality to the visitor and keying it off of some points on the route. So you have your story, your routes, and there is a number of them here. There is a number of themes we want to tell overly compressed. How would you apply it? The answer is how would you take a tour of the city, and how can Augmented Reality enhance the tour? 80% of the people that arrive at the destination often don't speak English now. Trinity College three years ago, 25% of their business that they got was from the UK. They were sort of English speaking. Now 5% of their business is from the UK. So what's happening now, okay the American market has come up, the European market has come up as well. But you're still left with a huge language issue and everybody in the tourism industry is to produce information in English, and we have to produce it in Irish, but that's not really helping a lot of people. So from a simple level in an Augmented Reality perspective, to be able to take information and serve it up in a manner that people can use their phone, or use whatever device in the future to tell the information, tell the stories, deal with language, deal with sites, and deal with there is a history that can't be seen. I think that's the challenge that we really see. I know it's very simple, but these problems are in general really simple. Think about other people, when you're a tourist, and you're hungry, you want recommendations, places to eat. The other thing is as well, I've been to Paris a few

times, I have to say to my shame I have only once or twice hit upon a really nice restaurant. I know that's ridiculous, you know the food is there, and it's really nice, but when you're walking up and down it's really hard to find a nice restaurant. So simply in these big cities, if you have a visitor rated Augmented Reality, that knows where you are, knows the restaurants, that's what it needs. The challenge is really when you have photographs in way finding and they have the fingers where they direct you to places and some have the map, and the little red dot is what there is to do within an area of five minutes. What we're doing is we're going to pay for these maps to be changed and the Dublin logo on it with a symbol. What I really like to do is the same type with a QR code, so when you get there we can then embed our information. Because the challenge really with cities is trying to find the space on the streets. I have learnt that over the last two years working with the city council walking to all those public places and you think, 'we will stick all our signs out there, that's going to cover it all off'. That is not going to happen. So any solution at the moment, John has a solution, he has a proposal for us, but the challenge that everybody faces is the declottering of the cities, the challenge that everyone else faces is providing more and more information to the people as tourist cities. The traditional approach was to introduce more clotter on the streets, the reality is that it's not going to happen because it's already clottered. So that's where the solution has to be in some sort of virtual solution. Deal with language and then deal with then the whole purpose of tourism will. Say if I come to Dublin and 70% of people plan their visit before they come, so they have all already decided roughly what they are going to do. Maybe there is the case if they do this work and they capture this work in some shape or form as they build their own itinerary. And then how would you build the itineraries of what people are interested in and then grab the information to serve them. The real challenge is and it's a very big challenge, the last thing you want to do is have them walking around with little cards like that in front of them in the city. I have seen that in a café where they have a little stand at the side, where you can 'dock', they have the little docking points. You'd actually come in, have a little docking point, put your headphones on, get a little update and then move along. As the technology changes, the masses become to the things. I think the language thing is an interesting thing in that. One of the things I've noticed on Paranel Square in Dublin there is this kind of freedom trail, and I've seen people with those headphones walking around, they are always on Paranel Square, and they always seem to download something on their iPhone or iPad, and then they rent a headphone and it's quite popular and they have the traditional map. I know it's kind of a step backward, but in order to move forward, you have to have a combination of those things. The challenge is that they face as well is there is an ambition of Failte Ireland with a thing they call the Independence Trail it's commemorates the 1916 Irish Independence throughout the year. And within the city there is a series of events that have happened that have a significant of either somebody who has been shot or where the Declaration has been signed. They wanted a map similar to this with these points 1,2,3,4,5 and there is a trail that way and a trail that way. They know all the trail, they have all the information. The challenge is how do you get that. How would you make that real for a tourist? How would you cut this up and where do you serve it up? There is certainly a kind of sense I feel about consolidating effort. The penetration of apps to the visitor, you see there is a thing called the Dublin Civic Trust and they map the city, the architecture, but nobody knows about them, and nobody knows about it. Whereas the office of public

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works, if a big organisation like that, say the English Heritage, you need to have some sort of hierarchy that they do a major piece of work and you go for that, so you say, 'I got to have the English Heritage app because it covers everything'. There is maybe a need for it in a big city, a few. I think you might have two kind of categories, there is the one where you have public space, public utility, public realm and then there is one where you have internal use, where you don't have safety issues, you don't have broadband issues, you don't have any sort of download charges. That's probably really where those things will flourish. When you look at the tourist in Malahide castle, there is a really old room, at a time we were looking at how would you make an atmospheric room, make the blind come down over the windows, the lights would change, which would have a very highly sensor based sense with high projectors. Whereas if you had your app and you're looking at that through the screen and the information is coming at you, you could probably do what you want. So it's probably kind of that sort of controlled space that is interesting. The other thing is one of the challenges is that we're looking at as a nation is we're developing this driving route. Most of it is done on foot. So within your car…

On the one level we just finished this work at a site down in Canamar, which is in the west of Ireland and it's a site where Macony had set up his radio transmitter and this is an amazing place, but everything is gone. There is hints what was there and one of the things we're going to develop as part of the project is a big car park. There is no car park, so visitors are going to pull in with their car into the car park. There is a perfect space, turn off the engine and something pops up and it's through their own language and it explains what the tour is going to be. You get this sort of experience, and then you can take it out. I think at the moment, it's still early days. In the end of the day it's content, it's the user. There is the device, and then there is the content. There really is an exercise around how ready is content? Does it actually serve up? Because it's all great, but what I find in jobs, and we do jobs in Calkenny, and we do strategic jobs for the city and we wanted to get plans that have been previously layered information, and we found that they don't archive their information in dwg files, so basically a consultant does the job, gives them the hardcopy or a pdf, so there is no way to get the layered kind of works. So while there is content there, people aren't collecting them properly so it can be useful for somebody else. I think there is a serious exercise in the management of content and the preparation of content for future use. But in the end of the day, no matter what project you're going to come to you have to have content and it is the key message. Even if this stuff is going on, and even if there was some sort of colligation, particularly on the Cloud being, some sort of storage of content, I'd be very interested in that area, because it's something that could be done immediately. If procedures can be put in place, the fact that there is so much electronic devices out there now appearing and in store, really the protocols are not there to come in uniformity of those sort of things and then all of the sudden, when you want to do something, there is layers of stuff. Some player will make that. They will do it in volume and nobody can compete with them. There is an element of kind of as a consumer, you have to rely on what's to come, as a developer there is a limit of opportunities in terms of scale, but for consumers there can be things that can be looked at, but I think the principle is the amount of data that's out there that's not pulled in one place. My sister works for Failte Ireland, and she is working on something called the tourism eye. She is consolidating a GPS and location sort of things, and she is taking the location that they have and GPS that, and they're

working into layers of that, so that you can segragately plan. So when you have the content, and you have GPS, you can say 'I want to look at a piece of the country, so I'll look at this, I want to see all the bus stops, boom. I want to see all the lamp posts, take the bus stops away, and only show me lamp posts' There are going to put banners up on the lamp posts. So how many banners are going to be outside? So you can actually plan through the use. But if you have databases on weather, databases on wave patterns, on scenic views, on bus stops, bus routes, if you have a huge amount together at once you can then do planning. If you have that there for one reason, it's a very powerful tool for other things. The thing is OPW, they offer some works that's out there as information. The Dublin City Council have maps. There is 6000 people working there for the Dublin City Council. So even for the consolidation of their information into a common database of things. For tourists, one, there is possibly, and Failte Ireland has ambitions to deliver this, the 1916. There is a budget to do it, and there is a report being prepared that shows all the key locations and all the stories. So all the content is there. There is a report with all the dots on it. Then there is a key on events and stuff as well. In some ways the city council are going to come back with no budget, but that's alright they're interested. But this Independence Trail is really exercising their minds of Failte Ireland of how they can do it. I've been saying to them, I can help them negotiate it through the streets, but it's going to take me two years. If you think I'm going to push this before the Dubline you can forget it. I want to get this done first and then you can come in. But I think what you need at this stage is this report and with these locations, somebody has already sorted out all the stories. There is enough there to start mocking something up. And then you're looking at something I can help you with picking the key locations. The reason why O'Connell Street is good, that's the centre spine. The centre spine runs from Paranel Square up to O'Connell. And that's where the point for the city council is. So you pick a chunk off that. You just need to pick the right chunk for the GPO. They're trying to work out a way how they can sit down with the city council and do this. You just need content and a case study on something that's real. If you pick something that's posing people and they don't have a solution for it that has a date and has to be delivered by, probably 2015, they're going to try and make money out of it. I can get you the stuff, I can get you the permission to get some stuff, and then go and develop, because that's going to be high profile. The GPO is the obvious one. What I'm guiding towards is take the Independence Trail as a guiding point. There is no disadvantage to what you're going to do. But it gives you a case study; it gives me a point to help to get some sort of funding outside of the case study. The thing about the GPO, they have an An Post interpretation on there. So there is going to be some stuff in there. You will then have them on a hook and you do it for a reason. The other thing as well is the other visitor centre we're doing just outside of Dublin Castle, there are three different tours on the Dubline Trail that all come here, and it can then go back into the centre integrated in, there is a lot of space to download, but I think it's enough. You know what's great is you can produce the Independence Trail, and this is a part of it and a bit that's really weak in the report is the media, and how to present it. You need to do it as part of the exercise for anybody, you need to be able to say what the scalability is and then you need to be in a position that you actually have layers. There is a hierarchy of importance of sites. But this will show, we're working on something real. You have the challenge of the GPO and to tell that side of the story, then you have the site as a functioning post office, but you have a challenge then to use it

inside. The other thing as well from your own perspective is trying to get some value from it. If you're seen to solve a problem that people have that has to be solved by a certain point in time, I mean I could solve this over a time of five years. So you're better to pick something, if you want to get out of the first stage of development and want to get into the second stage, we need to say, 'Cash', you need to be picking something that's time driven. It's around the collection of information and hosting. It's to come and get that sorted for large organisations. I think it would be a 3 minutes to spare, it comes up, '3 minutes to spare' and it give you options within 3 minutes of where you are. You go 'actually I'm a little bit hungry, but I'm not that hungry, I will be more hungry in half an hour, 15 minutes to spare, what's around me'. I think there is an element to it, when you have kids, and you're sitting there watching your tele, and they're all sitting there with their phones and iPads, they're on Instagram, they're liking something, and then you're grabbing the remote and turning it to something you want to watch and they give you the stinky eye. 'Hold on, you're not even watching the tele.' I think there should be an app where you can switch your tele on and see their screen to see what they're actually doing. Because one of the big concerns for parents is that they have no idea what their kids are doing on it, and what's going on. What I'm trying to sell in my consultancy is technology that can be implemented. What we're pigeoning now in Limrick is to look where to bring the stories of Limrick to life, where they can be told and which opportunities to tell them. In some ways, if I was to it and say how little opportunities there are, but you got to have a reality to it. We have something that can potentially work with people at the delivery stage of these things, it sort of means you kind of get an idea what solutions are required. You should try to talk to some restaurants to see about virtual menus and stuff.

I: Thank you very much.

Interview Transcript: Dublin Application Developer (EP8)

D: I've done one application it was prior to Nimbletours actually. I was doing some app development. Business development for Tapadore. We did an app for Wetherspoons in the UK. They used AR to let people discover where the pubs were. That was kind of interesting. I was sitting in my backoffice in Malahide here, using the app looking up Whetherspoons in the Northern Ireland. I kind of think it has limited benefit. Because it isn't very sophisticated. And I don't see people using that. The kind of stuff you showed me there that certainly got possibilities for interpretations. If you're looking at a building or a picture, an exhibit, and you can have something to animate that, to interpret that. But like I said the difficulty isn't so much actually triggering the interpretation, it's all of the work that's behind that, creating the content behind that is the challenging bit. I know I've been trying to engage with the Dubline people. I know for example that they're hot on AR. The concept is almost opposite from what you're proposing. Rather than having images of what the user is looking at and have them annotate it with Augmented Reality, what we're doing is, we're taking a picture and it'll create artefacts based on that. So we will take your picture, we will detect the fact and when you go to the Guinness Storehouse, we will have your face on the head on a pint of pourage and the idea there is you're providing people with digital artefacts, which they will then share. Then you say, they have some sort of tagline that says, 'Guinness in Dublin is the best in the world and this one is mine'. So you give people a reason to go on Facebook, on Twitter or whatever. And then there is other reasons that come off that idea. So you're personalising the, it's almost like you're personalising postcards, but it doesn't have to be just postcards. The mix of the real world and the virtual world, what we're trying to do is we're trying to bring them closer together because there are fun things to do by mixing them. The other idea we have is very simple stuff. The idea is things like flying the flag of the nation where the person comes from on the Spire. So we say 'Welcome' in Korean, and we put a giant Korean flag on the Spire. All we do is simple image processing.
I: You yourself weren't very convinced of AR. Is that the actual motion of the tourist that you're not convinced about, or are there technical issues as well that you think are a problem?
D: There are a couple of technical issues. I know how the GPS works, and when people are trying to do very close matching in the real world, it doesn't work as well. When people are trying to match up buildings, it doesn't work as advertised. When you see the videos, it is the absolute ideal. It can just look a little shit sometimes, when people are trying to overlay images and they're in the wrong place. And the idea was that you show the street how it was 100 years ago, and it's a little offside. There is a big problem with tourism apps. You see tourism in real numbers, tourism apps are small, because they are only relevant in specific locations. The good tourism apps, if you're talking about some general like Lonely Planet type of things, they're actually used by quite some extensively. But if you're looking for some deeper extension, then it has to be some more specific. Because it's specific that means it doesn't appeal to a wide audience. Therefore, you have relatively few downloads. But it's kind of a similar argument to say why would I write a book or a guide on this area. People do it, and they do it for 5000 people and they do it. So I'm not entirely sure to say because it has only 5000 downloads, it means it's not worthwhile. Of course from my perspective, from a tourism apps

perspective, what I always said to them is that you're keeping the link between the customer and the audience doing the research. You're sitting at the airport in Frankfurt before you arrive in Dublin, so if I'm trying to promote Malahide for example, I don't want them to forget about me between while they're doing the research to when they arrive in Dublin. And that happens quite a lot. What they can do is, if you got proper infrastructure, in Frankfurt, they can hid a button, they can download that information onto their device, so that they know it is there, when they need it.

