# USERS' EXPERIENCE OF E-GOVERNMENT SERVICES: A CASE STUDY BASED ON THE NIGERIA IMMIGRATION SERVICE

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**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE DEPARTMENT OF LANGUAGES, INFORMATION & COMMUNICATIONS MANCHESTER METROPOLITAN UNIVERSITY FOR THE DEGREE OF DOCTOR OF PHILOSOPHY**

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**Abstract**

The aim of this thesis is to contribute to a better understanding of users' experience of e-government services in developing countries through a study of a specific e-government service, the Nigeria Immigration Service (NIS) portal. This thesis therefore encompasses both the users' experience of e-government services and effect of the digital divide in the use of e-government services.

The NIS portal was chosen as the context for this study because it is the most well-developed e-government service in Nigeria. Those seeking to travel in and out of the country have no option but to use it regardless of whether they are currently living in Nigeria. Given the importance of profiling a significant number of users to support the investigation of relationships between variables, and the geographic scatter of the respondents, snowball sampling was used for the questionnaire survey used to collect the data. The questionnaire design and subsequent analysis was informed by previous research and theory in the fields of customer satisfaction, service quality, technology adoption and the digital divide. 351 completed questionnaires were collected and analysed using Statistical Package for the Social Sciences (SPSS) and Analysis of a Moment Structures (AMOS) Software. All respondents identified themselves as having used the NIS portal, with 50% reporting their main place of residence as Nigeria, and the remainder being resident in other countries.

The analysis of descriptive statistics and the responses to the open questions and statements used in the questionnaire suggested that the respondents had a low level of satisfaction with the NIS website, with much of their concern stemming from issues pertaining to security, support and trustworthiness. There were also concerns documented regarding the safety of personal and financial data. They also mentioned significant issues with the ease of use of the website and its quality. Nonetheless, users valued the quality of the content and information available through the portal and were positive about its convenience and potential to deliver benefits. In terms of usage barriers, the most significant is Nigeria's intermittent electricity supply, closely followed by the high cost of internet access, both of which pose a particular challenge, given the high rate of unemployment in Nigeria.

Exploratory and confirmatory factor analyses were used to generate an e-government user experience scale confirming the importance of dimensions

identified by other researchers, as well as identifying new factors. These were: security and support, content and information, ease of use, benefits, barriers, convenience, trust and website quality. Structural Equation Modelling (SEM) was used to investigate the relationships between these factors. Content and information were found to have a significant effect on ease of use and convenience. Website quality was found to have a significant effect on ease of use, security and support. The website's ease of use was found to have a significant effect on barriers and convenience to have a significant effect on perceived benefits. Meanwhile, security and support was found to have a significant effect on trustworthiness. Barriers and benefits as well as trustworthiness were all found to have a significant effect on user satisfaction.

Demographic statistics supported hypotheses testing on the digital divide in the use of e-government services. Demographic (age, education, gender and income), social-economic (employment) and geographic (location: rural and urban, developing and developed countries) factors affected the e-government users' internet experience, their access to computing facilities and their e-government experience thus confirming that a digital divide exists amongst NIS portal users.

This research makes a number of contributions. Firstly, it is one of a very few significant studies to explore user experience of an e-government portal in a major developing country. As a result, it has brought to light important concerns regarding users' security, privacy and trustworthiness as they relate to their personal information. Secondly, it compares users both inside and outside the country, thereby offering unique insights on the digital divide. Finally, it proposes an e-government user-experience model that identifies the relationships between the various factors that contribute to user satisfaction. Suggestions are offered for practitioners, e-government policymakers and researchers.

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Thank you all.

## Dedication

This thesis is dedicated to my mother and to the memory of my father, to whom I owe a great debt of appreciation for their help in getting me to where I am today. I have always tried to abide by my father's saying, *"Hard work does pay and there should be no shortcuts to anything that's worth doing well"*. Rest in Perfect Peace, Dad.

# Chapter 1: Introduction

## 1.1 Introduction

The need to encourage citizens to adopt e-government technologies has led to an increasing interest in the evaluation of such services, often in terms of citizen or customer satisfaction and notions of e-government service quality and its impact (Colesca and Dobrica, 2008; Yaghoubi, Haghi and Asl, 2011). Halaris et al. (2007) classify approaches to measuring the quality of e-government into three categories: the quality of traditional public services (e.g. balanced scorecard, Six Sigma); the quality of e-government services (e.g. the American Customer Satisfaction Index [ACSI] and the quality of e-services (e.g. E-S-QUAL, E-Qual, E-service quality). Halaris et al. (2007) also identify the following overarching dimensions: service reliability, personalisation, information/content, navigation/accessibility, security and system performance. Rowley (2006) identifies the features that researchers suggest contribute to e-service quality as being: site features, security, communication, reliability, customer support, responsiveness, information, accessibility, delivery and personalisation. Others have used the technology acceptance model (TAM) and/or the diffusions of innovation (DOI) theory as the basis for their study; for example, Carter and Belanger (2005) based their study on the TAM and the DOI, and found that perceived ease of use, compatibility and trustworthiness were important to e-government adoption.

However, although many of these instruments draw on similar foundations in the service quality literature and have common dimensions and while some have been developed from others, there is no consensus as to the dimensions of the various scales and indices. Together, these approaches to research on user experience and response to e-government generated a wide range of different variables for consideration for inclusion in this research.

Grigoroudis and Siskos (2009) identify one of the possible reasons for variations between different customer satisfaction and e-service quality models when they suggest that each model has arisen from and is most suited to a specific context. This suggests that context is important, both in terms of the characteristics of potential users and the specific systems being measured. Lindgren and Jansson (2013) however, argue for more exploration of e-government in different contexts.

Nonetheless, no research has fully explored the impact of demographic variables or, in particular, levels of users' experience of the internet and with e-government services. Such insights are likely to be important in developing countries where access to information technologies is less widespread than in developed countries (Hassan, Shehab and Peppard, 2011).

There is evidence that more research is needed regarding e-government in developing countries. For example, Sahu, Dwivedi and Weerakkody (2010) recognise the importance of e-government to developing countries and its potential impact on the rate of development, whilst Reddick (2010) argues that governments in developing countries have failed to provide e-services effectively due to a lack of achievement of pre-defined goals and benefits. (Hassan, Shehab and Peppard, 2011), in their recent review of e-service in the public sector, suggest that *"little work has been done to offer helpful and practical guidance for e-services in the public sector/e-government in the developing countries"* (p. 538).

### 1.2 Rationale for the Study

Governments worldwide have introduced e-government and e-service practices in order to reduce costs and to make their operations more efficient. Additionally, these practices have been introduced to provide a prompt service, improve the quality of a service, remove barriers to government services, tackle social exclusion and provide local access points (Praeg and Spath, 2011). Typical applications include information provision, downloading of forms, interaction, service delivery and e-democracy (Al Ajeeli and Al-Bastaki, 2011).

Nonetheless, this research has a number of limitations. Firstly, it is evident that there are two distinct theoretical perspectives based respectively on technology adoption paradigms and service quality paradigms. Layne and Lee (2001), in the wider information systems maturity literature, introduce the idea of the perception of benefits that accrue to users, thus it would seem that something can be gained from seeking to develop and test a model that merges these various theoretical perspectives. Furthermore, generic assessments of users' satisfaction with e-government services do not offer insights into the effect of digital divide variables. Only Becker et al. (2008) and Nam and Sayogo (2011) have considered the relationship between a digital divide and citizens' perceptions of e-government systems, hence showing that there is scope for further research in this area.

The potential value of this study is further strengthened by the fact that despite the potential importance of e-government to Nigeria, there is little research on user experience of e-government in the country. An exception, however, is the study conducted by Kazeem (2011), which has raised serious concerns regarding personal privacy, the possibility of fraud and other crime, insecure cookies and unauthorised access to personal information. Additionally, despite user experience being regarded as important for e-government adoption and effectiveness, there is no agreement as to the dimensions of this experience.

## 1.3 Context of the study

The context of this study is the e-government service offered by the Nigeria Immigration Service (NIS). The NIS controls and monitors entry and exit activities in Nigeria. It has developed its e-services to support information distribution among citizens, form processing and financial transactions, including online payment for new passports, passport renewals, and visa applications and processing as well as the processing of other entry permits (Kanat and Ozkan, 2009). Since there is particular concern about the success of e-government in developing countries, the e-services offered by the NIS were chosen as the focus of this study.

This context was chosen because there is a dearth of research on e-government in developing countries, which have been recognised as facing both implementation and adoption challenges with regards to it, as stated by Reddick (2010) and Hassan, Shehab and Peppard (2011). The NIS e-service portal was chosen because it can be accessed by both citizens and non-citizens and people whose main country of residence is either Nigeria or elsewhere. In addition, the website offers information and supports transactions and unlike some other e-government services, if someone wishes to move in and out of Nigeria they will have no choice but to use it, so it can be evaluated in terms of user-satisfaction. It is important that, whilst there is evidence that Nigeria is facing significant challenges in the implementation of e-government, the NIS is acknowledged to be one of the few successful e-government implementations in the country.

## 1.4 Research Aims

Aims: to contribute to both theory and practice by:

(i.) Advancing knowledge and theory regarding user experience of e-government

in developing countries, through the study of the Nigeria Immigration Service (NIS) e-government service.

(ii.) Advancing theoretical conceptualisation and understanding of the nature of the digital divide.

In order to achieve these research aims, three main questions and seven objectives were formulated.

### 1.5 Research Questions

(i.) Which factors influence the perceived user experience and benefits associated with the e-government services provided by the Nigeria Immigration Service (NIS)?

(ii.) What are the interrelationships between these factors?

(iii.) What is the relationship between user demographics and digital divide variables, such as access to computing facilities, user internet experience and user e-government experience?

### 1.6 Research Objectives

(i.) To develop an understanding of the conceptual and theoretical foundations relevant to the users' experience of e-government services.

(ii.) To review research on the digital divide in the context of e-government services.

(iii.) To identify factors which contribute to users' experience of the NIS e-government service.

(iv.) To generate insights into the users' experience with the NIS e-government service.

(v.) To develop and test a conceptual model of users' experience of the NIS e-government service.

(vi.) To explore the relationship between demographic factors and digital divide variables.

(vii.) To offer recommendations for further research and practice.

### 1.7 Methodology

This study used an online questionnaire-based survey, as the respondents lived in different locations across the world. Additionally, given the diversity of the population, a reasonably large sample was judged to be necessary. The questionnaire design was informed by previous research relating to experiences of e-government and other websites but used models from different paradigms,

including research on technology adoption, customer satisfaction and service quality. A research instrument was developed to capture perceptions of users' experience of the NIS website as well as other key demographic data. The research is partially deductive as it captured data from the questionnaire-based survey, but also inductive as it generated data from comments in response to open questions on users' experience in the questionnaire. Completed questionnaires were collected from respondents in Nigeria and 20 other countries around the world. Some respondents were from developed countries: Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Netherlands, the United Kingdom and the United States. Other respondents were from developing countries: Ghana, Gambia, Malaysia, Nigeria, Qatar, Singapore, South Africa, Tunisia and the United Arab Emirates.

The respondents were identified and contacted via snowball sampling. They were then were directed to the online survey by an e-mail link. The data generated from the survey was cleaned and any incomplete or inaccurate responses were removed. The data was then loaded into SPSS for analysis. Next, descriptive statistics were generated to profile the sample in terms of demographic data and to generate descriptive statistics for the Likert scale items. Finally, the data from the responses to the open questions were entered into nVivo software and analysed on the basis of the variables to which they related.

### 1.8 Contribution to Knowledge

This study seeks to make a contribution to knowledge on e-government with a specific focus on developing countries. It is unique in that the data was gathered from users accessing the service from both in and out of Nigeria, thus offering valuable insights on the experience of e-government over a geographically dispersed population, as well as on the digital divide. Also, the study's focus on Africa is valuable as prior research on e-government use, adoption and experience is limited in relation to this continent. This research will benefit e-government practitioners and governments by helping to improve the e-government services they provide.

### 1.9 Structure of the Thesis

The thesis is structured as follows:

**Chapter 1** provides the context for the research, outlines the central problem and rationale, identifies aims and articulates the research questions and objectives. It

introduces the approach used to address the research questions. Finally, the intended contribution of this research to the body of knowledge and theory is outlined.

**Chapter 2** provides a general background to the research context, i.e. the country of Nigeria, in terms of its geographical location, economy, tribes and culture. The development of e-government and the country's information technology policy as well as the e-government services provision in relation to the organisation being studied, the Nigeria Immigration Service.

**Chapter 3** presents a critical literature review in two main sections, relating specifically to the evaluation of the adoption of and experiences with e-services and e-government; and the digital divide in the context of both developing and developed countries.

**Chapter 4** discusses the methodology used for this research, including its design, data collection method and analysis, means of sampling, research generalisability, reliability and validity and ethical issues.

**Chapter 5** formulates a number of hypotheses based on the research problem and questions. The research models are also developed.

**Chapter 6** presents the findings of the research in five sections. The first presents the demographic characteristics of the sample. This followed by the exploratory factor analysis leading to the emergence of the e-government user experience scale constructs. The third presents the descriptive statistics from the e-government user experience scale dimensions and the comments from the open questions. Fourth, the outcomes of the confirmatory factor analysis and structural equation modelling, which led to the development of the e-government user experience measurement and structural model, are presented. Finally, this is followed by a discussion of the hypotheses testing regarding the demographic effect of digital-divide dimensions and its model.

**Chapter 7** discusses the findings in light of previous research. It articulates the contributions of the thesis in terms of advancing the conceptual and theoretical foundations relevant to e-government services and the digital divide as well as the development of both the e-government user experience scale and model.

**Chapter 8** concludes the thesis, presenting a summary, contribution statement, limitations, reflections and recommendations for further research and practice.

**The references** are cited in line with the Harvard referencing style, in the reference section.

**The appendix** section presents the sample materials used, such as the questionnaire and other data not cited elsewhere in the thesis.

# Chapter 2: Research Context

## 2.1 Introduction

This chapter provides a background to the research context, discussing the country of Nigeria in terms of geographical location, economy, tribes and culture, the development of e-government and the country's information technology policy as well as the e-government services provision relative to the case study organisation, the Nigeria Immigration Service.

## 2.2 Geographical Location and Population

Nigeria, located in West Africa, borders the Gulf of Guinea between Benin on the west and Cameroon on the east. It is a compact area of 924,768 square kilometres, where the land mass extends from the Gulf of Guinea in the south and Sahel in the north (Federal Land Information System [FELIS], 2015). Abuja is the country's capital city while other major cities include Ibadan, Kaduna, Kano, Maiduguri, Jos, Port, Harcourt, Enugu, Calabar and Aba (Ibid). The figure below is a map of Nigeria showing its major cities.


***Figure 2.1: Map of Nigeria (Globe Media Ltd, 2015)***

Nigeria's population density is the highest in Africa, ranging from a hundred people per square kilometre in the north-eastern and western central regions to over five hundred people per square kilometre in the south and north-western regions. The

2006 census estimated that the country's population was around 140 million: 50.8% male and 49.2% female, with an inter-census growth rate of 3.2% (National Population Commission of Nigeria [NPC], 2015). However, as of April 2015, the World Factbook puts the country's current population at around 177 million. This population is largely comprised of young people. A large segment of the population around 56.8% has the right to vote or run for office (Adeyemo, 2011; The World Factbook, 2015).

### 2.3 Tribes and Culture in Nigeria

Nigeria is a diverse country comprised of around 170 different tribal groups, although amongst them, only four have attained the status of ethnicity – the Fulanis, Hausas, Ibos and Yorubas (National Population Commission of Nigeria [NPC], 2015).

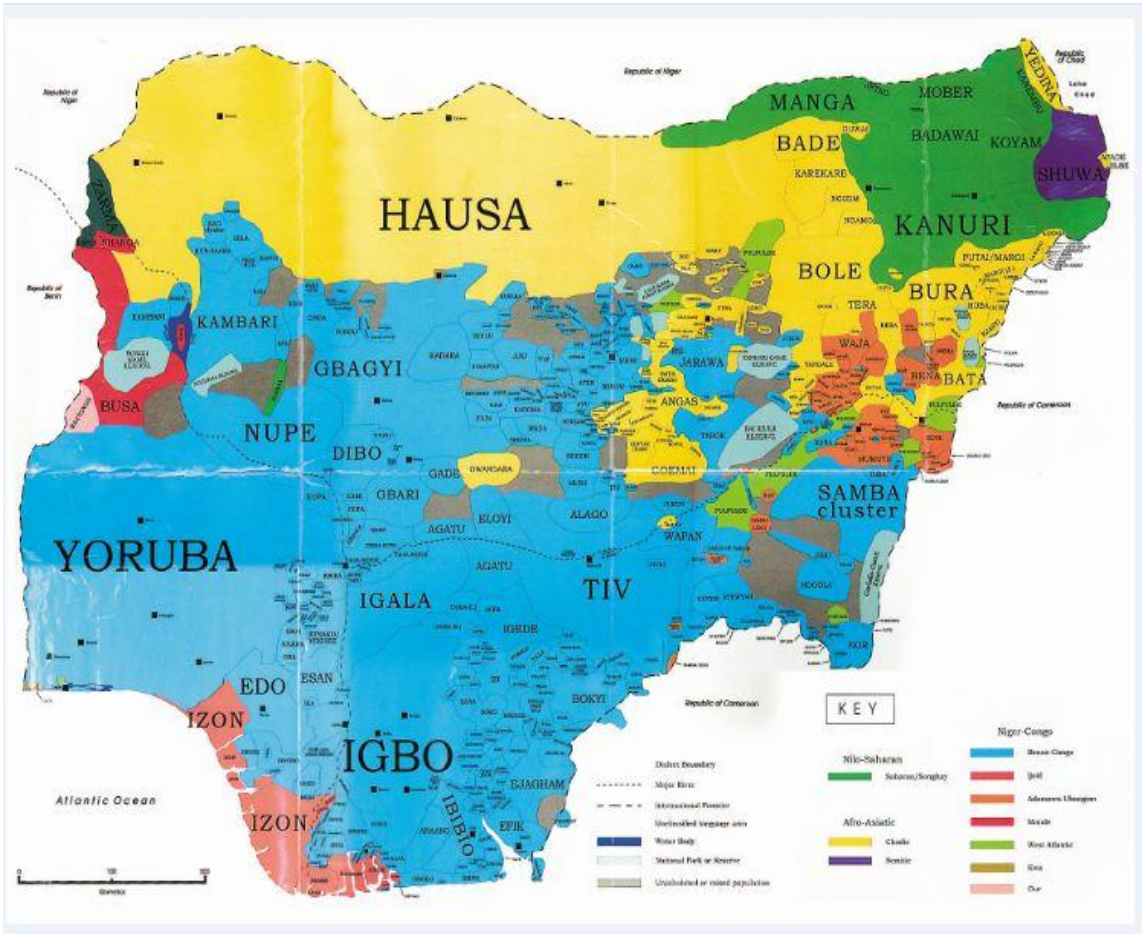


***Figure 2.2: Nigeria Ethnic Map (Nigeria Muse, 2010)***

Currently, there is concern that the minor tribes are deprived of modern resources and are less exposed to technological advancements than the major ones (Akpan-Obong, 2009).

The Nigerian culture values different types of arts including ivory and wood carving, leather, pottery, painting, cloth weaving, glass and metal works. The Nigerian culture is multi-ethnic; individuals cherish their traditional languages and over 250 are spoken. However, English is considered as the official language, with Hausa, Igbo and Yoruba commonly spoken among different tribes (Adeniran, 2008).

## 2.4 The Nigerian Economy

The Nigerian economy is one of the fastest growing in Africa and in 2015 overtook South Africa to become the largest African economy, being ranked 26th in the world's economy (*The Economist*, 2015). According to Adegbite, Ayadi and Felix Ayadi (2008), it is a middle income, mixed economy emerging market with well-developed financial, legal, communications and entertainment sectors. However, according to *The Economist* (2015), there has been an increase in poverty levels among Nigerians, from 52% of the population living on less than one dollar a day in 2004 to 61% in 2010. Despite Nigeria being the leading exporter of petroleum in Africa and ranked 12th in the world for this, 70% of the workforce are engaged in farming. Furthermore, outside the petroleum and agriculture sectors, the economy is amorphous and lacks basic infrastructure (Sackey, 2011). Nigeria has attempted to apply an economic reform programme, the National Economic Empowerment Development Strategy (NEEDS), with the purpose of enhancing standards of living by means of reforms of macroeconomic steadiness, deregulation, liberalisation, privatisation, transparency, technological advancement and liability (Adegbite, Ayadi and Felix Ayadi, 2008). According to the National Bureau of Statistics (2010), the telecommunications sector is one of the major drivers of Nigeria's economic growth with investment inflows since 2006. The sector *"grew by 33.66, 33.84, 34.02, 34.18 and 34.47% in 2006, 2007, 2008, 2009 and 2010 respectively"* and its *"contribution to GDP has remained positive, growing from 1.83% in 2006 to 4.56% in 2010"* (National Bureau of Statistics, 2010 pp 14). According to the National Bureau of Statistics (2014), despite Nigeria's unstable economy, the country has attracted over five billion dollars worth of foreign investment in the telecommunications, engineering and petroleum sector since 2005.

## 2.5 ICT Emergence in Nigeria and the Nigerian National Policy for ICT

The internet was introduced to Nigeria by a UNESCO-sponsored project, the Regional Informatics Network for Africa (RINAF). The Nigeria Internet Group was created as a non-governmental organisation with the aim of encouraging and

providing access to the internet (Adeniran, 2008). In January 1997, Linkserve Limited emerged as the first internet service provider in Nigeria and officially commenced commercial operations of internet services (Ibid.). In 2001, the Nigerian government launched a document plan, 'Nigerian National Policy for Information Technology', in Nigeria Federal Capital Territory, Abuja; this strategic plan provided tangible implementation strategies for a period of five years in relation to legal regulations concerning immigration, health and human resources development (Jidaw System Limited, 2011). This plan was part of an integrated approach to achieving e-government development within the Federal Government of Nigeria (Ibid.). The Nigerian National Policy for Information Technology was initiated to enhance government IT capabilities and utilise IT as an engine for the sustainable development of Nigerian e-government with a view to attaining global competitiveness in wealth and job creation (Ibid.).

14 years after the Nigerian National Policy for Information Technology was initiated, the country is struggling with the information technology infrastructure. This includes inadequate accessible computers, avoidable problems with internet connectivity and software (Adeniran, 2008). According to the ICT4D (2010), a key issue is information security. The ICT4D (2010) states that to deal with information security issues, the Nigerian government plans to implement new infrastructure projects. In 2011, the Nigerian Presidential Implementation Committee stated that the planned infrastructure projects will solve issues related to service delivery, technical issues, linking issues between agencies and tackling of common problems including authentication and secure transactions. Akpan-Obong (2009) writes that the main concern with Nigerian ICT is users' worries about security and privacy. He adds that there has been limited research in the area of information technology in Nigeria (Ibid.). Additionally, he suggests that a technologically advanced workforce could lead to ICT growth in Nigeria thus enhancing technology and telecommunications within the country.

### 2.6 Nigerian Mobile Phone Usage

In 2001, mobile phones were not as linked to the internet as they are now – i.e. no-one, or very few people, had mobile phones. Since the introduction of multiple mobile phone networks to Nigeria at the end of 2001, the access to mobile internet has greatly improved (Oduneye, 2015). According to the Nigerian Communications Commission (NCC) (2015), as of September 2014 the number of active mobile internet subscribers stood at around 82 million. Recent NCC (2015) statistics show

that there are 186 million active connected mobile phone lines, for a population of around 177 million (The World Factbook, 2015). According to the NCC (2015), Nigeria achieved 100% teledensity in February 2015. However, despite a steady growth in mobile internet use in Nigeria, the number of fixed and wireless broadband internet subscriptions is still very low, especially in rural areas. The internet is therefore an urban phenomenon in the country, which is a major issue (Kuboye, Alese and Imasuen, 2012; Premium Times, 2013). Even in urban areas, the overall internet service in Nigeria remains poor. In 2013, the Nigerian Minister for Communication Technology, Omobola Johnson, threatened to prosecute Nigerian telecommunication providers for poor service delivery (Premium Times, 2013). In 2015, there has been no improvement and internet services in Nigeria have poor network coverage and a high cost (Uduchukwu, 2013). The NCC (2015) has recognised this digital divide problem, including limited research on the issue, and called for further research in resolving it.

## 2.7 The Development of E-government in Nigeria

Nigeria's e-government system aims to enhance internal efficiency, public services and democratic processes in the legislation and administration section of the public sector (Aneke, 2009). By providing a funding mechanism for governmental organisations, the Nigerian government's ambition is to extend e-government implementation from federal government departments to both state and local government public services with a view to initiating a programme aimed at enhancing computer access across the country (Adeyemo, 2011). However, although the government ostensibly utilises their e-government website to deal with public affairs little information is made available on this website (Aneke, 2009).

The implementation of e-government in Nigeria was first managed by the Nigerian Port Authority, which saw the need to computerise the port's activities to ensure safe and effective operations and administrations, and this was taken over by the Nigeria Immigration Service (Adeyemo, 2011; Adeniran, 2008). To enable the development of e-government in Nigeria, the government planned to identify existing skills gaps among employees with the aim of implementing e-government projects in an effective way as well as providing training to fill those gaps (McGrath and Maiye, 2010). According to Okwuke (2013), the Nigerian government's new ICT policy, which aims to promote its e-government services, is a catalyst for national development.

The limited success of e-government in Africa and specifically, in Nigeria, was recognised and detailed in a recent UN (2014) bi-annual survey. According to the UN (2014), African countries still lag behind Europe and the US in e-government development with West Africa showing no major improvement in this area of government. The UN (2014) attributes Africa's lack of development to poor telecommunication infrastructures and lack of broadband access. Reddick (2010) argues that governments in developing countries have failed to provide e-government effectively due to lack of achievement of pre-defined goals and benefits.

However, a slight improvement can be discerned when the UN 2012 E-government Survey is compared with the same survey undertaken in 2014. By 2014, Nigeria had moved up 21 positions in the rankings from 162nd in 2012 to 141th in 2014 (see Table 2.1).

## 2.8 The Nigeria Immigration Service

The Nigeria Immigration Service (NIS) was formed in 1958 from the existing Nigeria Police Force Immigration Department (NIS, 2012). The newly formed organisation was assigned the responsibility of immigration duties ranging from the issuance of passports to Nigeria citizens, visas to foreigners and support to the government's foreign business activities (Ibid.). In 1963, the NIS became a department under the umbrella of the Federal Ministry of Internal Affairs (Ibid.). There was also an emergence of immigration officers made up of members of the existing Nigeria Police Force (Ibid). In 1963, the NIS underwent a series of reforms and structural changes including additional responsibilities such as control of aliens, border patrol management, the ECOWAS and the African Affairs/Bilateral division as well as the issuance of travel documents to Nigerian citizens and foreigners (Ibid.). It now has offices in all of the 36 states of Nigeria with headquarters in the Nigerian capital, Abuja, and likewise, in all Nigeria's High Commissions abroad (Ibid.).

| Country | Level of Income | EGDI | 2014 Rank | 2012 Rank | Change in Rank |
|---|---|---|---|---|---|
| High EGDI | | | | | |
| Tunisia | Upper Middle | 0.5390 | 75 | 103 | ↑ 28 |
| Mauritius | Upper Middle | 0.5338 | 76 | 93 | ↑ 17 |
| Egypt | Lower Middle | 0.5129 | 80 | 107 | ↑ 27 |
| Seychelles | Upper Middle | 0.5113 | 81 | 84 | ↑ 3 |
| Morocco | Lower Middle | 0.5060 | 82 | 120 | ↑ 38 |
| Middle EGDI | | | | | |
| South Africa | Upper Middle | 0.4869 | 93 | 101 | ↑ 8 |
| Botswana | Upper Middle | 0.4198 | 112 | 121 | ↑ 9 |
| Namibia | Upper Middle | 0.3880 | 117 | 123 | ↑ 6 |
| Kenya | Low | 0.3805 | 119 | 119 | - |
| Libya | Upper Middle | 0.3753 | 121 | 191 | ↑ 70 |
| Ghana | Lower Middle | 0.3735 | 123 | 145 | ↑ 22 |
| Rwanda | Low | 0.3589 | 125 | 140 | ↑ 15 |
| Zimbabwe | Low | 0.3585 | 126 | 133 | ↑ 7 |
| Cape Verde | Lower Middle | 0.3551 | 127 | 118 | ↓ 9 |
| Gabon | Upper Middle | 0.3294 | 131 | 129 | ↓ 2 |
| Algeria | Upper Middle | 0.3106 | 136 | 132 | ↓ 4 |
| Swaziland | Lower Middle | 0.3056 | 138 | 144 | ↑ 6 |
| Angola | Upper Middle | 0.2970 | 140 | 142 | ↑ 2 |
| Nigeria | Lower Middle | 0.2929 | 141 | 162 | ↑ 21 |
| Cameroon | Lower Middle | 0.2782 | 144 | 147 | ↑ 3 |
| **Regional Average** | | **0.2661** | | | |
| **World Average** | | **0.4712** | | | |

***Table 2.1: Top 20 African countries e-government ranking (UN, 2014)***

## 2.9 NIS E-Government Implementation

The NIS monitors the entry and exit activities of both Nigerian citizens and foreigners. It also investigates, inspects, screens, enforces and detects aliens (Nigeria Immigration Services, 2015). Furthermore, it ensures that implemented e-government (e-immigration) services conduct their operations online, such as information distribution among citizens, form processing and financial transactions (Kanat and Ozkan, 2009). In addition, it implements e-government services to provide an online payment facility for new passports within Nigeria and abroad. It also ensures that visas, changes of name and wedding registrations as well as certification processing are performed only in NIS offices located in Nigerian High Commissions abroad. Mundy and Musa (2010) identify that the Nigerian Immigration Service has enhanced immigration transactions, making the processes followed run more smoothly. These authors (2010) further state that the NIS e-government tool provides opportunities to enhance interactivity between the government, and citizens and non-citizens. Although scholars have commented upon e-government practices in Nigeria – for example, Fatile (2012) and Kazeem (2011) argues that e-government practices in Nigeria face major threats concerning personal privacy, the possibility of fraud and crime, unsecure cookies

and unauthorised of towards personal information. Previous researches do not provide an in-depth understanding of user experiences of e-government services and the effect of the digital divide in the use of these services.

### 2.10 Nigeria and the Nigeria Immigration Service as a Study Context

The government of Nigeria utilises its e-government services principally to deal with public affairs and transactions (Aneke, 2009). Both citizens and non-citizens access the Nigeria Immigration e-government services. The e-government website offers information and supports transactions. The Nigeria Immigration Service (NIS) controls and monitors entry and exit activities in the country; if a user wishes to move in and out of Nigeria, they must use the service. The NIS has developed its e-services to support information distribution among citizens, form processing and financial transactions, including online payment for new passports, passport renewals, visa applications and processing as well as the processing of various other entry permits (NIS, 2012). The NIS e-government service is the focus of this study as despite the potential value of e-government services in Nigeria there is very little research that considers user experiences of e-government services in Nigeria. It is essential to develop deeper insights into the factors that affect users' perceptions of the NIS e-government experience.

### 2.11 Examples of Tasks Involved in User Journey in Interacting with the NIS Portal

The examples stated in section 2.11.1 demonstrates typical uses of NIS portal, the tasks and how they might fit together. These examples are drawn from the researcher's personal experience, together with the NIS portal general guidelines available at https://portal.immigration.gov.ng/pages/passportguidelines and https://portal.immigration.gov.ng/?p=visaguidelines.

#### 2.11.1 General Guidelines for Passport Application

The process of obtaining a Nigeria passport of any type starts with:

(i) Visit the Home page of Nigeria Immigration Service (NIS) Portal at https://portal.immigration.gov.ng. The NIS portal homepage screen print is shown in figure 2.3.

(ii) Navigate to and click on the 'e-Passport' button as shown in figure 2.3

and user will be directed to the 'Passport Type Selection' page as shown in figure 2.4 to start the application process.

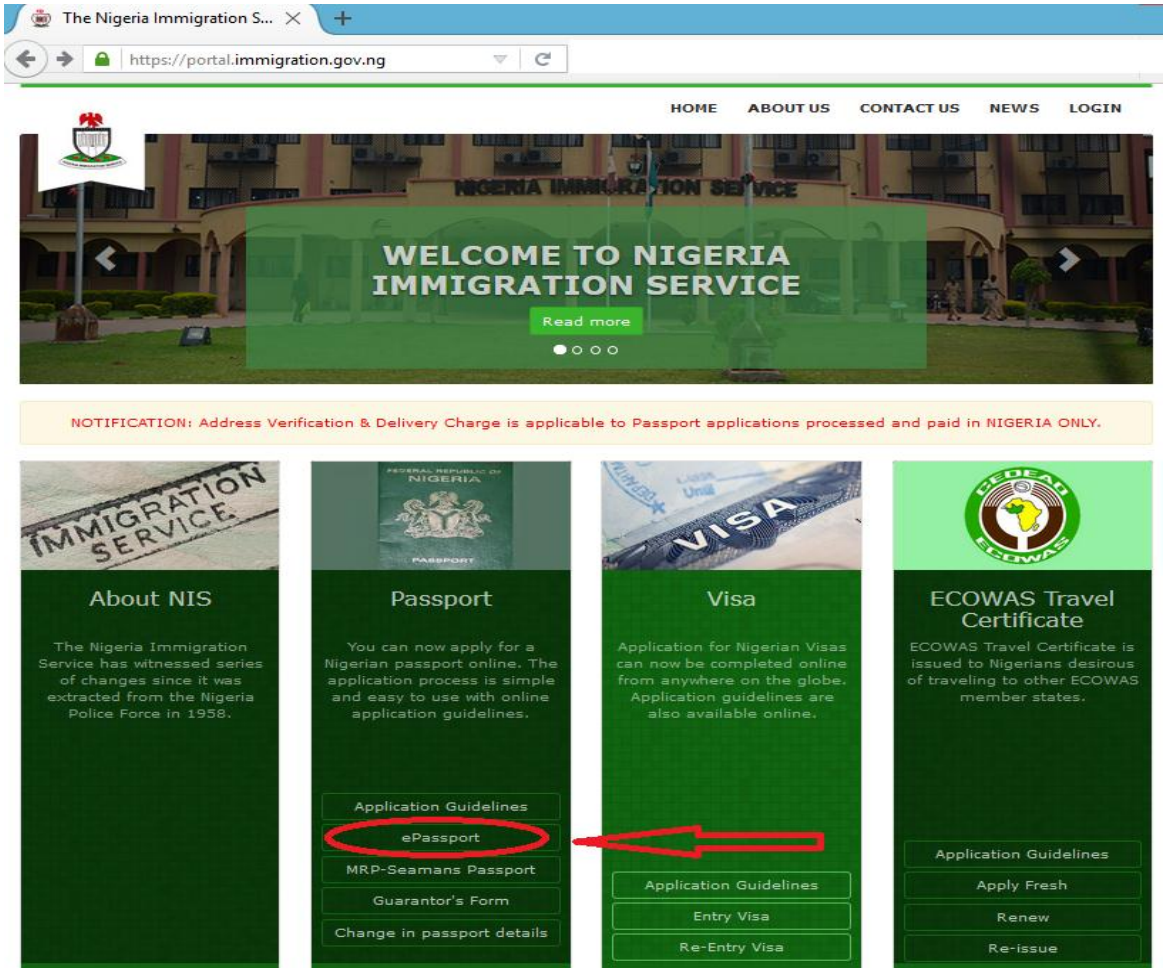


***Figure 2.3: NIS Portal Homepage***

(iii) Select a passport type "Standard e-Passport" OR "Official e-Passport" as shown in figure 2.4.

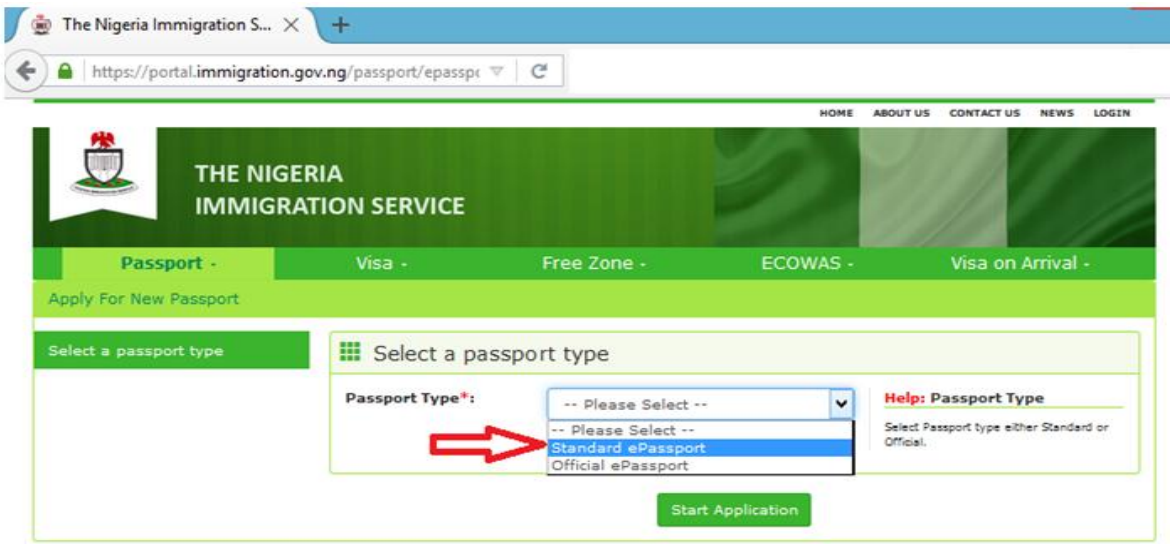


***Figure 2.4: Passport Type Selection Page***

(iv) Select a country from the drop down list (the country where you wish to attend the interview for your application processing). In this instance, the applicant has

selected ‘Nigeria’ as the country where applicant wishes to attend the interview for the passport application processing as shown in figure 2.5.

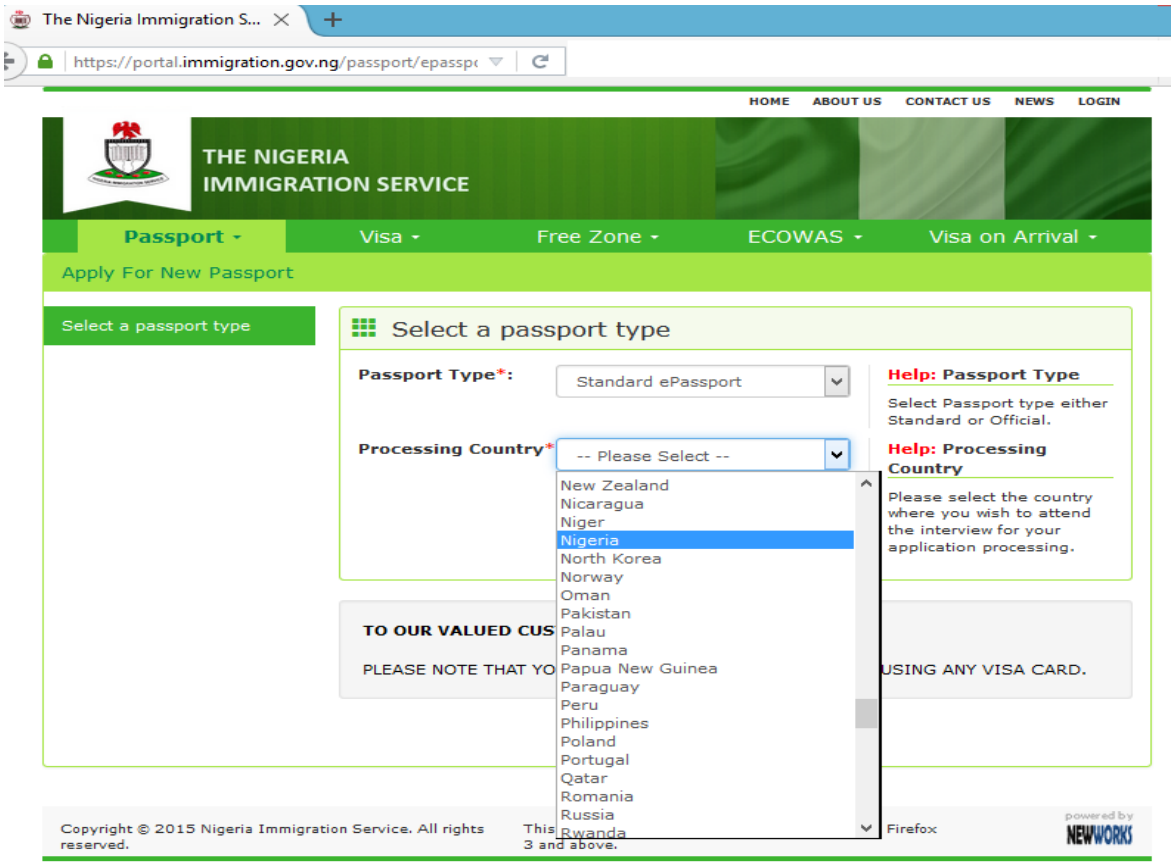


***Figure 2.5: Processing Country Selection Page***

(v) Click on ‘Start Application’ button as shown in figure 2.6; this will open the NIS passport application form for completion.

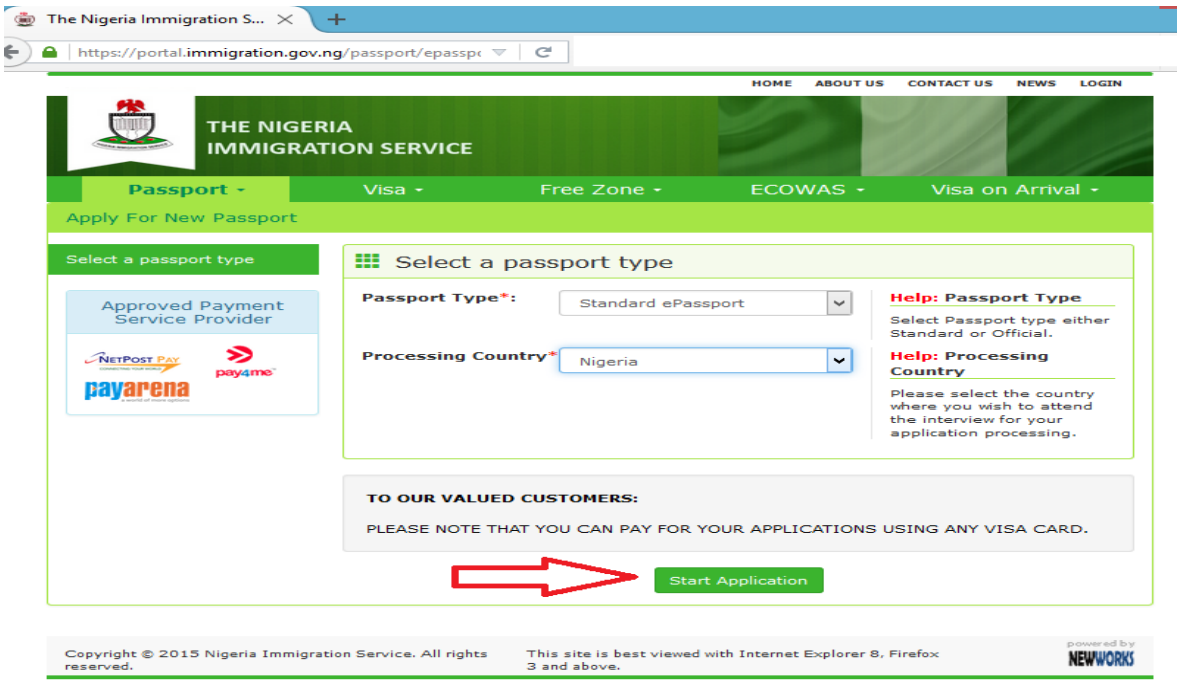


***Figure 2.6: Red Arrow Showing Start Application Button***

(vi) Complete all relevant sections of the Application form. Figure 2.7 shows the blank NIS passport application form. Then, click the 'Next' button to continue the rest of the application.

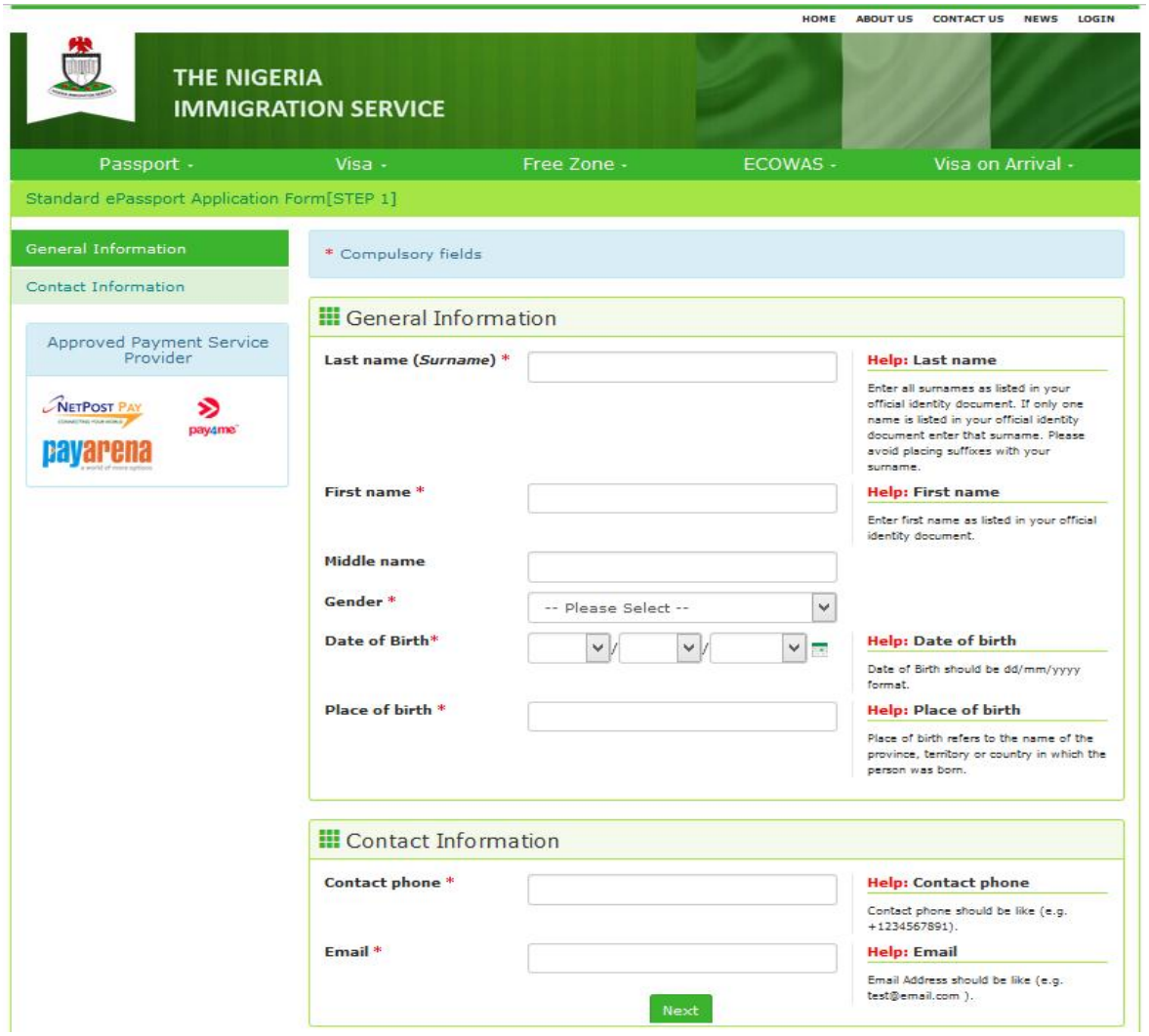


***Figure 2.7: NIS Online Application Form – General and Contact Information Capturing Page***

(vii) Select the passport 'Processing State and Office' from the drop down fields as shown in figure 2.8.

(viii) Enter displayed security code.

(ix) Tick the 'I ACCEPT FULL RESPONSIBILITY FOR THE INFORMATION PROVIDED IN THIS FORM' box as shown in figure 2.8.

(x) Click on 'Submit Application' button as shown in figure 2.8, after this the 'Applicant details page' that includes Applicant's application ID and Reference number will be displayed as shown in figure 2.9.

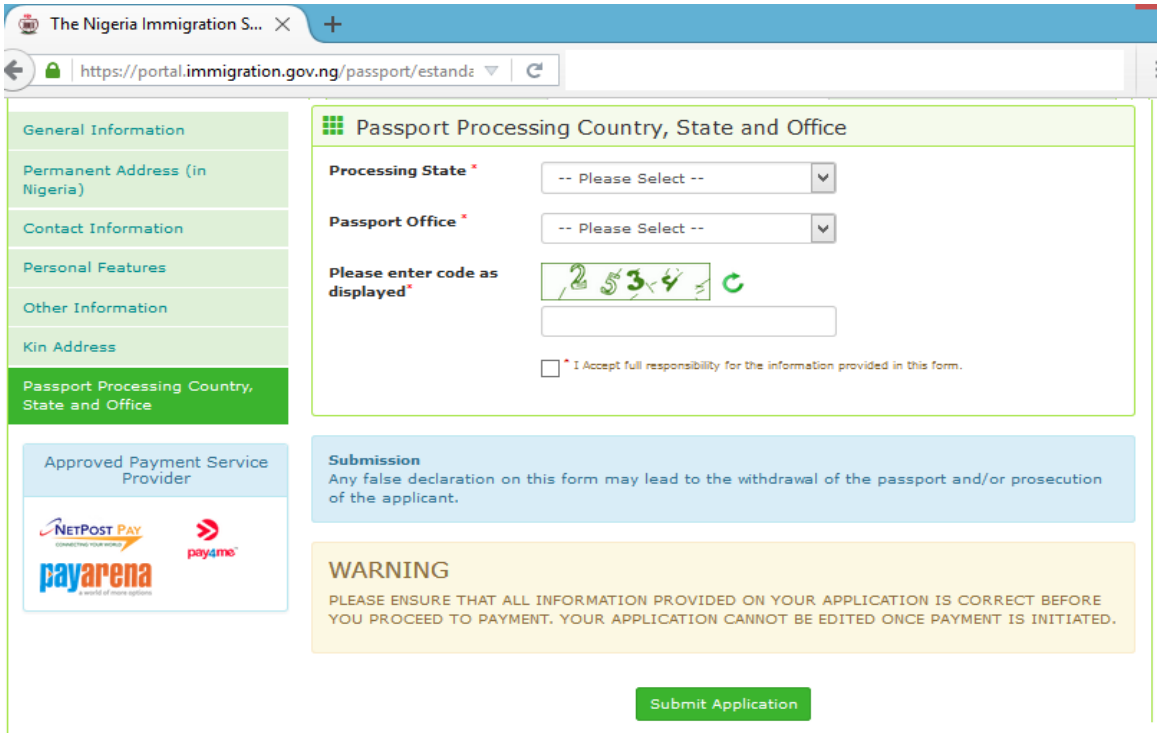


***Figure 2.8: Passport Processing Country, State and Office Selection Page***

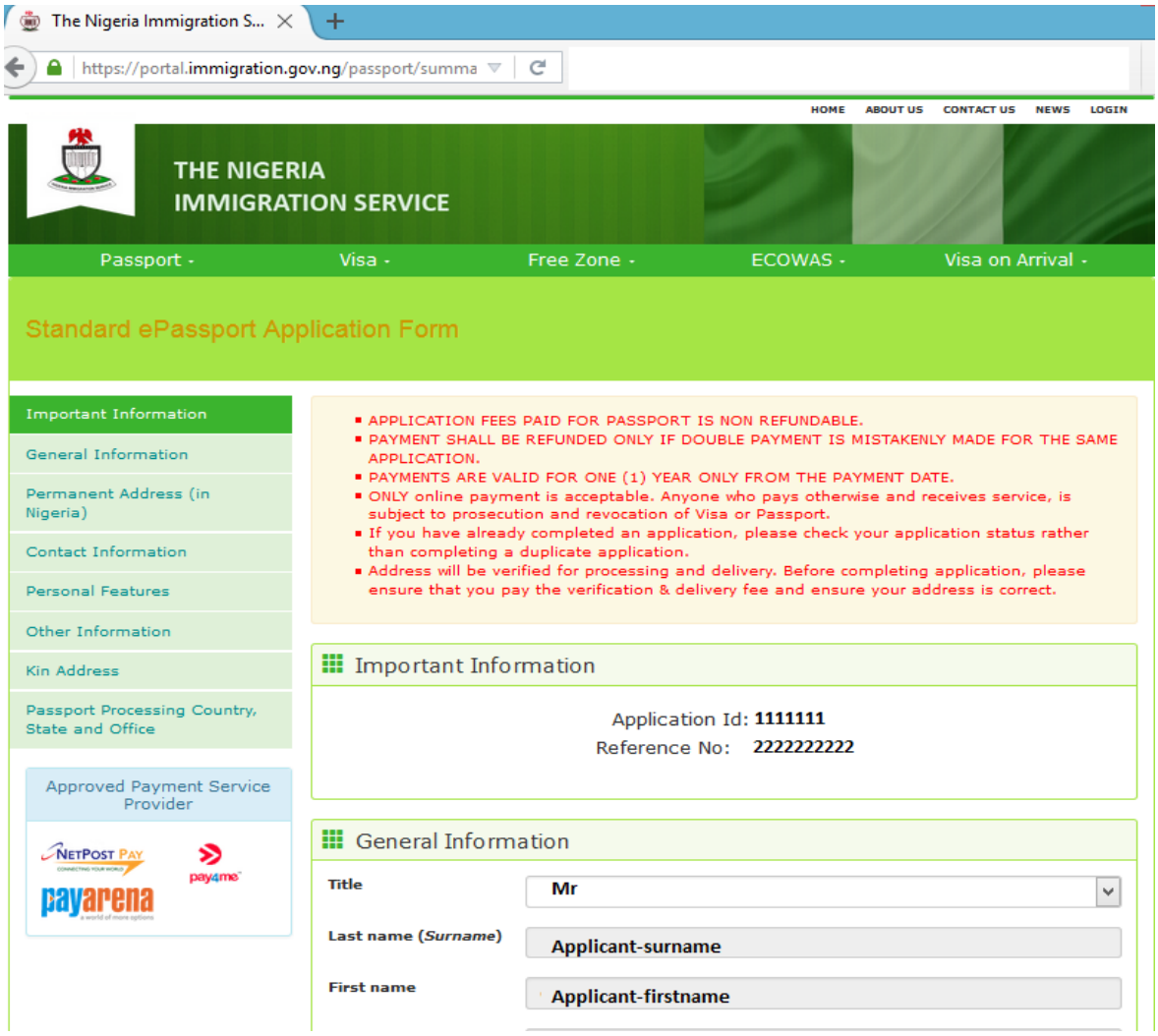


***Figure 2.9: Applicant's application ID and Reference page***

(xi) Click on “Proceed to Online Payment” as shown in figure 2.10 to make payment for the passport application. Then, the ‘Pay Options’ page will be displayed as shown in figure 2.11.

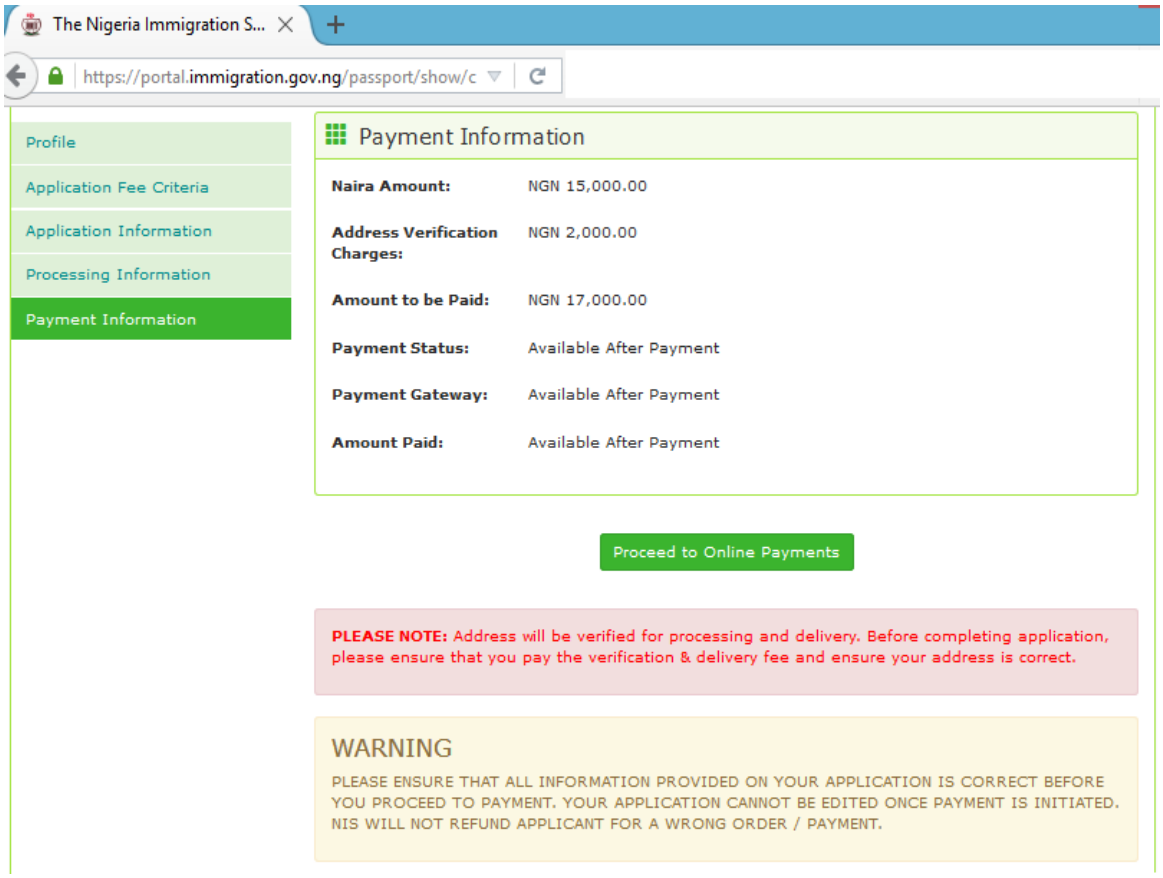


***Figure 2.10: Proceed to Online Payment Page***

(xii) At the ‘Payment Options’ page, tick the payment method: “Card Payment” or “Cash At Bank” as shown in figure 2.11. If applicant intends to pay at a bank, “Cash At Bank” should be ticked and click continue, page with a list of participating banks will be displayed. Aapplicant will proceed to a participating bank for payment using ‘Application ID and Reference Number’ shown in figure 2.9.

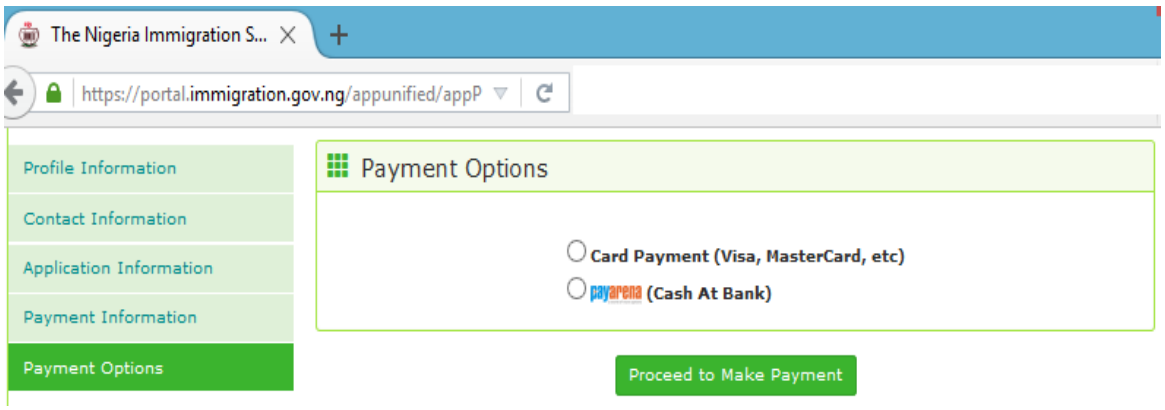


***Figure 2.11: Payment Options Page***

(xiii) After paymment made at the bank, applicants given a receipt that contains a "Validation Number". This "Validation Number" used later for confirmation of payment on the NIS portal.

(xiv) If applicant intends to pay using Credit/Debit card, applicant tick “Car Payment” option and click continue, card paymernt platform page will be displayed as shown in Figure 2.12. Complete all relevant sections on the card payment platform. After completion, click ‘OK’ to authorise the passport application payment.

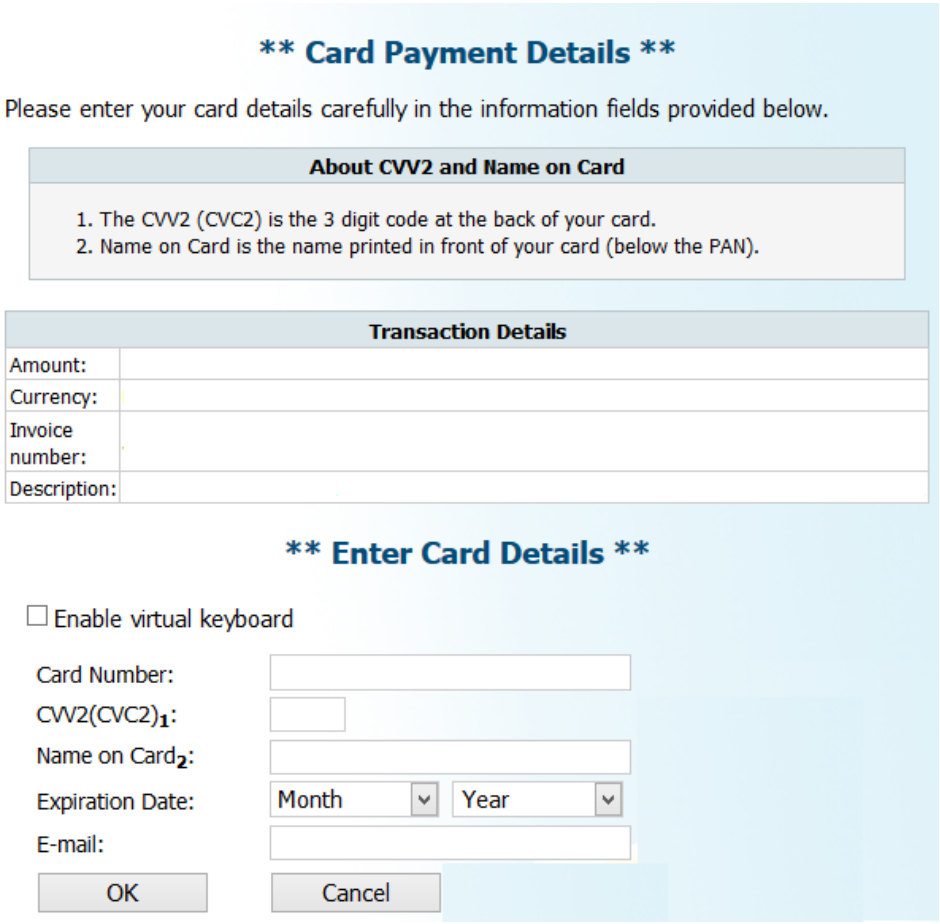


***Figure 2.12: Typical Credit/Debit card payment platform***

(xv) After payment either through a participating bank or credit/debit card, proceeds to the NIS portal for confirmation of payment following these steps:

(a) Navigate to the "Query Your Application Payment Status" page of the NIS portal and enter your Passport Application ID and Reference No.

(b) The "Validation Number" field will displayed

(c) Click "Search Record" button, the "Applicant’s Details" page where a date for interview has been generated will displayed.

(xvi) End of Online Passport Application Processing. Applicant then attended an interview on the scheduled date at the NIS office for photography and fingerprint capturing, after which the passport was then finally issued.

### 2.11.2 General Guidelines for Visa Application

The process of obtaining a Nigeria visa of any type starts with:

(i) Visit the Home page of Nigeria Immigration Service (NIS) Portal at https://portal.immigration.gov.ng. The NIS portal homepage screen print is shown in figure 2.13.

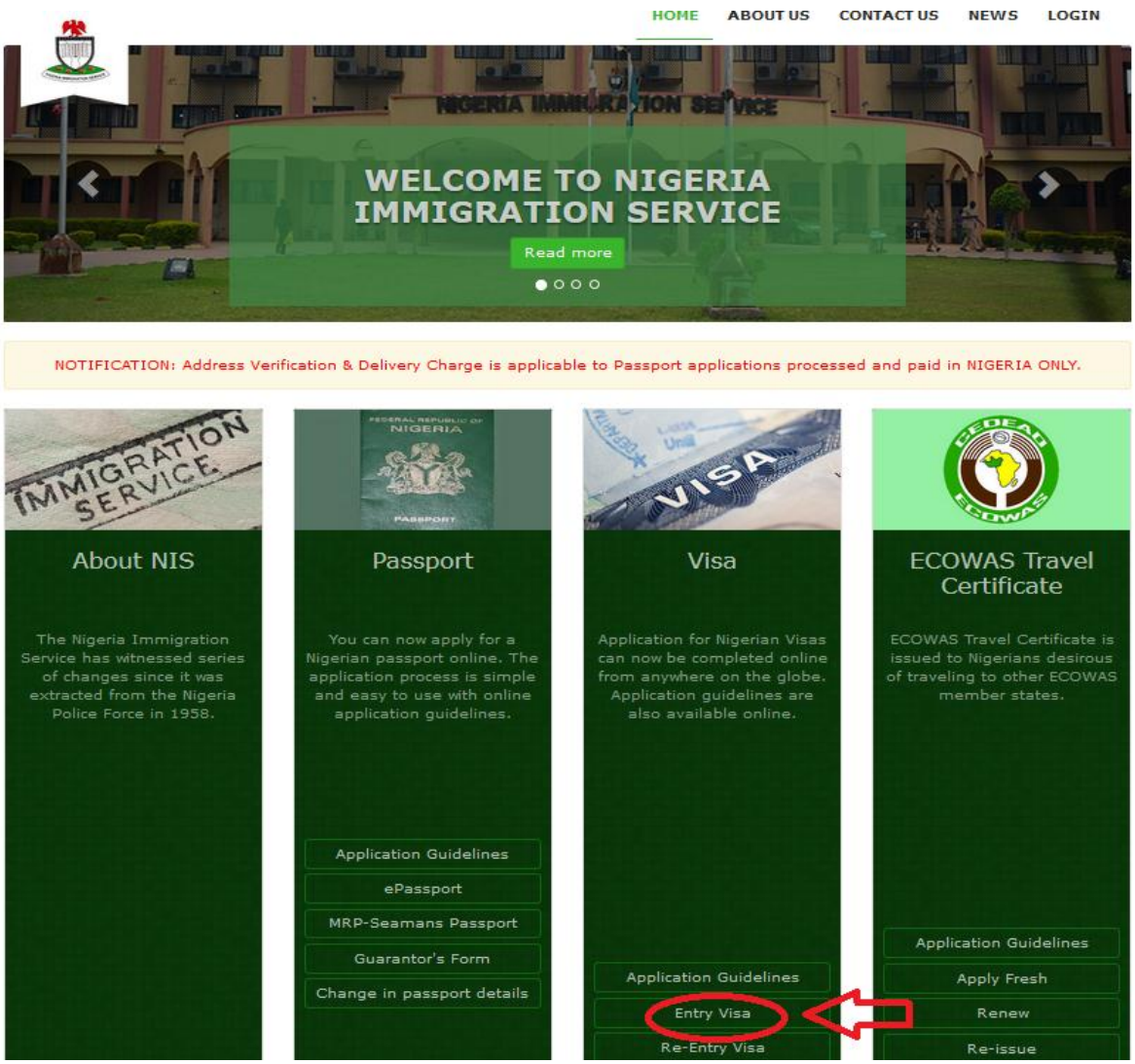


***Figure 2.13: Entry Visa button***

(ii) Navigate to and click on the 'Entry Visa' button as shown in figure 2.13 and user will be directed to the 'Select Processing Country'' page as shown in figure 2.14 to start the application process.

(iii) Select processing country from the drop down list (the country where the you wish to attend the interview as part of the visa application processing). In this

instance, the applicant has selected ‘United Kingdom’ as the country where the applicant wishes to attend the interview as shown in figure 2.14.

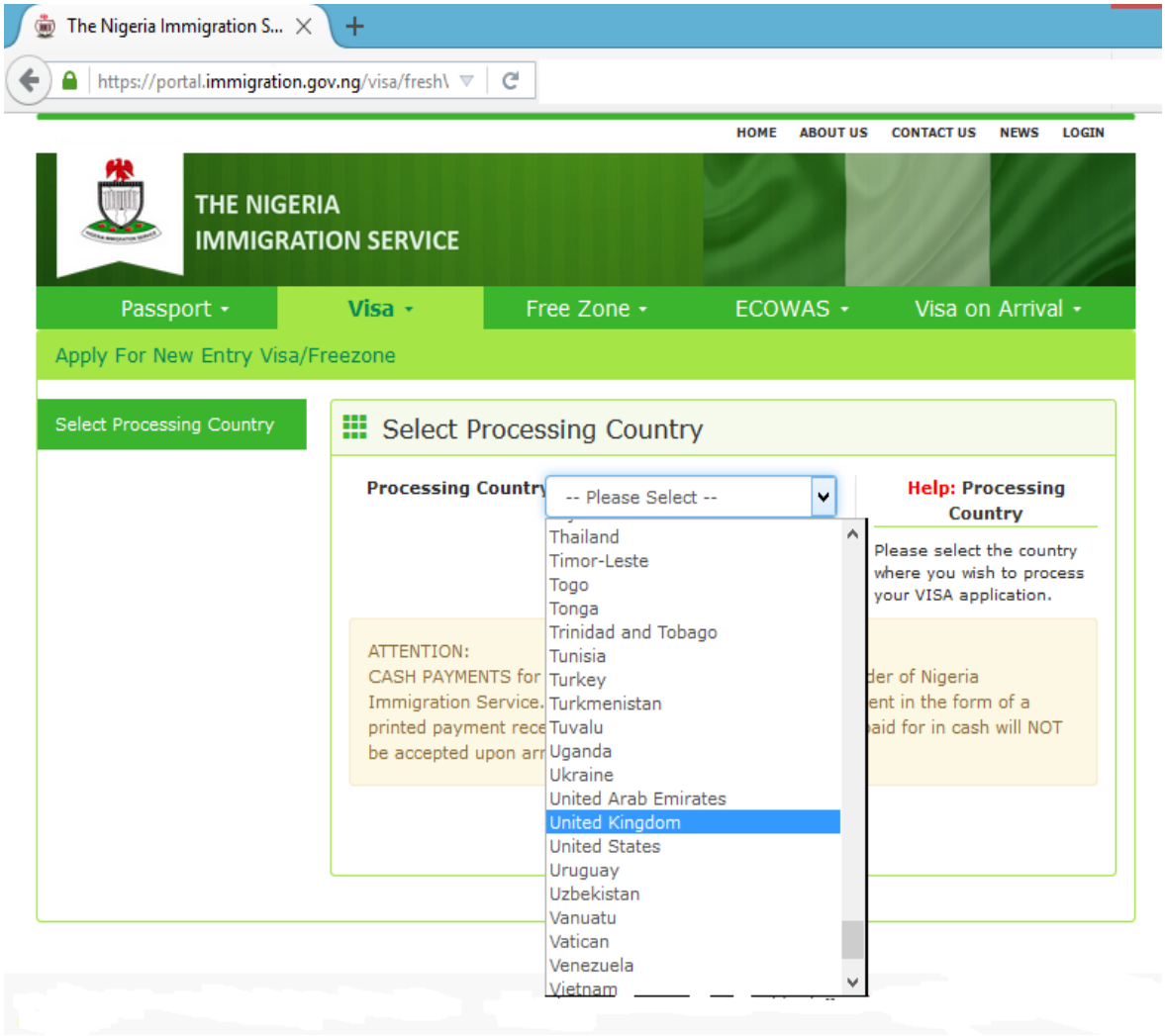


***Figure 2.14: Drop Down List of Processing Countries***

(iv) On selection of processing country, ‘Start Application’ button page displayed as shown in figure 2.15.

(v) Click on ‘Start Application’ and applicant redirected to a third party service provider website at: https://www.innovate1services.com/nis?appVars=dmlzYSMjI0dC. This is a third party service provider landing page away from Nigeria Immigration portal as shown in figure 2.16.