I: In the end if you develop an application, it has to be useful for someone. And ideally, what we are looking at the end-user is the tourist. You have some experience with the Dubline project. Have you worked with other tourists?

D: I've done some for a small town, I'm currently driving myself away from a small town Eneskone, which is a small app. I'm building an app for them. Again, what's happening in the tourism space is that tourism and business promotion is again they're coming together. Previously they were always seen as separate. So tourism promotion, heritage promotion and business promotion, if you're talking five years ago, you would have a website built for each, for the different things. Now what they're trying to do, is they're trying to merge all those different things into one coherent story. While you're promoting tourism in the area, you're also promoting the businesses in the area, and you're promoting the heritage and the culture in the area as well. There is trails and there is points of interest. They've got a marketing in Eneskone. I was talking last week, it's rendering on buildings, projection. It's genuinely projectors onto the building. But actually, I was thinking about that kind of thing as well from an AR perspective. The actual projection stuff is a lot more sophisticated, it takes the shape, and it also does compensation for carves, it perfectly aligns. It's projection mapping is what they call it. So it's actually a real building. There is one of these I think it was Sony that did it for one of the football matches, actually they had a guy up in the building coming in and out of the building kicking the ball back and forth and the building would become like one of those pinball machines, it was really clever. I suppose all we're talking about doing here, we're talking about making the experience more engaged and engaging. And that can happen on both sides of the screen. It can happen by taking information from the screen or viewing the world from the screen, or it can happen the other way, viewing the world as another screen. Because one of the things that has come off the top of my head is, if you're taking a static picture personalising as almost postcards, if you extend that out you could have actual movies. So you could have actual narratives, where the user is involved in a task. Let's say in Dublin they're chasing that task. But all you need is five or ten different poses and your storyboard just edit that in, and now there is a movie added on, which is in place, and is kind of cool. Have you seen the Ballet Gaonat with the waterfall in Templebar square? I'm not entirely sure if it's entirely relevant to AR. What they did in Templebar square, it's actually a cascade and they projected their logo on the waterfall. How much cooler would it be if it was actually your face, you would probably go and see it and take a photograph of that.

I: How do you actually see the public's acceptance of this new technology? Have you seen any other technology before where the public or tourists had to get used to this technology? Is it a fast process, or does it take a lot of time?

D: It does take a lot of time. I think it needs to become very real for them. Something like that, there is only a certain amount of people that will get around in doing that. But I think if it can come down to something very tangible like for

example a video that their friends have posted, I think people will use it. I think this kind of rewards to try it, and then they will probably do it. So in terms of AR people will use it for, a small number of people will use it just for the interpretative part of the experience. A lot of people just won't bother. But if you make it so it is actually rewarding for them to do so, then they will go on and try it. And that's just about getting people to use it faster.

I: How can you promote it? I mean there is AR technology on the one hand, maybe people who are aware of it might think it's a good thing.

D: For example giving them something to share is their promotion, but actually they're also getting something out of it. They're getting something to say to their friends. 'Look at how cool I am. I have been here, done that, really interesting.' It presents them in a good light. People a lot of them are driven by what other people think and view of them and that's why they share something. If you can make them seem cooler or better then they will probably go through the effort of whatever it is you're asking them to do in order to achieve that. So I think things like Layar have been around for years, but I suppose it has been around for 4 years. In terms of mass-market perspective, do people talk about it, I'm not sure they do. There has to be for the end-user, for the person using it, there has to be good reason to download this app. And the technology that you're using, although the technology is very cool, it's not important for the end-user. It may be cool when they're using it, but you got to make them smarter or cleverer or cooler than their friends in order to get a mass-market perspective.

I: I was also thinking about how do we promote the application? Do we just use already established platforms like Facebook or Twitter, or do we have our own social network in there, or how does it work.

D: I think the idea to create your own social network, it's hard, you can actually just start to share on Facebook, on Twitter, or on Youtube. I don't think there is a need. I think the whole idea of social network is the people that are on it. Creating your own room now, I think that boat has sailed. So use what's there and make it as wide as possible. So if you have an audience that is using a particular source of network, make it sharable on that too. Actually the idea prior to this one was to create a location based app store. And it was not about telling you what was popular because Facebook is popular everywhere. It's about telling you what's relevant where you are. So if you are sitting in Malahide, it will bring up apps in the Malahide area, so there is tourism apps, maybe there is a Pizza Hut, because it's more relevant if you're at an event in a stadium, it will give you the sponsors and all that. That was the thing that was distracting me last year. My idea about the Book of Kells is that you superimpose. In another way you actually got fatify, and oldify and beautify, so basically Book of Kellsify somebody. So you put them in and you give them the curly hair and all the business, and again sharable. But doing this with AR, doing this a little more dynamically is kind of cool, and I like that. If you actually look at the figures between 18-45 somewhat like 70% of the population have a smartphone. And then the people over 60s is 25%, so to all intends of purposes, put it on the smartphone.

I: Thank you.

Interview Transcript: Sales and Marketing Director Hotel Sector (EP9)

I: Alright. So we start right off I think, just to start with can you just briefly tell me about your current position, maybe any on-going projects and your connection to the tourism industry?

S: I've been in the tourism industry for the past 15 years as Sales and Marketing Director of different hotel organisations primarily, but also an online marketing company that specialises in the tourism industry. I've dealt with 3-star, 4-star, hostels, booking engines. I started my career off in regional developments, so I have a good variety of experiences within a fairly broad industry.

I: Okay, and how is your experience with mobile devices in the tourism industry? Have you had some experience in marketing with the smart phone or any other mobile device?

S: Yeah, I suppose in the past 2 years we would have accelerated marketing on mobile devices. Last October we've introduced mobile booking engines into all our hotel websites. It has been quite successful and makes up about 5-6% of our bookings. We noticed the trend is to book on the date. I think the challenge is probably in our industry is how to manage that, and because the bookings are very much in the last minute. The tendency I see in other hotels is to reduce rates for last minute bookings, whereas for ourselves we tend to increase the rates for the last minutes, which turn out to be a quite effective strategy. So it's a bit of a learning curve in the industry at the moment, and we're trying things like 'book tonight' buttons on our booking websites, and I suppose at the moment our challenge is to find a good payment gateway, and I find that the challenge is in the conversion process.

I: And with those mobile booking engines, how did you get into that in the first place?

S: We got into it in the involvement through our booking engine provider. We demanded from them that we wanted a booking engine; our customers asked that they wanted a mobile booking engine. I probably would have done one myself four years ago, but it was really at the infancy, it didn't work out that well. But it really had potential, you know an iPhone, Android, the first thing in the morning you look at, the last thing at night. I have more engagement to that than I do to a TV or a radio. I use it as my camera, my diary; I use it for my E-Mails. It practically runs my life as an extension.

I: Okay, very good. Have you also personally engaged with some tourism applications, or used some tourism applications before?

S: Yeah, I would have, I always look at new things, new examples, especially from different apps, from different locations as well. So if I was going on vacation I would research and the Internet would be my primary tool rather than years ago you would buy the Lonely Planet guide. Now you don't need to and I would look at different blogs, I'd download different apps and maps and make sure I'm prepared to wherever I go.

I: Alright, so you don't have one particular application that you always stick to?

S: No, I find that if I was going to Las Vegas, I'd download an app of Las Vegas. If I'd go to New York I'd download an app on New York and I probably use it more than I would with a guidebook.

I: And how is your experience with that? Did you cope with it pretty well? The application, was it well designed, or how was your overall experience?

S: Most of the time, no, because it becomes an advertising platform, whereas sometimes you look at Tripadvisor and their content, there is local content, local advise, it's probably a lot better than paid advertising. So I suppose in terms of Marketing, the push and the pull, you know where you push the advertising and you see that, it comes very commercialised, whereas somebody making a personal recommendation about a restaurant, attraction, I think there is more agreement given. Certainly for myself.

I: So the advertising aspect was one annoying point about such an application?

S: Depends what you want. If you want to end up in the tourist trap, the advertisements will pull you in there. If you want to see something that is slightly different, the local recommendations will steer you off in a different direction. It's like restaurants, if you go to certain tourist areas in Dublin, you will get probably less quality and higher prices compared to where the locals go.

I: Where do you personally see the trend, do you think in an application, which area is more important to include?

S: I think it's more towards starting, it's more social, say if I would say I'm going to New York, then people would start to engage with me on a social level, my friends and start recommending, things to do, places to see, places to stay socially. That becomes a conversation.

I: Okay, do you also engage with strangers on blogs and have conversations and stuff like that? Or just in your circles?

S: No, just in my circle. But that's just me. I know we are a different generation, they cast out a net and…but that's just my personal thing. That's just me. And I'd be in terms of privacy online, that's just something I would be very cautious of. I understand 95% of the rest of the world will just throw it out there.

I: We talked a little bit about those mobile or booking engines before. How would you implement your business or hotels let's say in a tourist application? Do you have any ideas? Because you have obviously used some tourist applications before, in Vegas, New York or wherever. And I'm sure you've also looked at some how they implement accommodation for example in the application. Do you see there any benefit or potential, or how would you implement it?

S: Yeah absolutely, and we're looking at a couple of applications to do around more kind of social. And what we don't want to do is become the Ginny pigs that make the mistakes. We have tried new technology, we have in the past with some success, some failures, and we just can't afford at this stage of the game because we're just so busy. There is always a cost and a risk, to take the risk on lots of different projects. So sometimes we say, we like the idea, we like the concept, we would give some advise, but we won't engage on it until there has been a period of development. So that's where we stand at the moment. And naturally enough if something came up like the Augmented Reality project, we'd jump on it and say, okay, let's have some first mover advantage. But in terms of the whole social sphere there is also the whole questions of the return of investment. Everybody is saying at the moment, Facebook marketing, get those booking engines up on Facebook. But you see at a certain point of engagement, we don't see any revenue coming out at the other end. Until that gap is bridged and someone comes up to me and says, 'Here is a case study where someone spent a certain amount of marketing funds on a campaign which resulted in 5times the return of investment' I just haven't seen that and nobody has come up to me and said, 'yes there is a

return'. I get a lot of kind of hearsay, that say, yes it's socially valuable, but even if you'd look into the New York market like the poster boy there would be the Roger Smith Hotel, and if you looked at the amount of funds, and you'd look at the return and you talk to the hotel manager, I'd be calling him and he'd say, 'no there is no return of the investment'. So then it becomes a vanity project, and what's the point. We're in the business, we have limited resources, and we're in the business of trying to make money. From a brand perspective and customer service perspective, yes, we will engage with it, but as a group, we have one person, one day a week. That's the expose to it at the moment. If we can see an improvement, we will drive more resources to it, or if somebody can come up to use and say, 'you're doing it wrong guys. You should be looking at from this angle.' We have taken some advisors, but nobody has convinced me yet, at this stage.

I: What was your first idea to be engaged in this social network, or advertise your hotel in social network? Was it just to create awareness, or did it have another strategic?

S: I guess ultimately strategic, you're looking to get awareness and sort of drive revenue. We're in the marketing game, the sales game, so you're trying to reach the customer with the views to getting them to book with the hotel. You gain a certain amount of reach, very little business, and the challenge I see at the moment is that hotels in particular and brands are starting to reward customers who are already brand ambassadors. And probably don't need to give them discounts or really special offers. So that's part of the challenge how to identify, and if you can get new customers, who then become brand ambassadors, great. But people who are already talk about you, endorse you, and would book you, and then you say, 'here you go here's a discount'.

I: Okay, it's probably more into this social network aspect. Do you, or is it enabled that they can actually purchase something online then?

S: Yeah. We have mobile, or our booking engines are on the Facebook platform. But we don't see a lot of bookings happening.

I: Oh, alright, that's something I personally thought a lot of times, with big hotel chains and their Facebook pages, but what is there really, there is some information, hotel locations, their address and telephone number, so why would I as a customer go there in the first place? I'd just go to their website right away.

S: We've run competitions for other properties and we have even given away a wedding. And we would have huge engagement online through the media. We would have generated a huge database. We had I'd say about 120 people that were qualified to enter the competition that were getting married in the next 24 months. And we released the competition prize, we contacted the other 119 people, we didn't get one booking out of it. Even after giving out that special offer. So we said, 'okay, we're not doing that again' because it was just people out there that were looking for something for free. There was no benefit, no engagement, no loyalty, no conversion of it, no transaction. So you live and you learn. Expensive mistake.

I: You've personally already, you know about Augmented Reality. Are you currently personally using any Augmented Reality applications yourself?

S: From time to time, I look into Aurasma. Just to see how this app is developing. And it's more of to see what's happening. The Google Glass Project is really, I'm reading an awful lot of it. Every time you pick up a tech magazine there is more and more about it about the last couple of months. So I knew about it a couple

months before, 'that is cutting edge' hadn't heard about it, or read about it. I've seen one or two examples of it, but I can see actually now that it's more and more evolving. More people talk about it now, there is more conferences. You see Google, you see bloggers blog about it, you see guys who take showers with it. This is happening, this is just around the corner. And I suppose the advantage for marketers is to be one of the first movers and create a bit of PR, awareness around it. That's where the opportunities lie.

I: How do you think AR could benefit your marketing activities? Do you see any potential in there?

S: I definitely do, I think it's going to be. You're looking at it from different angles as well. It's going to tell a story. It's going to tell stories a lot better, like we have people from concierge here, but not everybody wants to engage with a concierge if they're busy. We have a 'moncierge' which is a computerised tablet in the lobby, but people want to go up to the rooms and learn a bit about the hotel, learn about the facilities, maybe a movie about the history and they would be able to from their phone, maybe the Android or the Google Glass. They can be outside the building and maybe see what's inside, or what the offers are. I think the potentials are enormous once it's easy to use and it's not going to be expensive and certainly from a tourist perspective, the cities would have to go with free Wi-Fi. With 3G or 4G it will be expensive.

I: Actually another point that interests me is that, if AR or any kind of technology would be that much developed that it has a massive amount of users or is mainstream and maybe your major revenue would come from that, would you be willing to substitute it with actual people, for example the concierge that you mentioned? Because the job does it and the people are engaging with the technology more rather than with an actual person. Would you thinking about that from the hotel point of view?