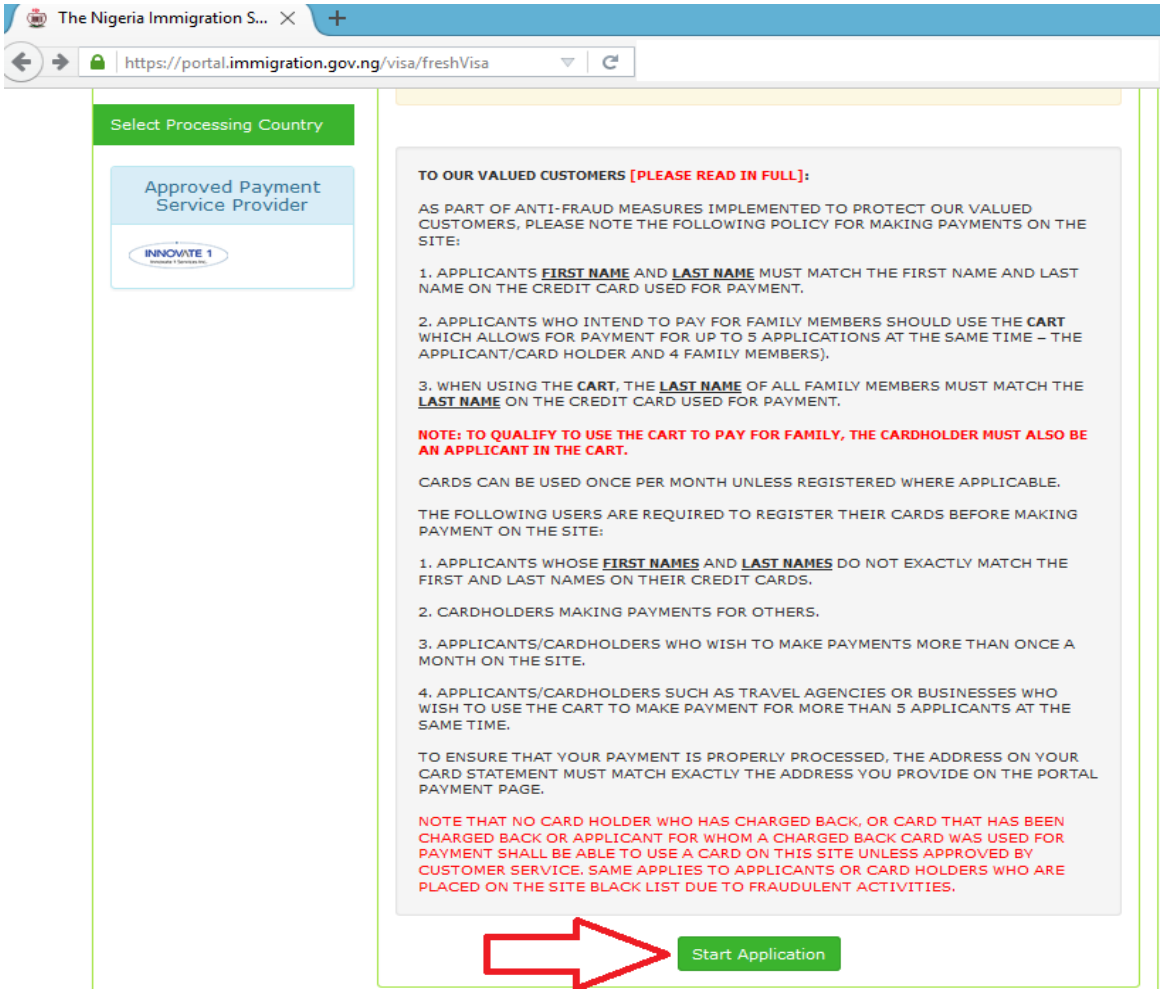


***Figure 2.15: Red Arrow Showing Start Application button***

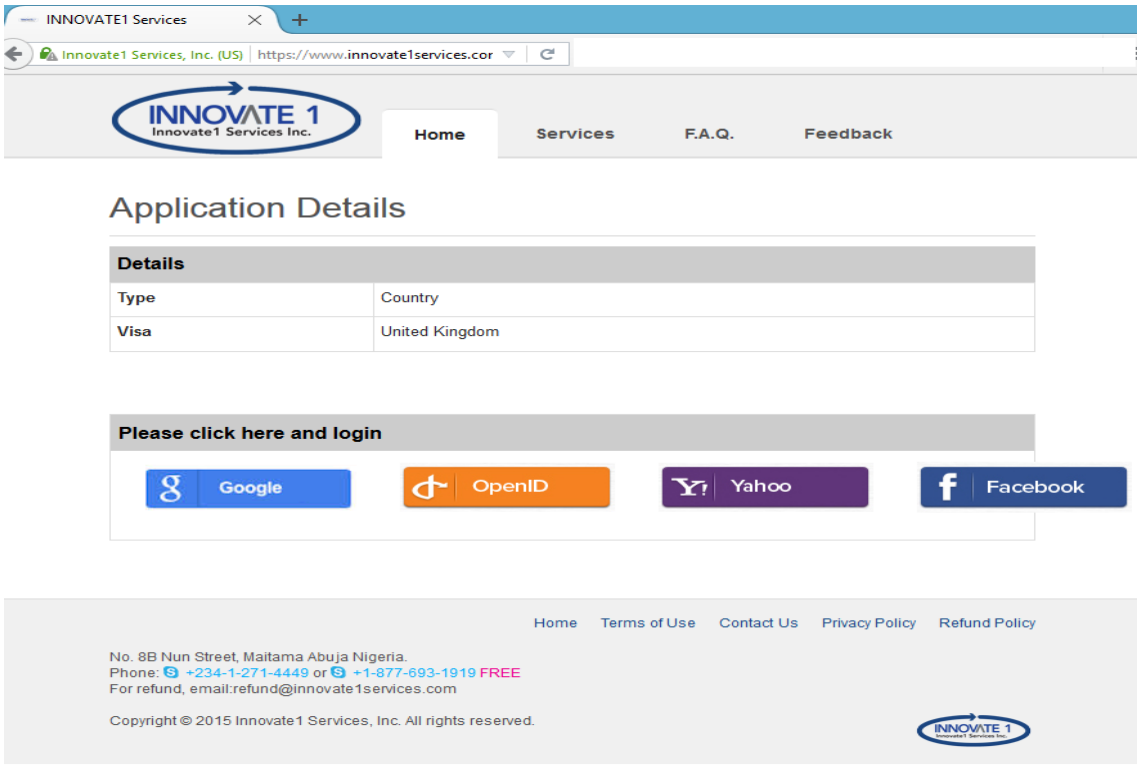


***Figure 2.16: Third Party Service Provider Landing Page***

(vi) At this Third Party Service Provider Landing Page, user select from GOOGLE, OpenID, YAHOO or Facebook to sign in using their existing credential or creates an account if applicant not already has one as shown in figure 2.17.

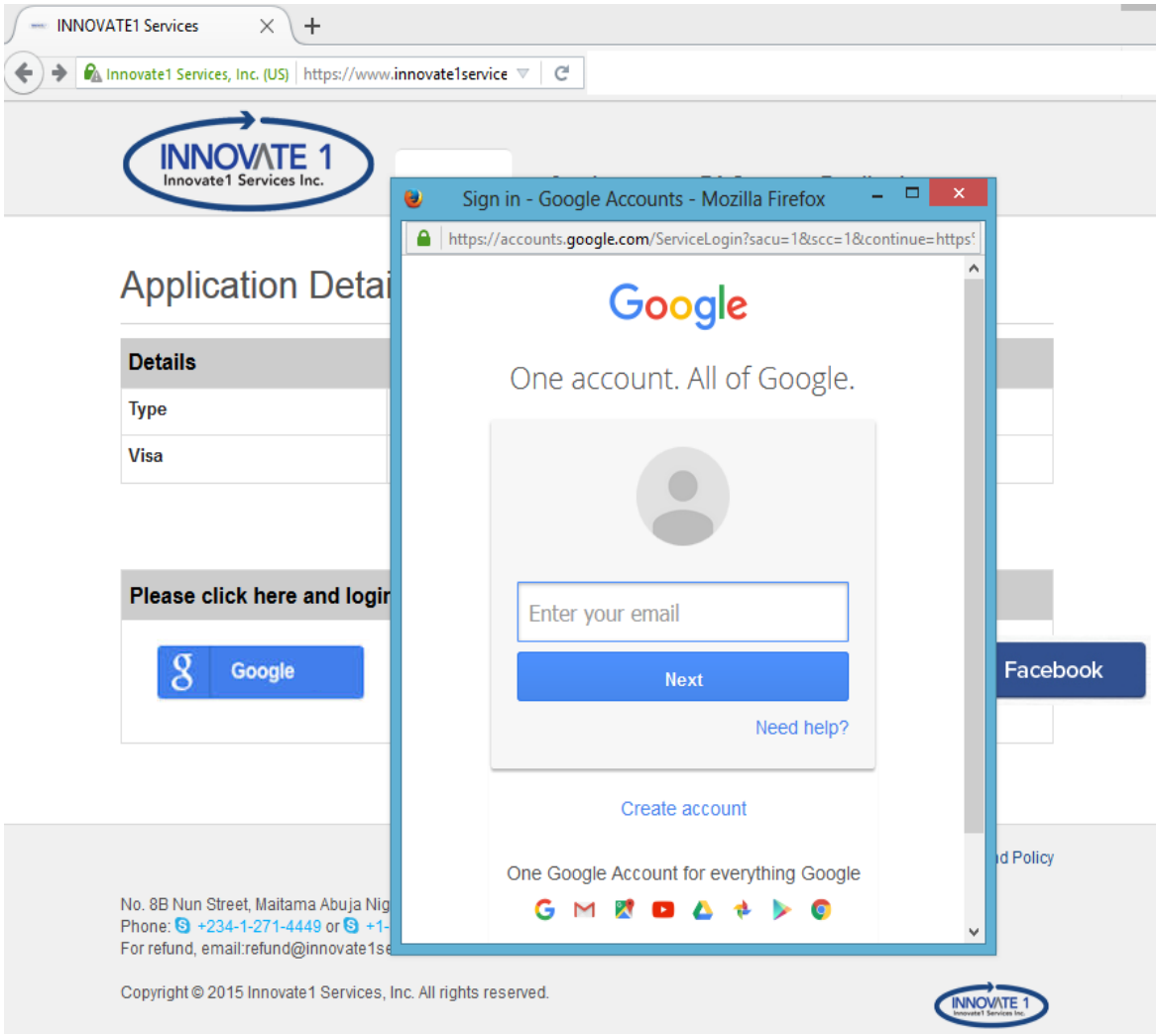


***Figure 2.17: Sign In Page to Third Party Provider Visa Service on Behalf of NIS***

(vii) After a successful login, user shared personal details with the third party provider and then click ‘Submit’ button as shown in figure 2.18.

(viii) On Submission, applicant presented with visa application form to complete as shown in figure 2.19. User then completes all relevant sections of the online visa application form shown in both figure 2.19 and 2.20.

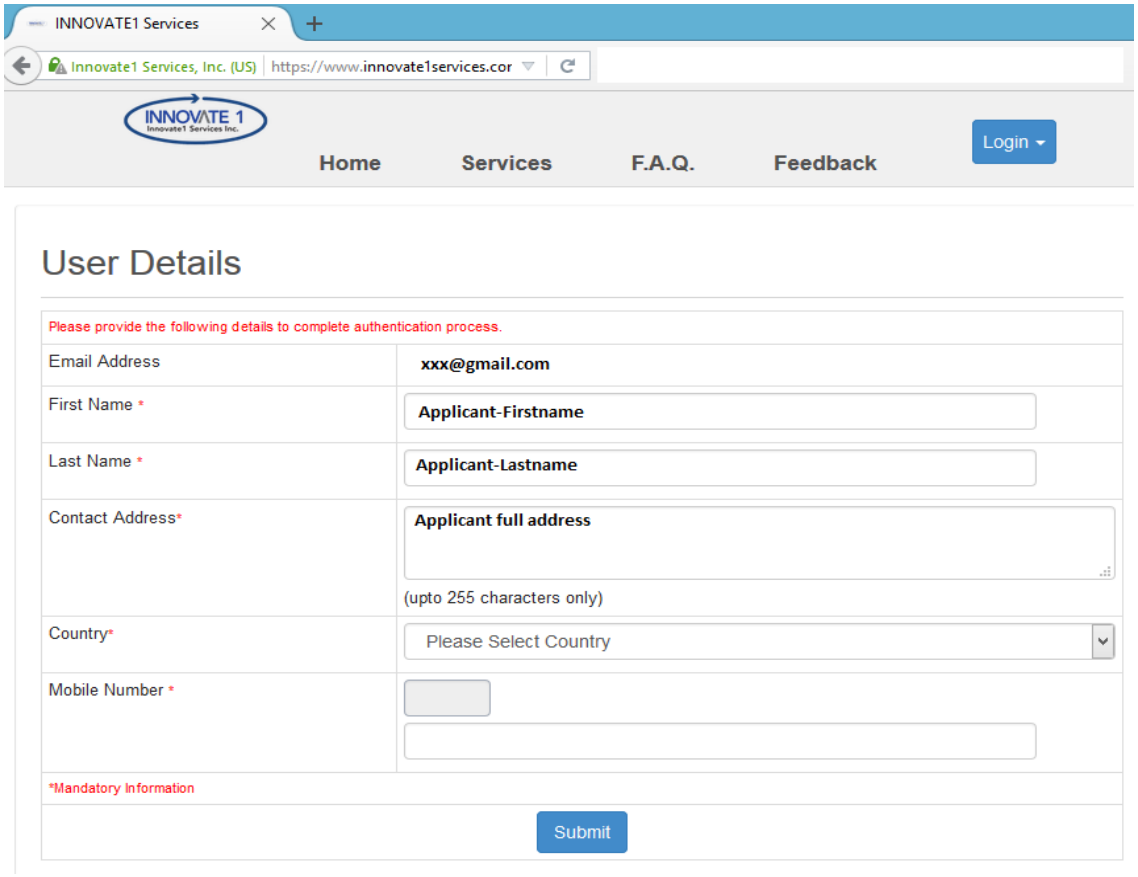


***Figure 2.18: Applicant sharing their details with Third Party Provider***

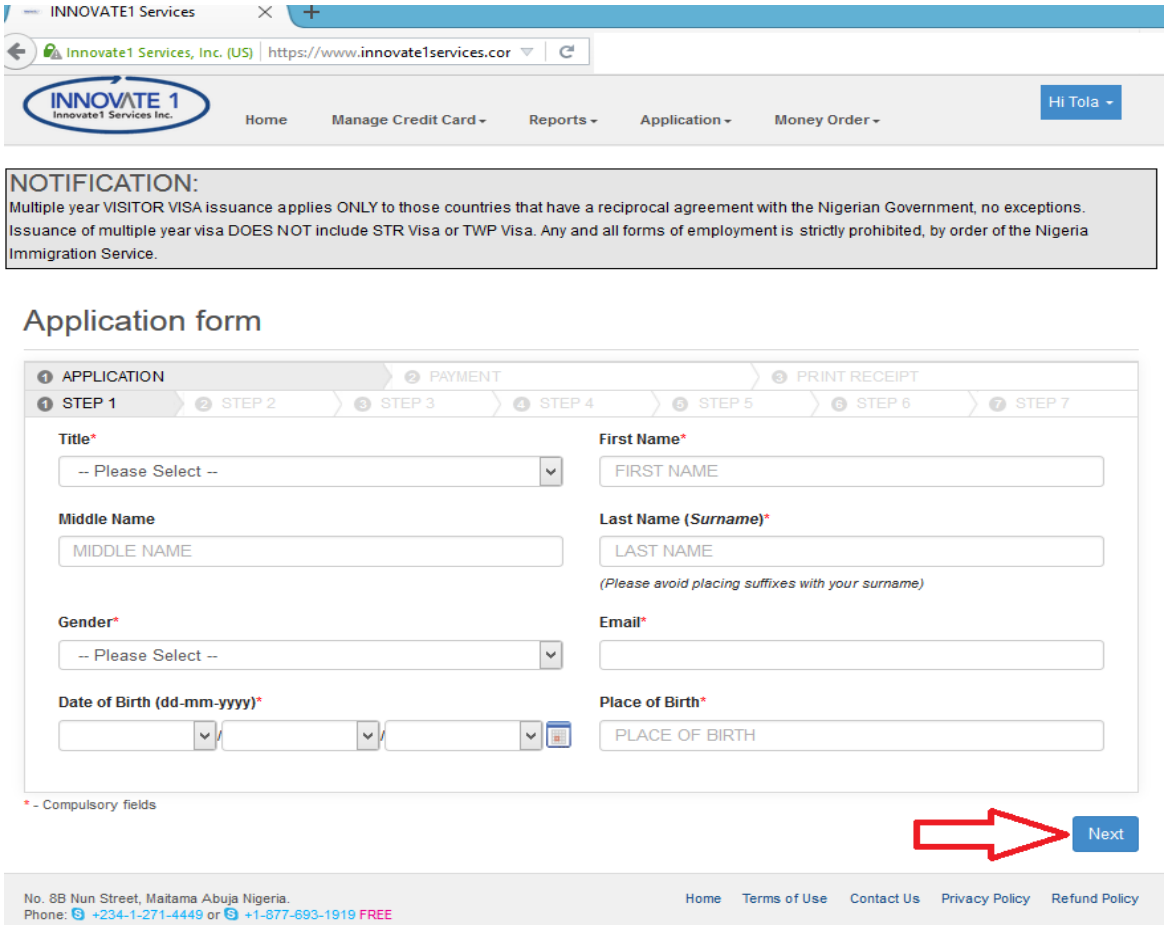


***Figure 2.19: Online Visa Application Form***

(ix) Click ‘Next Button’ to complete other sections of the online visa application form as shown in figure 2.20.

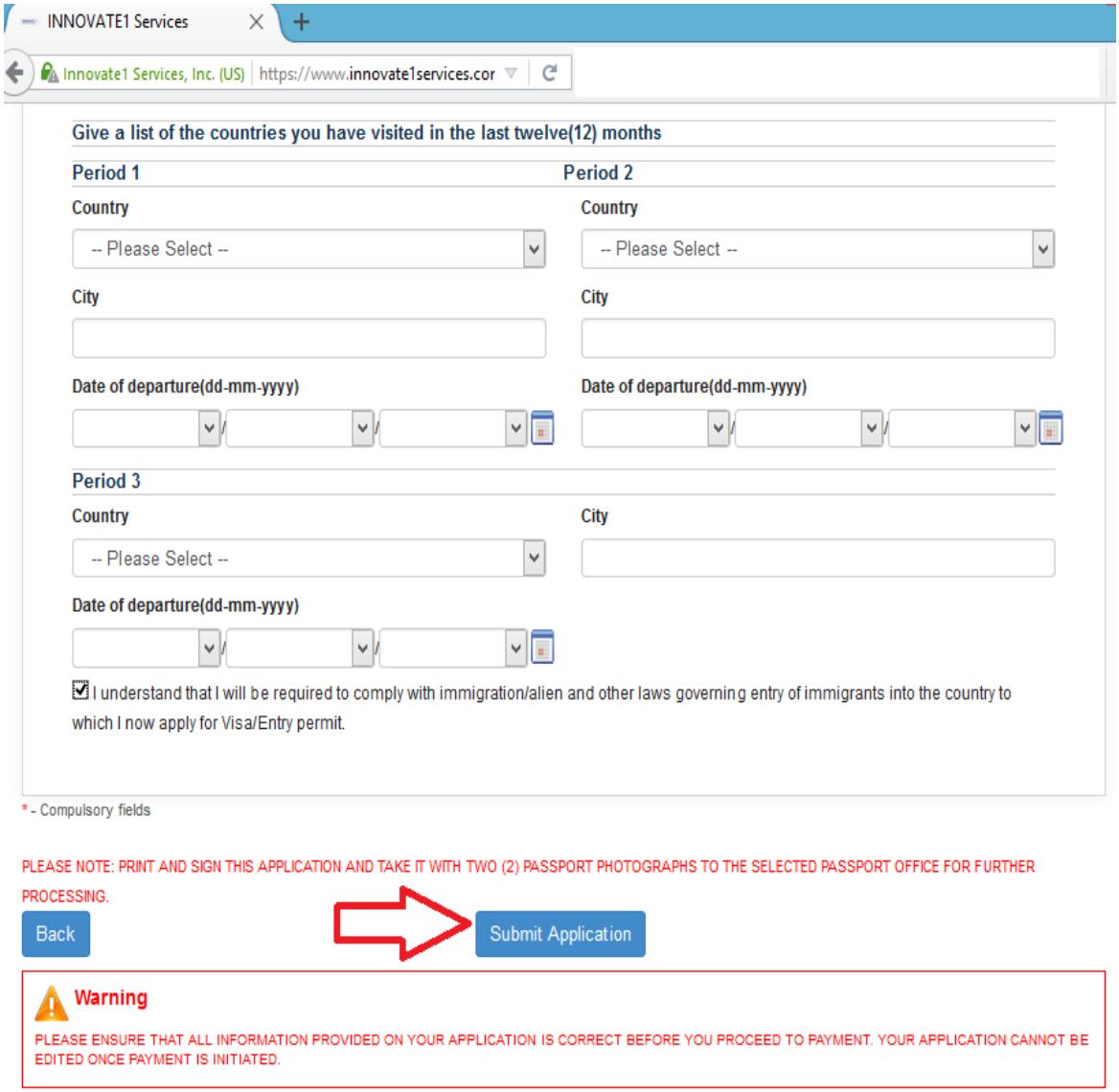


***Figure 2.20: Second Part of the Online Visa Application Form***

(x) Click on 'Submit Application' button as shown in figure 2.20. On successful submission of the visa application form, a page that contains applicant’s Application ID and Reference Number displayed, as shown in figure 2.21.

(xi) Click ‘Continue’ button as shown in figure 2.21 to proceed to the payment section.

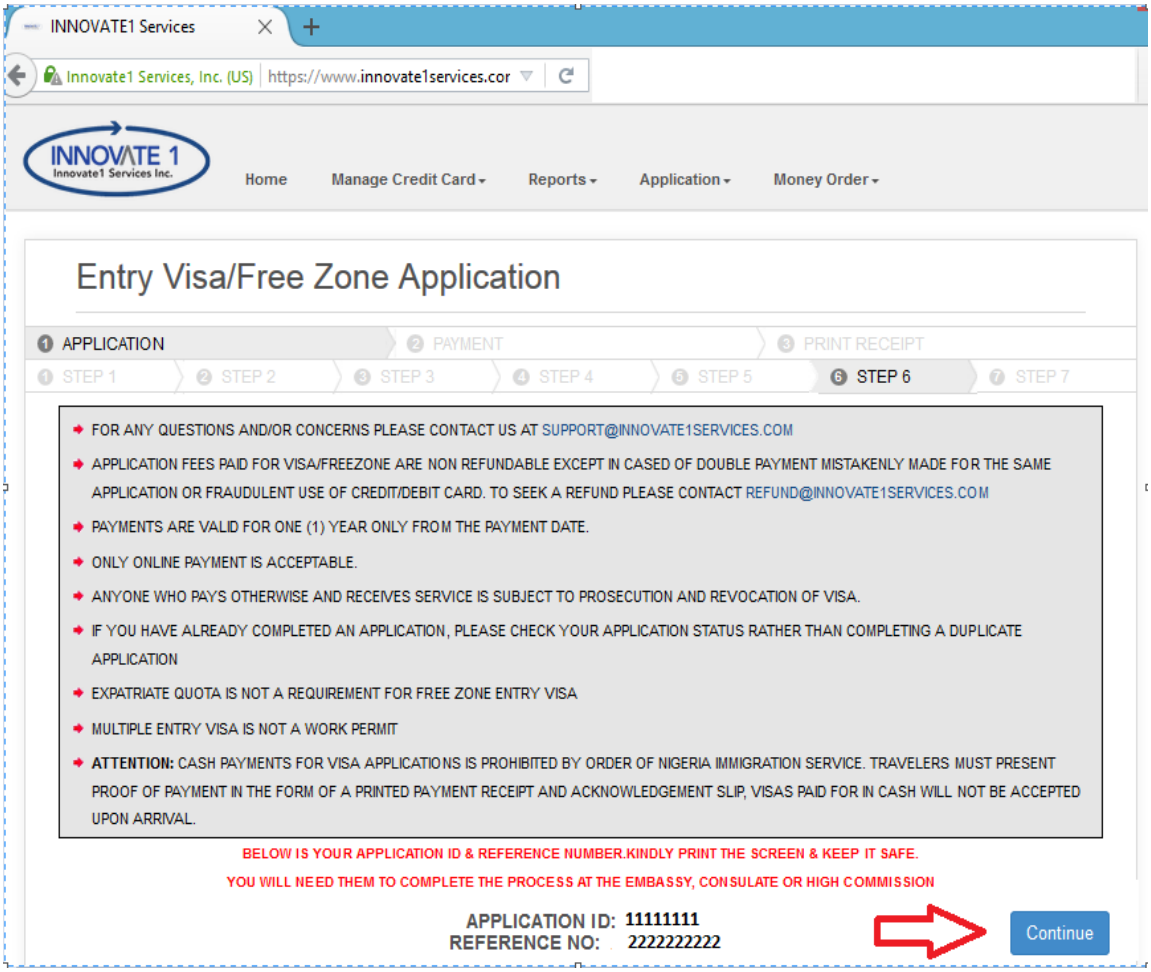


***Figure 2.21: Application ID and Reference Number page***

(xii) At the 'Payment Options' page, tick the payment method: "Card Payment" or "Cash At Bank" as shown in figure 2.22. If applicant intends to pay at a bank, "Cash At Bank" should be ticked and click continue, page with a list of participating banks will be displayed. Proceed to a participating bank for payment using 'Application ID and Reference Number' shown in figure 2.21

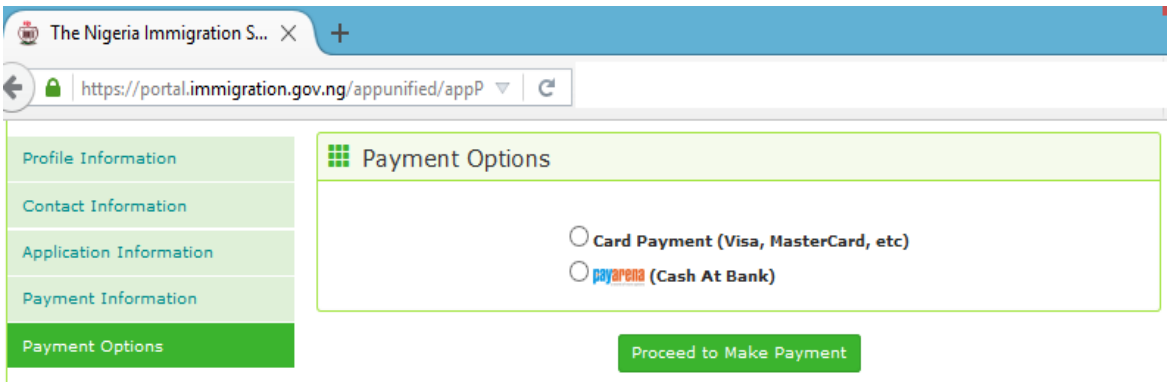


***Figure 2.22: Payment Options Page***

(xiii) After payment made at the bank, applicants given a receipt that contains a "Validation Number". This "Validation Number" used later for confirmation of payment on the NIS portal.

(xiv) If user intends to pay using Credit/Debit card, tick “Car Payment” option and click continue, card payment platform page will be displayed as shown in Figure 2.23. Complete all relevant sections on the card payment platform. After completion, click ‘OK’ to authorise the visa application payment.

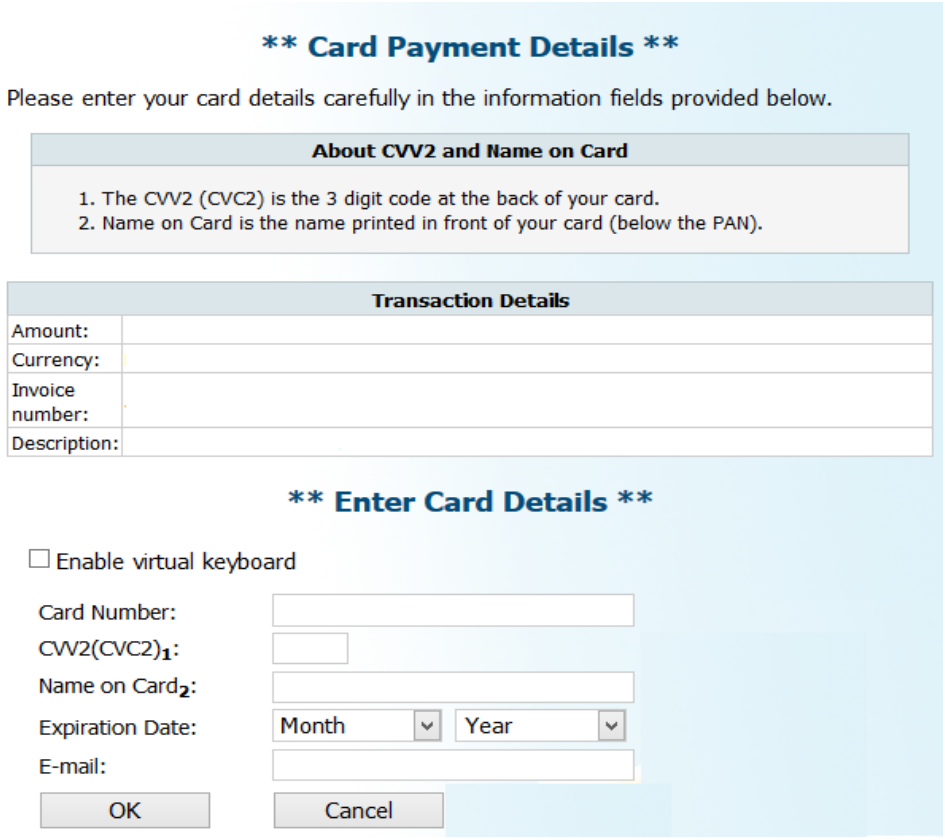


***Figure 2.23: Typical Credit/Debit card payment platform***

(xv) After payment either through a participating bank or credit/debit card, proceeds to the NIS portal for confirmation of payment following these steps:

(a) Navigate to the "Query Your Visa Payment Status" page of the NIS portal and enter your Visa Application ID and Reference No.

(b) The "Validation Number" field will displayed

(c) Click "Search Record" button, the "Applicant’s Details" page where a date for interview has been generated will displayed.

(xvi) End of Online Visa Application Processing. Applicant then attended an interview on the scheduled date at the NIS office for photography and fingerprint capturing, after which the visa was then finally issued.

## 2.12 Vignettes About NIS Portal Users

Finch (1987, p. 105) describes vignettes in the context of research as “short stories about hypothetical characters in specified circumstances, to whose situations the interviewee is invited to respond.” Similarly, Hughes (1988, p. 381) defines vignettes as “stories about individuals, situations and structures which can make reference to important points in the study of perceptions, beliefs and attitudes.” In this study, vignettes have been used to make reference to important points in the study regarding users and their situations as per their use of the NIS portal, to reveal perceptions and to highlight the issue of the digital divide in the study context.

### 2.12.1 User Vignettes

In this section, three vignettes are presented to demonstrate typical uses of the portal. These are informed by the researcher’s personal experience and data from the open questions asked in the questionnaire. These vignettes have been chosen to demonstrate the diversity of experiences of users of the NIS, and, in particular, to reflect differences between the context of users in rural and urban Nigeria, and in a developed country.

***(i) A User from Rural Nigeria Applying for a Passport***

Ben, an elderly man living in a village (in a rural part of Nigeria), had to travel for 37 miles to the nearest cybercafé to use the internet in order to complete an online application form to apply for a Nigerian passport. On arrival, Ben was shocked to be told that there was a waiting list to use the internet and that he was number 15 in the queue and would have to wait for up to five hours. Anxious not to miss the last of the few buses going back to his village that night, Ben approached the cybercafé attendant to ask for help. The attendant suggested that Ben pay for a fast-track service, at double the normal rate. Ben did so. Ben therefore gained the internet access he needed to complete the online application. The passport application forms were successfully completed and he proceeded to the payment stage.

Ben had only two choices of payment option: to pay by credit/debit card or to pay at a bank. Ben had no credit or debit card so had no choice other than to pay at a bank, which required him to travel for 10 miles from the cybercafé to the nearest bank. Ben did so, filled in the necessary form and made the payment to the NIS for his passport application. He then travelled back to the cybercafé. On reaching the

cybercafé, he found that the electricity supply had been cut off and there was no news as to when the power would be restored. Ben waited until the cybercafé closed at 7pm and left, having been unable to complete the payment part of the application that he needed to get an interview date for obtaining his passport. Ben had to give cybercafé attendant all his details, including bank payment details, so that his application could be completed for him before he returned the following day.

The next day, Ben travelled back to the cybercafé, to find that the payment part of the application had not been completed because the bank to whom he had paid the money had yet to process the payment form on their computer as there was no internet and they could not say when this payment would be processed. After three days of travelling to and from the cybercafé, the payment was validated and the online application was completed and Ben was finally able to schedule an interview date to obtain his passport. Ben then attended an interview on the scheduled date at the NIS office for photography and fingerprint capturing, after which the passport was then finally issued.

***(ii) A User from an Urban Part of Nigeria Applying for a Passport***

Juliet, a second-year university student living in university accommodation in an urban part of Nigeria, needed to get a new passport. She tried to turn on her laptop to start the application process and found there was no electricity supply, but her laptop still had 90% of battery power remaining. She connected her laptop to her smartphone mobile hotspot to gain access to the internet. She accessed the NIS portal, completed all the necessary parts of the online application form and then proceeded to the payment section. She brought out her bank debit card to make a payment online for her passport application. Her payment was accepted and validated. She then proceeded to schedule an interview date. She navigated to the "Query your Application Payment Status" section of the portal, and entered the Passport Application ID and Reference Number obtained as part of the application process. She then clicked the Search Record button and waited for the page that would generate her passport interview date to open. A message reading ‘Firefox can’t find the server at portal.immigration.gov.ng’ appeared, along with the text: ‘If you are unable to load any pages, check your computer’s network or internet connection’. On checking on her mobile, Juliet realised she had run out of the internet data she had paid for just a day earlier. She waited until the internet provider’s office opened later that day, purchased new data and proceeded to get

a passport interview date. She attended an interview on the scheduled date for photography and fingerprint capturing, after which a passport was issued.

***(iii) An NIS User from the United Kingdom Applying for a Visa***

Jimmy, a second year university student living in the United Kingdom, was curious to know more about Lagos in Nigeria, as part of the course he was taking. Jimmy switched on his laptop and searched on the internet using Google, typing in the text: 'How to apply for a Nigeria tourist visa' and finding a web link with the title 'The Nigeria Immigration Service' and a link to the URL https://portal.immigration.gov.ng with further text below the link '… Applications for Nigerian Visas can now be completed online from anywhere on the globe' (see Figure 2.24).

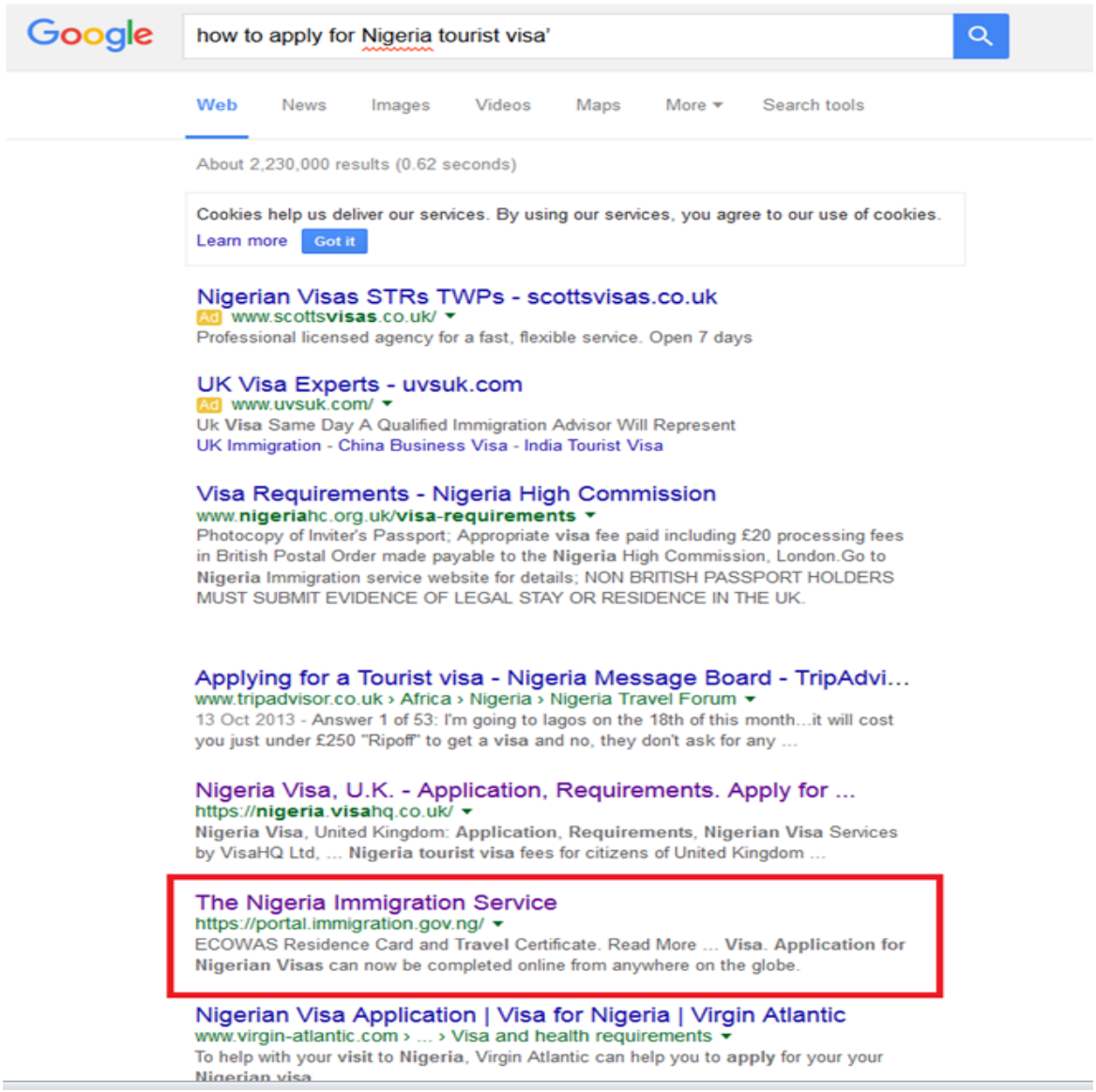


***Figure 2.24: Google Search Results for 'How to Apply For Nigeria Tourist Visa'***

Jimmy navigated from this page to a link entitled Apply Online which directed him to the URL https://portal.immigration.gov.ng/, where he started the visa application process. Jimmy completed all the necessary parts of the online application and paid using his debit card. After this, having obtained a Validation Number, Jimmy proceeded to the NIS portal on which he received confirmation of his payment using his 'Visa Application ID' and 'Reference Number'. Jimmy inputted the validation number, and the payment number he received from the 'approved payment platform provider'. He clicked on the 'Search Record' button and was directed to an 'Applicant's Details' page where a date for an interview was generated.

Jimmy had thus completed the online entry visa application process. He took his visa payment receipt, passport and other documents to the Nigerian Embassy in London, where he underwent the photography and fingerprint capturing process, after which his entry visa was issued.

### 2.13 Summary

This chapter has identified Nigeria and the Nigeria Immigration Service as the context of this study. There has been a discussion of Nigeria's geographical position and population, tribes and culture, economic issues and the emergence of the internet in the country. The development of e-government in Nigeria has also been addressed with a discussion of the Nigerian National Policy for Information Technology and the Nigeria Immigration Service (NIS) and its e-government implementation. Vignettes about different users of the NIS portal have highlighted the importance of the digital divide in this study context.

# Chapter 3: Literature Review

## 3.1 Introduction

This chapter firstly provides a basic definition of e-government, e-services, user satisfaction and the digital divide. These definitions are necessary from a theoretical perspective. The attempt to define an e-service has been included in this literature review to give an overview of e-service, as the study uses service quality theory as a basis for the evaluation of an e-government website. Other researchers that have that have taken this approach include Lindgren and Jansson (2013) and` Montazeri et al. (2013).

This chapter develops from these definitions and explores some underlying theories associated with them. The other aspect of the research, the digital divide, explores this premise in the context of both developing and developed countries.

## 3.2 Basic Concepts

### 3.2.1 The Definition and Concept of E-government

Heeks (2008, [online]) defines the term 'e-Government' as "*the use of information and communication technologies (ICTs) to improve activities of public sector organisations"*. Janssen (2007) defines e-government as the computerisation of public sector services by making them capable of providing a service to ensure good governance while utilising technology as the major mechanism of doing so. The World Bank (2011, [online]) defines e-government as "*government agencies use of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of the government".* According to Sisman, Sesli and Alkis (2009), e-government is the development policies practices where citizens and the government are able to execute their mutual duties, responsibilities and obligations by significant use of electronic communications and process-media. Furthermore, Almarabeh and AbuAli (2010) define e-government as the utilisation of information technologies by government agencies in the form of intranets, the internet and mobile computing, which have the ability to change relations with citizens and businesses. Goldkuhl and Rostlinger (2010) argue that the concept of e-government is not only the utilisation of information technology to give citizens and organisations a convenient access to government information and services, but also that of delivering public services to citizens and business partners working in the public sector. However, e-government implementation is also defined as the

attainment of citizen-centric services by means of digital media such as communicative government portals (Janssen, 2007).

Thus, it can be seen that e-government has several definitions and whilst these overlap to some extent, there are differences. In all cases, the main meaning of e-government can be classed as information and services provision through electronic means to the public (citizens and non-citizens) and private organisations. Hung, Chang and Yu (2006) and Janssen (2007) identify that e-government services are widely utilised in the public sector to enhance service quality in the form of tax filing and identity management, which includes the issue and renewal of identity cards and driving licenses. It also provides effective services in passport making, the filling and submission of government job application forms, producing birth certificates, marriage licensing, admissions to higher education and registering voters, among other services (Hung, Chang and Yu, 2006; Janssen, 2007).

E-government can be described as the use of computing technologies to improve interaction within government administrations, between a government and its citizens, a government and businesses and between governments.

### 3.2.2 The Definition and Concept of E-service

The term e-service is defined by Reynolds (2000) as a web-based service, and as an interactive service that uses an internet medium for its delivery (Boyer, Hallowell and Roth, 2002). According to Scupola (2009), an e-service is a business concept initially introduced and developed by Hewlett Packard and considered an effective idea and concept that assists in evaluating the utilisation of the World Wide Web. E-services have been discussed extensively in the literature with a distinctive differentiation of forms between informative and transactional services (Layne and Lee, 2001). According to Pavlichev and Garson (2004), the term e-service is a highly generic one that refers to the provision of services through the internet where it may include e-commerce and non-commercial services provided by the government. Seth, Deshmukh and Vrat (2005) define e-services as online services available on the internet where valid transactions of buying and selling are common as opposed to conventional websites where only descriptive information is available and on which no online transactions are possible. Boyette, Rankin and Thomas (2009) describe e-services as services available on the internet that include e-commerce transaction services for handling online orders and web applications hosted by application service providers.

Stiakakis and Georgiadis (2009) argue that an e-service differs from conventional services, as it is delivered to customers by means of the internet using advanced telecommunication and multimedia technologies.

The initiation of the concept of e-service has roots in the provision of effective and efficient services. In this regard, Al-Hashmi and Daremi (2009) observe that several organisations have contributed to some innovative researches to make their e-service more effective, faster and reliable using advanced technology. Rowley (2006), in her 'analysis of the e-service literature' research describes an e-service as embracing the media and all forms of communication. Rowley (2006) argues that an e-service is a combination of "deeds, efforts, or performances" that contain e-tailing, customer support and service delivery. Rowley (2006) defines e-services as *"deeds, efforts or performances whose deliveries are mediated by information technology (including the Web, information kiosks and mobile devices)."* In addition, she states (Ibid.) that *"such an e-service includes the service element of e-tailing, customer support and service, and service delivery."*

In conclusion, it is safe to define an e-service as a web-based interactive and/or transaction service, which may include both commercial and non-commercial online activities with a view to delivering a service to customers or end-users.

### 3.2.3 Defining the Term User Satisfaction

User satisfaction, according to DeLone and McLean (1992), is one of the most important measures of determining success of an enterprise. Andersen et al. (2011) define user satisfaction as the reflection of the context in which the information requirements of users have been fulfilled. In the context of e-government, Alawneh, Al-Refai and Batiha (2013) describe user satisfaction as an important factor that promotes the continued usage of such services.

User satisfaction is also defined as the perceived acceptability of a system (Kelly and Vidgen, 2005). However, Verdegem and Verleye (2009) define user satisfaction as the subjective sum of interactive experience strongly interlinked with perceived aesthetics and usability. Belanger and Carter (2008) identify nine service factors that influence user satisfaction, competitive price of products, customer support general feedback on the service, e-mail confirmations of user orders, merchandise availability, condition and return policy, on-time delivery and promotional activities. D'Atri and Sacca (2010) feel that user satisfaction can be

defined by users' evaluation of the service, whether it fulfils their requirements and expectations and whether the satisfaction is positively related towards loyalty.

User satisfaction is related to the notion of service quality, which relates to the outcome of the services provided. Regarding the relationship between user satisfaction and service quality; service quality is an important determinant of user satisfaction and Oliver (1993) has argued that service quality is antecedent to user satisfaction. Other researches that support Oliver's view include Anderson and Sullivan (1993), Fornell et al. (1996) and Spreng, Mackenzie and Olshavsky (1996) who all believe that user satisfaction is a result of service quality. Service quality refers to overall judgement perception, whereas an assessment of satisfaction is a one-off interaction with a service.

Shankar, Smith and Rangaswamy (2003) have demonstrated in their research that the influence of satisfaction on loyalty is much stronger online than offline, as satisfied online customers are inclined to make better use of the service, possess stronger repurchase intentions and are usually interested in recommending the service to their associates. Verdegem and Verleye (2009) identify that user satisfaction may well have a crucial impact on the large-scale adoption and utilisation of e-government services as the requirements of users are placed at the centre of the development and provision of electronic services. However, in an organisational context, several user satisfaction studies have demonstrated that an effective relationship between user satisfaction and information system effectiveness is mandatory (Ghane, Fathian and Gholamian, 2011). According to Andersen et al. (2011), user satisfaction in an organisation is perceived as the reflection of the context in which the information requirements of the manager have been fulfilled. Additionally, Zhang, Qian and Zhang (2009) assert that user satisfaction measurement is a critical factor in enhancing customer retention, customer loyalty and service reusability.

### 3.2.4 Defining the Term Digital Divide

This study encompasses both the effect of the digital divide in the use of e-government services and users' experiences of such services; therefore, it is useful to define the concept of the digital divide.

The digital divide has been recognised as relating to inconsistencies between individuals, households, businesses and geographical locations from their access to resources and computing facilities, to their use of information and

communication tools, including the internet (The Organisation for Economic Co-operation and Development [OECD], 2001; Wanasika, 2003; Prahalad, 2004; Norris, 2006; Po-An Hsieh, Rai and Keil, 2008). It also refers to a discrepancy between those having the skills, knowledge and capabilities to utilise technologies and those who do not (Jurich, 2000; Cullen, 2001; Sitawa-Ogutu and Rege, 2010; Hall and Owens, 2011). The digital divide can exist between those living in both rural and urban areas; between the educated and uneducated, along with those earning both a low and a high income and on a global scale, between more or less industrially developed nations (DiMaggio et al., 2004). The digital divide is not only related to accessibility to technology and its diffusion amongst geographic areas and social groups but to social, political, educational and economic issues, covering demographic attributes of race, ethnicity, income and geographical locations which reflect social inequality (Norris, 2000; Castells, 2001; Warschauer, 2003). The OECD (2001, p. 5) defines the term digital divide as the *"gap between individuals, households, businesses and geographical areas at different socio-economic levels with regard to their opportunities to access information and communication technologies".*

The nature of the digital divide differs on a national level. There are several countries struggling to bridge it, as it restricts the accessibility of computer systems and the internet for low-income citizens (Norris, 2006). Numerous developing nations, including Nigeria, as well as China, Russia and Brazil, are lagging behind in their efforts to reduce the digital-divide gap with low levels of internet utilisation and the restricted development of e-commerce (Akanbi and Akanbi, 2012; The Forum for East Asia-Latin America Cooperation [FEALAC], 2014). Nonetheless, e-government services are increasingly accessible, with education and income being strong predicators of both the utilisation of such services and the volume of these services (Norris, 2000; Castells, 2001; Warschauer, 2003). Significant digital divide indicators include: education, income, age, gender, frequency of internet use and access to computing technology for both the utilisation of e-government services and the volume of e-government services used (Belanger and Carter, 2006; Hall and Owens, 2011; Lucky and Achebe, 2013).

### 3.3 Theories Applied in Evaluating E-government and E-services

The literature on e-government and e-service quality measurement has demonstrated the influence of quality evaluation when an e-service is introduced in the public sector (Smith, 2011). In addition, in line with previous researchers'

findings, Sureshchandar, Rajendran and Anantharaman (2002) and Wang and Lo (2002) find that user satisfaction and service quality are related. According to Su et al. (2002), service quality affects value-perception while user satisfaction reflects customers' feelings about encounters and experiences with services provided. Therefore, this part of the thesis summarises theories that have been applied in evaluating e-government and e-services.

### 3.3.1 The Technology Acceptance Model

The technology acceptance model (TAM), according to Davis (1989, 1993), is based on the theory of reasoned action (TRA) and used widely to predict and explain individuals' acceptance of information technology.

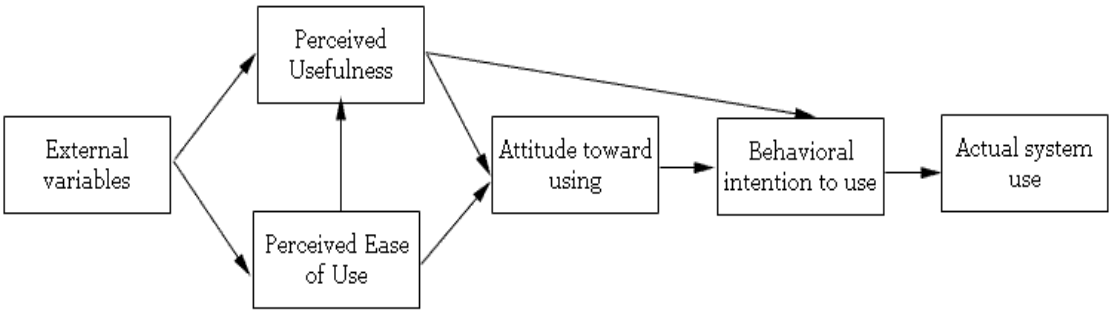


***Figure 3.1: Technology Acceptance Model (Davis, Bagozzi and Warshaw, 1989)***

According to Boyette, Rankin and Thomas (2009), the TAM can be used to analyse the motivational aspect of the use of e-service in businesses and the public sector and to understand customer behaviour. Additionally, the TAM identifies informal linkages between individuals' attitudes and perceptions towards technology and their actual adoption of an e-service (Cellary and Estevez, 2010).

The perceived usefulness and ease of use of e-services have demonstrated the effective evaluation of e-governance online services by citizens (Smith, 2011). Perceived ease of use is the extent to which a potential customer expects e-service solutions to be fairly easy to use. With the utilisation of e-services by citizens, the perceived ease of use and usefulness of the TAM is considered significant in measuring e-service quality (Cellary and Estevez, 2010). However, the TAM has been criticised as being incapable of illustrating key dimensions of e-service quality measurements, such as customisation, content and reliability through technology adoption modes.

### 3.3.2 Service and E-service Quality Models

The factors which raise the level of service quality, according to Sasser et. al. (1978), include security, consistency, attitude, completeness, condition, availability and training of service providers. Additionally, Lehtinen and Lehtinen (1982) have identified physical quality, interactive quality and corporate quality as factors affecting service quality. The first service quality model was developed by Grönroos (1984), as shown in Figure 3.2, to measure perceived service quality and the factors considered in the measurements including technical quality, functional quality and corporate image.

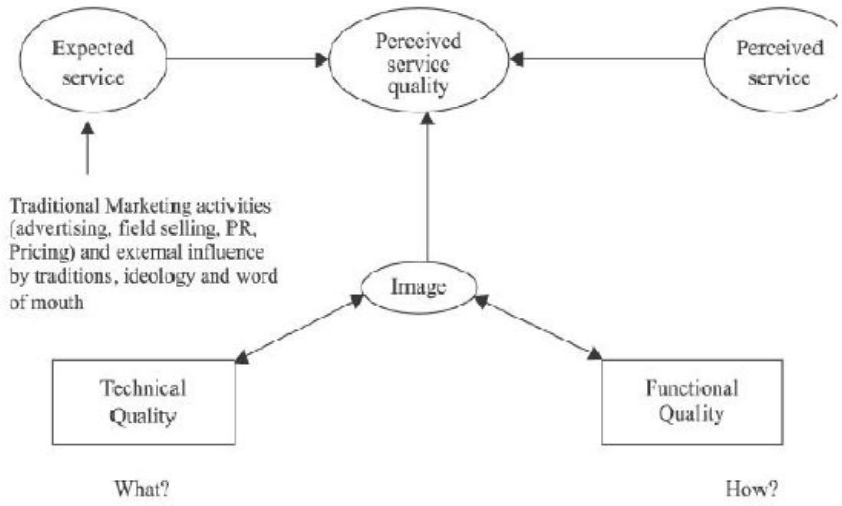


***Figure 3.2: Grönroos' Service Quality Model (Grönroos, 1984)***

Parasuraman et al. (1985) have analysed the dimensions of service quality and used the findings from their exploratory research to develop a GAP model to define and measure service quality (Saat, 1999). Subsequently, Parasuraman et al. (1988) developed an advanced model for measuring service quality: SERVQUAL. In the SERVQUAL model (see Figure 3.3), 5 dimensions and 22 items are presented in a 7-point Likert scale (Ojasalo, 2010). In the study by Parasuraman et al. (1988), functional service quality measured quality through empirical studies in banking, credit cards, repair and maintenance and long-distance telephone services.

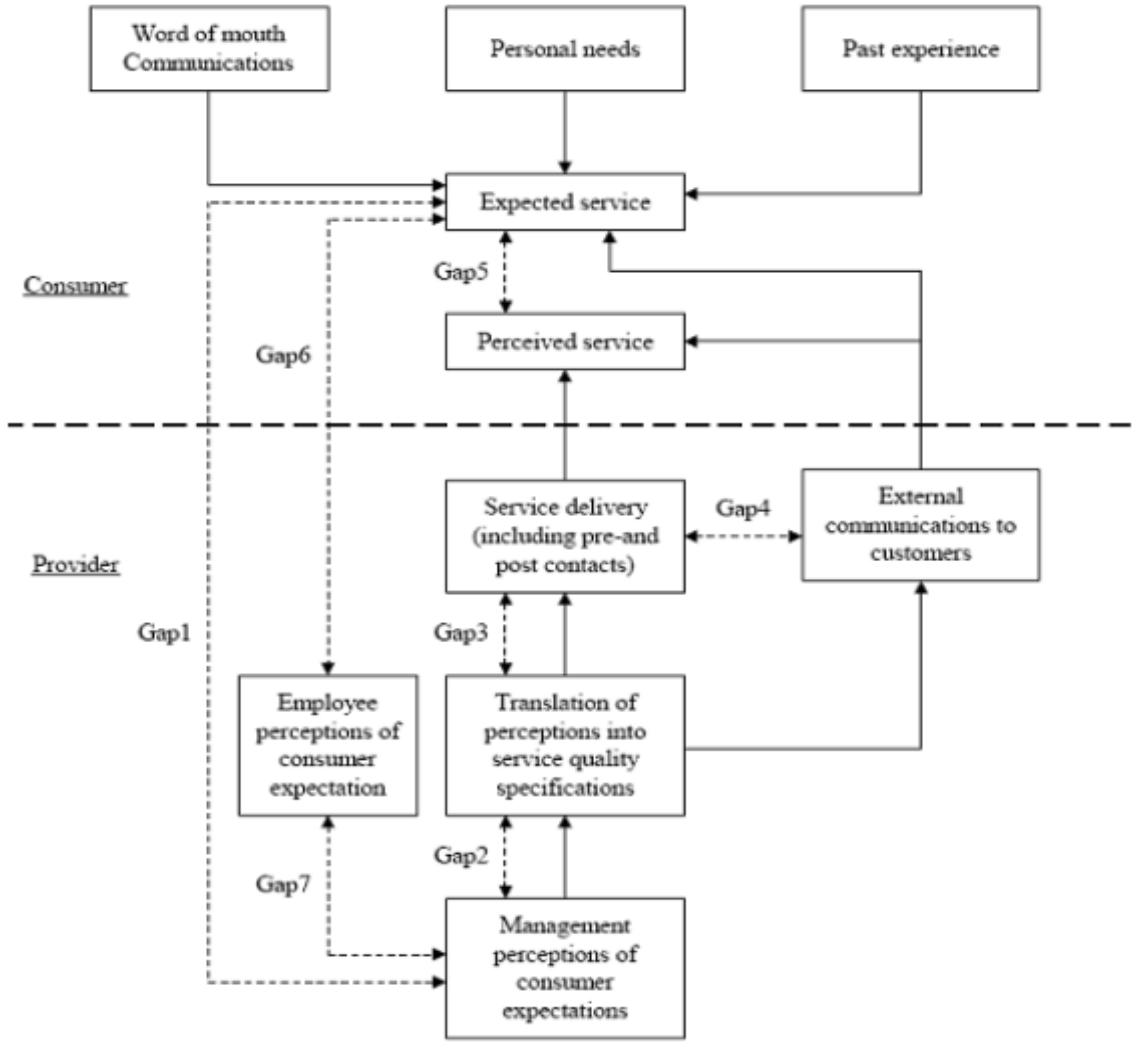


***Figure 3.3: GAP Service Quality Model (Parasuraman et al., 1985)***

According to Santos (2003), the term e-service quality is defined as consumers' overall evaluation and judgment of the quality of e-service offerings in virtual marketplaces. The e-service quality model, as identified in the literature by Kim, Kim and Lennon (2006), comprises ease of use, website design, reliability, system availability, privacy and responsiveness, the understanding of online companies and experience and trust, from the customers' perspective. Ease of use, as featured in the TAM, is identified as a significant determinant in the different dimensions of e-service quality measurement in business and public sectors. However, D'Atri et al. (2011) note that several researchers have identified ease of use as being a key consideration in customer e-service quality measurement.

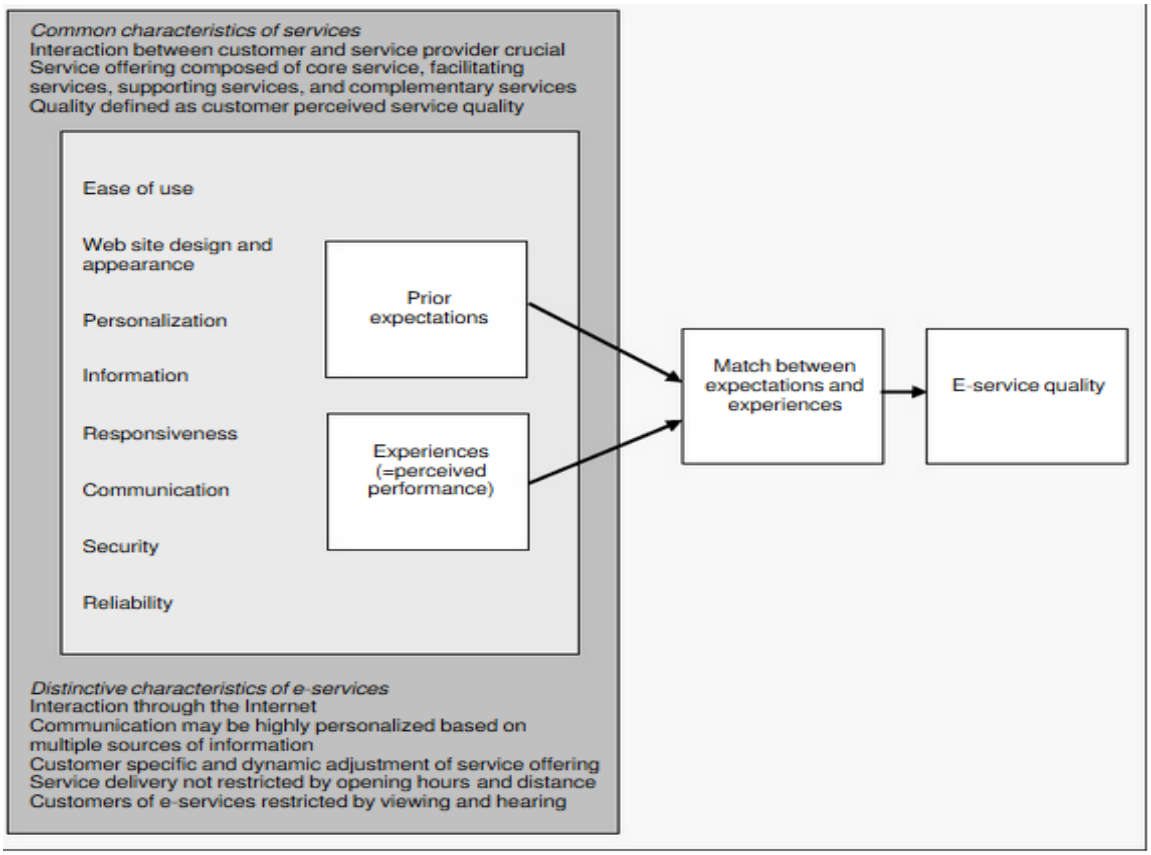


***Figure 3.4: E-service quality model (Kim, Kim and Lennon, 2006)***

### 3.3.3 Information System User Satisfaction Models

In addition to the e-service quality models, in the tradition of SERVQUAL the Information Systems (IS) literature has generated a range of models and indexes on user and customer satisfaction. The end-user satisfaction model developed by Doll and Torkzadeh (1988) is considered as an effective model for measuring user satisfaction and service delivery within the private sector. Researchers have identified the usefulness of this model by specifying the evaluation of the different dimensions presented by it (Sahu, Dwivedi and Weerakkody, 2009).

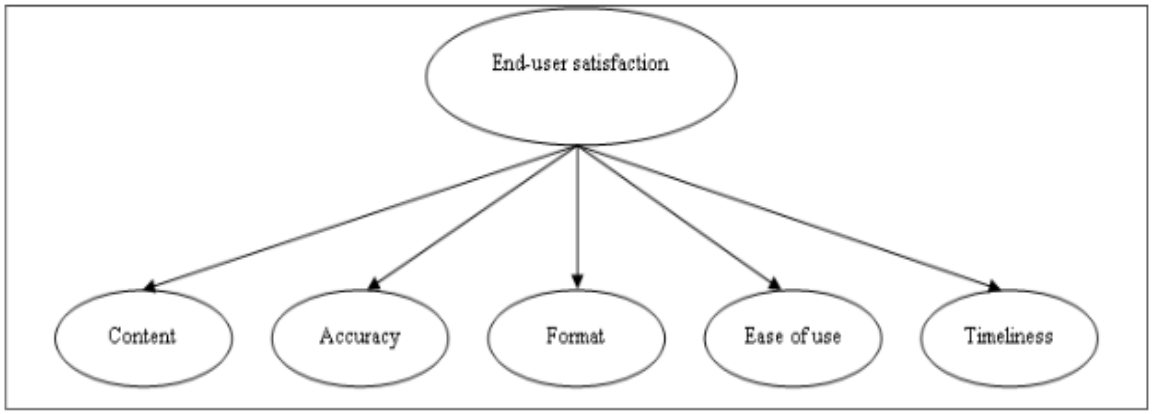


***Figure 3.5: User satisfaction model (Doll and Torkzadeh, 1988)***

Previous studies concerning the end-user satisfaction model demonstrate that this model has facilitated the e-government service delivery process and implementation to measure monetary and non-monetary aspects of user satisfaction (Rahman, 2010). The parameter depicted in this study of the measurement of customer satisfaction is the ability of users to understand the implemented e-service system. The ease of use is directly related to the design of the website, with respect to the currency of information given and the frequency of visits to the site (Janssen et al., 2010). In addition, studies have identified the efficacy of the end-user satisfaction model in determining customers' loyalty in terms of their retention and appreciation of the e-service (Au, Ngai and Cheng, 2008).

Kazeem (2011) discusses innovative methodological approaches to measure user satisfaction, including web metrics and tracking. The Common Measurement Tool (CMT) developed by the Institute for Customer Service for measuring citizen/customer satisfaction is a tool used for user-satisfaction measurement in government or commercial products or services. However, it is conceived around only five major elements: customer/citizen satisfaction, satisfaction levels, level of importance and priorities for service enhancement (Deloitte, 2009).

The research also identifies that the European Customer Satisfaction Index (ECSI) was developed to measure or benchmark customer satisfaction periodically in the private industrial sector. In addition, it has been adapted to benchmark federal agencies' website scores (Chen, 2012). Deloitte (2009) discusses the Mystery User Methodology (MUM), an innovative approach being implemented by the Greek Observatory for the Information Society, for the evaluation of online services of the Greek tax agency; this is the approach adopted in the retail industry known as mystery shopping to analyse customer services, merchandising and product quality as well as assessing customer satisfaction at retail points of contact and to produce recommendations from customers engaged in the mystery shopping.

According to Warkentin et al. (2002), customer satisfaction is influenced by citizens' perceptions of quality and their expectations of a service. The American Customer Satisfaction Index (ACSI) uses two interrelated methods to measure customer satisfaction: customer questionnaires and economic modelling (Halaris et al., 2007). Research shows that the American e-gov-ACSI is the most established model in this category, evaluating around 90 e-government sites

grouped into categories including transactions, information, portals, main sites and careers. It is observed that in the previous literature, there is a scarcity of models to measure the perceptions of users and the benefits of service delivery in the public sector (Angelopoulos, Papadopoulos and Kitsios, 2009).

## 3.4 Previous Research

### 3.4.1 Technology adoption research

Contini and Lanzara (2009) find that the developing countries government faces certain facilitators and barriers to e-government adoption in terms of understanding its meaning and concept related to the effective and efficient delivery of services. According to Boyette, Rankin and Thomas (2009), there are certain major barriers to the adoption of e-government related to the availability of technology, IT skills, operational cost and IT infrastructure, that play a significant part in the delivery and retrieval of information and transactions through electronic means. Riedl (2011) identifies that a government faces significant barriers to e-government investment that encompasses different factors including: legislative barriers, managerial barriers, technical barriers, user-culture barriers and social barriers. According to Holden, Norris and Fletcher (2003), within the adoption of e-government, the standard rules and regulations concerning the facilitation of e-services deployment can become an obstruction in the effective execution of these services.

Over a decade ago, Holden, Norris and Fletcher (2003) argued that a lack of adequate public service provider models, the ineffective assignment of government employees and the ineffective requirements of structural reforms in the government were hurdles to the effective implementation of e-services to satisfy citizens. Additionally, Idowu, Idowu and Adagunodo (2005) have found that the insufficient availability of effective technological tools restricts the development and deployment of e-government by the governments of several underdeveloped and developing countries.

It is observed that when considering e-government as an innovative phenomenon, citizens can resist change due to a lack of the technological skills needed to use e-government services (Wargin and Dobiey, 2001; Edelmann, Hoechtl and Parycek, 2009). This resistance to change is considered to be the major barrier to the use of e-government services.

According to Rahman (2010), public-sector organisations still often lack IT infrastructure hence are required to invest in the installation of new equipment and upgrade their existing software before considering adopting a modern e-government service. Rahman (2010) suggests privacy and security are the major barriers to e-government adoption and diffusion. However, Alutu and Udhawuve (2009) identify the lack of IT professionals and computer training as the major barriers to e-government adoption in the public sector. Nonetheless, the literature seems to agree that governments generally view a lack of technical infrastructure as the major barrier to offering online services and transactions by public organisations. Ebrahim and Irani (2005) have identified network capacity and communication infrastructure as the foundations for integrating information systems in e-government services thus providing reliable and effective services to the public.

Lam (2005) has identified the requirements for ensuring effective security and privacy in e-government strategy, which are currently barriers to the effective adoption of it. This review of the literature identifies certain gaps related to cultural and social barriers, as the existing researches do not focus on cultural challenges or the power of social structures in hampering the adoption of e-government by governments around the world (Goldfinch and Wallis, 2009). According to a research conducted by Alshawi and Alalwany (2009), the fear of losing personal information is also a major barrier to the public's adoption of e-government.

The cultures of different users means effective use of these services requires a planner to recognise each angle and granularity regarding the perceptions of cultural groups (Weerakkody, Dwivedi and Kurunananda, 2009). Similarly, the established powers within a country often impede the developmental phase of e-services and e-government, as they consider them a threat to their survival. Thus, an appropriate strategy is required to overcome these barriers to the implementation of an e-service (Camarinha-Matos, Boucher and Afsarmanesh, 2010).

Warkentin et al. (2002) propose a model to overcome barriers to e-government adoption for effective adoption by users hence gaining their trust. By evaluating online tax services, considering this is the most broadly utilised online service in several countries, authors have proposed several ways to improve the public's trust in these e-government services. For instance, institutional-based trust in the form of fair and independent judicial systems is considered to be a significant

factor in creating trust in e-government (Li and Suomi, 2007). Previous research also demonstrates perceived risk, behavioural control, usefulness and ease of use are key issues.

Moreover, research conducted by Kanat and Ozkan (2009) shows that the main determinant of e-government failure is the low adoptions by citizens. However, Belanger and Carter (2008), in their research study concerning e-government adoption, highlight a lack of understanding of citizen's requirements, a lack of marketing, a lack of trust, accessibility and usefulness issues and lack of citizen confidentiality as the major reasons for the public not choosing to use e-government services. Table 3.1 highlights these barriers restricting the adoption of e-government.

| Dimension | Examples |
|---|---|
| IT infrastructure | Shortage of reliable networks and communication. Inadequate network capacity or bandwidth. Lack of resource standards. Existing systems are incompatible and complex. Existing internal systems have restrictions regarding integrating capabilities. Lack of integration across government systems. Integration technologies of heterogeneous databases are confusing. Lack of knowledge regarding e-government interoperability. High complexity in understanding processes and systems in order to redesign and integrate them. Lack of enterprise architecture. Availability and compatibility of software, systems and applications. |
| Security and privacy issues | Fear of losing personal data and financial information, that must be kept private and not used for other purposes, divulged during transactions. |
| Trust issues | Users' perceptions of the reliability, reliance and safety of the e-government website / e-government services. |
| Resistance to change | Resistance to change by high-level management. Time-consuming in reengineering and administering changes to business processes in public organisations. |
| IT skills | Lack of IT training programmers in the public sector. A shortage of well-trained IT staff in the market. Few employees with integration skills. Website developed by unskilled staff. Unqualified project managers. Shortage of salaries and benefits in public sector. Flow of IT specialist staff. |
| Operational cost | Main supply comes from the central government. Shortage of financial resources in public-sector organisations. High cost of IT professionals and consultancies. IT cost is high in developing countries. Cost of installation, operational and maintenance of e-government systems. Cost of training and system development. |

| | |
|---|---|
| IT infrastructure | Shortage of reliable networks and communication. Inadequate network capacity or bandwidth. Lack of resource standards and common architecture, policies and definitions. Existing systems are incompatible and complex. Existing internal systems have restrictions regarding integrating capabilities. Lack of integration across government systems. Integration technologies of heterogeneous databases are confusing. Lack of knowledge regarding e-government interoperability. High complexity in understanding processes and systems in order to redesign and integrate them. Lack of enterprise architecture. Availability and compatibility of software, systems and applications. |
| Organisational | Lack of coordination and cooperation between departments. Lack of effective leadership support and commitment amongst senior public officials. Unclear vision and management strategy. Complex business processes. Politics and political impact. |

***Table 3.1: Comprehensive insight to barriers restricting e-government adoption***

### 3.4.2 Service quality research

According to Parasuraman, Zeithaml and Malhotra (2005) and Wimmer, Scholl and Janssen (2009), delivering e-services through an e-government platform is not sufficient for effective outcomes, as quality and effectiveness are integral aspects of e-service frameworks. Additionally, research has focused on a framework for the measurement of e-service quality that can deliver perceived value to users (Chang and Hong, 2011). Research has focused on e-service quality measurement based on the changing requirement of customers (Kushwaha and Agrawal, 2014; Tavanazadeh, 2014).

Aspects of quality have been found to have a multidimensional connection with designs, where speed is required for processing and communication receptiveness. Other studies demonstrate six dimensional quality measures while there is extensive literature concerning service quality measurement covering particular dimensions, including the look and feel of a website, communication, ease of access, reliability, perceptiveness and availability to e-service users at the required time (Alshawi and Alalwany, 2009).

Several studies concerning e-service quality measurement take the combination of traditional service and web-interface quality dimensions as a starting point. Yoo and Donthu (2001) developed SITEQUAL to measure website online service quality where the four dimensions are the ease of use, aesthetic design, processing speed and communication responsiveness. Parasuraman, Zeithaml and Malhotra (2005), developed a seven-dimensional E-S-QUAL scale to measure e-service quality. However, Kim, Kim and Lennon (2006) enhanced the

dimensions developed by Parasuraman et al. (2005) into a nine-dimensional scale of e-service quality with the aim to utilise it for content analysis and the evaluation of government organisations' websites.

A research conducted by Agrawal, Shah and Wadhwa (2009) shows that an e-governance online service quality (EGOSQ) is an effective model to determine user perceptions concerning online services, which affect the success of e-governance ideas, which depend on citizens' awareness and acceptance levels and hopes concerning e-governance. Zeithaml, Parasuraman and Malhotra (2000) identify the dimensions to measure service quality as compensation and contact, efficiency, fulfilment, privacy, reliability, responsiveness. These dimensions measure the capability of the service to perform the service the user expects, which is dependable and precise; it also measures the ability of the service to help customers (Ibid.). According to Madu and Madu (2002), SERVQUAL is an effective measurement scale designed to measure service quality from customers' perspectives. They identified the following 15 dimensions that measure service quality: aesthetics, assurance, empathy, features, performance, product/service differentiation and customisation, reliability, reputation, responsiveness, security and system integrity, service-ability, storage capacity, structure, trust and web store policies. Cao, Zhang and Seydel (2005) have supported this view. The assurance dimension of the SERVQUAL model measures the knowledge and courtesy of employees and their ability to express trust and confidence while the empathy dimension measures caring and attention to individual customers (Agrawal, Shah and Wadhwa, 2009).

According to a research conducted by Agrawal (2007), the SERVQUAL e-service measurement model estimates the difference between expectations and perceptions of the performance levels of service attributes and this conceptualisation considers service quality as the level and direction of inconsistency between the perceptions and expectations of consumers where expectations are viewed as the desired e-service. However, a research conducted by Cronin and Taylor (1992) has demonstrated that the SERVPERF scale, which is based on performance perceptions, gives a better measure of service quality compared to measures based on inconsistencies between expectations and perceptions. It is also observed from the research that the core dimensions of service quality measurement include what is delivered and how it is delivered, but

SERVQUAL measures only one aspect of service, that is, how the service is delivered (Alshawi and Alalwany, 2009).

Barnes and Vidgen (2000) have conducted a series of research studies to develop an effective instrument named Webqual before being renamed E-Qual, to measure the quality of different types of websites (Barnes and Vidgen, 2001a, 2001b; 2002). Barnes and Vidgen (2004), in their research concerning interactive e-government, have examined the outcomes of a survey measuring the quality of the website provided by the UK's HM Revenue & Customs, a government service used to collect taxes. To measure service quality, Barnes and Vidgen (Ibid.) used the E-Qual service model to assess website usability, information quality and service interaction quality to provide a framework and analyse e-government offerings. Their research provides a detailed assessment of the perceptions of users. They have discovered that service usability is a major issue and there is a requirement to understand and personalise service delivery. Halaris et al. (2007) have argued that SITEQUAL gives guidelines related to service quality measurement, being an effective scale in measuring website quality over time. Parasuraman, Zeithaml and Malhotra (2005) have developed another service model named E-RecS-QUAL, which measures perceptions of non-routine website users; it contains eleven items in three dimensions: responsiveness, compensation and contact.

Other researchers have proposed innovative service quality models. For instance, James-Huang and Chao (2001) have demonstrated that e-government websites require analysis based on usability standards, identifying that websites should adopt user-centred designs to permit users to efficiently find information. Research conducted by Holliday (2002) has proposed a collection of evaluation criteria for the levels of usefulness of e-government sites, which include factors of information in the form of information concerning the government, contact information, feedback options on the site, the search capabilities of the website and useful links for customers.

A research conducted by Alshawi and Alalwany (2009) finds that the e-ServEval model is effective for e-service quality evaluation concerning user perspectives. Papadomichelaki and Mentzas (2009) propose an e-government service quality model (e-GovQual) comprised of twenty-five quality attributes classified into four quality dimensions: reliability, efficiency, user support and trust. In the e-GovQual model, reliability dimensions measure the feasibility and speed of accessing,

utilising and receiving services on the website, while efficiency dimensions measure the ease of utilising the site and information-quality (Papadomichelaki and Mentzas, 2009). A user-support dimension measures the website's ability to assist users when needed, while trust dimensions measure the level at which the user believes that the site is safe from the intrusion and can guard their personal information. Tan, Alter and Siau (2011) discuss the e-government website evaluation index system utilising an analytic hierarchy approach developed by Liu, Wang and Xie (2010), the major components of which are content, function and technology. That the content dimension measures practicability, comprehensiveness, accuracy, timeliness, transparency and uniqueness (Tan, Alter and Siau, 2011). The function dimension measures online communication, online monitoring and the opinion survey attributes of the e-government website (Ibid). The technological dimension measures convenience, availability, security, website content protection and adaptability from users' perspectives (Tan, Alter and Siau, 2011). Based on previous e-services researches, Fassnacht (2006) has established a widespread hierarchical quality model for e-services comprised of three dimensions: e-service delivery quality, outcome quality and environmental quality.