S: I think part of the hotel experience, especially the Gresham Hotel is the people. The Irish hospitality experience is the Irish Welcome and the technology facilitates an action. You know something instantly with a certain action. But talking to a local is 10 times better actually speaking to a real person. So it might enhance it and people might be able to learn about it faster, but in the end of the day, no matter how many guidebooks you have, how many apps or journals you have about a destination. But actually speaking to someone from here, the concierge will know more about what's going on tonight, then any website in the city. He'd know about the hidden places. He'd know by your address, your age, what suits you like. If it's a rainy day, he'll tell you if you have a family, where to go, whereas a computer probably doesn't know that it is a rainy day. Sending someone to the zoo on a rainy day with the family might not be the best idea. But sending someone to the museum or tourist attraction that's covered might be better. So everything has its place, but I don't think it will substitute humans.

I: Do you see any problems with your current experience or knowledge of Augmented Reality, if you would implement it in your business or marketing, do you see any problems that could arise or challenges?

S: I suppose the only challenge is the whole area of privacy, if data is exchanged as well, who owns the data? But that's always the challenge with data.

I: But you don't see any technical difficulties, or anything?

S: No, I think we have to be prepared with the Wi-Fi difficulty, that it does enough bandwidth, that's always a challenge as well.

I: Before you implement a new technology, what are some factors that you go through, or that you would consider in order to implement a new technology into your business?

S: It's always ease of use. It's not me who is going to use it. I could be quite technology savvy and have my own idea. It's how my customer uses it. Because ultimately they're the end user. They're going to use it to make bookings, so it's making it as easy as possible. And we will modify. And also we will have focus groups from time to time with our customers, and we say, 'what do you think about this technology? How would you use it?' a bit like what you say with Augmented Reality and you get a lot of good information out of it, in terms of how do I get from Dublin Airport to the hotel by car, by bus. How do we get around the city, what happens if we get lost. 'I want to book…' one of them was, 'I only want to book for tonight. I don't want a calendar where I need to navigate through dates'. 'I want to pay my corporate account holder. I already have an account. How are you going to deal with me?' So it's talking to customers, listening, and have it customer-led, rather than having the marketing team, or the technology company in most cases, trying to lead the technology. They will only care about how easy it is to program not necessarily about the customer. And in the end of the day driving traffic and we pay to drive traffic on a website or a mobile booking engine. I want to make sure that it converts or have a transaction at the end of it.

I: So if you decide to implement a new technology into your business, is the main criteria how to create revenue, like the financial benefits, or is there anything else that might be more important?

S: The revenue element is very important nowadays, but also is the customer service, the customer engagement in our part of the business as well. Because without our customers we have no business. So I see the Augmented Reality as a way to enhance our customer's experience. I see it as a very innovative, I think it's a very good opportunity for us to be a kicking and screaming cutting edge technology user, as being a first mover within that hotel space in Dublin. I think it's going to be good for business if we can do it right, in terms of the engagement with other technology companies. And then our customers hopefully they have some fun on the way and they use it as an engagement to see how it goes along the way how it develops further up and uses as it develops.

I: The public Wi-Fi in Dublin, have you experienced using that?

S: I have never used it. I use 3G or the phone network as well. I've heard anecdotally that it can be quite slow, which is a concern if you're downloading stuff from an AR platform.

I: We talked about social network before, do you currently have implemented social network in your marketing strategy of your current business?

S: Yeah, LinkedIn, Twitter and Facebook and we have a social media expert that works with us one day a week across the properties in the group. It's not a sales activity, it's more from a brand and customer engagement. I do see some conversion from a social, not a whole lot and certainly not enough to file a return of investment, but I also aware that, by not doing it, there are certain part of my customers that are social, or potential customers that are socially active aware and I need to engage with them on an on-going basis. So it's one of these things that are not a core part of our business, but we're doing it, because we have to, to be honest. I would not rush to get a social media expert in full time as it stands at the moment. I've seen other hotel groups that have that, especially in the US, but just where we stand at the moment, I would be one of the first people to jump on the

Facebook and Twitter bandwagon a few years ago, but in the end I've just been saying, 'I give up. I'm doing this wrong.' But I don't think I was because I haven't seen anybody using it and making a fortune out of it. And I've spoken to guys over in the United States about it because I don't have a monopoly and a lot of good ideas. And if I saw and example of someone doing it well, I would replicate it ten times over. But I just haven't identified it yet.

I: Yeah, that's also what I saw. I'm also a bit sceptic with this whole making revenue and stuff through social network or using it as the main marketing tool because I see the same thing. They're out there but not using it as a profit making tool so that's going to be interesting. If your customer could use a tourism AR application to purchase or book a room here, would you consider that to implement, or do you think there should be considerations to be made?

S: I think, I don't think we will get to the stage where somebody will purchase a room, but I think AR will influence the purchase, so it will drive more engagement. You arrive in Dublin, there is a hotel there, and there is a really cool AR app. And people like to talk, they may go on Facebook, they may go onto a blog and tell their friends about this really cool stuff. I don't think we will actually get a transaction out of the AR app 'book now' kind of thing. But I think what AR will do, it will influence a booking, or a sum transaction, or a visit to a website, or looking us up, talking about us in some way, so it will have an influence. I see more that it'll be a PR exercise, which is very important for the value of our brand. So that's where I see the strengths of AR.

I: You're managing a lot of different types of hotels. Do you think AR would be suitable everywhere, or would you only implement it in specific types of hotels?

S: I suppose some of the hotels we have would be a 'motel' type of properties, so I wouldn't see the cost benefit in types like that. But the resort property, or golf resorts, having an AR golf app, where you could preview the course, having a 360 view, getting notes from people that played it, maybe a rundown from the designer. That could be on the phone and could be engaging, especially for a group, for a tech company, it could be quite exciting. I think hotels that, again, resort properties, you could have a live demo of tonight's specials from the head chef down in this restaurant, and it could have been recorded two weeks ago, but the perception is like, 'here is one for you' to get done in the restaurant. That sort of stuff. I think that we have an awful lot of information of our guests. So if somebody was checking in and was female and was corporate we could say, there was something on the movies, or there is something down…if you're male and you arrive with your family, the AR app could say, 'these are some things you can do with your family.' And it could have a two-minute video or whatever. So from a customer service perspective it could be hugely beneficial. So where I stand is, if I got direct business from AR, bring it on, great. But at the moment I see it as customer service, more support which is very important.

I: Can you think about any other suggestions to make the AR tourist application more user-friendly or more engaging?

S: I think as people start, or begin to use the AR, if they could merely rate it. Like they are in the Gresham Hotel and they could rate it, or if they had dinner in the Gresham Hotel and they could rate the menu, the potential there and the social influence, 'I was in the Gresham Hotel and I had a great meal.' But then from an advertising perspective as well, if I own for example the restaurant next door and chances are, if you like the Gresham restaurant, if you went to Dublin Zoo with your family, chances are that you'd like the Splash Tour. So you could actually

begin to learn and create an advertising eco system, that's not pushing on as ads, as many are, but you could accept ads that are linked to what your involvement at your current moment is like, where your destination is. Or you could pay to opt-out. Or don't pay and accept the ads. A recommendation, so you're still pushing ads, but they're relevant. And if they're relevant they're more likely to convert. And a lot of the problems with advertising is that 97% of it is irrelevant. And again, trying to keep it a little eco-system, the first movers in the first year it'd probably be more successful, it could be a platform to jump on.

I: Thank you very much.

Appendix I: Mobile Application Demonstrator Screenshots
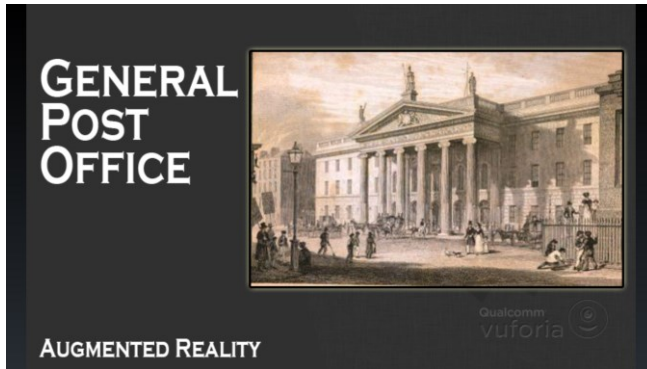
Mobile AR tourism application demonstrators used for Research Phase 2 and 3.
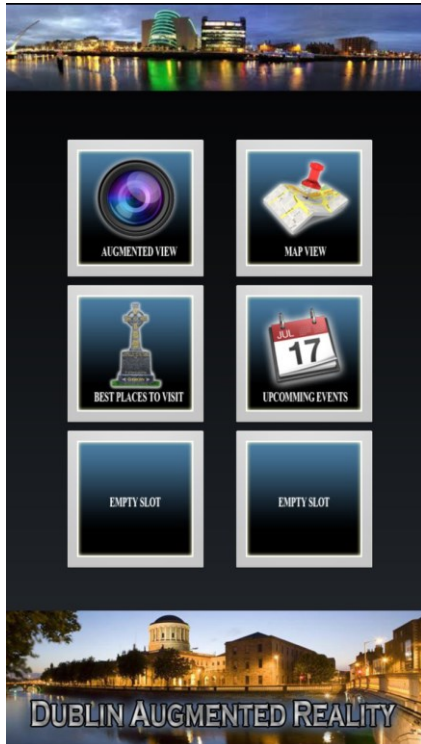
Main menu in application demonstrator

GPS-based AR overlay on O'Connell Street outside the GPO

Marker-based AR in GPO starting screen

GPO 3 dimensional model used for AR overlay

AR video overlay

Appendix J: Research Instructions for Focus Group Participants

1. Meet as a group with the Research Assistant (RA) in front of the Dublin's Spire at your allocated time.

2. Use the provided mobile device (from RA) and open the Dublin AR application. The RA will provide further information.

3. Click on the AR view function and check out your surrounding through the phone. Feel free to play around with the application.

4. Once instructed, follow the RA to the General Post Office (GPO). The RA will give you further information in front of the GPO museum.

5. Enter the museum and use the Dublin AR application on the appointed images/models to access more information.

6. When you're finished, return to the museum entrance where the RA will be waiting and give you further instructions.

7. Meet with your group at the lobby of the Dublin Institute of Technology (DIT) at your allocated time for the focus group interview.

Appendix K: Letter for Focus Group Participants

Dear Participant,

First of all we would like to thank you for participating in this research. Hereby, we guarantee that all of your provided data will be kept confidential and are not used for other purposes but for this study.

The research aims to explore the tourist experience using mobile Augmented Reality (AR) technology and investigates user perceptions of mobile AR applications for tourism purposes and motivation factors driving their use.
You were selected as you were identified as a suitable participant that meets the characteristics of the target sample. Your participation is voluntary, however is of great importance, as you would provide a valuable perception and opinion for the completion of this research.

The focus group should take around 20 minutes and will be conducted in Dublin Institute of Technology (DIT), Dublin.
Please do not hesitate, should you have any questions, as we will be happy to be of assistance at any time.

Thank you for your help.

Mr. Dai-In (Danny) Han

I hereby acknowledge and understand the purpose of this research and the use of the answers provided.

Signature

_____

Appendix L: Focus Group Question Codes

Dublin Augmented Reality (AR) Application

Reaction/Perception of Dublin AR

Positive Feedback Dublin AR

Negative Feedback Dublin AR

General AR Tourism Application

Mobile AR Tourism Application Function Requirements

Mobile AR Tourism Application Content Requirements

     Content design/Implementation

User Resistance towards AR Tourism Application

     Third Person User Resistance in other Market Segments

Appendix M: Focus Group Questions

Dublin Augmented Reality (AR) Application

1) What's your overall opinion about the experienced AR application?

    a. What did you like in particular about the experienced application?

    b. Which areas of the application would you improve?

General AR Tourism Application

2) Which features do you consider beneficial/useful in an AR application?

3) What kind of content interests you in particular?

    a. How should it be included in the AR application?

4) Could you think of a reason not to use the AR application?
    a. What might be reasons for other people (in your friends/family circle) not to use the AR application?

Appendix N: Focus Group Transcripts

Focus Group 1

I: Okay, as I told you guys before, it's really just a kind of informal feedback that I'm looking for. We will cover some questions that we will go over and basically I want you guys to take over and see what your opinion is. So I'm going to start straight off. What's your overall or general opinion about the AR application? Anyone can talk, really.

P2: I think it's a really good idea, because in the future, you will be able to, tourists will be able to like know any attraction, with possibly pointing the camera, is it the camera…at something and know anything about it. So I think it's a really good idea.

P4: I think if a tourist is new to an area, like it's the first time they've been here, with the app they can find places they are good to go and visit and help them find where it is, the location and stuff, it would work really well.

P3: I think it's accessible to use anywhere, at anytime, anyone. I think it's pretty simple to use and especially the new technology involvement in tourism, that's a good thing.

I: You can comment on each other as well, if you don't agree. (Everyone agrees)

P6: I think it's good, but I think as we used it in the museum, I think it's not very helpful because the information is already provided, so it's probably a waste of time and when you're like out in the street, I think it's very good to know where attractions are and other things are.

P9: I think you'll get tired of holding your phone when you're reading the walls in the museum.

I: So you think it's bad?

P9: No, I think it's bad when you're holding up your phone against a picture, you get tired of holding it like this.

P4: Yeah, the information doesn't stay on the screen, if you like move away your phone from the thing you're reading. It would probably be better if it could save the information so you could read it, I don't know.

P6: Yeah, I agree that the app probably could be improved. Perhaps the quality of the app.

I: Any other comments? What do the others think?

P3: I think it's helpful for…for some people perhaps with visual impairments if there is audio, so you can actually listen to it, rather than to read all the information on the board. That includes the elderly people, which is also a target market for museums. But it's more difficult for elderly people because they don't use much technology, so it's never an aspect, really.

I: Okay, alright very good. Let's just move on to the next question. What did you guys like in particular about this application? I mean some things were said already. Do you have any additional points? Anything that stroke you in particular?

P10: It's easy. Easy to access even though you have no idea what it is. You just click on it and it works. I think it has a problem. It only emphasises certain things. So it's easy to miss something. It's easy to miss if you just follow the app.

P4: It was quite quick as well. So it was working quite fast. So you got the information quite quickly, so that's a good point.

P6: Everyone has smartphones nowadays as well. Everyone uses apps and knows how to use it, so I think it's quite handy.

I: Anyone else? Alright then, which areas did you think were maybe not so good, and which areas would you improve in the application?

P4: Like we said before, holding up the phone to read the information that you want to know about, yeah basically.

P2: I think a good idea would be like take a photo and put on the information through that. It would keep you from scanning for information. All you want to know you just take a photo off and it triggers the information then.