Halaris et al. (2007) has stated that a model for assessing the quality of e-government services should be comprised of four layers: back office performance, website technical performance, website quality and user satisfaction. Esteves and Joseph (2008) have developed a three-dimensional model for e-government service evaluation, which includes the e-government maturity level of stakeholders and assessment levels, where these levels take into consideration technological, organisational, operational, service and economic factors.

A few user-centric models recently developed address the drawbacks of previously developed models. It is argued that successful e-government services are required to provide user benefits, which include ease of use, accessibility and inclusivity, confidentiality and privacy. Magoutas and Mentzas (2010) have developed SALT (a self-adaptive quality monitoring model) to monitor user satisfaction and the quality of e-government services.

Several researches measuring e-service and e-government qualities from the users' perspectives have been conducted and are shown in Table 3.2.

| Authors | Research Title | Aim of the Research | Country in which the research was conducted | Sample size | Type of respondents | Variables |
|---|---|---|---|---|---|---|
| Yang, Jun and Peterson (2004) | Measuring customer perceived online service quality | The main aim of the research is to describe a reliable and valid way of measuring online service quality where a web-based survey was used to validate and assess an online service quality model. | USA | 235 | Online customers | Reliability, responsiveness, competence, ease of use, security and product portfolio |
| Collier and Bienstock (2006) | Measuring Service Quality in E-Retailing | The goal of the research study was to extend the work on e-service quality from the perceptions of users, encompassing not only website interactivity but also outcome and recovery quality. | USA | 274 | Students | Functionality, information accuracy, design, privacy, ease of use, order accuracy, order condition, timeliness, interactive fairness, procedural fairness, outcome fairness, satisfaction and behavioural intentions |
| Gilmore, and D'Souza, (2006) | Service excellence in e-governance issues: An Indian case study | The research study conducted a measurement of e-governance quality with particular reference to Indian users. | India | 30 | E-government service consumers | E-governance quality, service excellence, user convenience |
| Alshawi and Alalwany (2009) | E-government Evaluation: Citizens' Perspectives in Developing Countries | The main aim of the research was to develop evaluation criteria for an effective, adaptable, and reflective assessment of e-government systems from the citizen's perspective. | United Kingdom | 400 | University students and professionals | Performance, accessibility, cost-saving, openness, trust, perceived ease of use, perceived usefulness |
| Jang (2010) | Measuring Electronic Government Procurement Success and Testing for the Moderating Effect of Computer Self-efficacy | This study measures the success of an e-government procurement system from the end-user perspective. | Taiwan | 361 | Public employees | Information quality, system quality, service quality, user satisfaction, system usage, net benefits (individual impact), computer self-efficacy |
| Nath and Singh (2010) | Evaluating Performance and Quality of Web Services in Electronic Marketplaces | The research study examines e-service quality and performance from the perspective of the user. | North Carolina | 150 | Professionals | Availability, accessibility, latency, environment quality, information quality, support, privacy, recovery, outcome quality |

| | | | | | | |
|---|---|---|---|---|---|---|
| Vencatachellum and Pudaruth (2010) | Investigating E-Government Services Uptake in Mauritius: A Users' Perspectives | The research study investigates wide factors relating to e-government uptake from users' perspectives and discusses the issues and outcomes associated with developing a fully mature e-government in Mauritius | Mauritius | 146 | Students and Professionals | Perceived usefulness, Perceived ease of use / effort expectancy, social influence, facilitating conditions |

***Table 3.2: Researches conducted on e-service and e-government quality measurements from users' perspectives***

According to Alshawi and Alalwany (2009), people in developing countries rarely make effective use of e-government initiatives. Hence the evaluation and adoption of an effective, adaptable and reflective assessment of e-government systems positively contributes to improving citizens' utilisation of an e-service (Alshawi and Alalwany, 2009). Yang, Jun and Peterson (2004) have conducted an ethnographic content analysis of 848 customer reviews of an online banking service to identify the online service quality dimension and a web-based survey to verify an e-service quality model concerning reliability, responsiveness, competence, ease of use, security and product portfolio. An online service quality model was designed in the research study to provide an effective tool to measure the strength and weaknesses of the internet-based service quality (Yang, Jun and Peterson, 2004).

Collier and Bienstock (2006) have conducted research to measure the service quality in e-tailing using the SERVQUAL model; they utilised formative indicators and the three-dimensional approach including e-service quality, process quality, outcome quality and recovery to reliably conceptualise e-service quality in the context of online retailers. The findings of the research demonstrate that customers analyse the process of placing an order by assessing the design, information accuracy, functionality, privacy and ease of use of the website. Hence this process quality positively influences customers' perceptions of the transaction's outcome. It is observed in the study that the transaction's outcome quality affects customer satisfaction. In addition, in service issue situations, the manner in which a retailer handles a service has a positive influence on customer satisfaction, which mediates the relationship from recovery and outcome quality to behavioural intentions (Collier and Bienstock, 2006).

Gilmore and D'Souza (2006) have conducted research to measure e-governance quality. Considering the high standards of e-governance provision, they expected

the huge amount of customers using e-government services to have a positive influence competitive advantage. The research study assesses service orientation and provides a conceptual framework using the SERVQUAL model to show how services are delivered to the public sector. The findings are that service providers must improve their service quality and performance in all areas to attain a competitive advantage (Gilmore and D'Souza, 2006).

Nath and Singh (2010) suggest that effective performance and quality measures of e-services should include both technical and business aspects. In addition, they recommend that future studies should integrate technical measures of e-service performance with developed measures for analysing service quality in a business (Nath and Singh, 2010). However, as shown in Table 3.3, researches that have measured e-service and e-government quality from users' perspectives were mostly conducted using university students, professionals, public employees and e-government service consumers as participants. Online customers may not necessarily be citizens using e-government services. Therefore, there is need for research to use a sample of actual users of e-government or e-services (Hassan, Shehab and Peppard, 2011).

Jang (2010) has conducted a survey of public employees and suppliers, utilising the DeLone and McLean Model of Information Systems Success to measure e-procurement system success and to evaluate the moderating influence of computer self-efficacy on users' perceptions of information system success. The research demonstrates that service quality has a crucial effect on the overall performance of an organisation by means of usage and user satisfaction with an e-Government Procurement (e-GP) system. In addition, measuring the success of the e-GP system from end-users' perspectives demonstrates that the findings of the research provide an insight into the design and enhancement of electronic government procurements (Jang, 2010).

Vencatachellum and Pudaruth (2010) have conducted a research that investigates the broad factors concerning e-government uptake from users' perspectives. It also discusses issues and outcomes concerning developing an effective e-government. The study integrates the TAM and the unified theory of acceptance to analyse user adoption of e-government services (Vencatachellum and Pudaruth, 2010); the findings are that users' adoption of e-government services can be effectively measured by assessing perceived usefulness and ease of use as well

as the social influence and facilitation conditions of the e-government service by these means (Ibid.).

Lee and Lin (2005) have developed an e-service quality measurement model to analyse the relationship between e-service quality dimensions and overall service quality and customer satisfaction. Their survey examines the reliability and validity of the service measurement model, using online customers. It can be observed from the findings of the research that the dimensions of website design, reliability, responsiveness and trust influence the overall service quality and customer satisfaction (Lee and Lin, 2005). Teicher, Hughes and Dow (2002) have argued that in the past, government organisations have paid scant attention to customers' perceptions of service quality. The study analyses measurements of e-service quality in the public sector and discusses how e-governments has changed to provide enhanced services. The findings of the survey of senior employees across three levels of government demonstrate that the influence of e-government on service delivery is but rather than well-distributed. However, there has been an increasing adoption of e-government measures lacking in sophistication which have proved useful to customers without addressing the issues of service equity and accessibility (Teicher, Hughes and Dow, 2002).

Jinmei (2011) proposes that the methods of evaluating the service quality of e-government, public services and measurements of service quality are of the utmost importance to service providers, specifically government institutions. The research finds that e-government service quality measurement is an explicit component of public sector reform. Also, the purpose of e-government should be to provide an excellent public service. In the study, the public-service quality of e-government is evaluated through measuring citizen satisfaction taking into consideration distinctions in practices between e-government and conventional government using SERVQUAL. The author of the study reveals e-government service issues and recommends initiatives to improve them (Jinmei, 2011).

A research conducted by Koskivaara et al. (2010) analyses service quality in early childhood education portals and day-care centre websites. The study investigates and compares the applicability of two different quality measurement instruments: e-government service quality by Yang et al. (2005) and SERVQUAL. The findings of the research provide guidelines for the systematic evaluation of government web services and recommend ways to improve their quality (Koskivaara et al., 2010). According to Yeh and Chu (2009), to better understand the relationships

between internal marketing, internal service quality, internal and external customer satisfaction and e-government services, the service-profit chain model can be utilised to propose an integral model. The research demonstrates the implications for the administration of an e-government service and improving customer satisfaction towards the services (Yeh and Chu, 2009).

Connolly's (2007) research demonstrates that the quality of service provided by the Irish Revenue's online tax filing and collection system, using the SERVQUAL measuring instrument, was adopted to be utilised with the online services provided by the government (Connolly, 2007). The research finds that the public who use the online services for their tax returns valued improving the delivery of the electronic government services provided by the Irish Revenue. The research also shows that the Irish citizens perceived quality to be driven by particular factors, which are all possible for the government to manage (Ibid.). The study gives an illustration of the effective dimensions of service quality and citizens' trust in the online service. The utilisation of the SERVQUAL measuring instrument for the research raises several issues concerning the measurement of perceived benefits and customer satisfaction with e-government services as well as improving the understanding of the e-service environment. Asogwa (2011) stresses that African governments have shown their willingness to use information and communication technologies in public administration services, while noting the fact that these governments lack continuity being frequently at fault of not updating their websites, high levels of poverty and low levels of human capital and knowledge (Asogwa, 2011). Additionally, in relation to this thesis, there is evidence that Nigeria is facing significant challenges in the implementation of e-government (Akunyili, 2010; Fatile, 2012; Ashaye and Irani, 2013).

Brady and Cronin (2001) have argued that SERVQUAL is only an effective measurement tool when reliability is perceived to be the major factor contributing to service quality. This study hence focuses not only on the way a service should be delivered but also on what is to be delivered. After analysing previous researches on e-service and e-government measurement models, it appears that to create user-centred e-government services, some essential elements must be considered. These elements face fundamental problems concerning a population's ability to utilise e-government, building trust and the need to align e-government to establish social and educational requirements in the form of access to needs, information and service requirements and technology requirements as well as

information and technology literacy, usability and the functionality of the e-service. Hence, the study is an emphasis on measures that tackle such issues and provides an effective solution to measure the perceived values and benefits of an e-service.

Previous researches on e-services have mainly focused on how consumers use these websites. However, e-service quality is about more than website interactivity. In addition, it is worth mentioning that a review of the literature reveals inadequate research on e-services or e-government measurements in developed countries and this knowledge gap is specifically apparent in Africa and consequently evident in the lack of progress in the continent (UN, 2010, 2014). Table 3.2 above shows the previous researches conducted using students, professionals, employees, online customers and e-government consumers rather than the citizens who use e-government services. Therefore, this study aims to extend the work on e-service and e-government quality to include not only website quality but other dimensions of effective e-service quality measurements. Additionally, the theory and practice are contributed to by developing an understanding of perceived user experience, and the associated benefits and values of e-government services.

## 3.5 The Digital Divide and Its Effect on E-Government Services

This section reviews the literature on the digital divide and its effect on e-government. A review of the importance of the digital divide is discussed as well as the significance of e-government in developing countries with a focus on Africa, based on previous researches.

### 3.5.1 The Digital Divide

The digital divide is the technology gap between individuals with access to computerised data innovations and those with constrained, or no means to gain, access, increasingly alluded to as the technology gap between the well-off and the more economically deprived (Norris, 2000; Cullen, 2001; Hall and Owens, 2011). Numerous elements impede access to computers and the web.

Norris (2000), Castells (2001) and Warschauer (2003) have all asserted that the digital divide is not only a concern of accessibility to technology but is also interrelated with social, political, educational and economic issues, covering demographic attributes of race, ethnicity, income and geographical locations that can potentially reproduce existing social disparities, and additionally cause the

latest forms of stratification. Brandtzæg, Heim and Karahasanović (2011) state that the digital divide can be characterised as unequal access to computing facilities. These researchers assert that the digital divide looks at different demographic and financial components including pay, training, age and gender. In addition, products and services influence the utilisation of the internet (Brandtzæg, Heim and Karahasanović, 2011). The digital divide is the disparity of access to computers and the web, and the skills and ability to use these tools.

Min (2010) states that the digital divide is the gap between individuals with technologically advanced skills and those that do not possess these skills. According to Sylvester and McGlynn (2010), the digital divide depicts demographics and the gap between individuals who do not have access, or have limited access to key information regarding technological advancements; in addition, it incorporates the imbalance of access to the web and the opportunities to research advanced innovations, which can help individuals improve their work. The digital divide is due to social distinctions, salaries, age, sexual orientation and people's social backgrounds (Sylvester and McGlynn, 2010).

Graham (2011) states that the digital divide is a term progressively used to portray the social ramifications of unequal access by some groups with a specific end goal to procure fundamental aptitudes. It is a term used when utilisation of the internet is wide and has a universal association; for example, the World Bank, the European Union and other global organisations have directed their research on ways to bridge the digital divide (Hilbert, 2011). The digital divide is relative to all types of technology access, including government, banking and retail, and can be a major issue where knowledge in new technological advancements is lacking.

According to Terlecki and Newcombe (2005), it is difficult to grant people equal status and share responsibilities globally without an understanding of the digital divide. Information generated through the internet is a great leveller as it allows people to learn and discover information relative to the world around them. According to Tsatsou (2011), a digital divide study gives an opportunity to be a part of the enormous conversation that is the internet. A study by Hilbert (2011) is about judging people who do or do not have internet access, based on questions relating to technology. Terlecki and Newcombe (2005) state that questions related to the digital divide must be asked. Access to and the development of information, communication and e-commerce resources are increasingly vital for economic and social development. According to Dewan, Ganley and Kraemer (2010), a digital-

divide study can help to examine access for citizens, businesses and regions to technologies and services.

Other, older technologies used to provide information include the radio, television, newspapers, and magazines, while more modern internet-based technologies include smartphones, such as iPhones, Blackberries and Androids, as well as laptops and tablets: the latter enable forms of interactive activities such as social networking. Waycott et al. (2010) argues that diversity in the use of technology or limited access to internet can lead to differences in the availability of information which will result in a digital divide. They further state that due to the gap between information and communication technologies, it is difficult to circulate information all over the world (Ibid.). Restricted access to information leads to users missing out on current issues, such as changes in government policies and education opportunities; as a result, a tangible barrier for people to work optimally is created. According to Oneya and Gitau (2011), fallout from the digital divide refers to a communication and information gap caused by the different abilities of the rich and the poor to access information. They further state that economically well-off people living in countries with the latest technology are empowered to access useful information such as electronic services, which can include e-learning opportunities etc., and can better communicate information than those deprived of this ability.

According to Sanou (2014), the International Telecommunication Union's (ITU) statistics show that there has been an increase in the access to internet worldwide as there are now almost 3 billion internet users, two-thirds of whom live in developing countries. Similarly, ITU statistics show an increase in mobile-broadband subscription with 55% of these emanating from developing countries. Figure 3.6 below shows the estimated active mobile-broadband subscriptions per 100 inhabitants between 2007 and 2014. However, despite the steady growth in mobile internet subscriptions in developing countries, fixed broadband internet subscription growth is slowing.

According to the ITU (2015), "44% of all fixed-broadband subscriptions are in Asia-Pacific, compared with only 0.5% in Africa". Figure 3.7 shows estimated fixed (wired)-broadband subscriptions per 100 inhabitants from 2005 to 2014.

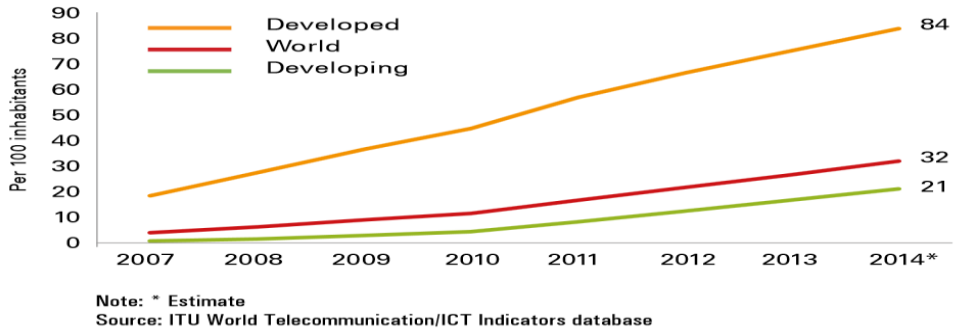


***Figure 3.6: Estimated active mobile-broadband subscriptions per 100 inhabitants between 2007 and 2014***

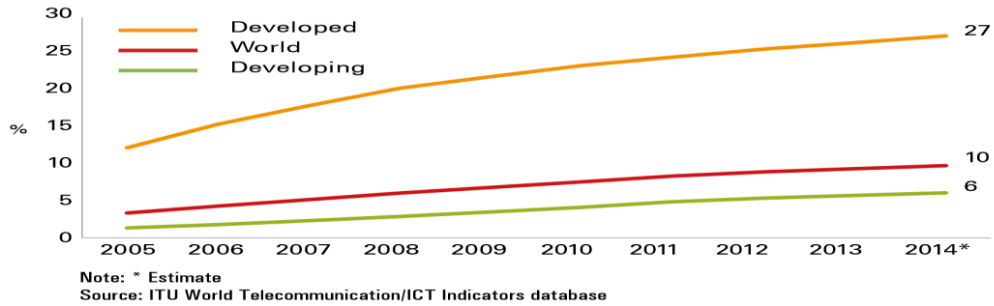


***Figure 3.7: Estimated fixed (wired)-broadband subscriptions per 100 inhabitants, 2005-2014***

Tsatsou (2011) states people who live in countries which keep upgrading and developing digitised networks and technologies can easily access information while those who do not can struggle. Schradie (2011) argues that countries which take advantage of the latest technologies have succeeded in minimising the influence of the digital divide. This has helped them to increase their efficiency and productivity compared to other nations. Waycott et al. (2010) states that the rapid increase in ICT such as the internet, email and mobile phones has helped reduce the problem of the digital divide, thus proving to be beneficial to organisations as well as individuals. While the digital divide and ICT can affect organisational efficiency, Heeks (2010) argues that the gap in information and communication is becoming a hurdle because it not only affects individuals and organisations but the economy as a whole. Therefore, it is important to minimise the digital divide and increase the use of ICT. However, to overcome differences among people or states and make the whole world into a global village, it is important that governments have information about the level of the digital divide and other kinds of measures or techniques that can resolve the issue. A study into the digital

divide can help to address issues that may lead to economic equality, social mobility, a healthier democracy and economic growth.

### 3.5.2 The Digital Divide and E-government

Although e-government has been seen as a means of reducing the digital divide, the reality is that this is not happening at the moment. Bélanger and Carter (2009) state that the digital divide is not only a technical issue but one that relates to economics and politics; improving communication access is an important factor in achieving a government's ability to close the digital divide. Talukdar and Gauri (2011) state that this vision is consistent with a government's goal to grow an innovative economy for the benefit of society by increasing people's awareness of opportunities through communication technologies and improving their access to technology, which will ultimately lead to economic growth. According to Talukdar and Gauri (2011), information technology has the potential to facilitate and develop safe communities. Additionally, a government's other goal be to reduce inequalities in education and employment by removing barriers in communication technology (Hermana and Silfianti, 2011). AL-Rababah and Abu-Shanab (2010) explore the potential effects of the digital divide on e-government by surveying a diverse group of citizens to identify demographic characteristics that influence the use of e-government services; the results indicate that income, education, age and use of internet significantly influence the use of e-government services.

Khan et al. (2010) reveal that the successful use of digital technologies including social media to provide public services and foster economic development has become an objective for governments over the world. Warschauer and Matuchniak (2010) state that the development of e-government can not only influence the efficiency and effectiveness of public services but has the potential to change the nature of a government's interactions with its citizens. Cordella and Iannaccib (2010) state that the current research and practice on the adoption of e-government and the achievements of organisations around the world tend to emphasise the extensive growth of this field.

### 3.5.3 Previous Studies on the Digital Divide and E-government Services

Ganapati and Reddick (2012) identify that e-government services targeting lower-income populations have become a policy focus. In the USA, a plan has been adopted to provide e-government services to low-income populations to help citizens to have easier access to welfare benefits. Howard, Busch and Sheets

(2010) state that in America, there is a digital divide gap between the rich and the poor. This gap relates to internet access but extends to the use of e-government services among those with access to the internet.

Research studies by Sipior, Ward and Connolly (2010) and Fernández-i-Marín (2011) explore the use of e-government services from a digital divide perspective. The purpose of their research was to find which economic, social and geographical factors moderate the means in which time spent on internet is linked with the use of e-government services. According to Fernández-i-Marín (2011), gender bridges the link between e-government services and internet use; the more women use internet services, the more they use e-government services. However, it was found that use of e-services does not rise with the use of internet (Fernández-i-Marín, 2011). However, in the research conducted by Sipior, Ward and Connolly (2010) concerning income indicators, the findings imply that the use of e-service increases with internet use but only among the respondents considered to have a low income. Moreover, the article shows that education and place of residence, as well as income, have major effects on the use of e-government.

In their research, Heeks (2010) and McMahon et al. (2011) seek solutions to the digital divide, particularly for governments that have a desire to move towards the widespread delivery of e-services. According to Heeks (2010), it is one of the basic challenges faced by the government in developing countries as communication and information technologies and the internet increasingly become essential to people's working and personal lives. To minimise the gap, the government in developing countries has developed equitable access to technology applications. Equity and digital divide issues should be seriously taken into account.

### 3.5.4 The Digital Divide in Africa

Shirazi, Ngwenyama and Morawczynski (2010) explore the digital divide in developing countries and suggest that communication technologies have the potential to provide opportunities, support economic growth and increase democracy in such countries. Vu (2011) argues that many developing countries have still not been able to benefit from communication and information technology (ICT). Gomez and Pather (2012) demonstrate that developing countries are significantly different in term of using ICTs to developed countries. According to Ali

(2011), there are different kinds of digital divide within a country, such as by gender, income and age divide.

Chen and Wellman (2004) state that the digital divide around the world is usually measured through statistical indices such as the number of computers, telephone lines and internet users relative to the total population. Gudmundsdottir (2010) reviews the research conducted by Chen and Wellman (2004) and asserts that it addresses issues related to the digital divide that affect many citizens in developing countries and the factors that isolate people from enjoying the benefits of communication technology and information still existing today, and that nothing much has changed.

Aker and Mbiti (2010) state that the global digital divide in Africa can be easily analysed with the help of macro-data and discuss specific examples of countries where this work can be undertaken, including Ghana and South Africa. Thompson and Walsham (2010) identify that Africa is negatively affected by the digital divide. Gudmundsdottir (2010) states that to achieve positive results, it is important to address the factors contributing to the digital divide, internet usage, attempts to bridge digital divide and other related issues. Thompson and Walsham (2010) illustrate that Africa faces a high level of inequality, a weak IT communication system particularly in rural areas and a lack of willingness to address ICT issues by the government as it gives ICT development a low priority in budget terms. Aker and Mbiti (2010) argue that information and communication technology measures the accessibility and diffusion across a society.

The digital divide and the factors responsible for it are exhaustively discussed in different researches. According to van Deursen and van Dijk (2010), the global digital divide can be calculated in terms of people with individual access to technologies. They suggest that foreign donors and national governments pay less attention to individual access to facilities and instead focus on ways to further local rural innovation systems devoted to finding relevant and cost-effective applications of the internet. Chen and Wellman's (2004) research examines the imbalances in the availability and usage of information technology infrastructure between developed and industrialised countries. Epstein and Gillespie (2011) take the view that developed countries are known for their stable wealth, modern information, communication and technological innovations as well as stable governance. Chen and Wellman (2004) feel that various factors which assist African countries to face the challenges of the information society have not been extensively discussed.

### 3.5.5 Dimensions of the Digital Divide

The research discussed in Section 3.6.4 shows that the three dimensions dividing e-government users are: access to computing facilities, previous internet experience and e-government experience.

#### *(i.) Access to Computing Facilities*

In regard to access to computing facilities, Thomas (2003) has focused on e-government and its effects on its users, stating that the rate of adoption of e-governance has fallen below global expectations; though individual access to computers can result in the increased adoption of e-government. After being given computer access, users can take advantage of the online services offered by the government. They can use these to communicate with the government more easily. This, however, can be affected by past experiences of e-government (Carter and Bélanger, 2005).

Akman et al. (2005) has argued that after being given access to computers, users can easily access information relating to the government. This enables them to be more aware of government policies and procedures. However, Dada (2006) has stated in his report that individuals who face hurdles in internet access can be restricted from accessing information related to the government, which can negatively affect their experience of e-government. Additionally, individuals with limited internet access cannot avail themselves of the government facilities available on the internet. They are deprived of the benefits offered by the government through the internet (Akman et al., 2005).

According to Hiltz and Johnson (1990), access to computers affects the level of satisfaction of their users. This is because access to a computer generally leads to access to the internet which allows users to interact on social networking sites, social blogs, professional sites and to access other information available on the internet. Lai and Kritsonis (2006) state that access to a computer allows users to easily perform a number of actions, such as document maintenance, and offers a variety of easily operational functions. It also allows users to make easy calculations and to perform different tasks quickly, thus satisfying their needs. Davis, Bagozzi and Warshaw (1989) have stated that access to a computer benefits an individual by saving them time as they can perform key tasks within seconds. It also allows users to maintain records and notes and to save images of events.

Computer access also allows an individual to perform financial transactions on the internet through online banking, money collection services (such as PayPal) and bill payments. Moreover, a study by Hiltz and Johnson (1990) has shown that a computer can also be an educational tool, providing users with access to large volume of information.

Formerly, internet access allowed users to extract positive information from a website and to save time. Yet according to Lu et al. (2011), the current availability of computers and their easy access can have a negative effect on users' internet experience. According to O'Neil (2001), computer access can result in users' privacy violations, such as receiving spam emails. The privacy of personal information and data storage can easily be violated if records are not properly protected.

A study by Rowlands et al. (2011) shows that computer users often make visits to social networking and other chat sites, and frequently access other entertainment materials, which can distract them from availing themselves of the other benefits of the internet. The internet is thus a large cause of time wasting. According to Spears and Barki (2010), unlimited computer access can even lead some individuals to engage in criminal activities. The wrong interpretation of information available on the internet can affect users' beliefs and approaches to life. Moreover, according to Spears and Barki (2010), computers can have a negative effect on health, with their prolonged use of computer frequently resulting in injuries and disorders affecting people's hands, necks, eyes and backs. Thus, access to a computer can negatively affect users.

***(ii.) Previous Internet Experience***

According to Kim, Ferrin and Rao (2008), users' past internet experience can have a negative effect on their happinness. In most developing countries, internet access is not easily available. Nitzan and Libai (2011) argue that such limited access does not meet users' needs as they are deprived of many of the facilities available on the internet. However, in Jung's (2011) view, users with unlimited access to the internet may have unwittingly exposed themselves to information abuse and threats. Furthermore, according to Parr-Laopez et al. (2011), easy internet access means that users are at liberty to access large volumes of information, which may not be correct, about all subject areas and fields.

### *(iii.) Previous E-government Experience*

Researchers (Khan et al., 2010; Akman et al., 2005; AL-Rababah and Abu-Shanab, 2010) have stated that e-government is modernising the way in which government agencies interact with citizens. Although e-services develop efficiency, responsiveness and transparency in the public sector, these benefits may not be realised by an entire population. These factors affect users' satisfaction and their e-government experience. According to Hermana and Silfianti (2011) and Almarabeh and AbuAli (2010), e-government services are convenient modes of providing online services and applications. This easy access helps people to fulfill their social obligations. Nonetheless, some people do not have easy access to e-government services due to the digital divide.

## 3.5.6 Factors Contributing to the Digital Divide

The following factors have been confirmed by researchers as influencing the digital divide include location, gender, age, education, employment and income.

### *(i.) Location*

Over a decade ago, Hindman (2000) and Norris (2000) stated in their studies that although the percentage of internet usage is increasing in urban areas, the gap between rural and urban communities cannot be neglected. Recent researches by Sitawa-Ogutu and Rege (2010), Warschauer (2012), White (2012), Park and Kim (2015) and Banihashemi and Rejaei (2015) have shown that a digital divide still exists between those living in rural and urban areas and that this gap has remained consistent over time. Statistical analysis reveals that the usage of the internet has less to do with living in urban areas than with the often low incomes of rural individuals. Most of the urban population has a comparatively high income, which enables them to easily avail themselves of technological facilities. According to Cresci, Yarandi and Morrell (2010), the cause of the digital divide between rural and urban individuals relates to the ages of residents: rural residents of 65 years and above constitute a relatively large percentage of these communities. As senior citizens are less likely than younger people to go online frequently; the percentage of internet usage is thus low for rural communities. Urban communities include a comparatively large number of young adults who frequently visit internet sites.

Studies by Graham (2002) and Bonfadelli (2002) have revealed that the usage of technology is found often more in urban individuals than in their rural counterparts. Urban individuals are fond of using technology and are more technologically astute

than those living in rural areas. The availability of large numbers of Internet Service Providers (ISPs) also allows urban individuals to have significant access to the internet. Furuholt and Kristiansen (2007) have argued that the limited choice of ISPs may be another reason for the digital divide; urban populations have vast options when it comes to gaining access to the internet whereas rural individuals have limited options. Recent research by White (2011) has also indicated a persistence in the digital divide.

According to Madon (2000), only one third of the world's population has access to the internet. Rouvinen (2006) states that internet usage is low in developing countries; the comparatively easy availability of the internet in developed countries allows their inhabitants to use it more frequently. People in developing countries face problems when it comes to internet connections due to a lack of resources.

Petrazzini and Kibati (1999) have also found that developing countries face limited access to the internet. This has restricted developing countries' citizens from taking full advantage of the e-government services provided. Citizens in developed countries enjoy easy access to the internet without facing many limitations thus making them significant users of it. Developed countries are far ahead of developing nations in terms of technological inventions and advancement. Gulati (2008) states that people in developed countries have more knowledge and experience of technologies than those in developing nations. Developing countries are striving to adopt technological innovations and internet technology. Studies by Guillén and Suárez (2005), White (2012), Park and Kim (2015) and Banihashemi and Rejaei (2015) have found that many people from developing countries have a low standard of living. They thus face issues relating to the affordability of an internet connection. People from developed countries enjoy a better living standard. Thus, due to affordable internet connections, they are significant users of the internet.

***(ii.) Gender***

According to Morahan-Martin (1998), men have claimed to know more about the internet than women. Moreover, technological awareness also influences the digital divide as women are generally less technological friendly than men. Howard, Rainie and Jones (2001) mentioned that a greater percentage of men use the internet to communicate in work environments as compared to women: 29% of men used the internet for the purpose of communication and only 9% of women used the internet for this purpose. According to Durndell and Haag (2002),

women's lack of interest in the technology has a crucial impact on internet usage. Wasserman and Richmond-Abbott (2005) revealed that males constitute a significantly larger percentage of internet users than females.

However, contrary to what could be described as gender stereotype on computer usage, all the previous researches have failed to take into consideration when conducting their research external factors such as level of age, education, cultural background and community that have influences in female computer usage. recent research conducted. For example, when taking age into consideration, Fallows (2005) revealed that younger women outpace their male counterparties regarding computer usage. Similarly, Hilbert (2011) as a result of set of data from 12 Latin America and 13 African countries that he analysed between 2005 to 2008, found that gender divide is influenced by these factors: employment, education and income. Hilbert findings indicated there are external factors that influence gender digital divide and these needs to be taking into consideration in future research.

A recent research by Antonio and Tuffley (2014) found that there is low technology participation from women in the developing world, resulting in a digital divide. This shows the possibilities of different research outcomes on gender digital divide which may have been influenced by the different context in which the research has been conducted.

***(iii.) Age***

The significance of age in the use of computing facilities is documented by previous researches (Nwalo, 2000; Idowu and Adagunodo, 2004). According to research by Thayer and Ray (2006), people's ability to use websites declines by 0.8% per year between the ages of 25 and 60. The cause of decline is due to the navigation issues they face while searching the internet. They also spend more time on scanning per page as compared to younger people. Lenhart et al.'s (2010) report reveals that young adults, ranging from 18 to 25 years, visit non-professional social networking sites more frequently in large numbers as compared to other age groups. Older people tend to have less access to computing facilities than younger age groups. This could be because older people tend to have less enthusiasm for technology than younger people. Heart and Kalderon (2013) also believe that older age groups lag behind in the adoption of ICT compared to younger age groups.

### *(iv.) Education*

Education has a significant impact in all areas of people's lives. It reshapes and polishes people's thinking abilities. Vicente and López (2011) argue that society needs information for its growth and development and education is an important aspect of this. Different levels of education play different roles in creating the perceptions of internet users. Education instils ICT skills in people thus making them aware of the importance of advanced technology and communications in their daily life. People who cannot read or write have no expectations of making practical use of computers or of accessing the internet. According to Zhong (2011), ICT has helped countries increase their literacy levels, as the internet has become an important medium in the learning process for students, especially in colleges, universities and technical institutes. The gap in accessing the internet and computers is influenced by the quality of education a student receives or aspires to achieve. However, in developing countries, the problem of internet access is present because nations are poor and the majority of people are uneducated (UN, 2014). Kiiski and Pohjola (2002) have stated that some people consider education as the most consistent global predictor in measuring experience and access to internet technology. Therefore, levels of education can impact on measuring the ability to take advantage of the internet in various ways. Furthermore, according to studies (Wilson, Wallin and Reiser, 2003; Chinn and Fairlie, 2006), as highly educated people keep up with technology, they enjoy easy access to the internet. This shows that they are further ahead in terms of technology than people who have received little education. It also suggests that people with high levels of education tend to have more experience of the internet because of their increased knowledge.

### *(v.) Employment*

Different employment statuses can impact on internet access and internet experience. Private employees mostly use the internet for communicating within the office. Most of them enjoy unlimited access to the internet but the use of it depends greatly on their level of work. If the nature of their work is internet-related, then they have more experience regarding its use than others (Rustad and Paulsson, 2005). Most use the internet to download information to perform routine tasks. Moreover, self-employed people use the internet for carrying out online transactions, such as online banking for conducting business transactions.

Fountain (2005) has found that unemployed people normally use the internet to search for jobs. Some unemployed individuals face issues regarding internet access as they have limited resources but that does indicate anything in regards to their internet experience. According to Vicente and López (2011), most students use the internet for searching out reading materials for their assignments and exams. Students (who may not necessarily be employed) also use the internet for social networking. This implies that employment status may impact internet access.

***(vi.) Income***

According to a research by van Dijk and Hacker (2003), people's income status may have a significant effect on internet access. The difference in internet usage is not only because of access but also due to limited access to information and communication technology as well as the media available to different segments of society. Individuals who earn high incomes usually enjoy easy access to both information and communication technology, and the internet. They are significant users of the internet as compared to people who earn low incomes, who cannot afford internet connections (Chakraborty and Bosman, 2005). Thus, all these factors are hurdles to acquiring high-quality internet access. Servon and Nelson (2001) have pointed out that technological facilities are available to people who have high incomes to gain access to the internet; due to the availability of portable devices, such as laptops and tablets, people on high incomes often have unlimited internet access while people who have low incomes often do not. Fuchs (2008) has also mentioned that people on low incomes face affordability issues when it comes to internet access. Internet access is available on lower rates, but due to the low living standards, people still cannot always afford this. According to Warschauer (2002), people with low incomes cannot afford high-tech fast-processing computers and using lower performance computers affects internet access.

## 3.6 Summary

This review of the literature has revealed that governments worldwide have introduced e-government and e-service practices to reduce costs and make their operations more efficient as well as to provide a prompt service, improve service quality and remove barriers to government services (Praeg and Spath, 2011). The research has also revealed that the need to encourage citizens' adoption of e-government technologies has led to an increasing interest in the evaluation of

these services, often in terms of citizen or customer satisfaction and notions of e-government service quality and impact (Colesca and Dobrica, 2008; Yaghoubi, Haghi and Asl, 2011). Halaris et al. (2007) places approaches to measuring the quality of e-government into three categories: the quality of traditional public service (e.g. balanced scorecard, Six Sigma); the quality of e-government services (e.g. the American Customer Satisfaction Index [ACSI] and the quality of e-services (e.g. E-S-QUAL, E-Qual, e-service quality). Halaris et al. (2007) identify the following overarching dimensions: service reliability, personalisation, information/content, navigation/accessibility, security and system performance. Table 3.3 shows the common key dimensions across the service quality literature and models.

| Variable | Variable definition | References |
|---|---|---|
| Barriers | This refers to what users feel or see as a hindrance to the fulfilment of a derived advantage or desired effect of using the NIS website system compared to the face-to-face service. | Sweeney, Soutar and Johnson (1999); Zhang and Prybutok (2005); Wangpipatwong, Chutimaskul and Papasratorn (2005) |
| Benefits | This refers to the extent to which users derived an advantage or a desired effect from using the NIS website system compared to the face-to-face service. | Parasuraman et al. (2005); Wangpipatwong et al. (2005); Parasuraman, Zeithaml and Malhotra (2005); Wangpipatwong, Chutimaskul and Papasratorn (2005) |
| Ease of use | This refers to the extent to which a user believes a specific computing technology will be free of great effort or difficulty. | Davis et al. (1989); Wangpipatwong et al. (2005) |
| Information quality | This refers to the quality of content of the NIS website and the way users perceive its accessibility or the usefulness of the information provided. | Eldon (1997); Aladwani and Palvia (2002); Wangpipatwong et al. (2005) |
| Trustworthiness | This refers to the users' perceptions of the reliability and safety of the NIS website / e-government services. | McKnight et al. (2002); |
| User satisfaction | This describes users' expectations, service encounter satisfaction and overall satisfaction. | Davis (1993); Zhang and Prybutok (2005); Olorunniwo et al. (2006); (Shankar, Smith and Rangaswamy, 2003) |
| Website quality | This refers to the users' views of or feelings about the NIS website in relation to how it achieves their objectives which includes legible content, clean page layouts, easy navigation, legible content and language used. | Yoo and Donthu (2001); Wolfinbarger and Gilly (2003); Zeithaml et al. (2002); Parasuraman et al. (2005); Zhang and Prybutok (2005) |

***Table 3.3: Common variables across the service quality literature and models***

Although many of these instruments draw on similar foundations in the service quality literature, there is an evident absence of a consensus as to the dimensions of the various scales and indices used. Grigoroudis and Siskos (2009) identify one possible reason for such variations in the different customer satisfaction and e-service quality models when they suggest that each model has arisen in and is most suited to a specific context. This suggests that context is important, both in terms of the characteristics of potential users and the specific systems being measured. Lindgren and Jansson (2013) argue for more exploration of e-government in different contexts.

No previous research has fully explored the impact of demographic variables and in particular, levels of prior internet experience on user evaluation and experience with e-government services. Such insights are important in developing countries where access to information technologies is less widespread than in developed countries (Hassan, Shehab and Peppard, 2011).

In conclusion, there is evidence that using technology is increasingly mandatory for citizens and non-citizens. User satisfaction is thus a more appropriate outcome variable than technology adoption, but there is insufficient in this area in relation to e-government websites compared to the number of studies that have been conducted about e-commerce websites. In addition, more research is needed to examine e-government in developing countries; for example, Sahu, Dwivedi and Weerakkody (2009) recognise the importance of e-government in developing countries and its potential impact on the rate of development, and Reddick (2010) argues that governments in developing countries have failed to provide e-services effectively due to a lack of achievement of pre-defined goals and benefits. Hassan, Shehab and Peppard (2011) in their recent review of e-services in the public sector suggest that 'little work has been done to offer helpful and practical guidance for e-service in the public sector/e-government in the developing countries' (p. 538) and that 'future research should focus on enhancing the area of citizen's belief about the benefits of new governmental e-services' (p. 539). In addition, Goh et al. (2012) posit the need for research to explore whether e-service quality has an effect on users' satisfaction when considering demographic factors (such as age, income and ethnicity). Thus, the literature reveals that there has been a lack of research to address user satisfaction of mandatory e-government services provided in developing countries, this research seeks to address this**.**

E-government has the ability to revolutionise how a government communicates with its citizens, enhancing the responsiveness, efficacy and transparency of the public sector (Sitawa-Ogutu and Rege, 2010)**.** Regrettably, the entire population does not often benefit from these services. The digital divide is due to two factors: access and skills. This research shows the effects of the digital divide on e-government services by analysing a group of citizens to identify the demographic features affecting their use of it. Such services are significantly impacted by location (urban/rural area; developing/developed country), gender, age, education, employment, income, access to computing facilities, and previous internet and e-government experience which affects users' experiences of e-government services.

Previous digital divide research tends to focus on individuals, households, race, income, education, age, gender, infrastructures and businesses. It is important to note that no studies have compared a group of native and non-native users of a specific e-government service or the digital divide between developed and developing countries in the context of a specific case or users in both urban and rural areas based on this specific service.

In light of this inadequate research in the areas described in the previous paragraph, this study explores notions and experiences of the digital divide in the context of one e-government service, the Nigeria Immigration Service (NIS). This service has been chosen for a number of reasons. Firstly, Nigeria is a large and important developing country, with large rural and urban communities. Secondly, the NIS e-service has been described as a relatively successful e-government service (Yusuf, 2006). Finally, given the essential nature of the service, the research can offer direct comparisons between users with different levels of access to technology, in terms of their evaluation of the service.

# Chapter 4: Methodology

## 4.1 Introduction: What is a Methodology?

The word methodology, when used in research, refers to the approaches and strategies adopted by a researcher to carry out a study in accordance with their desired aim and stipulated research objectives (Kumar, 2010). The purpose of this study is to develop an understanding of perceived user experiences, and the associated benefits and value of e-government services. Remenyi et al. (2003, p. 8) define methodology as the *"overall approach to a problem which could be put into practice in the research process, from the theoretical underpinning to the collection and analysis of data".* Similarly, Collis and Hussey (2009, p. 11) describe methodology as the *"overall approach to the entire process of the research study".* Therefore, this chapter discusses in detail a number of important aspects associated with the research methodology. These include the research philosophy, approach, strategy, design, sampling, data collection and data analysis.

## 4.2 Research Philosophy

The research philosophy and approach adopted depends on the research questions, context and access to data. The objective is to provide appropriate answers to the initial research questions as well as a research strategy that works well for the specific research endeavour (Saunders, Lewis and Thornhill, 2009). The inductive approach may be more appropriate than the deductive approach where the researcher is specifically researching to find reason or to what extent rather than just describing an event or the occurrence. However, it has been suggested that a researcher should have knowledge of different research approaches in order to be able to provide for any eventuality as the research progresses (Ibid.). The research philosophy and approach adopted for this research were positivism and deductive respectively. These choices are due to the researcher's view of the nature of the work, the independence of social actors and his view on what constitute acceptable knowledge and the observable phenomena used to provide credible facts focusing on causality, generalisation and reducing phenomena to the simplest elements. Additionally, as the data collection most often used is characterised by highly structured and large samples, adopting positivism is most appropriate in this research (Saunders, Lewis and Thornhill, 2009). As the deductive approach involves a high degree of certainty (because of the fact that the researcher is moving from a particular observation to a broader

theory and conclusions), adopting the deductive approach in this research seemed to be more appropriate than using the inductive approach (Ibid.).

### 4.3 Research Philosophy and Paradigm

A research can be described as a systematic investigation, activity or inquiry that involves systematic data collection and analysis with the purpose of better understanding a field or producing new knowledge (Saunders, Lewis and Thornhill, 2009). Research is defined by Saunders, Lewis and Thornhill (2009) as "*something that people undertake in order to find out things in a systematic way, thereby increasing knowledge*." Selltiz, Wrightsman and Cook (1976, p. 2) have defined research as the attempt "*to search again or to take a careful look to find out more.*" Kerlinger (1986, p. 1) has defined the term from a social science point of view as "*a systematic, controlled, empirical and critical examination of natural phenomena guided by theory and hypotheses, about the presumed relations among such phenomen*a". Leedy (1993, p. 11) elaborates on this idea further by suggesting that research is "*a studious inquiry or examination of a primarily critical and exhaustive investigation or experimentation which has an aim of discovering new facts and their correct interpretation using a revision of accepted conclusions, theories or laws in light of the newly discovered facts or the practical application of such conclusions or laws*."

Before adopting any research strategy, it is important to be clear about the research philosophy and paradigm to be adopted in the study. This will assist the researcher in selecting the most appropriate method for conducting the research, as the philosophical stance adopted influences the way in which a piece of research is conducted (Creswell, 2003; 2009). A research philosophy, as defined by Saunders, Lewis and Thornhill (2009, p. 107), is the *"development of knowledge and its nature"* meaning that *"the research philosophy aids the development of knowledge in a particular field"*. The choice of a philosophy, therefore reveals the way in which a researcher views the world (Saunders, Lewis and Thornhill, 2009).

According to Saunders, Lewis and Thornhill (2009), there are four main research philosophies: positivism, realism, interpretivism and pragmatism, which can be explored within the concept of the research paradigm. Cohen, Manion and Morrison (2007, p. 27) define a research paradigm as *"the broad framework, which comprises perception, beliefs and understandings of theories and practices to*

*conduct a research*." Saunders, Lewis and Thornhill (2009, p. 118) define a paradigm as *"a way of examining social phenomena from which particular understandings of these phenomena can be gained, and explanations attempted."* There are three main components of a research paradigm: epistemology, ontology and axiology (Saunders, Lewis and Thornhill, 2009). With the aid of these components, Saunders, Lewis and Thornhill (2009) demonstrate the difference between the four main research philosophies, as shown in Table 4.1.

| | **Positivism** | **Realism** | **Interpretivism** | **Pragmatism** |
|---|---|---|---|---|
| Ontology: the researcher's view of the nature of reality or being | External, objective and independent of social factors | Is objective. Exists independently of human thoughts and beliefs or knowledge of their existence (realist), but is interpreted through social conditioning (critical realist) | Socially constructed, subjective and may change | External, view chosen to best enable answering of research question |
| Epistemology: the researcher's view regarding what constitutes acceptable knowledge | Only observable phenomena can provide credible data and facts. Focuses on causality and law, reducing phenomena to their simplest elements | Observable phenomena provide credible data and facts. Insufficient data means inaccuracies in sensations (direct realism). Alternatively, phenomena create sensations which are open to misinterpretation (critical realism). Focuses on explaining within a context or contexts | Subjective meanings and social phenomena. Focuses upon the details of a situation, a reality behind these details, subjective meanings motivating actions | Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research question. Focuses on practical applied research, integrating different perspectives to help interpret the data |
| Axiology: the researcher's view of the role of values in research | Research is undertaken in a value-free way, the researcher is independent of the data and maintains an objective stance | Research is value-laden; the researcher is biased by world views, cultural experiences and upbringing. These will impact the research | Research is value-bound, the researcher is part of what is being researched, the two cannot be separated and so will be subjective | Values play a large role in interpreting results, the researcher adopting both objective and subjective points of view |
| Data collection techniques most often used | Highly structured, large samples, measurement, quantitative, but can use qualitative measures as well | Methods chosen must fit the subject matter, quantitative or qualitative | Small samples, in-depth investigations, qualitative | Mixed or multiple method designs, quantitative and qualitative |

***Table 4.1: Comparison of four research philosophies adapted from Saunders, Lewis and Thornhill (2009)***

## 4.4 Research Approaches

Research approaches are defined by Creswell (2014, p. 3) as “the plans and procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis and interpretation.” There are clearly distinct differences between the research philosophies described in Table 4.1, so for a researcher to choose which philosophical paradigm to follow, a discussion of research approaches will help them to decide on the philosophical assumption to adopt. According to Saunders, Lewis and Thornhill (2009), there are two primary research approaches: deductive and inductive.

### 4.4.1 Deductive Research

A deductive research approach typically involves a search for causal relationships between variables, the testing of hypotheses and the use of a highly structured methodology, which ensures research reliability and validity (Saunders, Lewis and Thornhill, 2009). The approach involves a researcher creating a theory based on deduction, and assumes that the researcher and the research process are independent of each other in terms of previous knowledge and theory while collecting data to test that prior knowledge or theory (Saunders, Lewis and Thornhill, 2009). Deductive concepts need to be operationalised in a way that the facts derived must be quantitatively measured and generalised (Saunders, Lewis and Thornhill, 2009). Robson (2002) argues that deductive research should be based on five progressive stages, which are:

i. Formulating a hypothesis from the theory developed.

ii. Expressing the hypothesis in operational terms, which proposes a relationship between two distinct concepts or variables.

iii. Testing this operational hypothesis.

iv. Examining the outcome of the inquiry.

v. If necessary, modifying the theory in light of the findings.

### 4.4.2 Inductive Research

Inductive research involves getting a feel for what is happening in a specific context, organisation, process or event in order to better understand the nature of the situation; it necessitates a researcher firstly making observations, and then devising a theory by analysing the data (Saunders, Lewis and Thornhill, 2009). However, this approach has been criticised as being too descriptive and permitting false conclusions (Saunders, Lewis and Thornhill, 2009). In addition, as a researcher is immersed in the data collection events, the possibility of bias is

greater when compared to research undertaken using the deductive approach (Saunders, Lewis and Thornhill, 2009). Deductive approaches involve theory testing, whereas inductive approaches require theory building. Table 4.2 summarises the major differences between the deductive and the inductive approaches.

| Deductive | Inductive |
|---|---|
| Moves from theory to data | Moves from data to theory |
| Collects quantitative data | Collects qualitative data |
| Applies restrictions to ensure validity of the data | Adopts a more flexible structure to permit changes of research emphasis as the research progresses |
| It is necessary to select samples of a sufficient size in order to generalise conclusions | Less concerned with the need to generalise |
| Researcher is independent from what is being researched | The researcher is recognised as being part of the research process |
| Can be a lower-risk strategy than inductive research, albeit that there are risks, such as the non-return of questionnaires | The researcher is concerned that no useful data patterns or theories will emerge |
| Can be quicker to complete than inductive research, albeit that time must be devoted to setting up the study prior to data collection and analysis | The process often involves a much longer period of data collection, and an analysis has to emerge gradually |
| Data collection is usually based on 'one take' | Data collection is a gradual process, sometimes with multiple stages |
| It is usually possible to predict time schedules accurately | Time schedules cannot be predicted accurately as the process depends on the events occurring at a specific time |

***Table 4.2: Major differences between the deductive and inductive approaches to research. Adapted from Saunders, Lewis and Thornhill (2009)***

## 4.5 Research Strategy

A research strategy can be described as the detailed approach by which a researcher intends to answer a research question or questions. A research strategy is the general plan for how the questions will be answered; it contains clear objectives derived from the questions, citing the sources from which the data will be collected and any potential constraints that may hinder the smooth process of the research (Saunders, Lewis and Thornhill, 2009). Creswell (2009, p. 5) defines a research strategy as a *"plan or proposal to conduct research".* Saunders, Lewis and Thornhill (2009, p. 600) define a research strategy as *"the overall method of how the researcher will go about answering research questions".* A research strategy must identify factors such as accessibility or availability of data,

the timeframe for data collection, locations, financial aspects and any other ethical considerations related to the research.

There are various types of research, with the most common ones being exploratory, descriptive and explanatory (Saunders, Lewis and Thornhill, 2009).

### 4.5.1 Exploratory research

Exploratory research is suitable in the absence of measures or instruments, if variables are unknown or where there is no available theory or prior knowledge base (Creswell, 2009). According to Creswell and Clark (2011, p. 87), exploratory research *"is most useful when a researcher wants to generalise, assess, or test qualitative exploratory results to see if they can be generalised to a sample and a population".* It is a useful method of finding out *"what is happening; to seek new insights; to ask questions; and to assess phenomena in a new light"* (Robson, 2002, p. 59). When conducting exploratory research, a researcher should be flexible and willing to change the direction of the study in case new evidence emerges (Saunders, Lewis and Thornhill, 2009). Saunders suggests three ways of conducting exploratory research: literature review or search, focus group and subject experts and interviews.

### 4.5.2 Descriptive Research

Descriptive research seeks to provide a detailed account of observations of activity or circumstances without exploring the causal relationships involved within that action or situation (Saunders, Lewis and Thornhill, 2009). Robson (2002, p. 59) suggests that the purpose of descriptive research is *"to portray an accurate profile of persons, events or situations".* In descriptive research, the researcher needs to have a clear idea of the phenomena about which researcher will seek data prior to collecting it (Saunders, Lewis and Thornhill, 2009).

### 4.5.3 Explanatory Research

Explanatory research seeks to explain the causal relationships between variables through testing hypotheses in order to gain an understanding of the relationships between variables, using statistical techniques (Saunders, Lewis and Thornhill, 2009). Explanatory research is *"most useful when the researcher wants to evaluate trends and relationships with quantitative data, but also be able to describe the mechanism or the reasons behind the resultant trends"* (Creswell and Clark, 2011, p. 87). Table 4.3 shows different research strategies and their characteristics.

| Research Strategy | Main Features | References |
|---|---|---|
| Experimental | - A type of research that owes much to the natural sciences, and features strongly in social science e.g. psychology<br>- Used to study causal links, to see if a change in the independent variable influences a change in the dependent variable<br>- Used frequently in both exploratory and explanatory research to answer 'how' and 'why' questions<br>- Involves using groups such as experimental and control groups<br>- Mostly conducted in laboratories rather than in the field<br>- A high degree of internal validity is achieved by having control over sample selection and the context in which an experiment occurs<br>- A low degree of external validity is possible because the research is conducted in a laboratory and is unlikely to relate directly to the real world<br>- Research is laboratory-based; therefore, generalisation of findings is likely to be lower than in field-based research<br>- Involves the selection of samples of individuals from known populations<br>- There is a random allocation of samples to different experimental conditions, the experimental group and the control group<br>- There is the introduction of planned intervention or the manipulation of one or more of the variables<br>- Involves the measurement of a small number of dependent variables and control of all other variables<br>- Useful for most researches as it is usually used only on captive populations | Saunders, Lewis and Thornhill (2009) |
| Survey | - A common and popular strategy usually associated with the deductive approach<br>- Frequently used to answer who, what, where, how much and how many questions<br>- Often used for exploratory and descriptive research<br>- Useful in that it allows the collection of a large amount of data from a sizeable population in a highly economical way<br>- Data collection is usually obtained with the use of a questionnaire administered to a sample<br>- It is highly reliable as the data collected is standardised thus allowing for easy comparison<br>- Comparatively easy to explain and understand<br>- Allows for the collection of quantitative data that can be analysed with the use of statistical techniques<br>- Data collected using a survey strategy can be used to suggest possible reasons for particular relationships between variables, thus producing models of these relationships<br>- Gives researchers control over the research process<br>- When sampling is used, it is possible to generalise findings | Saunders, Lewis and Thornhill (2009) |
| Case study | - Involves an empirical investigation of a particular contemporary phenomenon within its real-life context using multiple sources of evidence<br>- The boundaries between the phenomenon being studied and the context within which it is being studied are not clearly evident<br>- The ability to examine and understand the context is limited by the number of variables for which data can be obtained. It also has the ability to generate answers to the questions 'why?', 'what?' and 'how?'<br>- Often used in both explanatory and exploratory research<br>- Often uses multiple data collection techniques (mixed method) such as questionnaires, semi-structured group interviews, observations and document analysis | Saunders, Lewis and Thornhill (2009); Robson (2002); Yin (2003) |

| | | |
|---|---|---|
| | - Use of multiple case studies improves generalisability of findings<br>- Good for exploring and challenging existing theory and providing a source of new research questions | |
| Action research | - Research in action rather than research about action<br>- Involves practitioners in the research<br>- Research usually involves organisational change<br>- Iterative nature of the process of diagnosing, planning, taking action and evaluating<br>- Findings from action research could inform other contexts<br>- Useful for 'how' questions<br>- Researcher embedded in research context directly in the research, to a greater extent than with other research strategies | Saunders, Lewis and Thornhill (2009) |
| Grounded theory | - Useful when trying to predict or explain behaviour<br>- Often regarded as the best example of the inductive approach<br>- The emphasis is upon developing and building theory<br>- Data collection starts without the formation of an initial theoretical framework<br>- Theory is developed from data generated by a series of data collection interventions<br>- Does not involve hypothesis testing<br>- Rooted deeply in the inductive approach | Saunders, Lewis and Thornhill (2009) |
| Ethnography | - Purpose is to describe and explain the social world the research subjects inhabit in the way in which they would describe and explain it<br>- Often very time consuming<br>- Involves the researcher immersing himself/herself in the social world or research context<br>- Researcher needs to be flexible and ready for change at any time due to possible frequent changing patterns of thought about what is being observed<br>- Particularly useful if the researcher wishes to gain insights about a particular context and better understand and explain it from the perspectives of those involved | Saunders, Lewis and Thornhill (2009) |
| Desk research | - Involves making use of administrative records and documents as the principal source of data<br>- Allows research questions which focus upon the past and changes over time to be answered<br>- Could be exploratory, descriptive or explanatory<br>- Using an archival strategy makes it important for the researcher to find out what data are available<br>- Reduces time and effort spent on the research as whole compare to other research strategies<br>- Provides useful background information and screens out irrelevant materials<br>- Often considered as low cost compared to field research<br>- Requires a researcher to have in-depth knowledge of the research area | Saunders, Lewis and Thornhill (2009) |

***Table 4.3: Research strategies and their characteristics***

## 4.6 Research Methods

A research method is an approach that provides a context within which suitable strategies and methods can be chosen and developed to achieve the overall purpose of the study (Maxwell, 2012). There are two primary research methods: quantitative and qualitative. According to Creswell (2009), a research that follows a quantitative research approach is within the concept of the post-positivist

knowledge claim position as post-positivists accept that researcher, theories, background, knowledge and the values can influence what researcher is observing (Creswell, 2009). Creswell (2009, p. 7) states that "*the problems studied by post-positivists reflect the need to identify and assess the causes that affect results*." The quantitative research method involves narrowing down hypotheses to specific variables, collecting data and testing theories using instruments to support or reject the hypotheses (Creswell, 2009). The quantitative method allows for the collection of large data samples in a wide area (Creswell and Clark, 2011). The researcher uses checks to reduce error and eliminate any bias. On the other hand, Creswell (1998, p. 15) states, *"qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The research builds a complex, holistic picture; (the researcher will) analyse words, reports, detailed views of informants; and conduct the study in a natural setting."*

The qualitative research approach involves the use of events, case studies, personal observations and experiences, interviews, and visual and historical texts to obtain empirical materials (Creswell, 2011). In qualitative research, the focus is on validity and this is important to establish that the researcher and the participants' accounts are accurate, trustworthy and credible (Creswell, 2011). Table 4.4 compares the quantitative and qualitative approaches.

| Quantitative approach | Qualitative approach |
|---|---|
| - Uses closed questions<br>- Involves predetermined approaches<br>- Involves numeric data<br>- Tests or verifies theories or explanations<br>- Identifies variables to study<br>- Relates variables to questions or hypotheses<br>- Uses standards of validity and reliability<br>- Observes and measures information numerically<br>- Uses unbiased approaches | - Uses open-ended questions<br>- Involves emerging approaches<br>- Involves the use of text or image data<br>- Collects participant meaning<br>- Focuses on a particular idea or phenomenon<br>- Focuses more on validity<br>- May brings personal values into the study.<br>- Creates an agenda for change or reform<br>- Collaborates with participants |

***Table 4.4: A comparison between the quantitative and qualitative approaches; adapted from Creswell (2009)***

One of the key features of qualitative research is the use of more than one procedure in a research, which is not the case in quantitative research. Qualitative

research uses subjective information, and also examines complex questions, which can be difficult using quantitative methods (Creswell, 2011).

## 4.7 Research Techniques

Research techniques in this study relate to the distribution of questionanires. Once the measurement items scale was developed, the questionnaire-based survey was selected as the data collection method for the study. There are different ways to administer questionnaires, depending on the extent of the researcher's access to a population, costs and target population coverage as well as response accuracy. The most commonly used data collection modes are discussed in Table 4.8.

| Data collection mode | Advantages | Disadvantages |
|---|---|---|
| Face-to - face | - High response rate as it is difficult for respondents to quit<br>- Interviews can clarify ambiguous questions | - Intrusive as physical contact with respondents involved<br>- Expensive where there is the need to recruit extra field participants<br>- Interviewer bias<br>- Smaller sample size due to cost |
| Mail | - No interviewer bias as no physical contact involved | - Poor response rate<br>- Time-consuming as has to pass through the postal system; respondents may not post surveys back at the appropriate time<br>- Can get lost in transit<br>- Not suitable where there is a need for clarification |
| Online (internet) | - Less intensive as there is no physical contact involved<br>- Fast response when using online questionnaires as data can be collected within a month as there is no need for return post<br>- Selective as respondents can be screened to ensure only the target population completes the questionnaire<br>- Allows distribution of the questionnaire even to the remotest place on earth<br>- Cheaper as savings are made on telephone calls, stamps and field staff recruitment, especially where a large sample is needed<br>- Flexibility: questions can be skipped or tailored to individual responses, depending on previous questions or answers | - Low response rate as respondents may decide not to complete the questions<br>- May be expensive for respondents in places where internet access is still difficult |
| Telephone | - Higher response rate due to direct contact with the respondent<br>- Good for national coverage | - Biased as the respondent may not like the style or voice of the interviewer<br>- Not useful where images need to be shown to respondents<br>- Intrusive as respondents may not like talking to a stranger |

***Table 4.8: Modes of data collection. Source: Oppenheim (2005)***

## 4.8 Data Collection Methods and Tools

Data collection is a necessary process for every piece of research. It encompasses all methods of gathering the required and relevant data from various sources to carry out the different parts of the study (Saunders, Lewis and Thornhill, 2009).

### 4.8.1 Data Collection Techniques

Different techniques can be used to collect primary data, and the most commonly used include focus groups, interviews, observations, questionnaires and surveys (Saunders, Lewis and Thornhill, 2009; Durrance, Fisher and Hinton, 2005). Table 4.5 describes the commonly used data collection techniques as posited by Durrance, Fisher and Hinton (2005).

| Data collection type | Strengths | Weaknesses |
|---|---|---|
| Focus groups | - An approach frequently used to gather in-depth attitudes, group beliefs, and anecdotal data from a small group of participants at one time<br>- Group dynamics might generate more ideas than individual interviews<br>- Can be effectively used to focus on details regarding issues found through surveys or other data collection methods<br>- Participants are not required to read or write. It relies on oral communication | - Requires a time commitment from the researchers and participants when setting up and facilitating a group, as well as identifying the participants.<br>- Requires a strong facilitator to guide the discussion and ensure participation by all members<br>- Usually requires equipment to record and transcribe focus group discussions |
| Interviews | - Good approach to gather in-depth attitudes, beliefs and anecdotal data from individual participants<br>- Personal contact with participants might elicit richer and more detailed responses<br>- Provides an excellent opportunity to probe and explore questions | - Requires a time commitment from the researchers and participants<br>- Requires a quiet area to conduct interviews<br>- Requires equipment to record and transcribe interviews<br>- Can be difficult to obtain reliable data due to attitudes of participants<br>- Analysis is time consuming |
| Observation | - Provides indicators of the impact on research that might be more reliable than data gained by asking people<br>- Good technique when there are observable products and outcomes | - Requires a time commitment from the researchers and participants to observe and record the observations<br>- Cannot ask questions of participants during the observation<br>- Might want to use follow-up interviews to verify observations |

| | | |
|---|---|---|
| Questionnaires | - Good for gathering brief written responses on attitudes and beliefs<br>- Can include both closed- and open-ended questions<br>- Can be administered in written form or online<br>- Personal contact with the participants is not required<br>- Minimal requirements, as one researcher can easily manage the distribution and collection of surveys, and issues such as privacy, quiet areas, etc. are typically not concerns | - Responses are limited to the questions included in the questionnaire.<br>- Participants need to be able to read and write to respond.<br>- Takes time to pre-test a written questionnaire to make sure that questions are clearly stated.<br>- Relies on participants' perceptions. Be aware of potential gaps between participants' responses and reality.<br>- Questions can be misunderstood, especially if they are self-administered. |

***Table 4.5: Methods of data collection, adapted from Durrance, Fisher and Hinton (2005)***

## 4.9 Questionnaires

Oppenheim (2005) described questionnaire as a research instrument or tool used for data collection that contains a series of systematically placed questions in order to extract the desired responses from respondents to measure the research variables. In a typical survey-based research, a questionnaire is used to collect data on a particular research topic (Creswell, 2009). It is usually designed with a broad topic in mind and sometimes with already established constructs that are measured through multiple indicators (Ibid.). There are two primary types of questions: open-ended or closed (Oppenheim, 2005). has made a comparison between closed and open-ended questions, as shown in Table 4.6.

| Closed questions | Open-ended questions |
|---|---|
| Quick and easy for participants to answer | Participants might need to provide clarification for giving a specific answer |
| Participants' answers are easier to compare | Participants' answers are difficult to compare |
| Easier to ask sensitive questions | Sensitive questions are difficult to ask |
| Simple to analyse | Requires time and are difficult to analyse |
| Easier to code answers for statistical analysis | Coding responses are difficult, thus makes statistical analysis difficult |
| Respondents' answer choices are restricted | Allows participants an unlimited number of possible answers |
| Restricted to researcher-specific language | Respondents respond in their own language |
| Restricted opportunity to probe respondents' answers | Good for exploring, self-expression and richness of details, opinions and feelings |

***Table 4.6: Comparison between closed and open-ended questions***

A closed question offer respondents a choice of replies such as Yes or No or something more complex, such as the degree to which respondents agree with the question ascertained by them ticking, underlining or circling their chosen answer. In open-ended questions, respondents are free to state what they believe is the

best answer to the question; they are not limited or restricted to any choice of answer thus giving them the freedom to state their views (Oppenheim, 2005). Oppenheim (2005.)

## 4.10 Question Scaling

Scale, as defined by Bernard (2013), is "*a device for assigning units of analysis to categories of a variable*". It is used to rank individual responses to a question or statement, or to compare a group's response to questions. Trochim (2006) has defined scaling as "*the branch of measurement that involves the construction of an instrument that associates qualitative constructs with quantitative units*". Scale is used for measuring dimensions underlying a set of ranking or ratings (Bernard, 2013).

### 4.10.1 Scale Types

There are various types of scale used in a questionnaire but the most common is the Likert scale. This was developed by Rensis Likert in 1932 as a means of measuring respondents' attitudes to a series of specified statements on a topic or theme. It shows the degree of respondents' agreement with statements, thereby tapping into the cognitive and affective component of their attitudes (McLeod, 2008). Other commonly used scales include the Guttman scale, developed by Louis Guttman in 1944, used for measuring patterns of respondents' answers to questions, and the Thurstone scale developed by Robert Thurstone in 1929 to measure respondents' attitude to questions.

| Likert | Guttman | Thurstome |
|---|---|---|
| Easy to construct; not time-consuming | Little guidance for item selection | Hard to construct; time consuming |
| Respondents have at least 5 alternative choices of answers | Unequal scale intervals | Respondents are restricted to only one choice of answer (agree or disagree) |
| Fairly easy to understand | Hard to understand | Hard to understand |
| Good result of validity and reliability | Poor result of validity and reliability | Poor result of validity and reliability |
| No need to use judges | No use of judges | Involves the use of judges, who may be biased |
| Requires less statements or questions | | Requires lots of statements / questions |
| Uses a general measurement format | | Average value is used as the scale score |

***Table 4.7: Comparison of different types of scale***

## 4.11 Population and Sampling

### 4.11.1 Defining Target population

A target population is defined by Hair et al. (2007, p. 174) as "*the group of objects or elements relevant to the research project*". It is the population for which the researcher wants to make inferences. In this research, the sampling unit in question are individuals who have used the Nigeria Immigration electronic services for any transactions or to access information irrespective of where they live. The focus was to identify users' experience of e-government services as provided by the Nigeria Immigration Service through their website, https://portal.immigration.gov.ng/. In addition, the individuals needed to be at least 18 years old. The participants could be any race, nationality, gender or have any other form of affiliation.

### 4.11.2 Sampling

Sampling can be described as the process of selecting a unit (or units) from a population under study. Saunders, Lewis and Thornhill (2007, p. 112) describe sampling as "*one of the most crucial components of studies that involve collection of primary data from the population*". It is the process of collecting data on a small part of the whole parent population, showing what the whole picture looks like (Saunders, Lewis and Thornhill, 2009). Therefore, as sampling refers to the procedures used in extracting a suitable sample size from a population, the key to it is achieving representatives of the population. This procedure is further divided into three significant categories: sampling frame, sample size and technique (Hair et al., 2007).

### 4.11.3 Selecting the Sample Frame

A sampling frame refers to all of the participants in a population that could take part in the study (Saunders, Lewis and Thornhill, 2007). The main aim of a researcher in quantitative research is to obtain a representative sample by selecting a proportion of the population which will form a bigger picture, or that can produce a generalisation of it (Ibid). In this research, it was not possible to select a strict sample frame since the Nigeria Immigration e-services are accessed by both citizens and non-citizens who reside in different parts of the world. The participants in this study were selected from emails and their names made available to the researcher.

Hair et al. (2007) suggest that there may be elements outside the sample frame or duplicate elements within it. However, there was no evidence of such occurring in this research as each participant's email was displayed on completion of the survey. These email addresses were later screened to ensure there were no duplicates and later deleted to protect participant confidentiality. Another possible flaw in this survey was the participants who may not have conducted any transaction, or visited or used the Nigeria Immigration website e-services completing the survey. Nonetheless, this survey was designed to screened out such scenarios.

### 4.11.4 Sampling Technique

Sampling technique refers to the manner in which a researcher extracts a sample from the population (Saunders, Lewis and Thornhill, 2007). There are sampling approaches, and these are: probability and non-probability sampling. In probability sampling, also known as non-zero probability, each member of the population has an equal chance of being selected. It provides the most valid and a credible result because it reflects the population from which it has been selected (Hair et al., 2007). It is further divided into two types: random and stratified sampling. In random sampling, each participant within the population has an equal likelihood of selection. There is no bias involved in this type of selection and the procedure is very strict (Saunders, Lewis and Thornhill, 2007). Stratified sampling is the process of making a mini-reproduction of the population and then dividing it into specific categories pertaining to the research, with the intention to guarantee that the samples represents these categories (Ibid.).

Non-probability sampling, also known as non-representative sampling, is particularly useful in a situation where random or stratified sampling may be too expensive or unobtainable (Saunders, Lewis and Thornhill, 2007). It is further divided into three categories of sampling: quota, purposive and convenience. Quota sampling is a method where a certain percentage of the population is designated, with the selection made from this population. Purposive sampling involves selecting a designated sample of the population who is knowledgeable about issues pertaining to a research thus assisting the researcher (Creswell, 2003). Purposive sampling has a subset known as snowballing sampling, the process of choosing participants through referrals from others (Saunders, Lewis and Thornhill, 2007). The weakneses of snowball sampling according to Saunders, Lewis and Thornhill (2007) include sample will not be chosen at random, it is

difficult to determine sampling errors and the sampled populations can be unrepresentative. However, snowball sampling has its on strengths which include, opportunity to conduct research beyond any known poplation's segment. Opportunbity to discover charatcertistics of population never thought existed Saunders, Lewis and Thornhill (2007). Convenience sampling refers to an accidental sampling where selection may be unguided, and all members of the population have un-equal chance of being chosen (Creswell, 2003).

### 4.11.5 Sample Size

Yin (2009, p. 18) defines a sample size as the *"extent or number of samples capable of representing the entire population".* The sample size is significant in research as the overall findings gathered from the primary data are dependent upon it and any inaccuracy associated with it can lead to misleading findings (Saunders, Lewis and Thornhill, 2007).

## 4.12 Data Analysis

Data analysis is the process that begins once data has been checked and freed of any errors. It involves inspecting, cleaning, transforming and modelling data with a view to achieving or extracting valuable information to support decision-making (Pallant, 2010; Ader, 2008). Different statistical methods can be used to analyse data. The method used depends on the specific study and the information to be extracted to suit the research objectives (Pallant, 2010). Hair et al. (2007) have suggested two steps to analyse data; firstly, the generation of descriptive statistics and secondly, the execution of statistical tests for the hypotheses.

### 4.12.1 Data Examination and Missing Data Handling Process

The data collected needs to be processed and assessed to check internal consistency to assure its quality for further analysis. This involved checking any missing data and possible errors (Pallant, 2010). This is because missing data resulting from incomplete survey questions can cause the researcher problems (Janssens, 2008).

## 4.13 Research Context: the Nigeria Immigration Services Website

The NIS e-government service is the focus of this study. As stated in Chapter 2, the government of Nigeria utilises e-government services, particularly to deal with public affairs and transactions (Aneke, 2009). The Nigeria Immigration Service (NIS) controls and monitors entries and exits. The Nigeria Immigration e-government services website is accessed by both citizens and non-citizens. If a

user wishes to move in and out of Nigeria, they have to use the website. The NIS has developed its e-services to support information distribution among citizens, form processing and financial transactions, including online payment for new passports, passport renewals, visa applications and processing as well as the processing of various other entry permits (Nigeria Immigration Service, 2015). Despite the value of e-government services in Nigeria, there is very little research on user experience of e-government services in the country. Therefore, this research will advance knowledge of e-government in developing countries, through the study of the Nigeria Immigration Service (NIS) e-government service. Additionally, it will advance the theoretical conceptualisation of the digital divide.

This context has been chosen because there is inadequate research on e-government in developing countries, which face implementation and adoption challenges with regards to it, as stated by Hassan, Shehab and Peppard (2011) and Reddick (2010). The NIS e-services portal was chosen because it is accessed by both citizens and non-citizens.

## 4.14 Research Methodology Adopted

### 4.14.1 Practical Reasons for Choosing A Questionnaire and An Online Survey

This study employed an online questionnaire, due to the geographical dissemination of the participants. The participants wished to remain anonymous, citing concerns with privacy, and due to the voluntary nature of this research the adoption of a questionnaire with the use of an online survey was considered to be the most practicable and appropriate means of gathering information. It was considered crucial to profile a significant number of users to support the investigation and due to the geographic scatter of the respondents across the globe and the fact that the research aimed to achieve an adequate sample size the online survey method was appropriate in this instance for data collection. According to Saunders, Lewis and Thornhill (2009), an online survey allows for the collection of a large amount of data from a sizeable population in a highly economical way. It is highly reliable as the data collected is standardised, thus allowing for easy comparison, and can be used to suggest possible reasons for particular relationships between variables, thus producing models of these relationships (Saunders, Lewis and Thornhill, 2009).

However, it has to be acknowledged that this method has a number of limitations, which include:

- Limited control over who completes the questionnaire
- Participants can complete the questionnaire even if they have not used the NIS portal
- Partially completed questionnaires
- The potential for misunderstanding, as questions may be interpreted differently, especially amongst those who are inexperienced in the use of e-government, and this could lead to unclear data.

### 4.14.2 Quantitative Study

The goal of this research was to develop a measurable model of users' experience of e-government services based on the literature and to test it. Therefore, for the purpose of this research, the quantitative approach was chosen to test the user experience research model empirically. A quantitative approach is regarded as useful for profiling a situation and investigating the relationships between variables (Oppenheim, 2005). This research adopted quantitative approach test developed research model, as this research involve relating the variables to questions and the hypotheses based on theoretical statements, to test or verify theories or explanations to determine whether the predictive generalisation of the theory holds any truth (Creswell, 2009). A quantitative approach was particularly suitable for this research as the respondents are scattered across the globe, and given the diversity of the population a reasonably large sample was judged to be essential (Creswell, 2009).