I: Okay, any other things you would improve in the application?

P3: A woman speaking would be better for men. It's nicer to listen to a woman rather than a man. A voice's softness and everything.

I: Alright, yeah that's a fair point. Was it for most of you, or all of you guys the first time you've seen Augmented Reality? Or has anyone seen it before? (Everyone denies) So it's the first time for all of you. What was your overall reaction to it?

P4: It was good, pretty cool, clever.

P3: Impressive. (Everyone agrees)

P10: It's just a prototype so there is not much information. But from what I've seen it's nice, so I'd like to see more. For example restaurants, and other things that might interest me. As in, I could vote the things that I like and I don't like.

I: Okay, alright good. So if we then talk about in general, Augmented Reality or technology, which features would be useful or beneficial for tourists in an Augmented Reality application?

P4: Like a map of the area they're in, especially if they're first time visitors. If you have to know the places to see or are of interest and you'd have a map to help you getting around. That would be quite useful.

P1: I thought instead of just seeing a destination, I would like to navigate where the attractions are rather than looking where you are when you're already there.

P3: I think it would be useful if there was a general map, apart from the point where you're currently in, so you go to the general map and search for a point where you want to go to, or have different things that you could click on, find more about it and then let the application take you there. So it's like Google Maps really with information about attractions, you know what I'm saying?

I: Yeah, I know what you're saying. Any other things that you think would be useful? Like for you if you imagine, right now you're a tourist and you walk around Dublin and you'd have an AR application available, what would you put in there? What would you like the application to do?

P2: Like it was before, it was actually playing music before, when you didn't know it was there. So instead of holding your phone and walking with your camera to see if anything is there, maybe if it told you like, it's such and such a thing and then give the information that you have to know.

P4: Maybe if it told you the different types of transport that you can get in the city to get around the things that you want to see. Or that you could get information and times and stuff on attraction that you're trying to visit and when they're open and how much it would cost, so like give you some additional information as well as like educational information.

I: Yeah okay. Do you guys agree?

P3: I agree. (Everyone agrees)

I: Anything else you personally would like to have in the application?

P10: I would like to block some things. If you keep seeing something you don't like you could block it.

P9: I think you should be able to choose which area you like, like say on the map inside showing 50 restaurants, transport and places of interest. You pick certain points, like transport or restaurants, or…

I: Okay, so you could filter…okay.

P4: Maybe if it was also able to tell whereabouts you were. So it could give you different places around, like nearby where you are. So it doesn't actually give you an attraction on the other side of the city, when you're…so it could actually tell where you are.

P6: Yeah, like the map idea, if you could zoom out from where you are from close by.

I: Okay. What kind of content, like before you said you want to block out things. What kind of content would interest you guys? I mean yes, we had like museum and historical content right now, but that's maybe not what interests you. What kind of content would you like to have, or see?

P8: Nandos, food and stuff like that.

P10: It would be nice to choose something, like if you're looking for a pub, just search for pubs near here, and if you're looking for souvenirs, just search for that, so they're not popping out at the same time.

I: Okay, any other things you can think of?

P10: See the weather on it, see every information you need as a tourist.

I: What do you need as a tourist?

P10: Well, right now, I want to know where James Joyce's house is. It would be nice to have a device where you just search for it, and it gives you directions how to get there. On the way I want to have a cup of coffee, just insert that and get a cup of coffee. Just take the most direct turn.

I: Mhmh, you guys agree? (Everyone agrees) Alright good. Could you think of any reasons not to use the application? Now, we have said a lot of things that are beneficial, but when would be a reason not to use the application or AR application?

P10: We should limit the use of it. You are actually in a new place and here to discover instead of stay on our smartphone. You should just take it out, if you absolutely need it. I would like to see the people for example here, to see the people, see the places, and not just stare on my cellphone. So I wouldn't use it very much. But at a point of interest, I would use it, if I need more information.

I: Okay, any other comments? When you would prefer to use let's say just a map instead of an Augmented Reality application. What would prevent you from using one?

P2: If you don't have a device that could have the device, then you're not going to be able to use it. It runs out of battery, or…

P1: But if your phone is not connected to the network. Because we've come here and cannot connect to the network. What if you get charged and stuff and you have to go to the Internet you wouldn't be able to use it.

P3: Does it require WiFi? Does it?

I: It is not yet decided, but it could be Cloud based, then it requires WiFi, yes.

P3: If it requires WiFi then it's going to be very restricted, because there isn't WiFi in many places apart from the city centre here.

P4: And they have to take into consideration that maybe international tourists that are coming here they need the app, because it's their first time or something. They've got their phone from abroad and it's obviously going to charge it to use it. If that's not working, then they're obviously not going to use it. And that's the people the app is trying to target the most, like those tourists and stuff, so that's maybe a bad point.

P3: If you're going to make the application international, then there would have to be different choices of languages in the application. So if the target audience in Dublin, might be…if it was China, then there would have to be Chinese language available, so in the current or particular place, making sure that the language is available, you know.

I: Any other thoughts? How about if you'd have to pay for the application? Would you pay for the application?

P2: I would do. If I'm going to Dublin and I don't know anything about Dublin and if it was cheap then I probably would do, yeah. You're getting a lot more information, so if you were to come to Dublin again next year, then you would obviously better know how to use it.

P6: I'd agree. If I was going to a city I didn't know, I'd probably pay for it.

P3: There are a lot of people who have iPhones or smartphones and they download a lot of Game applications, and they pay for it as well. I think they wouldn't mind paying two Pounds for the application, even though there might not be much usefulness for it.

P4: I think it'd be worth it as well. I think it'd be worth if it's not too expensive to find the different places you'd want to visit in a city or where you're going. Like when you're on holiday and stuff, you don't want to be lost in the middle of a city, where this could actually show you some decent attractions that you could go and see. I think it could be like quite a good thing to purchase.

I: So what do you think can the AR application do that let's say Google can't do for you?

P7: It's quick.

I: Okay, instant access to information? (P7 agrees) Alright.

P10: It's more specific. It breaks the language barrier as well. If a foreigner doesn't speak English in the city if everything is in Irish, and I can't pronounce or looking in a map.

P6: I think it's similar to Google Maps, but I think it provides just a bit more information for more tourists, especially.

I: Or can you imagine why other people wouldn't use the application? Maybe not you, maybe your friends, your family…

P3: They use Google Maps and search for the information, attraction on Google and don't pay for the application. If it was up to five Pounds then they would probably buy it, but still it's the effort really. And some people would prefer to go to Google Maps, which they're used to using.

P4: And maybe people that are used to using maps and findings things out themselves and where to go to, like the tourism offices and stuff in the city centre to use some maps and stuff rather than going on their phone and trying to use the technology. It's less effort for them to talk to somebody face to face to find out about all the attractions that interest them.

P2: I think most of the people do like research before they come to the destination so they're like, 'I want to go here.' And they just go there, so initially you don't need the application.

P10: It takes the adventure out of travelling. So there is no risk really. You can always take it out of your pocket. It takes the human mind out of the equation.

I: Okay, so you're more the adventurous type?

P10: I would like to have that. I like to travel without tour guides…

P3: Like five years ago, not many people had smartphones and they didn't use applications. But now it's so common and so popular among young people than the older ones. So in the next five years it's going to be that popular that the application is going to have a big target audience and it's going to be wider. More people are going to be interested in accessing it.

P10: Wouldn't Google Glass make the application obsolete?

I: It's definitely a point to discuss, yes. I can tell you more about it after we're done here.

P3: In the application, if you chose a certain attraction there also might be an entry price, or admission. I don't know if anybody has seen it, but…has anybody seen it? No? So admission fee would be a good idea, so the target audience knows how much they will be expected to pay.

I: Alright. Very good, let's see. That was actually it already.

Focus Group 2

I: Alright, well first of all, thank you very much for coming guys and for your time. Ehm, let's start straight off. Eh, with the first question. What's your overall or general opinion about the Augmented Reality application? That you've just seen.

(Participants hesitate)

I: Anyone can just start talking. It doesn't matter. There is no rule.
P2: I think it's a really good idea. And it's good to learn by listening, not just reading. It's more interactive and then it let's you connect more with what you're seeing.
I: Okay. Feel just free to talk to each other.
P6: Well, it was not working well.
I: It was not working well?
P6: No. (Other participants agree.)
I: Why was that?
P6: You had to try many times. It's true though. It is true. (P3, P4, P5 agree).
P8: It was also a not in line. Like the buildings and monuments were a bit off side, wasn't it? (P5, P6 agree) If you just pointed…
P6: I'm just thinking, it was like upside down.
I: Okay.
P5: But that was working, it was good.
P2: Yeah, it's a really good idea though. (Everyone agrees.)
P7: Yeah, but I think it's not good to move around with your phone like that. You will be too focused on that, you don't know what's around you.
P6: And also if you have people like old people (Others agree.)
P8: I thought maybe if it wasn't just mobile, but like a tablet…(P3 agrees.) Yeah, so older people could see that. It would be better.
P7: But not all people have a tablet.
P8: Or if that would be like an option to get them in the museum right beforehand.
P9: Some people might have one some people might not.
P8: Yeah.
P2: Like people that travel…
P6: And if you have a crap phone you can't use it.
P7: Yeah that's true.
P8: And if there was like different languages. Like because all of it was in English. But ehm, not all of them speak English, the ones that come to Dublin obviously, so that might be. That the adoption and stuff like that…
P9: Or if you just type it into Google and you can't find it. Like it's right in front of you and you know it's to the left.
I: Any other opinions?
P3: I think if we pull the information, it would be nice to have a copy of it. Let's say if you leave the museum, that you have at least a memory of it, or saved on your mobile phone or something. (P7 agrees.) Because you know you might just be able to read it in the museum, but what if you would like to read it again at home. You know just to have the same information that popped out.

P7: Yeah especially for educational purposes, for assignments, you could take that. (P8, P9 agree.)

P3: Because you would obviously use it in that place, but not when you're outside of that place.

P8: Yeah, maybe like record what you've seen.

P3: Exactly. Yeah.

P2: It's also true for the audio. It was really quiet.

P9: But you'd have to headphones in it. But if it would be that loud, you wouldn't use it, would you.

P2: Yeah, you'd need headphones.

P7: Yeah, but you're blocking yourself out from the…surrounding. (Others agree.) You might as well not go to the museum, if you're going to be on the phone.

P3: Yeah, exactly. (Everyone agrees.)

I: Yeah, very good. So what did you like in particular about the experienced application? I know you've said a lot of things already. Did you want to add anything? Was it like a 'wow'-effect?

(P9 denies.)

P7: It was good to have additional information to what was actually in the museum.

P8: I liked the fact that you just pointed at..you didn't have to take a picture. It was just using the camera lense and then give you like additional information.

I: Anything else?

P3: Yeah, I think I didn't really enjoy it. Like what you said. (pointing at P7) Sorry, I don't know your name. Like I'm in a museum, but it could have like…I could have as well not be in a museum. So actually I didn't really enjoy it.

P6: Ehm, it kind of gives you like a butt pain if you stand like that. Like if you move, it goes away and it doesn't work anymore.

P3: Almost like being in a concert. Just watch an artist live, but you just record it and you make sure that you have the whole thing included and then you kind of miss the whole concert that you have it on your mobile phone. (P6 agrees) So I just think it's a bit pointless.

P8: Yeah, because there is pictures around, but you just focus on the picture in your phone that comes with the information.

P3: Exactly.

P7: But the bits about the cafés and shops, that was good. (Everyone agrees.)

P1: Yeah, I would use it all the time.

P3: The good thing is apart from…it would actually give you a bit more information than what was given to you in reality, so that was a plus.

P2: And it speaks to you, so that's good for children or people who maybe suffer from like dyslexia or something. (P8 agrees)

P8: Or blind people yeah.

P6: It's really like, or if you're deaf and you need to read…

P2: So they can experience it, too. (Everyone agrees.) I think that's a good idea for people that struggle with that.

P8: Yeah, I enjoyed the app more so, because if you're in a city that you don't know, like last night we were looking for a Chinese restaurant. If we'd have that, it would pop up on the map and show us, so..

P7: It would be good if it showed the menus and stuff, so you could be like, 'what is that?' and just go. (P8, P9 agree.)

I: Alright good. Okay, ehm and which areas of the application would you actually improve? Where you think it was maybe…

P3: The graphic maybe? (P1 agrees.)

I: Okay.

P9: Seems like it's just like video that you click to play, so it's just like uh…so a bit more like technology wise you could improve it that way.

P3: Yeah, maybe a bit like a hologram in a mobile phone, kind of…(P7, P8 agrees.) So it kind of blends nicely with…

I: Yeah, with the reality. (Everyone agrees.)

P7: But then you can just stand still…(P6 agrees.)

P6: Yeah, that's the problem.

I: Then you what sorry?

P6: You have to stand still and then you like…

P1: You could just take a picture of it and then it comes up.

P3: I think we just have to go to the gym more often for that.

I: My god, so weak those arms.

P8: I think outside it could be improved more, because it was a bit off. Like we were standing outside and it was off…

P9: So it wasn't 100% right, yeah…just technically. Like not aligned. It's just a minor improvement.

P7: Was there actually like a route that would take you there? Like it would show you a route so you could actually…

I: Yeah, navigation, you mean?

P7: Yeah.

I: Okay. No, there was not. But yeah…any other improvements?

P7: I suppose the Search, like if you look for a particular shop and you search for it. And then by walking you navigate…

I: So that would be actually alright to hold your phone to navigate yourself? (Everyone agrees.) but you can't hold your phone for two seconds like this.

P6: Two seconds? That was like the whole video thing.

P7: Yeah, it's like…

P6: It's like five minutes you're like this.

P3: The only thing that I don't get is it more like navigation, or more for attractions?

I: It depends, I mean this is just a prototype that we've developed. So we can really just play around with it. The content, the functions, or whatever.

P7: What is it called?

I: Augmented Reality application.

P7: Is that the name of it?

I: Ehm, it's called Dublin AR. Or DublinAR, apparently the Dublin people are called.

P7: And how would you know if it is this?

P9: Yeah.

I: What's that?

P7: If you would look for something like that, and you wouldn't know what's it called…

P9: How would you find it?

I: If you just type in the playstore, or…Appstore. If you type in Augmented Reality it usually give you like…

P7: Yeah, but if you didn't know what it was.