### 4.14.3 Survey Research Strategy

This research does not fit any of the research strategies described above apart from the survey research strategy. A survey strategy is a piece of research that involves making a comparison between units of observation. As this research involves worldwide use of the Nigeria Immigration website, a survey strategy was considered to be a more appropriate strategy to adopt than any other. A research strategy's suitability for a specific study depends on the purpose of the study. Most researches adopt a survey research strategy as it allows for the collection of a large amount of data from a sizeable population in an economical way (Saunders, Lewis and Thornhill, 2003). A survey research strategy was considered to be appropriate for this study, which tests a user experience models and hypotheses,

as it constitutes a generalisation within the study context of the proposed model with the sample data (Saunders, Lewis and Thornhill, 2009). In this research, a survey research strategy was adopted as the most suitable strategy for data collection as it *"provides a quantitative or a numeric description of trends, attitudes or opinions of a population by studying its (population) sample"* (Creswell, 2009, p. 12).

### 4.14.4 Closed Questions

This research adopted closed questions to make the coding of responses easier, statistical analysis less difficult and to facilitate the comparison of the emerging data. This research also took into consideration some of the advantages of open-ended question types by providing a few at the end of the questionnaire, thus giving respondents self-expression as well as to clarify their responses. This gave the researcher an option to further explore respondents' thoughts, opinions and feelings.

To suit this research, and where appropriate taking into account previous researches, the closed questions used related to respondents' e-government service use and experience with ICT. Other questions were developed to collect demographic data, including gender, age, education, income, employment sector, country of permanent residence and localisation (rural or urban dwellers). Only respondents aged 18 and above were allowed to participate in the survey as this is the minimum age that allows one to conduct transactions directly with the Nigeria Immigration Service (see Appendix 1 for the questionnaire).

### 4.14.5 Rationale for 5-Point Likert Scale and 'Yes' or 'No' Options

This research adopted the Likert scale for all ordinal variables in the questionnaire so the responses would be easily quantifiable. It was also used because it has a high validity rate and is highly reliable. Furthermore, it makes it easy for participants to answer the questions. In addition to the Likert scale, this research adopted 'Yes' or 'No' closed questions. Tick boxes were also used for the nominal variables in the questionnaire as the questions do not have evaluative connotations or underlying continuum hence the only score for these types of question is a binary one (Oppenheim, 2005). The Likert scale adopted was a five-point scale rather than a seven-point one, to allow respondents to answer and judge the questions appropriately. In addition, a five-point scale makes it easier for the rating midpoint during analysis. Additionally, it allows for a standard point of

comparison and the mean weighted average of the data can been calculated easily. The Likert scale five-point format shows whether a respondent agrees with the postulated statements.

Table 4.9 shows Likert scale five-point format of whether and to what extent a respondent agrees with particular statements. In addition, to show the frequency distribution of the respondents to any other questions, the Likert scale format used was shown in Table 4.10.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |

***Table 4.9: The Likert scale five-point format for* respondents' agreement with the statements in the questions**

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Never | Rarely | Occasionally | Frequently | Very frequently |

***Table 4.10: Likert scale five-point format for* respondents' frequency distribution to questions**

For measuring the respondents' attitudes towards quality in other questions in the questionnaire, the Likert scale format used was shown in Table 4.11.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Very unsatisfied | Unsatisfied | Neutral | Satisfied | Very satisfied |

***Table 4.11: Likert scale five-point format for* respondents' attitude towards quality in other questions**

The Likert scale fixed-choice response format set-ups are designed to measure respondents' attitudes and opinions (Oppenheim, 2005; Bernard, 2013). All of the measurement items were framed as statements accompanied with five-point Likert scale formats.

Additionally, demographic chosen include age, education, gender and income, social-economic (employment) and geographic (location: rural and urban, developing and developed countries) as these factors likely to have effect on the NIS. This study makes use of open questions, thereby offering insights and information on users' attitudes towards the NIS portal

### 4.14.6 Rationale for Non-Probability Sampling (Snowballing)

In this research, the non-probability sampling approach was chosen to draw samples from the population. This is because the researcher was not able to obtain a record of users of the Nigeria Immigration e-government services or visitors to its website due to privacy concerns. In addition, the NIS portal users resided in different parts of the world, the researcher hence can only chose participants who were easily available to collect information from. Snowball sampling was considered to be particularly appropriate considering the fact that the potential respondents are scattered across the globe. The consequence of snowball sampling is that over-sampling of a particular group can lead to bias or respondents introducing new participants who may cause bias. However, there was no evidence of such an occurrence as the survey was designed to screen out duplicated emails, thus ensuring the credibility and validity of the results. The respondents initially selected were identified by the researcher's associates. Subsequent respondents were obtained from information provided by the initial respondents. Therefore, the sample frame was spatial, and the research aimed to achieve an adequate sample size.

## 4.15 Pre-testing Questionnaire (Pilot Survey)

There is a need to pilot a questionnaire, as this according to Oppenheim (2005) will remove any inconsistencies and to confirm its wording, structure and design. Piloting a questionnaire is useful in terms of obtaining estimations about the predicted data responses, quality of information and its validity along with the comprehensibility of the instrument (Ibid.).

The questionnaire used for this survey was uploaded to www.freeonlinesurveys.com and assessed by 25 people over a three-week period. The respondents included one professor, three senior lecturers, nine doctoral students, two business analysts, four user acceptance testers, two undergraduate students, three pensioners (above 65 years) and one self-employed person. The respondents' selection was influenced by different factors such as level of education, age, gender, internet experience and employment. The selected professor and senior lecturer are both experts in the field of information and communications with in-depth experience of e-government, e-business, digital information, information seeking behaviour and interactions. They both gave robust feedback on the wording, structure and design of the questionnaire. As for the other two senior lecturers, one was from the field of education and the other in

business management. Together, they commented on the general suitability of the questionnaire and gave advice on the wording.

As for the nine doctoral students selected, five were from developing countries and four from developed countries. They worked in various fields: psychology, education, management, IT, engineering, mathematics, physical education and sociology. They provided useful feedback that involved clarifying the instructions, wording and general suitability of the questionnaire. The two undergraduate students were from developing countries and in the education field; both gave feedback to help clarify the instructions. Both business analysts and user acceptance testers were selected due to their experience in user requirement analysis and user acceptance testing in the field of computing. They provided valuable information with regards to the structure and wording of the questionnaire. The three pensioners were selected to access the questionnaire in order to give an opportunity to this age group. The aim was to get feedback on the questionnaire's suitability as well as clarifying the instructions. Finally, the self-employed individual selected for the pilot survey provided feedback on the difficulty of getting access to the internet. By the end of the feedback process, the questionnaire was considered to be clear and fit for purpose.

An open textbox was made available for the respondents to express more of their opinion to the answer given to the questions, the instructions given in the questionnaire, and any repetitions or confusing questions as well as any other comments they wanted to make. Based on the feedback, the wording of some of the measurement items were changed, including questionnaire numbering and the instructions were also edited.

## 4.16 Data Analysis

Data analysis is the process that begins once data has been checked and freed of any errors; firstly, the generation of descriptive statistics and secondly, the execution of statistical tests for the hypotheses. In this research, the following data analysis will be conducted.

### 4.16.1 Data Examination and Missing Data Handling Process

The data collected needs to be processed and assessed to check internal consistency to assure its quality for further analysis. This involved checking any missing data and possible errors (Pallant, 2010). This is because missing data

resulting from incomplete survey questions can cause the researcher problems (Janssens, 2008).

### 4.16.2 Descriptive statistics

Descriptive statistics help to explain, summarise or show the spread of data in a meaningful way; it is most useful with a large sample. Descriptive statistics show frequency distribution, which describes how the scores of respondents are distributed; they also give a measure of central tendency, which describes how data is clustered around a central point; the main measurements include mean, median and mode as well as the measure of dispersion (spread) which describes how data can be explained with regards to the range, interquartile range, variance, standard deviation and absolute deviation (Howell, 2007). Descriptive statistics describe how spread out the data scores are (Ibid.).

### 4.16.3 Factor Analysis

Factor analysis, as described by Pallant (2010, p. 181), is *"a data reduction technique. It takes a large set of variables and looks for a way data may be reduced or summarised using a smaller set of factors or components."* There are two main approaches: exploratory and confirmatory factor analysis (Pallant, 2010). In this research, both were used.

### 4.16.4 Exploratory Factor Analysis

An exploratory factor analysis (EFA) *"is often used in the early stages of a research to gather information about the interrelationships among a set of variables"* (Pallant, 2010, p. 181). An EFA was used for the creation of a measurement scale, as this tool is suitable in complex sets of data for identifying the correlation amongst variables (Pallant, 2007). Prior to conducting the EFA, the suitability of the data for this test needs to be assessed. Pallant (2010) recommends that the Kaiser-Meyer-Olkin Measure of Sampling Adequacy should be above .6 and Bartlett's Test of Sphericity value should be significant at .05 or less to show that the data set is suitable for factor analysis.

### 4.16.5 Confirmatory Factor Analysis

A confirmatory factor analysis (CFA) is a "*process to test (confirm) specific hypotheses or theories concerning the structure underlying a set of variables*" Pallant (2010, p.181). A CFA tests whether data fit a measurement model (Janssens, 2008). Conducting a CFA on each of the variables ascertained whether

all of the items loaded satisfactorily onto their respective variables and whether each variable displayed a satisfactory model fit for the confirmatory model.

### 4.16.6 Structural Equation Modelling

Structural equation modelling (SEM) is defined by Byrne (2010, pp. 3) as *"a statistical methodology that takes a confirmatory (i.e. hypothesis-testing) approach to the analysis of structural theory bearing on some phenomenon."* This structural theory represents the 'causal' processes that produce observations on multiple variables (Bentler, 1998). In this research, AMOS, version 22 will be used for the SEM to test the influence of one or more of the variables on another and to provide their interrelationships as well as to measure the variable path analysis model.

## 4.17 Reliability

Reliability, according to Hair et al. (1998, p. 117), is *"an assessment of the degree of consistency between multiple measurements of a variable."* Reliability indicates the consistency and quality of research findings. Hair et al. (2007) state that *"a survey instrument can be considered reliable if repeatedly applying the instrument results in consistent scores"*. When subjected to a series of tests and retests across time periods, the results obtained should not vary significantly. Calculating the coefficient alpha, also known as Cronbach's alpha, is another way to ascertain reliability. This is the most commonly used measure of checking the reliability of the internal consistency of the entire scale used in a research. The Cronbach's alpha should be at least .70 although .60 may also acceptable where large data is used (Hair et al. 1998; Pallant, 2010). Composite reliability is another test of the reliability and consistency of data; for every latent variable, the composite reliability needs to be calculated. Janssens (2008) recommends a composite reliability value of at least .70. In this research, Cronbach's alpha and composite reliability were adopted to test the internal consistency of the data and assess the scale reliability.

## 4.18 Validity

Validity in a research, according to Hair et al. (2007), *"is the extent to which a construct measures what it is supposed to measure."* There are four types of this: construct, content, convergent and discriminant validity.

### 4.18.1 Construct Validity

Construct validity is critically important in any research as establishing it for the measurement items validates the result and strengthens the representativeness of

the findings in the existing population (Hair et al. 2006). According to Hair et al. (2006), the construct validity is concerned with measurement accuracy as it addresses the extent to which items used to measure the theory-based latent variable actually reflect such a variable. To establish construct validity, the researcher needs to perform content, convergent and discriminant validity tests (Hair et al., 2007).

### 4.18.2 Content Validity

The content validity, also known as the face validity, of a scale, asks whether scale items measure the items they are supposed to. This is done by checking if the variables similar in nature load together on the same factor and whether there is any explanation for the differences (Hair et al., 2007). In this research, to ensure content validity, all items that measured each construct were adapted from previous researches and piloted. Based on the feedback from the pilot, amendment and appropriate corrections were made to some of the items before being used in the final questionnaire.

### 4.18.3 Convergent Validity

The convergent validity *"indicates the degree to which two different indicators of a latent variable confirm one another"* (Janssens, 2008, p. 306). This means that the variables within a single factor are highly correlated; this is evident by the factor loadings. There are different ways to measure convergent validity, which includes assessing each construct for significant critical ratios of 1.96 or more ($p < 0.5$) and ensuring that the standardised regression coefficient value is greater than .50 (Hair et al., 2007). Convergent validity can also be measured by calculating the average variance extracted (AVE), reflecting how much the overall variance the latent construct is responsible for within the measurement items; that AVE should be .50 or more, as the higher the variance extracted the more the item actually represents the latent construct (Ibid.).

### 4.18.4 Discriminant Validity

Discriminant validity refers to the extent in which factors are distinct and uncorrelated; variables should relate more to their own factor than to another factor (Hair et al., 2006). A discriminant validity test can be conducted through a comparison of the squared correlation between two constructs with the variance extracted between those two constructs; the square of the correlation between the two constructs should be smaller than their corresponding average variance

extracted (AVE) (Hair et al., 2007). In this research, all required validity tests will be conducted to ensure each construct item measured what it was supposed to.

### 4.19 Generalisability and Transferability

Generalisability refers to whether research findings can be applied to cases or situations beyond the specific context in which the research was conducted. Transferability refers to the process by which the readers of a piece of research can make connections between elements of a study and their own experience and transfer the findings to other situations. The findings and elements of this research may be generalisable and transferable to other contexts, for the following reasons:

(i.) No other studies have compared a group of users of one specific e-government service, with these users living both inside and outside of the relevant country.
(ii.) This research has the compared digital divide between developed and developing countries within the context of a specific case.
(iii.) This research has studied the users of an e-government service in both urban and rural areas.
(iv.) This research is based on a specific topic which has not been covered in any other study.
(v.) The case study country, Nigeria, is the most populated in Africa. The findings from this study are therefore transferable to other developing countries.
(vi.) The findings from this study will be useful to e-government practitioners and governments who will ideally feel obligated to improve their e-government services in light of them.

### 4.20 Ethics

The ethical aspects of this research were addressed by implementing the following procedures:
- All of the respondents who participated in this study were informed about its aims and objectives. They all participated voluntarily, and they were advised they had the right to withdraw at any stage from the completion of the questionnaire.

- The questionnaire used in this study did not necessitate the collection of sensitive information from the participants. In addition, no discriminatory or any other unacceptable language or material was contained or used in the questionnaire that any participant could deem offensive irrespective of age, race, gender or sexual orientation.

- All data collected was intended for this study and will be used for any purpose other than for the research; it will be discarded in line with Data Protection Act 1998.

- All materials used in this study that do not belong to the researcher have been duly acknowledged, and the research has not knowingly or unlawfully obtained any materials without the due consent of the owner of such materials or acknowledgement of them. Any omission therein is regretted.

### 4.21 Reflection on Methodology Limitations

The limitations of this study are related to the sampling process and the method used for data collection. This study adopted snowball sampling, as the researcher was not able to obtain a record of users of the Nigeria Immigration e-government services or visitors to its website due to privacy concerns. Also, an online survey was adopted for data collection due to the participants being located all over the world.

The limitations of snowball sampling include the facts:

- There is no random sample
- It is difficult to determine sampling errors
- The sampled populations can be unrepresentative
- There is the possibility of bias towards certain professional groups and those familiar with the use of computing technology.

On the topic of the method adopted for data collection, the limitations of an online survey include the issues that:

- It can be difficult to tell who has completed the online survey
- Participants can complete the questionnaire even if they have not used the NIS portal
- Questionnaires can be only partially completed
- Questions may be interpreted differently and this can lead to ambiguous data.

# Chapter 5: Research Model and Hypotheses

## 5.1 Introduction

This chapter begins by defining the focus of this study, then presents and describes in detail the proposed hypotheses based on the literature review where a theoretical basis was presented. This chapter therefore encompasses the key variables used for measurments, proposed hypotheses and models for the user experience of e-government services and the digital divide.

## 5.2 Developing Measures for the Study

This study aims to contribute to a better understanding of users' experience of e-government services in developing countries through the study of a specific service, the Nigeria Immigration Service (NIS) portal. Halaris et al. (2007) classifies the approaches to measuring the quality of e-government into three categories concerned respectively with: the quality of traditional public services (e.g. balanced scorecard, Six Sigma); the quality of e-government services (e.g. the American Customer Satisfaction Index [ACSI] and the quality of e-services (e.g. E-S-QUAL, E-Qual, e-service quality, SERVQUAL). Such previous studies have generated a rich bank of items for measuring aspects of user experience associated with e-government. This research has used measures adapted primarily from previous research and the literature on e-government services, service quality and e-government adoption and satisfaction. These previous studies generated a rich bank of items for measuring aspects of user experience associated with e-government. In order to identify the key factors for inclusion in the questionnaire utilised for this study, a database of items used by previous studies, including those in the technology adoption, user/customer satisfaction and service quality traditions was collated; **see Appendix 3**, in which a comprehensive list of measurement items extracted from previous researchers is detailed. The key variables was used to developed proposed user experience model based on the literature.

In this model, six variables were identified as factors influencing users' experience of e-government services, based on relevant research, including studies on technology adoption, customer satisfaction and service quality. Next, hypotheses were then formulated based on the proposed research model, and to test to determine the strength of theses hypotheses relationships. Based on this research goal, this research is primarily explanatory as it is quantitative intensive.

## 5.3 Generation of Measurement Item Scales

The items included for measuring each variable were selected from previous researches after an extensive review of the literature **(see Appendix 3)** including those in the technology adoption, diffusion of innovation, customer satisfaction and service quality traditions as shown in Table 5.1. The measuring items were selected based on their relevance to the context of the study, any duplicate items were eliminated and minor variants consolidated. The process was made easier by the extent of re-use or adapting of items from earlier studies, by previous researchers. Items were clustered under factors. The items were then selected and adapted and the wording was changed for some in accordance with the context of the study: the NIS. In line with the literature reviewed, all variables were defined, while some definitions were adopted directly; some had their wording changed in accordance with the study context. Table 5.1 shows the measurement items generated and adapted from previous researches:

| Construct | Construct definition | Items | Adapted from | Recently used by |
|---|---|---|---|---|
| Barriers | This refers to what users feel or see as hindrances to the fulfilment of the advantage or desired effect of using the NIS website system compared to face-to-face service. | - It is costly to have internet access in order to use government e-services.<br>- An intermittent electricity supply makes it difficult for me to use NIS e-services.<br>- It is difficult to seek technical support from the NIS website team.<br>- Lack of access to a computer results in extra cost when using the NIS website e-service.<br>- I worry about my financial details being stolen.<br>- I have no negative reason to not use the NIS website.<br>- I worry about safe transactions online.<br>- I worry about my personal information being used by others.<br>- Using the NIS website to apply for a passport or a visa may cost me more.<br>- There is a lack of technical support available on the NIS website.<br>- The NIS website is too complex to use. | Sweeney, Soutar and Johnson (1999); Zhang and Prybutok (2005) | Udo, Bagchi and Kirs (2008) |
| Benefits | This refers to the extent in which users derived an advantage or a desired effect of using the NIS website system compared to the face-to-face service. | - I am able to use NIS e-services at a time that suits me.<br>- I am able to use NIS e-services from anywhere in the world.<br>- I am able to accomplish tasks more quickly using the NIS website compared to the face-to-face service.<br>- Making use of the NIS website reduces my travelling expenses.<br>- Making use of the NIS website reduces my queuing time.<br>- I do not consider the NIS website of any benefit to me.<br>- Making use of the NIS website allows me to conduct a transaction out of normal working hours.<br>- Making use of the NIS website reduces my visa / passport application process time.<br>- Making use of the NIS website improves | Parasuraman, Zeithmal and Malhotra, (2005); Wangpipatwong, Chutimaskul and Papasratorn (2005) | Wangpipatwong, Chutimaskul and Papasratorn (2008); Shareef et al (2011) |

| | | | | |
|---|---|---|---|---|
| | | the effectiveness of my visa / passport application.<br>- Making use of the NIS website simplifies my visa / passport application processing time.<br>- Making use of the NIS website reduces the time associated with my initial enquiry | | |
| Ease of use | This refers to the extent in which a user believes a specific computing technology will be free of great effort or difficulty. | - I can use the NIS e-services without any form of technical support.<br>- I can easily use e-services on the NIS website.<br>- I find enough information on the NIS website to process my transactions.<br>- I find it easy to navigate the NIS website.<br>- I find the NIS website user-friendly.<br>- I find it easy to understand the information on the NIS website.<br>- I feel comfortable using the NIS website.<br>- I find it easy to obtain information for my needs from the NIS website.<br>- I find it easy to complete transactions on the NIS website.<br>- I do not consider the NIS website to be user-friendly. | Davis, Bagozzi and Warshaw(1989); Wangpipatwong, Chutimaskul and Papasratorn (2005) | Hung, Chang and Yu (2006); Wangpipatwong, Chutimaskul and Papasratorn (2008); Mohammad, Almarabeh and Ali (2009) |
| Information quality | This refers to the quality of the content on the NIS website and the way users perceive its accessibility or usefulness of the information provided. | - There is adequate information on the NIS website for me to process any transaction.<br>- The content of the NIS website is useful for my purpose.<br>- The information on the NIS website is up to date.<br>- The NIS website layout makes it easy for me to find things at first sight.<br>- The NIS website provides detailed information on the services available.<br>- I do not consider the information on the NIS website to be accurate.<br>- The information on the NIS website is reliable.<br>- The NIS website provides information in an appropriate format.<br>- There is sufficient information on the NIS website for me to make a transaction decisions.<br>- The information on the NIS website meets the needs of both citizens and non-citizens. | Li (1997); Aladwani and Palvia (2002); Wangpipatwong, Chutimaskul and Papasratorn (2005) | Hung, Chang and Yu (2006); Barnes and Vidgen (2007); Wangpipatwong et al. (2008); Mohammed, Almarabeh and Ali (2009); Karunasena and Deng (2012) |
| Trustworthiness | This refers to the users' perceived reliability, reliance and safety of the NIS website / e-government services. | - It is safe to conduct financial transactions on the NIS website.<br>- The NIS website provides adequate measures to protect my financial details.<br>- The NIS website security policy is clearly stated and accessible to the users of the website.<br>- I am happy to put my personal information on the NIS website.<br>- The NIS website protects my personal information.<br>- I am worried about putting my confidential details on the NIS website.<br>- The information that I give on the NIS website is only used for the reason for which it is submitted.<br>- My information is only accessed by an authorised person.<br>- The NIS website has a good reputation.<br>- I feel confident that I can rely on transactions conducted through the NIS website.<br>- I feel confident that the NIS will meet their obligations for transactions conducted through their website. | (Harrison McKnigh, Choudhury and Kacmar, 2002) | Hu et al. (2009) Shareef et al (2011); Papadomichelaki and Mentzas (2012) |

| | | | | |
|---|---|---|---|---|
| User satisfaction | This refers to the users' perceived expectations, contentment or pleasure derived from using NIS website / e-government services. | - The cost of getting access to and using the NIS e-services.<br>- The ease of access to the NIS website.<br>- The technical support received while using the NIS website.<br>- The usefulness of the information provided by the NIS website.<br>- The security of transactions provided by the NIS website.<br>- The convenience of accessing the NIS website anywhere and anytime.<br>- The extent to which the NIS website meets my expectations.<br>- Overall, how satisfied are you, with the e-service on the NIS website?<br>- Overall, how satisfying is your experience with the NIS website? | Davis, (1993); Zhang and Prybutok (2005); Olorunniwo, Hsu and Udo (2006) | Hu et al. (2009); Udo, Bagchi and Kirs (2010) |
| Website quality | This refers to the users' views or feelings on the NIS website through the path of achieving their desired objectives that include legible content, clean page layouts, easy navigation, legible content and language used on the website. | - Completing the forms online on the NIS website has been made easy for me.<br>- Technical support available on the NIS website is as good as on any other e-government website that I have used.<br>- The NIS website is well-designed compared to other e-government website that I have used.<br>- I always have problems using the NIS website.<br>- Using the NIS website is a pleasant experience.<br>- The NIS website enables me to interact with this government agency.<br>- I feel adequately informed when using the NIS website.<br>- I always know how to find things when using the NIS website.<br>- I feel confident that I understand the language used on the NIS website.<br>- I feel empowered when using the NIS website. | Yoo and Donthu (2001); Wolfinbarger and Gilly (2003); Zeithaml, Parasuraman and Malhotra (2002); Parasuraman, Zeithaml and Malhotra (2005); Zhang and Prybutok (2005) | Hu et al. (2009); Udo, Bagchi and Kirs (2010); Shareef et al. (2011) |

***Table 5.1: Measures table***

## 5.2 User Experience Hypotheses Development

A number of variables were drawn from the theoretical discussions presented in the literature review in Chapter 3 and the hypotheses developed, which comprised the research model. The research model is shown in Figures 5.1 and 5.2, with the meaning and theories supporting the relationship in the model presented.

### 5.2.1 Information Quality

According to Li (1997) and Aladwani and Palvia (2002), the term 'information quality' refers to the quality of a website's content. Wangpipatwong, Chutimaskul and Papasratorn (2005) refer to this as the way in which users perceive the quality of information provided within a website. DeLone and McLean (2004) have stated that information quality includes the relevance, timeliness and accuracy of the information made available to e-government website users. Content can be in the form of graphics, simple information, questionnaires, forms, appearance, fonts,

colours and links. In order to increase adoption and satisfaction rates, website designers and developers focus on a website's information and content irrespective of whether it is static or dynamic according to the targeted users' needs (Alshehri et al., 2012; Al-Jaghoub, Al-Yaseen and Al-Hourani, 2010). It should be noted that through information quality, an e-government service conveys its usefulness to the user (Parent, Vandebeek and Gemino, 2005) and this promotes not only the benefits of accessing the necessary information but also ease of use (Detlor et al., 2013). In the view of Yuan, Xi and Xiaoyi (2012), when a user does not find what they are seeking on the site, then there is a possibility that they might not visit the site again. Al-Jaghoub, Al-Yaseen and Al-Hourani (2010) have suggested that apart from presenting relevant information on the website, it is also crucial to present content logically through navigation that promotes ease of use. The information quality of an e-government site is judged through accuracy, reliability, relevance and ease of use (Papadomichelaki and Mentzas, 2012). It represents how the offered interface is capable of benefiting and promoting users' ease of use (Detlor et al., 2013). This discussion led to the following hypotheses:

***$H_{US1}$: Information quality influences the benefits of the NIS portal***

***$H_{US2}$: Information quality influences the ease of use of the NIS portal.***

### 5.2.2 Website Quality

Yoo and Donthu (2001), Wolfinbarger and Gilly (2003) and Zeithaml, Parasuraman and Malhotra (2002) refer to users' views of an e-government website as being of a high quality if it achieves their desired objectives, including legible content, clean page layouts, easy navigation and simple language. The website's quality can be ascertained through its ease of use and the convenience of accessing information on it. According to Aladwani (2013), ease of use relates to information and content on the site as well as the system controlling the web design. The performance characteristics and features of e-government websites determine the level of website quality (Youngblood and Mackiewicz, 2012). Other indicators of website quality include: connection speed, navigability, interactivity, responsiveness and security (Aladwani, 2013). A website of a high quality has a positive effect on users' frequency of visits and their use of its services (Elling et al., 2012). Quality is linked to satisfaction levels and ultimately adoption of e-government services (Armstrong, 2011). The website's quality has an important role in formulating individual perceptions and hence leads to an increased usage of the e-government website (Elling et al., 2012). An e-government website considered to be of a high

quality is easy of use, resulting in a quick delivery of services, improved interactions and greater convenience for the user (Kaisara and Pather, 2011). A quality website is a platform that offers citizens control of the means to interact with their government (Kohlborn, 2014). A high-quality website is easy of use (Almahamid et al., 2005) because with a controllable, clear and understandable design, it facilitate website users identifying its reliability, responsiveness and performance. These are the key features of a website service for consumers in the adoption and satisfaction of e-government service (Alshehri et al., 2012). This discussion led to the following hypotheses:

***$H_{US3}$: Website quality influences users' perceptions of the trustworthiness of the NIS portal***

***$H_{US4}$: Website quality influences the ease of use of the NIS portal.***

### 5.2.3 Ease of Use

The ease of use of an e-government service, according to Davis, Bagozzi and Warshaw (1989) and Wangpipatwong, Chutimaskul and Papasratorn (2005), describe as the extent to which a user believes that using a specific system is or will be free of any effort or difficulty. Ease of use is a vital factor upon which the adoption and satisfaction of e-government services are reliant (Wangpipatwong, Chutimaskul and Papasratorn, 2008). The ease of use of e-government websites makes people more likely to use them (Ibid.). When using government services on electronic platforms is free of effort or difficulty, the barriers to using such services are reduced (Beldad et al., 2012). If users can complete and perform a transaction effectively on the NIS portal with relative ease, they will be interested in using the online service. Difficulties in using a system or website can be an active barrier as it portrays the e-government website as unsuitable to users (Kumar et al., 2007). This discussion led to the following hypothesis:

***$H_{US5}$: Ease of use influences barriers to use of the NIS portal.***

### 5.2.4 Barriers

According to Sweeney, Soutar and Johnson (1999) and Zhang and Prybutok (2005), the term 'barriers' in e-government services refers to what users feel or see as a hindrance to the fulfilment of the advantages or desired effects of using a website or e-government service compared to a face-to-face service. Urciuoli, Hintsa and Ahokas (2013) suggest that e-government barriers refer to aspects that limit or obstruct the use of e-government services. Barriers to e-government include financial constraints (Urciuoli, Hintsa and Ahokas, 2013), lack of staff, lack

of knowledge, lack of support, staff resistance, lack of community interest, privacy issues, security issues and technological needs (Schwester, 2009 and Wangpipatwong, Chutimaskul and Papasratorn, 2008). These perceived risks play a huge role in the users' satisfaction with an e-government website (Gilbert, Balestrini and Littleboy, 2004). Risk is an important barrier that influences the use of e-government services and affects the perceived satisfaction and adoption levels of users (DeMaagd et al., 2013). Gilbert, Balestrini and Littleboy (2004) state that a barrier in technological terms is a risk that makes users wary of becoming engaged with an activity; due to the prevalence of barriers, communities have been slow to adopt e-government services (Bwalya, 2009). Barriers have a strong influence on the potential benefits of an e-government service (Kamal, Weerakkody and Irani, 2011). They restrict citizens' feelings of control when using a website and affect their satisfaction with the use of e-government websites (Bwalya, 2009). Moreover, they can also hamper the personalisation of users' services which influences their satisfaction with an e-government website (Kumar et al., 2007). Without tailoring services to the specific needs of users, a government is not able to satisfy or encourage them to re-use the services (Ibid.). This discussion led to the following hypothesis:

***$H_{US6}$: Barriers influence user satisfaction with the NIS portal.***

### 5.2.5 Benefits

Parasuraman, Zeithaml and Malhotra (2005) and Wangpipatwong, Chutimaskul and Papasratorn (2005) employ the term benefits to refer to the extent to which users derive an advantage or a desired effect of using an e-government website system compared to a face-to-face service. The idea of a benefit in this context has further been defined as a consumer's belief in the extent to which he or she will gain an advantage from an online transaction with a website (Kim, Ferrin and Rao, 2008). According to Kassim and Asiah Abdullah (2010), benefits affect users' online satisfaction.

In this study, satisfaction refers to users' perceived expectations, and the contentment or pleasure derived from using the NIS portal/e-government services. Previous research findings suggest that end-user satisfaction is a significant factor in measuring user experience (Davis, 1993; Zhang and Prybutok, 2005; Olorunniwo, Hsu and Udo, 2006). In the context of this study, the researcher has aimed to measure user satisfaction. This is related to users' perceptions of an online service's convenience (transactions), the reliability of the information

available (transparency) and its interactivity (Hu et al., 2009; Udo, Bagchi and Kirs, 2010; Welch, Hinnant and Moon, 2004). In this research, satisfaction is significant in the overall use of e-government services. This discussion led to the following hypothesis:

***$H_{US7}$: Benefits influence users' satisfaction with the NIS portal.***

### 5.2.6 Trustworthiness

Harrison McKnight, Choudhury and Kacmar (2002) use the term trust to refer to users' perceptions of the reliability and safety of e-government services. Citizens' confidence in the technological platform provided by a government is identified as imperative in the adoption of e-government policies (Bélanger and Carter, 2008). Trust is defined as the level of expectation imposed by users of government services. It forms an important construct and catalyst for users in predicting their intentions to use the state's e-government services (Bélanger and Carter, 2008). Trust is referred to as the feelings users have towards the government's control over the retrieval, storage and sharing of their information (Bélanger, Hiller and Smith, 2002). In e-government, trust is identified as a well-established construct with several conceptualisations (Bannister and Connolly, 2011). E-government website use is directly associated with users' satisfaction, which is directly associated with users' trust in e-government services (Bannister and Connolly, 2011). Trust and experience is gained through usage and adoption. Trust helps users to share their personal information online and to engage in e-government online transactions (Al-Hakim, 2007). The increase in e-government adoption has been identified with high degrees of trust (Parent, Vandebeek and Gemino, 2005). Perceived trust has a major influence on e-government service adoption and satisfaction (Alawneh, Al-Refai and Batiha, 2013), as it increases or decreases the risk levels perceived by users (Bélanger and Carter, 2008). In order to have control over the perceived trust levels of service users, it is necessary to focus on key criteria such as privacy, security and other similar risks (Urciuoli, Hintsa and Ahokas, 2013). Other issues like confidentiality, usability and quality are interdependent, and also have a major impact on the satisfaction and adoption of e-government services (Kumar et al., 2007; Bwalya, 2009). This discussion led to the following hypothesis:

***$H_{US8}$: Trustworthiness influences users' satisfaction with the NIS portal.***

## 5.3 User Experience Conceptual Framework

Based on the theoretical framework discussed in the literature review and the hypotheses set out in this chapter, the following conceptual framework was proposed, and this incorporates concepts from previous models to test e-government services. This model was conceptually based on end-user satisfaction, technology adoption and e-service quality models as discussed in the literature review. It relates to the concept that benefits, barriers and trustworthiness affect user satisfaction **(**Bannister and Connolly, 2011**).** This study consider users' satisfaction with a specific e-government website in light of their experiences with it. User satisfaction is determined by the overall quality, especially of the information, of the website, including its ease of use, its perceived benefits and trustworthiness and the barriers to using it. The e-government services user experience hypotheses and the e-government services user experience (eGSUE) model developed are shown in Figure 5.1 and Table 5.2 respectively.

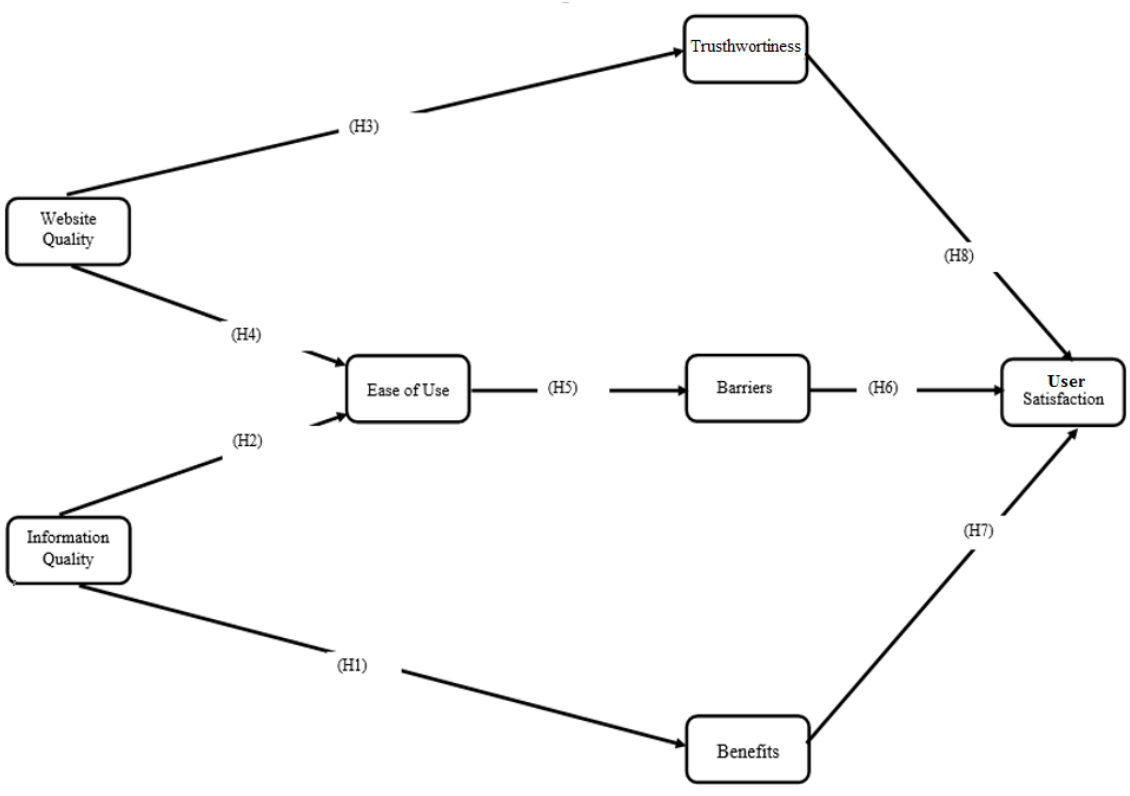


***Figure 5.1: Proposed e-government services user experience* (eGSUE) *model***

| | Hypotheses |
|---|---|
| $H_{US1}$ | Information quality influences the benefits of the NIS portal |
| $H_{US2}$ | Information quality influences the ease of use of the NIS portal |
| $H_{US3}$ | Website quality influences users' perceptions of the trustworthiness of the NIS portal |
| $H_{US4}$ | Website quality influences the ease of use of the NIS portal |
| $H_{US5}$ | Ease of use influences barriers to use of the NIS portal |
| $H_{US6}$ | Barriers influence users' satisfaction with the NIS portal |
| $H_{US7}$ | Benefits influence users' satisfaction with the NIS portal |
| $H_{US8}$ | Trustworthiness influences users' satisfaction with the NIS portal |

***Table 5.2 Proposed e-government services user experience hypotheses***

## 5.4 Digital Divide Hypotheses Development

Demographic statistics supporting the hypotheses testing on the digital divide in the use of e-government services are discussed in this section. Demographic (age, education, gender and income), social-economic (employment) and geographical (people living in rural and urban areas and in developing and developed countries) factors were considered as causing a digital divide as they affect e-government users' access to computing facilities, internet and e-government experience. The research model used to guide the study is depicted in Figure 5.2, and the previous research supporting the relationship shown in the model is presented.