I: Oh, if you didn't know what was Augmented Reality? That's exactly the challenge that we face.

P3: Yeah, I think we probably just need to promote it more.

P6: Is it only for Dublin?

I: Ehm, the one that we showed, yes. Only for this part. Because that's the prototype we developed it for. But if you go on the App Store for example, there is other Augmented Reality applications already. Also like navigation ones as well.

P3: So is there like different countries that work on that? Like equally?

I: Yeah, exactly. Alright, let's move to some general questions. Which features in an Augmented Reality application in general would be useful for you? For you as a tourist in Dublin for example.

P2: Ehm, show me places that weren't there for example. (P7 agrees) Like if you hold up your phone and it would show you places that you didn't know were there and you could try something new if you're not from the area. It could tell you where to go and give you directions so you don't get lost in a big city on your own.

I: If you imagine, you're the person who could decide what the application should do, what would you like Augmented Reality to do for you?

P2: I think it would be good like, you know if you have the talking SatNavs and it tells you, 'turn left' and stuff, actually tells you where to go. I think that would be even more straight forward then…if you could click say on your destination, you want to go to a café, you click and it will start telling you where to go. I think that would be really good. (P1 agrees.) Yeah, and then you can't go wrong, because there are so many people who are like technophobics.

P7: Well, if there was an attraction and you would click on it and see what it was before you go to it, so you have some information before you go, it would be valuable. So instead of you going there, you could click on it and browse what they have there. Like a café, what food they have.

P8: Yeah, because sometimes you don't like the menu and you just leave.

P7: Yeah, so you end up going there and…

I: Yeah absolutely. Alright, you can do the questionnaire later, I will give you some time, okay? Anything else you would like, like any features you would like to have in the application? If you would design a tourist AR application?

P6: It would tell me the weather.

I: Okay.

P7: Well you know that when you're standing there. (everyone laughs)

I: It's raining…

P3: I think when you had a folder where you could store information the Augmented Reality is providing you. Like a little book you can go on an drag on. I don't know, so you can always go back there.

I: Okay. Any other features?

(Participants hesitate)

P8: You could have like a list of places you have seen or been and you've found information about, so like if anyone else was to ask you, where is good to go in Dublin and what is to see, you could go on about and tell them where you have been and all.

P2: I think you could have ratings, like people, do you know, what's it called, do you know…

P8: Tripadvisor? (P3 agrees.)

P2: Tripadvisor! So like if you had that sort of connection, so like if it came up in the Café and you're like, 'Oh I don't know' and you click on it, and there is lots of ratings, and they're like five star you'd want to go there. You'd be more inclined to give it a try.

I: Yeah, okay good. So ehm, let's move away from features and go into content. What kind of content would interest you as tourists in Dublin? Think about…

P5: What do you mean?

I: For example, right now the application content was very focused on museum, historical content, and stuff like that. But maybe that's not what interests you really. So for you guys, what would you put in there?

P6: Shops.

P9: Pubs and clubs.

P7: Maybe you could have like different sections for families, family attractions, and a section for wheelchair, so if you have someone in a wheelchair it gives you what you can do. (P9, P3 agree.)

P1: Pubs.

P9: We all would go, like if there is that strip we have to go to. Probably already exists.

P3: Hotels, hostels, again.

P1: Shopping centres. (P3 agrees.)

I: Do you want to know anything in particular about all those things? Or just where they are?

P6: If they're good places or not. If I want to eat something, I want to know if it's good. (P1, P2, P7 agree.)

P7: Yeah, with the rating. Like where you can put a bit more information. (hesitating) we've already said what you're asking.

I: No, that's fine. I'm just waiting if anyone else wants to say anything. Alright, good. Ehm, could you think of a reason, now you have told me a lot of things why the application would be good. What about reasons that would prevent you from using an Augmented Reality application?

P9: If it costs money. If you have to pay for it, then there is a way to get around it.

P2: Yeah, there's a way, Google. (P9 agrees)

P3: Like if it asks you too many personal, like personal questions, details. When it wants your personal details. I think most people are afraid that it could be shared with certain parties.

P6: And if you have to stand still forever.

I: Alright okay. Yeah, that's a good point.

P8: Maybe the size of the phone screen. Like some are large and it's easier, some are small. If it's a small screen you can barely use it as well for something.

I: Okay. So do you think it should be adjusted to the screen, or have two separate applications? Like this one you could only use on a tablet, and this one…

P8: Adjusted to the screen, or just a portion. Like if it was the same phone, all types of phones it would look the same on all phones and adjusted to the small one.

P7: I think it would be good if you could mess around on it as well.

I: What do you mean?

P7: Like move things around. Like if there was a building there, you could move it. Or draw mustaches on people's faces.

I: Oh, so you want to personalise things or…

P7: Yeah. I think it would make it more fun, if you could like draw on it. If you would like just give it to a kid and they would walk around and be entertained.

I: Okay, how do you entertain kids with that?

P7: So they could draw a car on the road.

P8: Or maybe have the information like, having different choices of the information. Like having information for adults that would understand it and then maybe have two options. One child version and an adult version. Say, the same information, but just adapted to the age group.

P7: I think it's always good to make something for kids. (P1 agrees.)

P2: I think it's always for a target market, because old people are not going to have Androids and smartphones, so automatically you're sort of shutting down who you could sell this to, or who could use this. Because it's going to be young professionals or teenagers who would use it.

P1: But are they actually going to use it?

P2: But that's not what I mean…

P8: But you wouldn't use it all the time, would you? You would just use it, when…yeah, if you're a tourist, then yeah you would, but if you're at home, I don't know if you would.

P9: It's all about how you're going to advertise it though, like how are we going to find out about it? There's a way they need to think about.

I: Yeah, that's what they think about.

P7: It's definitely good for tourists to get the way where you want to, and what so ever.

I: Yeah, but that's a good point. We definitely have to think about how we are going to market it. How we can make people aware of what Augmented Reality is in the first place. Because a lot of people, or the majority, don't have a clue what Augmented Reality is. They've never seen any of it. The only thing they can refer back to is like Star Wars or something. Or like Mission Impossible with the…okay, alright. Good. Does anyone want to add anything? Or what do you think…one last question. What do you think if not you, but for other people. Why wouldn't they use it? For example your friends, your family members…can you think of any reasons?

P6: My mum is too old. She wouldn't use it. She wouldn't know how to use it.

P7: I think people might feel silly walking around with the phone in the hand (in front of them) and especially in big cities where there is crime, and people just walk and grab it.

P2: Some people might quite find it a patronizing device, like telling you where to go, what to do. You're holding it up and you feel kind of…very touristy. (Everyone agrees.) And some people don't like that, do they, so…

P1: If you're on a day out and use it, you want to enjoy the day out and the people during the day. You're just focusing on your phone for most of it.

P2: Sometimes you just want to work things out for yourself, you know. (Everyone agrees) People like exploring. You don't always want things in front of you as it is. That's part of the fun of exploring.

P8: And I feel like if you're with a family, you can't really fit everyone in one small screen so everyone can see it. Like if you're a large family, you can't fit all to hear, or stand or to see.

P3: I think that older people would rather socialise and talk to other people what they're looking for, rather than checking it on the phone, or read about it prior to the attraction, or going.

P7: The whole point of going to the museum is like to experience stuff (P1, P2 agree). I don't think I would use it in the museum (P9 agrees). Most people, like young people are on the phone most of the time anyways, so…

P6: But if you look at some photos and you don't know what it means, I find it useful to have an application. (P8 agrees)

P5: It's good if you have a photo and don't know what it's all about, or if you have a big text and children are afraid to read it, and if someone is telling you, not just telling you that you hear a voice, but if you have a small video or showing something (P3 agrees) it's easier for children and maybe more attractive and useful for them. (P9 agrees) Instead of reading like a big text.

P6: It's less boring you know.

P2: But people might find it at first not reliable, because it's brand new as well. (P3, P9 agree) So if you got this comment and it says, 'oh this bar is really great.' Like on the Tripadvisor thing, you might not trust it. Because it's brand new and not many people know about it. Because for those things, you build a reputation and then people, everyone jumps on the boat to use it. (P3 agrees)

I: Alright, does anyone else want to add anything?

(Participants deny)

I: Okay, very good. That was it already. Let's see. Okay. It's all good.

Focus Group 3

I: Okay, are you guys ready? Alright. Let's just start off with the first question straight away. What's your overall or general opinion about the AR, or Augmented Reality application?

P6: Of what?

I: About the application that you've just seen.

P7: It's good.

I: What exactly?

P5: I think it's really clever.

I: Which part of it? I mean very nice comments, very good grades, but…

P7: Is it for tourists?

I: Yeah.

P5: It's good then. It's better than spending lots of money on all the tourism stuff, you just get the app and go by yourself.

P8: If it just works well as well, you know what I mean.

P9: Yeah.

I: What about the others? You can honestly say what you think. I mean if you think it sucked, then it did, in your opinion.

P1: I think they should do like, I know it's kind of hard to do it in Dublin and in Manchester as well, because I think it's kind of hard for one guy to go around and take pictures of every location and do like a worldwide thing. So like wherever you go, you'd have that.

I: Okay, so you'd like the application pretty much anywhere you go?

P1: Yeah.

P10: And have it in different languages. (P3 agrees)

I: Alright, what kind of languages were you looking for?

P5: Well the most used.

P7: Yeah, the top, the most ones that were just going there. Like Spanish…

P1: Chinese (P5 agrees)

I: So was it like…before you saw the application, has anyone ever seen Augmented Reality before today?

(Everyone denies)

So was it like a 'wow' effect, or was it just like…

P5: Yeah, it was. (P6 agrees) Ehm, I think it was easy to use, which is good as well.

I: Does everyone agree? It was easy to use?

(Everyone agrees)

P7: I didn't have a go.

I: You didn't have a go?

P7: I just watched, but it looked cool.

I: Any other comments? Everyone liked it pretty much?

(Everyone agrees)

Okay, very good.

P7: Is it just on Android?

I: Ehm, for the moment, yes. But it's just a prototype, so it's not available on anything yet, anyways.

P7: But it will be?

I: We'll see. But yeah, Android is like the first thing it will be available on. Okay, alright. So what in particular did you like about the AR application? What features did you like about it?

P7: That it gave information like a video.

P5: And that it read it out to you. (P7, P8 agree)

P4: It catches your attention more if someone reads it out.

P5: It's more interesting listening to something instead of reading something.

P3: Like for other stuff, I would walk past, but if there's something popping up, I would stop and start looking at it.

P5: It's for things you don't really realise they are there.

I: For example?

P5: Like…in the museum, it had that picture and it spoke to you, I would just stand there and... It got a bit boring after awhile. But if it had a video and spoke to you about it, it would be more interesting. (P10, P6 agrees.)

I: Any other things you liked about it?

P2: It was quick and had enough information, which you didn't know was there.

I: Yeah, very good. Okay. Ehm, so which areas of the application do you think you would improve in order to make it better for you? Or better for you to use?

P5: We had an issue with the alignment, didn't we. (P1 agrees)

I: Sorry, which one

P5: The alignment with the Spire one, it was a bit off. Yeah, and we were all like,…well apparently it was working for the others, but not for us. Yeah, so just to make sure they're all going on.

P7: Where they're supposed to be.

P5: Yeah. It took me awhile to realise there was something wrong with it, but he told me there was something wrong with it.

P7: We tried it with a different one, didn't we.

P5: Yeah, but it was still the same. I guessed it was just part of it.

I: So it was not marked properly on the spot?

P7: Yeah, because the Spire was on the floor. (P4 agrees)

I: I see, alright. Any other things you would improve?

P3: If you had like a version with big glasses, if you'd have like a bad eyesight or something.

I: Sorry, big glasses?

P3: Big glasses like on the street.

P7: If you could choose the font with glasses.

P10: The font.

I: Oh the font, okay sorry.

P5: Or like change the accent of the person talking.

I: Okay yeah.

P8: Do you need the Internet to use it?

I: Yes.

P8: I think there should be one where you can download it onto your phone, because if there was no Internet around, where would you use it?

I: Makes sense, yeah. Would you rather prefer to download, let's say 10MB from the Internet and then be able to use it freely, or would you rather have the application like download straight away in two seconds and then have it like Cloud based, so you will need the Internet all the time?

P5: It depends.

P7: You can't access the Internet all the time.

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P5: Here, we don't use the Internet so often, so as a tourist…

P8: If you're at home and you would want to see it, you could download that. (P5, P6 agree)

I: Yeah…did you guys know that Dublin has a City-free WiFi available?

P7: No. (everyone laughs)

P5: You should see her face on it.

I: Yeah, it's called GoEx WiFi or something. It's from the City Council, they provide it.

P6: Oh, for gods sake.

P4: No, I can't go on it.

I: It doesn't work everywhere though, so don't be too happy about it. I have never used it personally. Okay, anyways, let's move to like more general questions then. Which features do you think would be useful to have in an Augmented Reality application for tourists?

P6: What?

P5: What features.

I: What features do you think would be useful for tourists in the application?

P7: A compass.

I: A compass?

P7: Yeah like so they can move around. (P5 disagrees)

P8: But if there was a 'Nearby' like if there was something going on certain events or like…

I: Okay, events, yeah.

P1: You could have like a 'nearby' thing to see what's around. Because when you're lost or something and you point at a building you can then see where you are.

I: Okay, yeah, pinpoints your location?

P1: Yeah.

I: Okay.

P10: Search, so you can search like an attraction. You can search for it.

I: What would you like to see about an attraction though?

P9: Like the costs, and the distance and if you put something like what kind of transport is available to get there.

P10: Yeah what transport.

P2: You could put like, if there is free attractions, because not everyone is going to pay. Like for what it is free and what you have to pay.

I: Anything else? What you in particularly, like you're now tourists in Dublin. What do you find particularly helpful, or what kind of application would you like to have as a tourist?

P5: Some points or places to eat. (P6 agrees)

I: Places to eat besides McDonalds, maybe.

P5: Yeah, exactly. Besides fast-food. Late and cheap transport. Like a list of cheap taxis, like where it is parked up and 10Pounds after this, and…

I: Any other things you would include?

P2: So what's the nearest transport route, like what's the closest public transport.

I: Alright, very good. Ehm, so what kind of content interests you personally? Because this application was very much designed for the historical content about the Irish Independence, right? But maybe that's not what really interests you. So for you personally, what kind of content would you like to have in the application?

P5: Pubs and clubs, sort of thing. (P6 agrees)

I: Pubs and clubs, okay.

P7: You need to see it for target audiences and that sort of thing.

P3: If you could call up like restaurants and their menus and prices and that sort of thing before you would go inside.

I: So you don't have to go inside.

P3: Yeah, just like you go…

P7: Yeah, just like you walk into a place and you don't like it, you walk back out.

P5: If you're going to make it attractive for all market types, then like do things for children. Point out the closest playground or something like that.

P2: You could put different age groups in. So you put in what age you are and it tells you what you could do.

I: Okay, so you actually have tabs in age groups?

P2: Yeah.

P8: Or like set your profile what kind of person you are.

I: Yeah, exactly. So do you mean that the application should filter everything for you, or…

P10: Yeah. (P2, P9 agree)

I: So what about those pubs and clubs would you like to see in the application?

P5: Well what kind of place it is. You've got like the main places where you can go out and dance. Then you have the places where you sit down and chill.

P6: Student bars.

P5: Yeah, and then the ones where they play live bands, and stuff like that. It's like a complete variety.

I: Okay, yeah. Any other content?

P7: We're out of ideas now.

I: That's okay. No problem at all. Alright very good. Ehm, could you think of any reason that could prevent you from using the application? Or any Augmented Reality application?

P8, P5: Internet.

I: Alright, very good.

P7: What if you were blind or stuff like that?

P5: But would you have a phone? You wouldn't have a phone like this if you were blind.

P7: No, but like…for people like that.

P6: If you can't hear, you have something that speaks to you…

P5: And how does that help?

P6: Oh…(laughs)

I: If you were blind she was thinking…it reads it out to you to annoy you even more?

P6: Alright guys.

P7: Something for people with like disorders.

I: Exactly yeah. Very good.

P2: Maybe if it's like you have to pay for it to download the app.

I: Okay yeah. You wouldn't pay for any application?

P1, P5: It depends on what it is. (Everyone agrees)

I: What would you pay for?

P1: I'd pay for it.

I: You would pay for, sorry?

P1: I'd pay for this if it was worldwide. I wouldn't pay for it, if it was just for Dublin or Manchester.

I: Yeah, alright. Do you guys have like a limit of how much you would pay for an application?

P5: Not over three pounds? (P8 agrees)

P2: I never had to.

P5: I just look for one that's free. I would pay for this one, would you not? It depends on the devices.

P7: But they're not. They're all different devices, aren't they?

I: Yeah. You have like applications for 50pens and then you have applications for like 30 Pounds.

P5, P6: Oh, not 30 pounds. I wouldn't pay that much.

I: I think those navigation apps they're all like around 15-30.

P8: Space. It's also an issue.

I: What kind of space?

P8: The space on your phone. There might be no room for the app.

I: Yeah okay. Can you think of any other reasons for other people? If you think about in your family circle, in your friends' circle, that they would not use the application for a particular reason?

P10: I think it would be too complicated for them. (P7 agrees)

P5: My mom wouldn't use it.

I: Do you think it would be helpful if the applications had some instructions or something?

P10: Yeah.

P1: Yeah, I think it should be like when you buy it, it should have a start page that explains how to use it. (everyone agrees)

P5: But it should also be like, you should be able to go back to the instructions as well, like if you get confused or something.

P7: Like a 'Help' section.

P5: Yeah exactly. And it would be good if you could find it on the App Store as well, like for Apple phones and stuff.

I: Okay. Any other reasons not to use it?

P1: Some people just prefer to do their research, without like…carry books and stuff, like travel guides. Without having to use technology first of all.

P5: It also depends on how much it is. If you can get the tour guide cheaper than what the app costs, then you would get the tour guide.

I: How about your preference? Your personal preference. Would you rather browse the stuff online before you go on holidays, or would you rather just go to a destination, download an application like this and then try it out and see where you go?

P5: I would download the app.

P8: Both. (Others agree)

I: You would do both?

P7: You would use the app if it's working. I would use the app.

I: Any other ideas? Suggestions? (Participants deny) Alright very good. Thank you very much. I will just stop this video, okay.

Focus Group 4

I: Alright, so, all I want is your honest opinion. It's part of your coursework, so the more you say, the better it is, alright? So what's your overall opinion, in general about the AR experience, or the AR application?

P6: Really good.

P5: All it needs to work, like when we were at the Post Office or museum. We just stood there and hold it, and she told us we should just scan it and something will come up.

P4: Yeah, it worked though.

P5: Well, it didn't for me. You had to stand back. I tried and she told me to stand back. So I had to go back to the wall a bit and hold it and wait for ages. So it was just a bit annoying.

P6: It might be just the first version…

P5: Yeah, that's why I said, it needs a little bit of work.

P6: Maybe it could save the picture, it would be easier to scan.

I: Yeah, exactly. To capture the picture.

P9: Have multiple languages as well. (Everyone agrees)

P4: Oh that's such a good shout. But must your phone be able to do that? Have a multiple-language option…

P3: It would be the app that does it.

P4: Oh, I get it.

I: Yeah, exactly. But was it like a 'wow'-factor for you guys, was it something completely new?

P4: It was really good, yeah. (Everyone agrees)

P1: I mean some of the things just takes time to get through. It's just early.

P7: I mean there were so many times when I was in a big city, and I stand in front of this building and it looks so familiar, but I have no idea what it is. (P5, P8 agree) I just stood there like…I've seen it.

P6: It just marks what is it. (P7 agrees)

P2: I don't really know what it is..

P7: You know the Post Office with the bullet holes.

I: Yeah, you don't know what it is really…

P2: I was so happy walking past the Noodle Bar.

I: Alright very good. So, what did you like, I mean you've said a couple of things what you liked about it, but in particular did you want to add anything what was good about the application?

P6: I think that you can use it on the phone, because the phone you have always with you I think.

P7: I got a little confused in the beginning, because I thought it was just programmed for Dublin. Obviously it was…was it GPS?

I: GPO.

P7: What's the difference between GPO? What is the…not like Google Maps, but like it uses your current location.

I: Oh yeah, GPS.

P7: But it's not like as if you're planning a day out and you're going somewhere and you download it for this place, as if when you're there if that makes sense. But in case you stumbled on something, you didn't really need to be there and still get information. I think that's pretty good.

P6: And it's also great when you can see in 150 metres or something, where is the restaurant, where is this…(everyone agrees) You don't have to go exactly to this place, but you can see.

P5: Yeah, what's around you, yeah.

P6: If there is something interesting there, or you should go this way or that way. (P7, P2 agree)

I: So you liked pretty much the features outside more than the ones inside?

P5: But I think it was good that when you were inside, one of them was a video, wasn't it? One of them was a picture, and the other one was just text. That was kind of good that it was different. That it was kind of visual, wasn't it. (P7, P1 agree)

P4: Because usually when you're in a museum it's always just some text.

P1: Does it h0ave some option where you can…so it's just me hearing…

I: You can turn your volume off? Or you can use headphones.

P1: Yeah.

P4: Do you need to pay for it?

I: Well that's another question. Because this one is just a prototype.

P4: Yeah, when it gets really big.

P7: I would, I would charge for it. (P1, P6 agree)

P1: Despite that, would you just be able to scan with it, like anything and would it work?

I: It is a question what you want to do. If you want to pinpoint it, then you don't need to scan it, you can do it with GPS.

P1: If you'd want more Information…

I: Then, maybe it's going to be hard, because you would have to stand a certain distance. But was there like any information that you preferred? Like for example outside, it pretty much just told you what it is, and it just gave you an overview per audio, did you hear that? Like it explained what it is. (Everyone agrees) Whereas inside, it was more…the guy was talking, the postman.

P6: I prefer more outside, because inside we said when we are going to a museum or somewhere, there is always text. There is always an atmosphere in the museum, so I think it doesn't need…it might be confusing.

I: Yeah okay. So do you guys agree with her? Do you find inside is less useful than outside, or…

P7: Yeah… I think it's a good idea, but I can just go and read the textbox below it, without sounding rude or anything. But like yeah. It's a good idea, but I would prefer the outside one.

P6: Yeah, and there could be problems scanning it. (P5, P7 agree)

P5: And if it gets busy inside, you will be like, 'Excuse me' and then when they're looking, you're just like…

P6: Yeah, we were in fact just our people and there were already problems (P7 agrees)

P3: I think there should be like a thing where it knows when you're outside. Because if it didn't have that 'play' button at the GPO, I would have no idea what it was.

P2: What was it?

P1: The General Post Office.

P2: Oh yeah.

I: Oh my god. It's like half an hour ago.

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P7: Oh, do you guys know I thought we were talking about WiFi then. Oh this blows my mind.

I: Yeah, there are two abbreviations.

P3: GPS is the WiFi, GPO is the General Post Office.

P7: Alright, great thoughts.

P2: It always sounds like it has something to do with Internet or something.

P4: Yeah, GPS…

I: Good, no worries. So which areas of the application would you improve? We said already…

P3: The photo, putting the photo on.

I: Putting the photo on? Like in what way?

P3: Like because you stood there, and it said, 'The Spire is there, and the Post Office is there', but putting a photo on, so it's like, we weren't even near the Post Office, but it came up with it. (P5 agrees) Like if it came with a photo of it, you'd actually know where you're going.

P5: Yeah, if you have like a picture of the building coming up underneath it, when you click on it for more information then you know if you see it, you're like, 'Oh so that's what it looks like' when you walk toward it.

P3: It could help with the directions.

P5: Because signage is not so good in Dublin.

P3: We could be like app producers.

I: Yeah, that's very good. Anything else you guys would improve?

P2: Can you use it on other phones? Because I don't think you can get apps on like a Blackberry, can you?

P1: They have some, but it's limited.

I: You can use on what sorry?

P2: Just use on other phones.

I: Oh, just on different operating systems and stuff.

P7: Yeah, or iPads and stuff. To use on that.

P2: Yeah, or something that's different.

P5: But maybe you know when I was holding it like that and the text would come up, I would move it somewhere else, and the text would disappear, so maybe if you could have like a box or something like, I don't know what you would call it, but maybe to freeze it, and then you could like put it there like swipe it and read it away from having to stand like that. (P7, P1, P2 agree) That would be cool. There is no more points.

I: Everything else is perfect?

P5: Apart from those minor tweaks.

P1: If you're actually walking around and scanning things you get more information on things that aren't there.

I: For example?

P1: I don't know, if you're scanning a building, when it was built, the history of it…

P4: We were just talking about what if you were blind?

I: Okay, or if you're deaf…

P4: But then again, it comes up…

I: But then again, if you're blind, why would you have a smartphone? You'd rather have a mobile phone with…

P4: You'd have a Nokia you can play snake on…

I: Yeah, exactly. So yeah, what for limited, or in their capability limited people?

P3: There should be like a kids version.

P7: Oh yeah, this is so true.

P2: They wouldn't see it. If I was a kid, I was like…dwarfs walking around. What if they can't reach it?

P4: It should got a zoom function.

P3: Zoom…yeah, I don't know.

P2: But what if you want to scan it, like scan a text, and you can't reach it?

P5: 'Can you just pick me up?'

P3: You can't. You should be able to do it.

I: Alright, let's go to the next question. Which features would you find useful or beneficial in an Augmented Reality application in general now, apart from this one?

If you think, let's say you're an App designer, which features do you think would be useful to have in there?

P3: Ehm, maybe if you could like save the information onto your phone. Like what the person that comes up says, it stays in your phone. (P4, P7 agree) Because it could be that you want to see it again sometime later. (P5 agrees)

P1: Or like a link that leads you to their website.

P5: A hyperlink. Yeah, for more information.

P3: Or print.

P1: Print where?

P5: Print? Why?

P3: Like if there was a wireless printer anywhere you could.

I: Yeah, okay. Any other things you're looking for? Let's move away from features. How about content then? Because this application was very much focused on the GPO focused, right? Very historical. But maybe that's not what interests you really. You said already.

P1: Are we supposed to design the application?

I: Could be. So what kind of content would interest you?

P7: I think just something not too complicated.

P2: I think something about Dublin. I'm not interested in those…

P3: I think P7 is interested in that kind of buildings.

I: Or think about you being in Dublin, exploring Dublin, what are you looking for?

P3: Something that stands out.

P7: You want to see like other sites and…

P5: If you could see all the shops together, like Topshop and all that. It would just be really helpful if you'd know, 'Oh it's there.' without having a sign. Like P9, he smelled it.

P7: That was funny.

P5: He was like, 'I smell it.' So we're like 'can we go in'? 'It's like 30 seconds away.' I will never forget that.

P5: It'd be good if you'd have different complex. You know like in a big city, you'd think you have a big swimming bath.

P2: Swimming bath?

P5: Yeah, you know like a swimming bath, for like families with kids. I would come with my family to a swimming bath.

I: Okay, because that's exactly the problem, you know. You come to Dublin and you don't have a clue what's going on or what's where.

P2: I'd want to know events that are going on.

I: Exactly.

P7: I would use that app in Manchester.

P1: It would be good if you could scan down a street, so you can see what there is. So that would be good instead of searching for specific places. So you can see any good places.

P7: Isn't it hard not to try and nick other peoples' ideas? You know Google Maps is very similar you know to like the one, but just more advanced. Is it hard to…you want to create something unique, but at the same times it's kind of…

P3: They're very similar.

P7: You know what I mean, you'd have to have something…

P3: Apart from the one inside. (P4 agrees)

P7: Yeah, the inside one is different, but just the one when we were at the Spire bit.

P4: It was just like Google Maps looking around.

P7: Yeah it literally is. It's very similar.

P3: Yeah, how tall the Spire was that should be on the App.

P4: You should be able to ask questions.

P7: How would you go about getting that information? If you would have audio to get information. It'd have to be recorded.

P5: Like Wikipedia.

P7: Yeah, but like everything would have to be recorded about a short paragraph. You would have to record every single place. Like if I want to know about Spa or something like that, it'd have to be…Oh god that blows my mind. That's far too much.

I: Alright, good. So could you think of any reason not to use the application?

P1: No.

P3: If you'd live there.

P5: If you can't be bothered to get your phone out to scan. I don't know. I'm just lazy. If I see my bag lying over there, I can't be asked.

P8: It's not very safe.

I: It's not safe?

P8: I wouldn't walk around with my phone like this.

P2: Why not?

P4: It would feel like someone would nick the phone while you use it.

P8: Outside yeah.

P5: Someone could just grab it, while you're holding it up to the Spire.

I: Or if you think about other people in your friends' circle, in your family circle, why wouldn't they use it?

P4: They wouldn't know how to.

P2: My mum doesn't use a smartphone.

P5: It might be too technologically advanced for them. My grandparents probably. My grandfather is a proper geek and loves stuff like that, 'Look it's so interesting.' But we wouldn't start…

P7: Most people literally don't know about this stuff.

I: But for you guys, was it now still complicated, or was it simple enough to use?

P5: I think once they showed us, it was simple. (P2, P7 agree)

I: But what if we wouldn't have shown you how to use it?

P7: I wouldn't have known. (P1 agrees)

P1: I wouldn't know that we have to hold it and it would come up.

P7: Yeah, but the one inside the museum, they were telling us what to do, and I was still like…

P4: But if they'd tell you in the application, I would be able to (P2 agrees)

P3: There should be like a box that said, 'Scan'. So we could click a button and it would literally just scan it. Because we were holding it and moving it around…

(P4 agrees)

P4: Yeah it's true. It should show it's doing something.

P3: Like a loading…

P1: Or like a light that flashes. Or would it not? What's it called?

I: The technology or…

P1: No the App.

I: Dublin AR.

P1: Oh so it's just for Dublin. Oh yeah.

I: Alright. Any other things you want to add? Any ideas?

(Everyone denies) Okay. Thank you very much. Have a look at your second sheet, or a bunch of sheets. That's a questionnaire. I know there is a lot of questions, just bear with me and try to answer them as good as you can. You can tick or circle, whatever.

Focus Group 5

I: Alright, so what I'm going to do, I'm just going to throw in questions into the room and you take over pretty much, okay? What do you think in general about the AR application that you've seen so far?

P2: It was really good. (Everyone agrees)

I: What was so good about it?

P7: Like you could see what was right there. It was like a map, but you could actually see what was there.

P4: Like in a map you wouldn't naturally see where it is, but here you could actually see it where everything is. (P10 agrees)

I: Was it like the first time for everyone to come in contact with Augmented Reality? (Everyone agrees) So was it a 'wow'-factor, or…

P5: Yeah, I have never seen this before.

I: What was the problem?

P5: I wouldn't know how to find it. Like how does it actually know it's there? (P4 agrees) I can't explain it. I think it's just one of those things…I don't understand.

I: Was anything not so good maybe? Or where you though…what was your first reaction when you saw it?

P3: Wow! (P1, P5 agree)

P8: But it was like, you could only see it when you're there. When you walked off, you couldn't see it. The restaurant bit was a bit stuck, so you'd have to wander around a bit until you would see the restaurant. (P2 agrees)

P10: How far does it, you know when you see through it, how far does it go, the distance?

I: It depends on how it is programmed.

P7: But I found it better than the other one you showed. I wasn't too much fond of it.

I: You mean outside or inside?

P7: No, the one that had all the things in the surrounding.

I: Oh, you mean Junaio?

P7: Yeah, it was better because that thing had too much on it at the same time.

I: Oh okay. You didn't like it?

P7: It flaws…

P10: Yeah and the one in the museum, you'd have to hold it a certain way for it to pop up. If I was on my own, I wouldn't have thought that anything was there.

P8: Yeah, I would have thought that it doesn't work. But I'd come back to it.

P4: We were watching something and the video was upside down. I think you'd have to see it on different phones.

P8: You just had to stand there until it stops.

P6: Yeah, if it was busy then you couldn't stand.

P4: You would have to stay there to play the video but when you moved it…

P1: If it would stay on once it starts the video, especially if you have to hold it up to watch it. It would be better if you could hold it down and watch it rather than being stuck like that. (P2, P4 agree)

I: Yeah, any other comments? Okay, good. So we kind of talked about it a little bit already, but was there anything in particular you liked about the application? You said that you could access information instantly.

P10: I like the fact that it shows different information ports actually. Different information in the museum. (P2 agrees) It gives you more depth about what you're seeing.

I: What do the others think?

P5: It's like usually for things like that people need laptops and stuff like that. Like how I used it, it just freezed. It just goes to fast and then freezes and just goes off. But with that, it's just easier. It just comes and you click it and it just works instantly. (P4 agrees) It doesn't have to load on the street, like the camera is just there.

P8: I'd use that if it works.

P4: Especially if you don't know the street name you can just use the app and you just know. (P5, P8 agree)

I: Any other things? Like inside maybe what you liked. Or did you like it?

P7: Like what?

I: Good morning. Like we talked about outside and you the additional information. But was there anything else that you liked?

P6: I liked the cinema.

P7: But that's not part of the app.

P9: It would read it to you.

P6: Yeah, but it told you a story in it.

I: What's that, sorry?

P9: It would read the story to you.

I: Oh okay. So you would prefer that rather than reading it yourself? (Everyone agrees)

P5: What if you don't understand English though?

P9: That's why you would have another languages. It's in Irish on one of the things.

I: Okay, yeah very good. Which areas of the application would you improve?

P3: The sensing. You know when it knows. When you look at it, you can get it without waiting. You can get it on a specific point (P2 agrees) and then it catches it and gets it, I think that needs to be improved.

P9: For example you should like see that the area is there, instead of like moving around. (P2, P5 agrees)

P10: when we were watching the video, and it finished, it just went black instead of getting off. And you were just there didn't know what was supposed to happen and then it was just weird.

I: Okay. Any other things that annoyed you maybe in the application?

P3: It would freeze sometimes. Yeah, it would freeze and take time to get back in.

P9: I think also when the camera doesn't work well.

P10: I think maybe it should be pointed out there what there will be when you're in the museum. We were walking around in the museum like this (holding up her phone) with the camera (P2, P3, P4, P5 agree). So instead, if you know where they'll be you can be like, 'Oh there is one on this picture.' Hold it, and then watch instead of being…

I: Okay, yeah. How about outside? The outside one?

P9: Can you select, like say if you're looking for a restaurant, you can just put it in and then it finds them for you?

P10: But then it would show the categories or something…

I: Any other things you would improve? Did it work smoothly outside as well?

P4: Yeah, it was okay (P2, P3 agree)

P10: Is it that you can go into more specifics? Say, you type in restaurants and then you can go into Italian restaurants…?

I: No, you can't…

P7: It's just the restaurants it can find in the area.

P1: It's just like the restaurants in the area whichever are the closest.

P10: I think it would be good if the app had that on.

I: Alright, very good. Let's talk about general about Augmented Reality, not this application now. Which features do you think would be useful for tourists to have in an AR application?

P6: Maps, language.

I: Maps, language? In what way?

P3: Maps? Like showing as well like tourist attractions and stuff like that.

I: Okay. Would it be similar to what we have now already? Or would you make it different?

P3: Yeah, like that. Just easier to what you have already. Like you could take a picture and it takes you there. Not take you there, but you know what I mean, yeah that would be much more easy than a person that doesn't know the area and then they need to read a map and try to find it themselves. Languages as well, P6 said.

I: Language, what about languages?

P7: Like have more choices.

P5: Because you got them in all the tourist places, like at some places, you can like download the tour, before you go on the tour in another languages.

I: Okay. So this kind of option, or similar option.

P10: And put prices on it. Say you would look for a restaurant and you're on a budget. All that. (P7 agrees) On attractions.

P1: Yeah, like entry fees and stuff like that.

P4: Yeah, opening times.

P5: Yeah, what is free and what you need to pay for. (P2, P10 agree)

I: Okay. Any other things? You moved a little bit into content now as well. How about, if you think about content specifically? What interests you guys, when you're a tourist somewhere else? In Dublin or whatever. Anywhere really, what are you looking for as a tourist?

P10: Things to do. All that interactive stuff.

I: What kind of interactive stuff?

P10: Like museums, or theme parks, which is fun.

I: Okay. Does everyone agree? (Everyone agrees)

P3: Like all the good restaurants, bars good clubs, and stuff like that.

P10: When I was in a big city, I really loved that I actually tried home-made food actually made in that city, and not chains and stuff. (P3 agrees)

I: Okay, so local information, okay. Anything else you're looking for? When you think about your experience in Dublin. Did you have any problems while being a tourist here? Anything where you thought, I need some help, need some guidance, anywhere.

P4: We didn't really go out. Like anywhere apart from the city. We didn't have an idea where we stand or where to go. (P3 agrees)

P3: Yeah, we had to ask the people. On one of the first nights, we went to one of the bars we just asked the people working there, because there was really no information what's going on or where tourists can go. (P2 agrees)

P10: There is like this app in England and you can search which city you're in and then which night you're going out and then it gives you all the list of club nights.

I: Alright. What did you say was that app?

P10: Easy clubbing? Yeah. It's not that…it just started I think so…

P4: It would be good if you can put in like where you stand, or if you can log in your hotel and it would give you notifications.

P1: There is an app like that if you look for it. It finds your location and then tells you, you can look for like bars, restaurants, hotels in your local context.

P4: Or maybe like an app that you give you like…I know that would be a lot of work, but had street views of how to get there. Or if you have like the app, to show you certain direction points or something like that.

P10: You also like, just because you know where the clubs are you don't necessarily know which ones are good. (P4 agrees)

P4: Yeah, so have like recommendations or something. (P2, P3 agree)

P10: Like the Internet, where the student club nights were, otherwise you would go clubbing and be disappointed.

P3: I was disappointed yesterday.

I: Any other things that interest you?

P8: Shopping.

I: Shopping? How would you include that in the application?

P5: We literally like just walked down the street and found where the shopping bit is. Like even if you use Google or stuff like that before you came here, it doesn't really tell you where to go and stuff. It just turns out like 'top clubs' and things like that, but the same, it doesn't really tell you where to go or anything. (P10 agrees) So like what they were saying before. Everyone goes to Tripadvisor now, it could be more like actual tourists that would recommend things, like put that onto as well.

P4: Maybe if you could put your preferences before like if you are near a location that you liked it would give you notifications and stuff like that. (P5 agrees)

I: Anything else? Or do the others agree, or…(P2, P10 agree)

P10: I like the idea, but when I go shopping, I just like to walk around. Because if people know like, 'where is Topshop' and go straight there. I like to go to different ones.

I: What about you guys? (P4 agrees)

P5: It depends where you are, doesn't it.

P10: But like Abercrombie. It's seems like it's way out of the way, but people come just for that.

P5: But it is like a big thing, isn't it?

P3: I thought it was like a museum. I didn't know it was a clothes shop.

P10: It's just like in London. It's completely out of the way, so you need to know where to find it.

P1: If I'd come down here, or to Dublin because I know Dublin has got an Abercrombie, but you would automatically walk down that street over there and walk down there, but it's not there. (P5 agrees)

P5: You wouldn't know where it is.

P1: Yeah exactly.

P9: Have like different maps, a map all for shopping where you can see like all the different shops, and then one for restaurants, I think I would like that one.

I: Alright, very good. Could you think about any reason, not to use the AR application?

P6: Because you don't have a smartphone to use it.

P3: It could use a lot of data, maybe. Because if you have like all these notifications, push notifications, and all that…

P7: But if you use the Internet, you could apply for that.

P3: Yeah but have you noticed? It's hardly connected. It makes out like…but it doesn't connect. So if it would come up but it doesn't connect, then you can use a lot of data, if you have a lot of information.

P10: Are the…you know when you hold the thing up and things come up, does it show you like a distance the closer you get, so you can know how close you are? Like if it changes.

I: Yeah, outside, the GPS one? Yeah.

P8: Older people wouldn't use it. (P2, P3, P4 agree)

P3: Probably for a niche market.

P8: It's probably better to send you there…

P5: I think like independent tourists as well. Because say like shops some people might like high street, other people might like vintage, which is usually hidden away. So they probably think, oh it's probably just going to send you there, where the high street is, but some people like certain things. Some people might like to find their own way to find some things, so…probably not everyone, but…

I: How about for you guys, what would be a reason not to use the application?

P4: I would use it. (P5 agrees)

P6: How would you know about it? Like you're actually not going to know about it, are you? Unless you're like…

P9: You must have like an advertisement to watch…

P3: It's just like on Youtube, you know where you have the advertisement and you can't click it away. You have to watch it.

P5: It would put tour guides out of jobs.

P9: Yeah but if you're on that, you're not seeing anything else.

P4: Isn't it also like a safety thing, when you walk with a smartphone on the street, someone could obviously muck you. (P5 agrees)

P10: I wouldn't use it unless I get lost. Because I like exploring and walking around without knowing which way to go.

P1: But then it's good if you didn't know where something was, like I wouldn't know that was the Spire, but if you hold it up and it gives you information on it. That's probably what I would use it the most, when I didn't know what something was and I wanted more information on it.

P4: If you didn't know the name of something… (P1, P8 agree)

P10: They could've used it for the Dubline Trail for the massive colourful things. (P1 agrees)

P4: In the Dubline Trail some of the things, like maps or something weren't in the right place, so you wouldn't know which trail was which, so in the app that would be really helpful.

P1: You know we got lost and we asked a local and she had no idea what we were looking for so that would have been so handy.

I: Yeah, any other reasons that would prevent you from using it?

P6: I think if you haven't had WiFi. Because I think it uses Internet and without it you can't really use it, can you? (P1, P3, P4 agree)

P10: And battery. (Everyone agrees) When you're using Google Maps, it just drains your battery.

I: Yeah, definitely. It just sucks out your battery. Any other comments? Or suggestions? Alright, very good. Thank you very much. Have a look at the second

sheet. It's a questionnaire regarding Augmented Reality, regarding technology. It's a lot of questions, so sorry about that. Just bear with me. Some questions might be a bit confusing, just try your best.

Appendix O: Dublin Augmented Reality (AR) post-experience Questionnaire

AR(Augmented Reality) Questionnaire

> **Dear participant,**
>
> **The following questionnaire aims to get an insight into the user experience of "AR (Augmented Reality)". All of your provided data for this study will be kept confidential and are not used for other purposes but for this research. Although it might be burdensome, please try to fill out this questionnaire in a sincere and honest matter. (The survey will take approximately 5 minutes to complete.)**

※ **The following questions serve the analysis of demographic characteristics. Please circle (O) the applicable answer or indicate it with a tick (√).**

1. **Gender**
    ① Male ② Female

2. **Age**
    ① 20 and below ② 20-29③ 30-39④ 40-49⑤ 50-59⑥ 60 and above

3. **Current educational degree**
    ① High School and below ② 2-year HND course   ③ 3 or 4 year degree course

    ④ Postgraduate course and above

4. Occupation
    ① Student   ② Administrator ③ Sales ④ Technician   ⑤ Manual labor
    ⑥ Professional   ⑦ Self-employed⑧ Civil servants ⑨ House wife/husband

    ⑩ Other

5. **Income**
    ① 1,000 GBP and below   ② 1001GBP – 2000GBP ③ 2001GBP – 3000GBP

    ④ 3001GBP – 4000GBP ⑤ 4001GBP – 5000GBP ⑥ 5001GBP and above

6. Marital status
    ① Married   ② Single ③ Widowed

7. Have you used Augmented Reality (AR) in the past?

① Yes   ② No

Please rate (✓) the following aspects of the application from 1 (Not at all important) to 5 (Very important)

Function Requirements for AR tourism applications	1	2	3	4	5
Simple and easy to navigate through the application					
Pinpoint tourist's location on a map through GPS and provide directions to tourist attractions and restaurants/hotels					
Save tourist preference to filter information to user requirement (family, wheelchair access)					
Personalise information according to tourist's profile					
Application menu is easy to understand and provides clear categories					
Search filters to access information on specific products and attractions easier					
Planner - Organise/Schedule trip					
Recommendation of activities, venues, destinations according to saved user interest					
Update information in the application on a regular basis					
Freedom to change recommended trip schedule					
One application to access all tourism relevant information					
Multiple language function to overcome language barriers					
Link to social network platforms such as Facebook and Twitter					
Discounts in connection with tourist attractions and restaurants					
Memorise trip itinerary and information content to access at a later stage (Travelbook, Trip memories/photobook)					
Show pictures next to textual information to recognise attractions and restaurants					
Simple and professional application design and graphics					
Fast and smooth working application					
Price and product comparison					
Exchange rate calculator					
Tourists' data security					
Connect with other devices to share information					
Booking function for accommodation and restaurants					
Audio/video support for interaction for handicapped tourists					
Access additional information anywhere at anytime					
Offline mode for information access without WiFi (pre-download the application content)					
Accurate GPS sensor to overlay AR information					
Helping guide/instructions for the first start of the application and on demand					
Application sends push notifications where information is available					

| Content Requirements for AR tourism applications	1	2	3	4	5
Map to display information of the immediate area/surrounding (tourist attractions, gas stations, ATM, restaurants)					
Brief background information on attractions/venues (products, opening times, prices)					
Reviews, comments and ratings of other tourists					
Public Transport Information and maps showing routes (bus, train, taxi)					
Provided information is significant for the timeframe of travel					
Restaurant menus					
Events, daily specials and promotions					
Accommodation room availability					
Country etiquette (culture, restaurant, general behaviour)					
Special requirements (food, disability)					
Local weather information/forecast					
Option to access more information (link to website)					
Application is available in other cities besides Dublin					

Please rate (✓) the following aspects of the application from 1 (strongly disagree) to 5 (strongly agree)

I do not use AR tourism applications because…	1	2	3	4	5
…I was unaware of Augmented Reality					
…there is insufficient information about AR in general					
…there are no useful AR application to date					
…I avoid unknown technology					
…it is inconvenient to hold the mobile device at a designated angle for longer time periods					
…I do not want to focus on the mobile device too much during my travel					
…the capabilities of my phone are too limited for getting the full AR experience (space, battery, screen size, operating system)					
…I do not want to input my personal details in the application					
…the reliability of the application is limited since it's still unknown					
…I am anxious to use the mobile AR tourism application outside to access information due to theft					
…false image recognition can result in giving me wrong information					
…I need to learn how to use the application					
…I research information prior to the trip					

…I prefer to use Google Maps instead of a new tourism application					
…I prefer to explore destinations in an adventurous way					694

People would avoid the application if…	1	2	3	4	5
…there is too much irrelevant information on the application					
…the application has glitches (application freezes, shuts down)					
…there are advertisements in the application					
…the information on the application is limited					
…they are from Dublin					

Appendix P: SmartPLS Screenshots
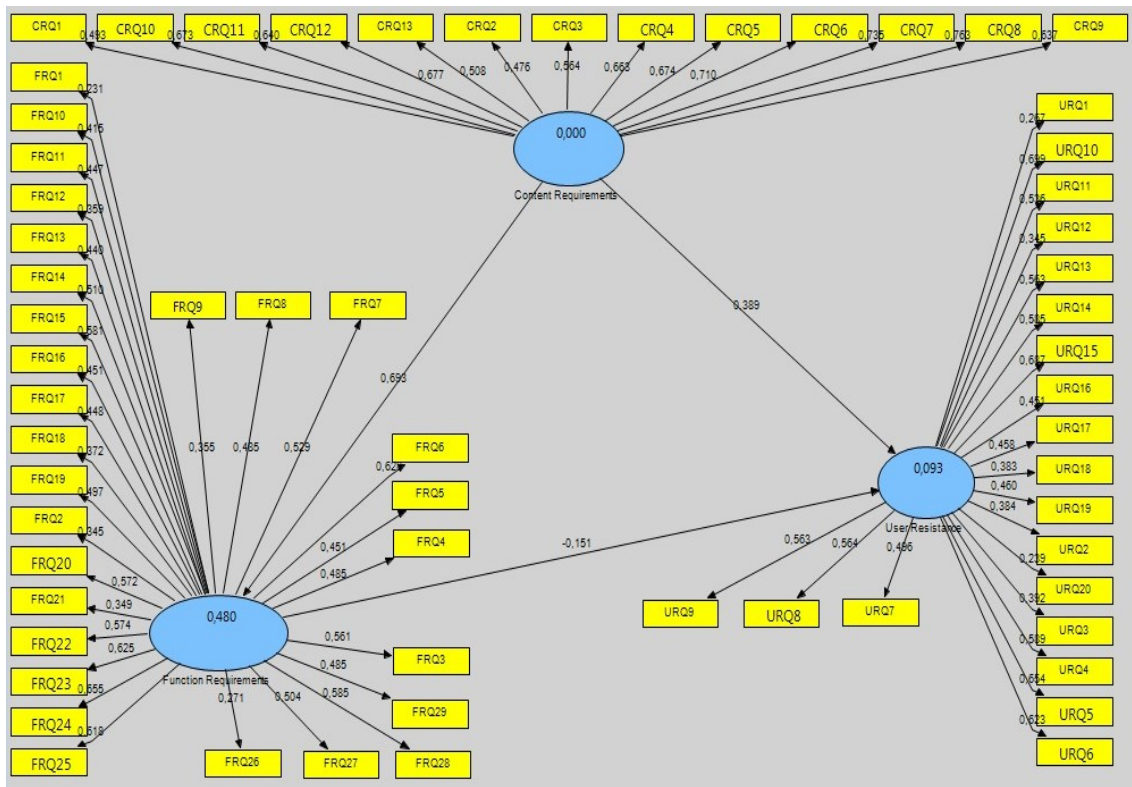
SmartPLS screenshot of all 62 requirements and factor loadings
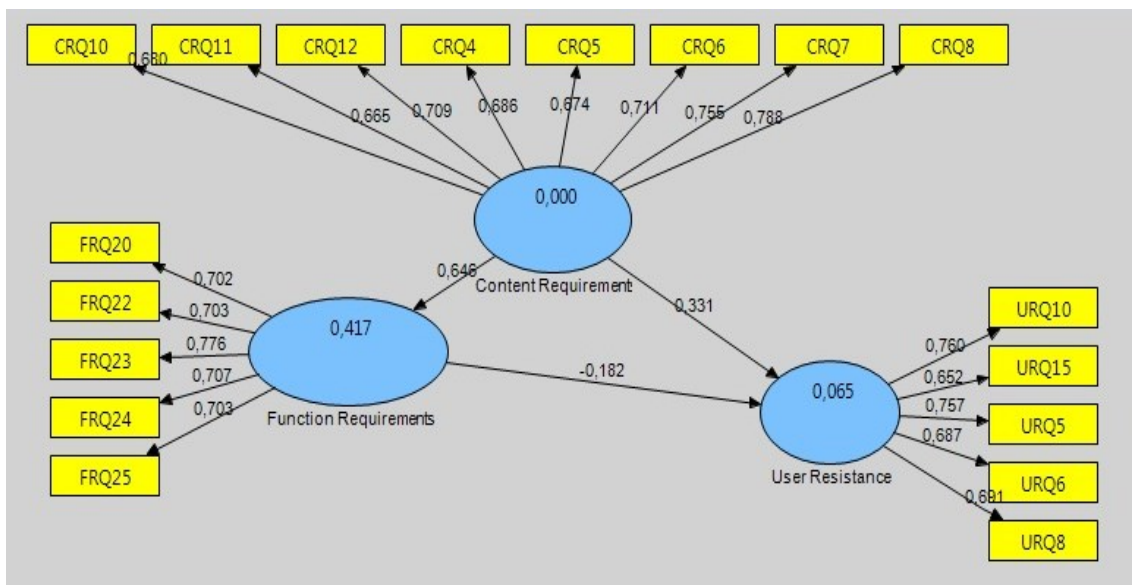
SmartPLS screenshot of final 18 requirements and factor loadings

Appendix Q: List of initial 62 identified Tourist Requirements

Code	Tourist Requirement
CR1	Map to display information of surrounding
CR2	Brief background information
CR3	Reviews, comments and ratings of other tourists
CR4	Public Transport information
CR5	Provided information is significant for the timeframe
CR6	Restaurant menus
CR7	Events, daily specials and promotions
CR8	Accommodation room availability
CR9	Country etiquette (culture, restaurant, behaviour)
CR10	Special requirements (food, disability)
CR11	Local weather information/forecast
CR12	Option to access more information (link)
CR13	Application is available in other cities
FR1	Simple and easy to navigate
FR2	Pinpoint tourist's location
FR3	Save tourist preference
FR4	Personalise information
FR5	Application menu is easy
FR6	Search filters
FR7	Planner
FR8	Recommendation according to user interest
FR9	Update information regularly
FR10	Freedom to change schedule
FR11	One application to access all tourism information
FR12	Multiple language function
FR13	Link to social network platforms
FR14	Discounts with attractions and restaurants
FR15	Memorise trip itinerary
FR16	Show pictures next to textual information
FR17	Simple and professional design
FR18	Fast and smooth working application
FR19	Price and product comparison
FR20	Exchange rate calculator
FR21	Tourists' data security
FR22	Connect with other devices to share information
FR23	Booking function for accommodation and restaurants
FR24	Audio/video support for handicapped tourists
FR25	Access additional information anywhere at anytime
FR26	Offline mode for access without WiFi
FR27	Acciurate GPS sensor to overlay AR information
FR28	Helping guide/instructions
FR29	Application sends push notifications

UR1	Unaware of AR
UR2	Insufficient information about AR
UR3	No useful AR application
UR4	Avoid unknown technology
UR5	Inconvenient to hold the mobile device
UR6	No focus on the mobile device
UR7	Capabilities of the phone are too limited
UR8	No input of personal details
UR9	Reliability of the application is limited since unknown
UR10	Anxious to use the application outside due to theft
UR11	False image recognition result in wrong information
UR12	Need to learn how to use the application
UR13	Research information prior to the trip
UR14	Prefer to use Google Maps
UR15	Prefer to explore destination adventurously
UR16	Too much irrelevant information
UR17	Application has glitches
UR18	Advertisements in the application
UR19	Information on the application is limited
UR20	User is from Dublin

Appendix R: Personal Reflection and Background of the Researcher

This section will discuss the actions and process that were taken during the qualitative research by considering the background of the researcher. Therefore, the following provides a brief outline of the researcher's background and view of the world.

I was born and raised in Germany. Having parents from South Korea, my life has always been a crossroad of multiple cultures. From the time I started going to school and taking part in society, home was entirely Korean culture driven while outside, I was surrounded by the German traditions, culture and views. Nonetheless, my parents always reminded me of the virtues and importance to maintain and understand the Korean culture, its traditions and values, for which I was educated at home as well as in Korean school on weekends. When I turned 16 years old, I went for an exchange program to Wisconsin, USA, eager to feel and make decisions independently and experience new cultures. However, I only realised until later that this was the start of a multi-cultural life. Since getting back from the U.S. it has been challenging to stay and live in one place for long periods of time. After graduating from High School, I took the opportunity to live in South Korea to improve my mother tongue and explore the culture on my own. Working as English and German teacher in order to finance the stay abroad, it has made me realise the differences and preferences of the German and Korean culture for which I was very grateful. Although the close circle of friends has been mainly Korean, I noticed that my attitude towards work, life and inter-relationships are strongly influenced in a German way. However, curious about different cultures and the desire to travel has brought me to live in countries such as Australia, China, Switzerland and the U.S. Nonetheless, after approximately one year I have always felt the need to move on and explore other destinations that I can call 'home'. Experiencing various cultures by living among them has widen my horizon of thought and increased my ability to think from different perspectives, which has had a significant impact on this research.

From early on, my interest in the field of consumer technology was wide-ranging, particularly with the constant need to own and use the latest mobile device on the market. Naturally, the interest in smartphones, as well as tablets and other mobile devices triggered the curiosity of applications that were able to enhance the user experience and utilise the gadgets to its full capacity. On the other hand, while travelling has always been my passion and has inspired me in various ways, my interest in cultural heritage sites had been limited. Being convinced that I was missing out on a big part within tourism particularly in bigger cities, I was committed to look for ways to get a different angle and approach to urban cultural heritage sites. Therefore, before I started the course, I had already made up my mind with regards to the research topic and was able to read into the area of Augmented Reality and tourism prior to my enrolment at Manchester Metropolitan University. Nonetheless, it needs to be recognised that this study was guided and kept in track of the AR research project in Dublin, and therefore participants for the data collection were accessed through the connections made during the project as well as the gatekeeper, who was collaborating with the project. Along with the research, I have attended and spoken on various conferences on AR and e-Tourism and attended meetings with multiple stakeholders from Dublin and Manchester for a potential application which made me realise the potential of AR to solve many of the industry challenges due to its qualities of being able to use virtual space to make information accessible in the immediate environment. It has been a very steep learning curve, which I had to adjust to, both for research quality as well as time management in order to comply with the project outcomes. Nonetheless, the pressure has helped me to keep due dates for the project and in parallel keep my research dissertation on track in order to turn in the first draft within a desired timeframe.