### 5.4.1 Location

Over a decade ago, Hindman (2000) stated that although the percentage of internet usage was increasing in urban areas, the gap between urban and rural communities has not decreased in this respect. Studies by Graham (2002) and Bonfadelli (2002) have also found that usage of technology is found more in urban individuals than in their rural counterparts.

The main cause of the digital divide in rural areas is the low income of rural individuals. Most urban individuals earn a comparatively high income, which enables them to easily avail themselves of technological facilities. Cresci, Yarandi and Morrell (2010), Sitawa-Ogutu and Rege (2010) and Warschauer (2012) confirm that nothing has changed since that research and that the digital divide still exists amongst individuals irrespective of location.

According to Petrazzini and Kibati (1999), developing countries face barriers of limited access to the internet. Rouvinen (2006) has argued that people in developed countries can easily connect to the internet, allowing them to use it more frequently, when compared to people in developing countries. People in developing countries face problems when it comes to the easy availability of internet connections due to a lack of the resources required for this service. According to Gulati (2008), people in developed countries have more knowledge and experience of technologies than those in developing nations. Developing countries are striving to adopt technological innovations and internet technology. People in developed countries thus have more experience of internet usage than those in developing countries. Studies by Guillén and Suárez (2005), White (2012), Park and Kim (2015) and Banihashemi and Rejaei (2015) argue that people from developing countries have low living standards which results in their limited access to computing facilities.

Limited internet access prevents developing countries' citizens from taking full advantage of e-government services. Citizens in developed countries often enjoy easy access to the internet without facing any limitations, making them significant users of it. Developed countries are far ahead in terms of inventions and technological advancement, enjoy better access to computing facilities and affordable internet connections and are significant users of the internet. This discussion led to the following hypotheses:

***$H_{DD1}$: Location (rural/urban) affects access to computing facilities***
***$H_{DD2}$: Location (rural/urban) affects internet experience***
***$H_{DD3}$: Location (rural/urban) affects e-government experience***
***$H_{DD4}$: Location (developing/developed country) affects access to computing facilities***
***$H_{DD5}$: Location (developing/developed country) affects internet experience***
***$H_{DD6}$: Location (developing/developed country) affects e-government experience.***

### 5.4.2 Gender

In research undertaken by Morahan-Martin (1998), men claimed to know more about the internet than women. Moreover, technological awareness influences the digital divide as women are less technological adept than men. This makes men more experienced users of the internet than women. Howard, Rainie and Jones

(2001) mention in their report that a greater percentage of men use the internet to communicate in work environments as compared to women. According to Durndell and Haag (2002), women's lack of interest in the technology has a crucial impact on internet usage. Wasserman and Richmond-Abbott (2005) have revealed that more men than women use the internet, as women face limitations when it comes to internet access while men. In addition, men began using the internet, through visits to cybercafés, earlier than women and hence have more internet experience than women. Thus, gender is a key factor in internet accessibility. Dixon et. al. (2014, p. 991), in their recent research on the digital divide between male and female users of the internet at public access points in Austin, Texas in the United States, found that *"male users outnumber female users in public access internet usage, even accounting for age and ethnicity".* Additionally, a recent research by Antonio and Tuffley (2014) finds that there is low technology participation from women in the developing world. This research led to the following hypotheses:

***$H_{DD7}$: Gender affects access to computing facilities***

***$H_{DD8}$: Gender affects internet experience***

***$H_{DD9}$: Gender affects e-government experience.***

### 5.4.3 Age

The significance of age in the use of computing facilities has been documented by previous researches (Nwalo, 2000; Idowu and Adagunodo, 2004). Lenhart et al. (2010) reveal that all age groups make frequent use of the internet but the websites they visit are different. Young adults, ranging from 18 to 25 years, visit non-professional social networking sites more frequently in large numbers than those in the other age groups. Older age groups tend to have less access to computing facilities than people in the younger age groups, although older people might make more use of e-government services but less use of social networking sites. This could because the older age group tends to be less interested in technology than the younger age groups. This view is supported by Heart and Kalderon (2013), who recognise that older age groups are slower in adopting ICT than younger age groups. This discussion led to the following hypotheses:

***$H_{DD10}$: Age affects access to computing facilities***

***$H_{DD11}$: Age affects internet experience***

***$H_{DD12}$: Age affects e-government experience.***

### 5.4.4 Education

Education has a significant impact in all areas of life. People who cannot read or write rarely expect to make practical use of computers or of accessing the internet. Kiiski and Pohjola (2002) assert that education is the most consistent global predictor in measuring experience and access to internet technology. Education reshapes people's thinking abilities and the different levels of education play different roles. It is said that people with a high level of education are more likely to have computers and broadband connections than people with a lower level of education, with the former more likely to have internet access at home and to spend a lot of time on the web. Education helps instil ICT skills thus making people aware of the importance of advanced technology and communication in their daily life. Therefore, levels of education can have an impact in measuring people's ability to take advantage of the internet in various ways. The gap in accessing the internet and computers is influenced by the quality of education a person has or aspires to have. According to studies (Wilson, Wallin and Reiser, 2003 and Chinn and Fairlie, 2006), as highly educated people keep up with technology, they enjoy easy access to the internet. This shows that they are ahead in terms of technology as compared to people who have a lower level of education. It also suggests that people with high levels of education tend to have more experience of the internet because of their increased knowledge. In developing countries, the problem of internet access exists because these nations are poor and the majority of people have a low level of education (UN, 2014). This discussion led to the following hypotheses:

***$H_{DD13}$: Education affects access to computing facilities***

***$H_{DD14}$: Education affects internet experience***

***$H_{DD15}$: Education affects e-government experience.***

### 5.4.5 Employment

An individual's employment status can impact internet access and experience. In the context of work, private-sector employees mostly use the internet for communicating within the office. According to Goldberg, Wagner and Brewer (1997), government employees often use the internet for the purpose of downloading information to perform routine tasks. Self-employed people also use the internet for carrying out online transactions, such as online banking for receiving payments. According to Fountain (2005), unemployed people normally use the internet to search for jobs. Some unemployed people face issues

regarding internet access as they often have limited resources but that does not relate to their internet experience. However, most of them enjoy unlimited access to the internet but the use of it depends greatly on their level of work; if the nature of their work is internet-related, then they have more experience regarding its use than others (Rustad and Paulsson, 2005). Vicente and López (2011) argue that most students use the internet to seek out reading materials, doing their assignments and preparing for exams. They also use the internet to communicate with friends.

Therefore, employment status may impact internet access, but it does not appear to have a significant effect on it. This discussion led to the following hypothesis:

***$H_{DD16}$: Employment affects access to computing facilities***

***$H_{DD17}$: Employment affects internet experience***

***$H_{DD18}$: Employment affects e-government experience.***

### 5.4.6 Income

According to research by van Dijk and Hacker (2003), individuals' income has a significant effect on internet access. Individuals who earn a high income enjoy easy access to both information and communication technology and the internet. Servon and Nelson (2001) have pointed out that technological facilities are available to people with high incomes to gain access; due to the availability of portable devices, such people can often have unlimited internet access, and are significant users of the internet as compared to people who have low incomes. According to Warschauer (2002), people with low levels of income cannot afford high-tech fast-processing computers and the use of lower performance computers affects internet access. People with low incomes cannot always afford internet connections (Chakraborty and Bosman, 2005). Thus, all these factors are barriers to acquiring high-quality internet access. Fuchs and Christian (2008) have also mentioned that people who earn low incomes face affordability issues when it comes to internet access. This discussion led to the following hypotheses:

***$H_{DD19}$: Income affects access to computing facilities***

***$H_{DD20}$: Income affects internet experience***

***$H_{DD21}$: Income affects e-government experience.***

## 5.5 Proposed Digital Divide Hypotheses and Model

The proposed digital divide hypotheses and model supporting the relationship are presented in Table 5.3 and Figure 5.2.

| Hypotheses | |
|---|---|
| $H_{DD1}$ | Location (rural/urban) affects access to computing facilities |
| $H_{DD2}$ | Location (rural/urban) affects internet experience |
| $H_{DD3}$ | Location (rural/urban) affects e-government experience |
| $H_{DD4}$ | Location (developing/developed country) affects access to computing facilities |
| $H_{DD5}$ | Location (developing/developed country) affects internet experience |
| $H_{DD6}$ | Location (developing/developed country) affects e-government experience |
| $H_{DD7}$ | Gender affects access to computing facilities |
| $H_{DD8}$ | Gender affects internet experience |
| $H_{DD9}$ | Gender affects e-government experience |
| $H_{DD10}$ | Age affects access to computing facilities |
| $H_{DD11}$ | Age affects internet experience |
| $H_{DD12}$ | Age affects e-government experience |
| $H_{DD13}$ | Education affects access to computing facilities |
| $H_{DD14}$ | Education affects internet experience |
| $H_{DD15}$ | Education affects e-government experience |
| $H_{DD16}$ | Employment affects access to computing facilities |
| $H_{DD17}$ | Employment affects internet experience |
| $H_{DD18}$ | Employment affects e-government experience |
| $H_{DD19}$ | Income affects access to computing facilities |
| $H_{DD20}$ | Income affects internet experience |
| $H_{DD21}$ | Income affects e-government experience |

***Table 5.3: Proposed digital divide hypotheses***

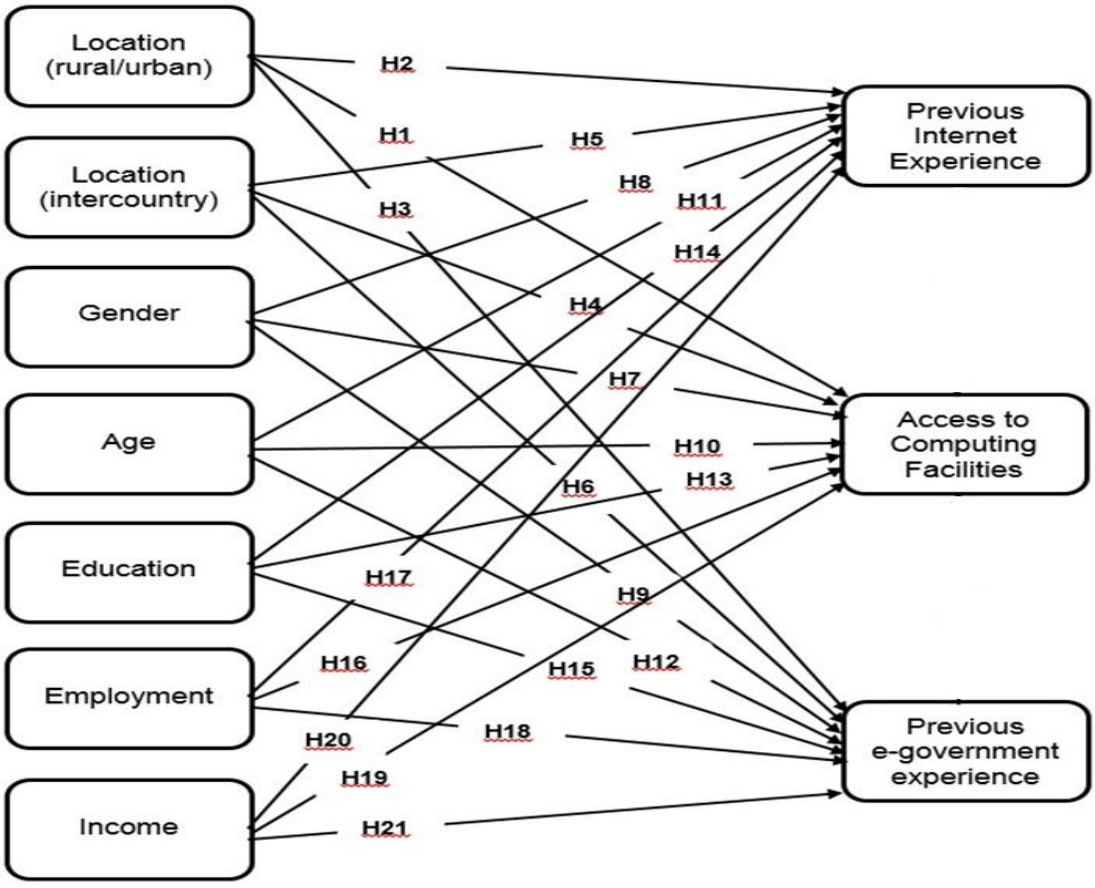


***Figure 5.2: Proposed digital-divide model***

# Chapter 6: Findings and Analysis

## 6.1 Introduction

Firstly, the data was loaded into SPSS, version 22 for statistical analysis and cleaned to remove any incomplete or inaccurate responses. In this study, the descriptive statistics compiled included the frequency distribution and the measures of central tendency and dispersion. Descriptive statistics were then generated both to profile the sample in terms of demographic data and to inspect it prior to undertaking further analytical analysis.

The generation of descriptive statistics and other further statistical analysis involved loading the data into SPSS, version 22. The data was then subjected to various descriptive analyses, including of demographic factors such as age, income, gender, education, county (of residence), location (rural/urban) and employment sector. The descriptive statistics presented in this research include a frequency table to group respondents according to the demographic factors. The descriptive statistics generated to profile the sample in terms of demographic data and to generate descriptive statistics for the Likert scale items. Finally, data from responses to the open questions was entered into NVivo, version 10 and analysed on the basis of the variable upon which they commented.

First, the initial reliability testing for the constructs was conducted and an exploratory factor analysis using principal component analysis led to the creation of an e-government services user experience scale. To test the proposed e-government service user experience modelling, a confirmatory factor analysis (CFA) followed, which was conducted on each individual construct for instrument model fit and refinement. The hypotheses were tested by applying the structural equation model, which resulted in the creation of the final model.

Next, with the aid of t-test and ANOVA using SPSS, the results of the survey were compiled, firstly with demographics and descriptive statistics, and hypotheses testing to profile the extent to which the digital divide related to the users of the NIS e-government website who participated in the study.

### 6.1.1 Data Examination and Missing Data Handling Process

The data collected was processed and assessed to check internal consistency to assure its quality for further analysis. This involved checking any missing data and possible errors (Pallant, 2010). This is because missing data resulting from

incomplete survey questions can cause the researcher problems (Janssens, 2008). In this case, missing data was eliminated before further statistical analysis was conducted

In this research, 1,782 respondents viewed or attempted to complete the online survey. The questionnaire screened out participants who had never used the Nigeria Immigration Service website. 1,371 people were screened out. 411 respondents were granted access to the online-based survey upon confirming a logic question previously used by the Nigeria Immigration Service website. 351 questionnaires were completed in full. 60 uncompleted surveys were eliminated when harvesting the data. Missing uncompleted questionnaires did not produce any problems with regards to missing data issues. The online questionnaire was designed to prevent respondents from skipping questions. This helped to minimise potential problems with missing data.

## 6.2 Demographical Characteristics of the Sample

### 6.2.1 Gender Distribution

There was an almost equal representation of both males and females in the sample: 50.1% and 49.9% respectively.

### 6.2.2 Age Distribution

Figure 6.1 shows that most of the respondents were aged between 18 and 55 years, with an even distribution in each of the age brackets. Only a relatively small percentage (0.9 %) of respondents were over 55, and only a very small percentage were over 65.

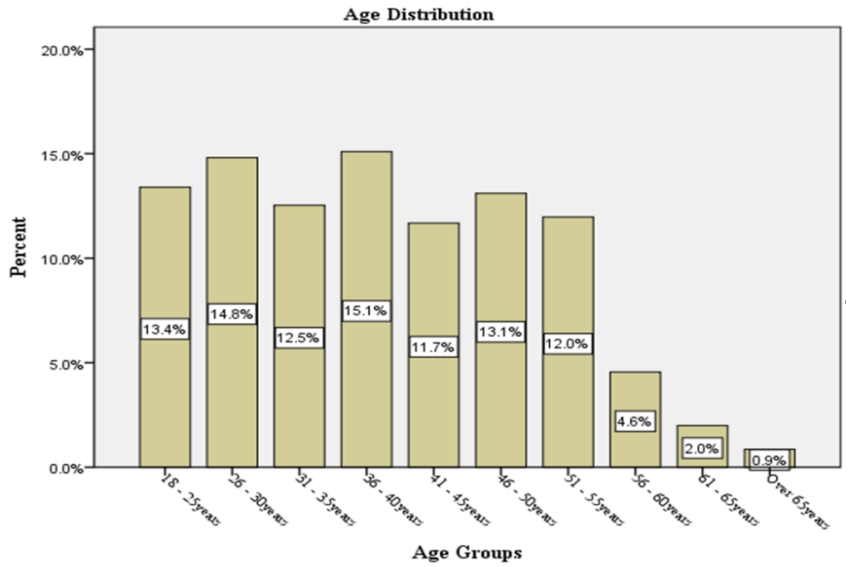


***Figure 6.1: Age distribution***

### 6.2.3 Educational Status

Figure 6.2 shows the respondents' educational status. 66.7% of the respondents had a bachelors degree or a higher qualification, 33% had a diploma, college or technical qualification while only 0.3% was not formally educated.

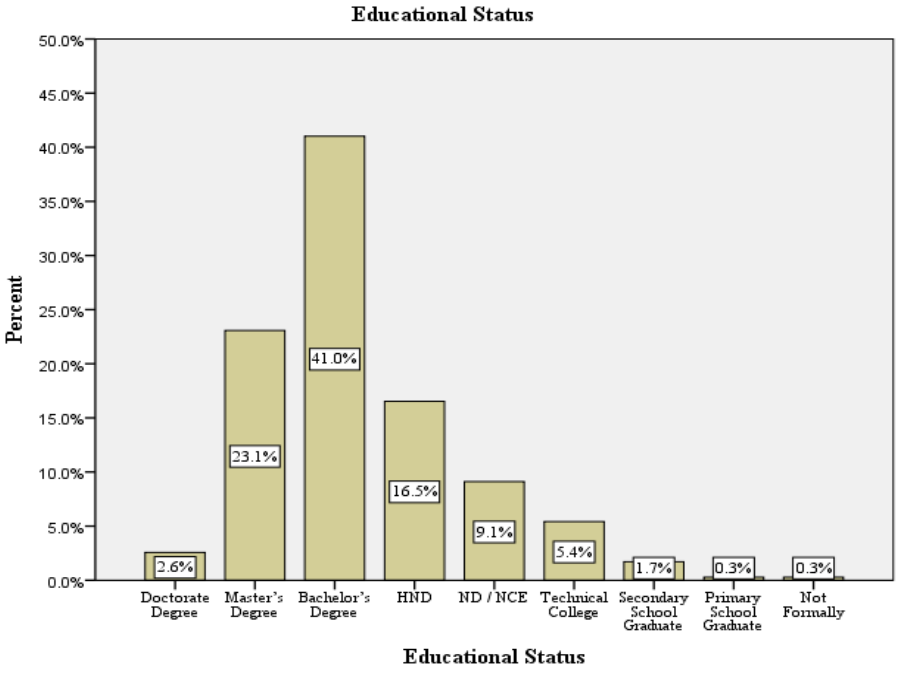


***Figure 6.2: Educational status***

Overall, the sample was well-educated and this was to be expected as the users of an immigration website are the subset of the population who have the wherewithal to engage in international travel.

### 6.2.4 Country of Permanent Residence

Figure 6.3 shows the respondents' country of permanent residence. Importantly, for both representativeness and further analysis of the digital divide, there was a relatively even split between citizens and non-citizens. For non-citizens, the largest group was living in the United Kingdom (22.5%), followed by the United States (9.1%) and Canada (4.3%).

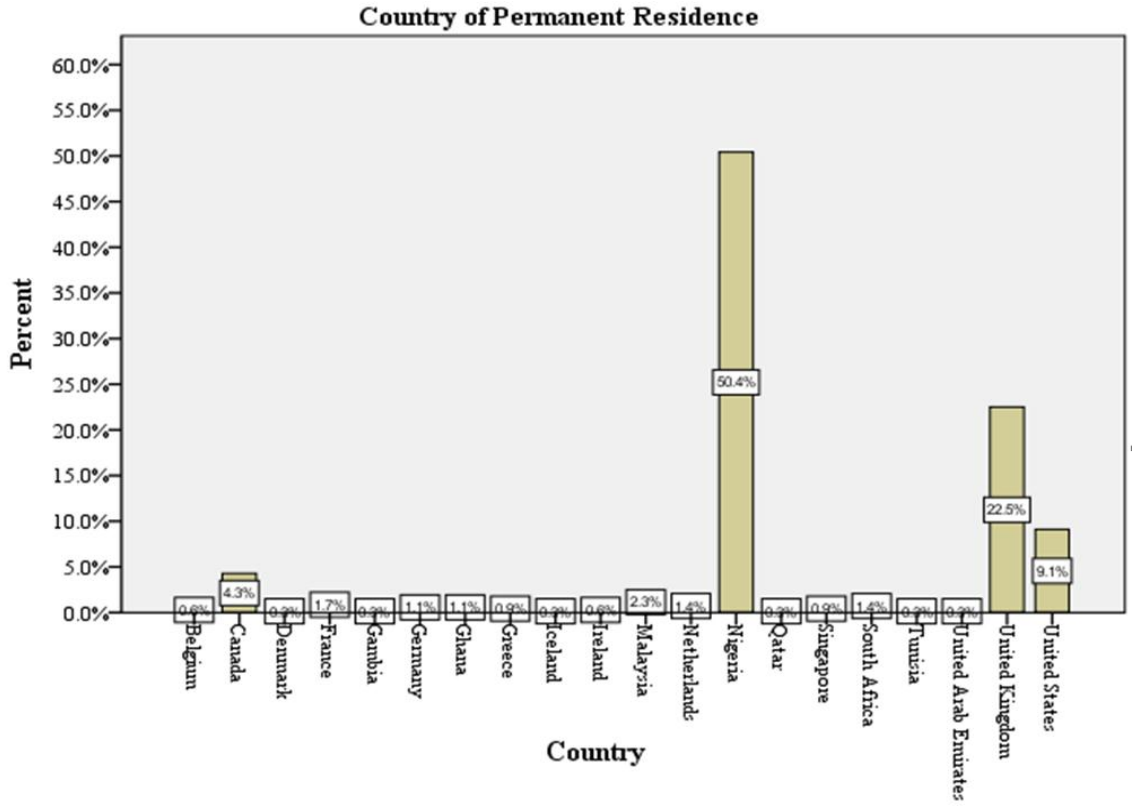


***Figure 6.3: Country of permanent residence***

### 6.2.5 Employment Status

Figure 6.4 shows that most (73.2%) of the respondents were working at the time of the survey. Of these, 16.5% were employed by government agencies, whilst (56.7%) were either self-employed or working for a private enterprise.

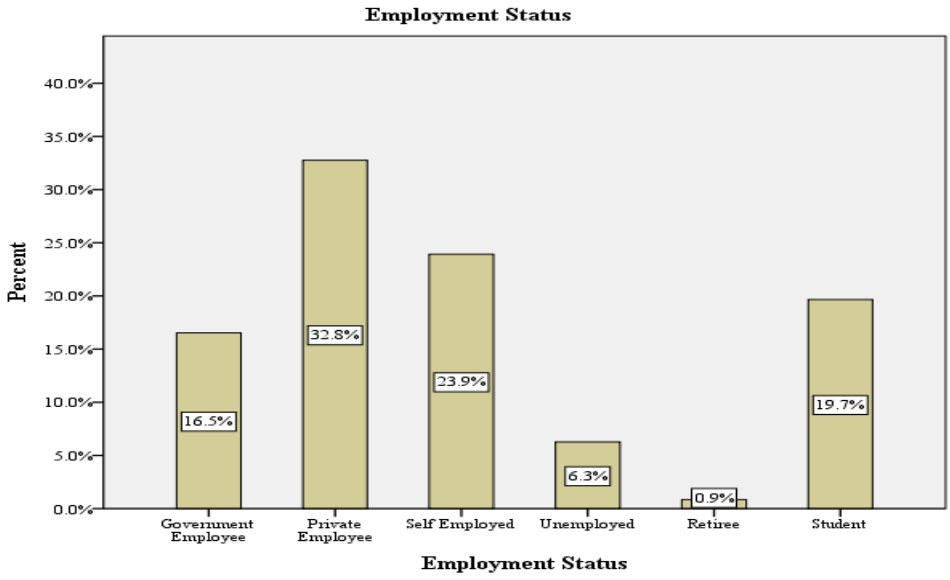


***Figure 6.4: Employment status***

There was also a significant group of students in the sample (19.7%) and a small group of unemployed and retired people.

### 6.2.6 Perceived Income Status

Figure 6.5 shows the respondents' perceived income status. They were asked to categorise themselves according to how high they perceived their income to be. 55.8% categorised themselves as having either a medium or a high level of income, whilst the rest viewed their income level as low. Accordingly, there was a good spread of income levels within the sample.

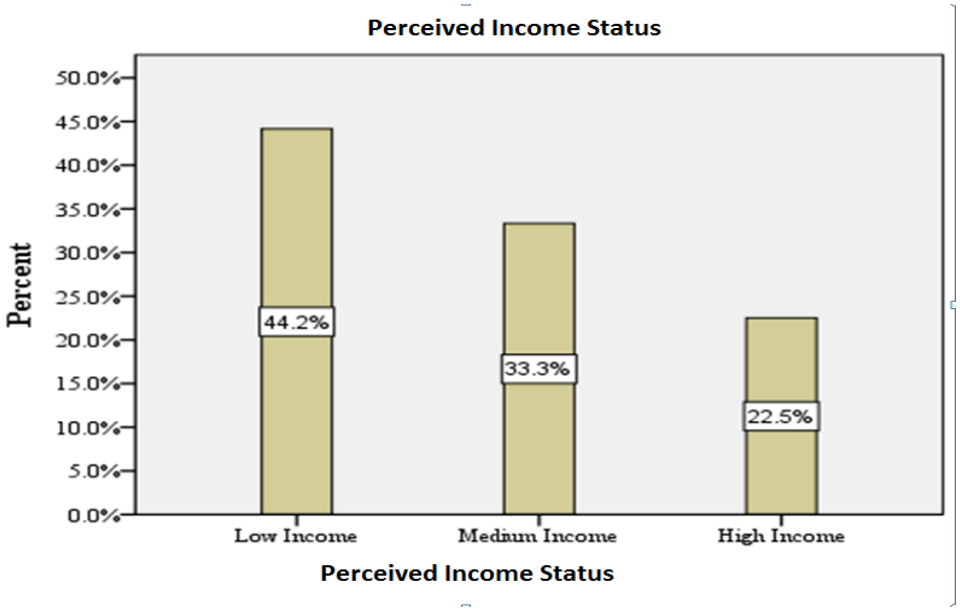


***Figure 6.5: Perceived Income status***

## 6.3 Exploratory Factor Analysis For E-Government User Experience Scale Constructs

### 6.3.1 Exploratory Factor Analysis

An Exploratory factor analysis (EFA) was selected for the creation of a measurement scale as this tool is suitable for use with complex sets of data to identify a correlation between the variables (Pallant, 2010). The EFA was conducted using the Statistical Package for the Social Sciences (SPSS), version 22. Before conducting the analysis, all negatively worded items, EoU10c, PBn6c, PIQ6c, PBr1c, PBr2c, PBr3c, PBr4c, PBr5c, PBr7c, PBr8c, PBr9c, PBr10c and WQS4c, were reversed. User experience statements were then subjected to a principal component analysis (PCA). A PCA was used to eliminate items from the measurement scale, and to identify the dimensions of user experience in the context of the NIS website. The Kaiser's criterion was applied and only factors with eigenvalues of 1.0 or more were retained (see Table 6.2); the scree plot test was used to validate the retained factors. Once the number of factors was decided, the next step was to rotate the factors using Varimax with Kaiser Normalisation. The

Pattern Matrix showed a clear structure with meaningful strong loadings of variables onto only one component that represented most of them. However, ten items that did not load sufficiently strongly onto any specific factor or were below 0.5, as recommended by Field (2005) they were removed. The factors were then named in accordance with the items loaded onto them. Table 6.4 presents the e-government user experience scale developed from this process.

### 6.3.2 Data Suitability

Prior to conducting the EFA, the suitability of data for this test was checked. The first check was the Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy (KMO) with a recommended minimum value of 0.5 (Kaiser, 1974), with values between 0.7 and 0.8 considered to be generally acceptable and 0.9 as a suitable dataset for a satisfactory factor analysis. In this analysis, the KMO of Sampling Adequacy value was 0.917 (see Table 6.1) which confirmed that the dataset used was well suited for factor analysis.

Bartlett's Test of Sphericity is another check that tests dataset suitability; it assesses the strength of the relationship between the variables. It tests the null hypothesis that the correlation matrix is an identity matrix, such that all of the diagonal elements are 1 and the off-diagonal elements are 0. This null hypothesis needs to be rejected and for this, Bartlett's Test of Sphericity should be less than 0.5 (Bartlett, 1954). In this analysis, Bartlett's Test of Sphericity was .000 and thus significant (see Table 6.1), meaning that the null hypothesis was rejected and the correlation matrix was not an identity matrix, hence the dataset was appropriate for factor analysis.

| KMO and Bartlett's tests | | |
|---|---|---|
| KMO Measure of Sampling Adequacy | | .917 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 16856.360 |
| | Df | 1953 |
| | Sig. | .000 |

***Table 6.1: KMO and Bartlett's Test***

On confirmation that data was suitable for EFA, it was subjected to a principal component analysis (PCA), as shown in Section 6.3, showing the total variance explained in the EFA conducted.

### 6.3.3 Total Variance Explained

The 63 items used in the questionnaire were subjected to a principal component analysis (PCA) which revealed the presence of eleven components with eigenvalues exceeding 1, explaining 27.14%, 11.52%, 7.15%, 5.33%, 4.47%, 2.96%, 2.48%, 2.29%, 2.04%, 1.66% and 1.61% of the variance respectively. Table 6.2 shows all the factors extracted from the analysis together with their eigenvalues and cumulative variances.

| Total Variance Explained | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| Component | Total | % of Variance | Cumulative | Total | % of Variance | Cumulative | Total | % of Variance | Cumulative% |
| 1 | 17.096 | 27.136 | 27.136 | 17.096 | 27.136 | 27.136 | 6.154 | 9.769 | 9.769 |
| 2 | 7.260 | 11.524 | 38.660 | 7.260 | 11.524 | 38.660 | 5.875 | 9.325 | 19.094 |
| 3 | 4.503 | 7.148 | 45.808 | 4.503 | 7.148 | 45.808 | 5.817 | 9.233 | 28.327 |
| 4 | 3.355 | 5.325 | 51.133 | 3.355 | 5.325 | 51.133 | 5.241 | 8.319 | 36.646 |
| 5 | 2.815 | 4.468 | 55.602 | 2.815 | 4.468 | 55.602 | 4.394 | 6.974 | 43.620 |
| 6 | 1.862 | 2.956 | 58.558 | 1.862 | 2.956 | 58.558 | 4.244 | 6.737 | 50.357 |
| 7 | 1.562 | 2.479 | 61.037 | 1.562 | 2.479 | 61.037 | 3.585 | 5.690 | 56.047 |
| 8 | 1.442 | 2.289 | 63.326 | 1.442 | 2.289 | 63.326 | 3.389 | 5.380 | 61.427 |
| 9 | 1.285 | 2.040 | 65.366 | 1.285 | 2.040 | 65.366 | 1.993 | 3.163 | 64.589 |
| 10 | 1.043 | 1.656 | 67.022 | 1.043 | 1.656 | 67.022 | 1.507 | 2.391 | 66.981 |
| 11 | 1.012 | 1.607 | 68.629 | 1.012 | 1.607 | 68.629 | 1.039 | 1.648 | 68.629 |
| Extraction Method: Principal Component Analysis | | | | | | | | | |

***Table 6.2: Total variance explained***

### 6.3.4 Scree Plot and Factors Extracted

A scree plot is a graph of eigenvalues plotted against all of the extracted components. It helps the researcher to determine the number of components to be extracted from the Rotated Component Matrix. Catell's scree test (Catell, 1966), which involves plotting each of the components' eigenvalues and inspecting them to identify the point where the scree plot starts to tail off (when the curve changes becomes horizontal) (Pallant, 2010), was used for this here. Catell (1966) and Pallant (2010) recommend that all components above the elbow or up to the point where the scree plot tails off should be retained as these components contribute the most to an explanation of the variance in the dataset under study. In this analysis, an inspection of the scree plot revealed a clear break after the eight components. Using Catell's (1996) scree test, the eight components were retained for further investigation. The use of these eight components was further supported by the results of the rotated component matrix which showed only them (see Figure 6.6 for the scree plot graph).

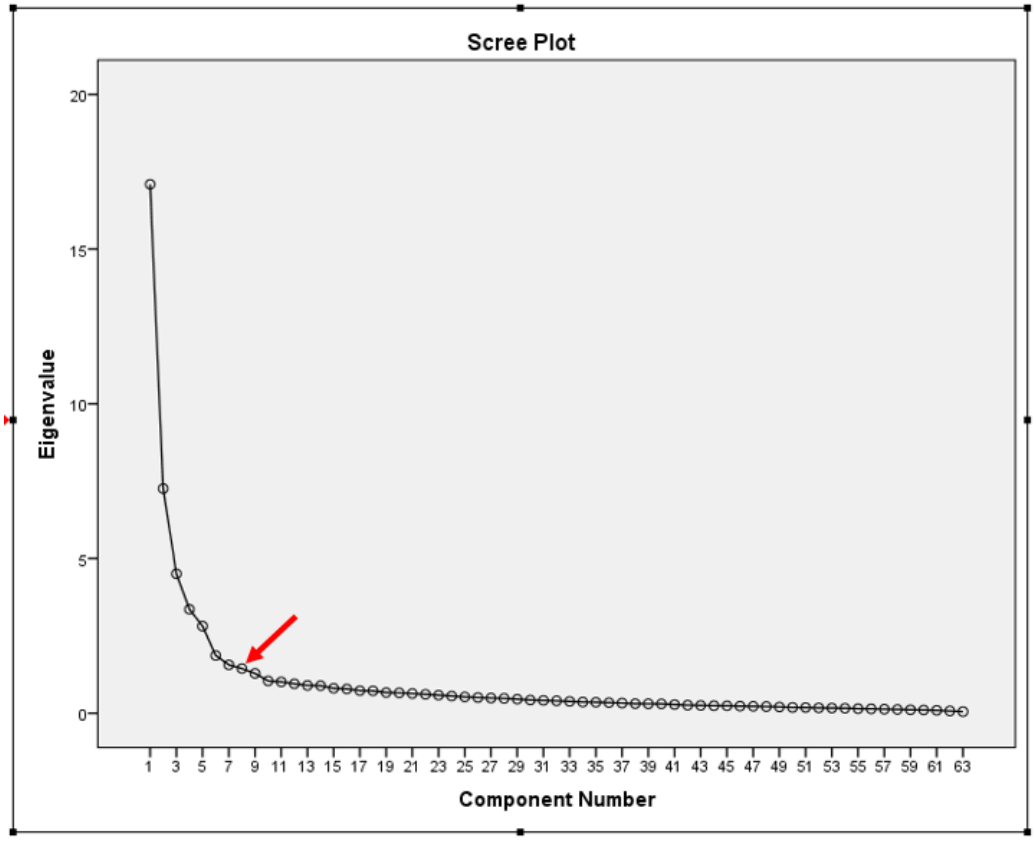


***Figure 6.6: Scree plot***

### 6.3.5 Rotated Component Matrix

The rotated component matrix produced by SPSS helps to identify items which load onto the same factor. Stevens (1986) recommends the loading of an absolute value of 0.5 and above. In this analysis, the rotated component was produced by suppressing any loadings of less than 0.5 and ordering the variables by loading size to support easier interpretation (see Table 6.3 for the rotated component matrix). The first eight factors were retained in the rotated component matrix table shown in Table 6.3, in line with the scree plot test.

| Rotated Component Matrix[a] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Component | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| PBr7c | .876 | | | | | | | |
| PBr8c | .866 | | | | | | | |
| PBr5c | .809 | | | | | | | |
| PBr6 | .621 | | | | | | | |
| WSQ3 | .606 | | | | | | | |
| PBr10c | .602 | | | | | | | |
| WSQ2 | .601 | | | | | | | |
| PTr3 | .577 | | | | | | | |
| PBr3c | .530 | | | | | | | |
| EoU8 | | .746 | | | | | | |
| EoU4 | | .741 | | | | | | |
| EoU9 | | .741 | | | | | | |
| EoU5 | | .738 | | | | | | |
| EoU10c | | .736 | | | | | | |
| PIQ4 | | .631 | | | | | | |
| EoU2 | | .621 | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EoU7 | | .591 | | | | | | |
| PIQ5 | | | .760 | | | | | |
| PIQ7 | | | .742 | | | | | |
| PIQ10 | | | .706 | | | | | |
| PIQ2 | | | .702 | | | | | |
| PIQ9 | | | .686 | | | | | |
| PIQ1 | | | .672 | | | | | |
| PIQ3 | | | .651 | | | | | |
| PIQ6c | | | .584 | | | | | |
| PIQ8 | | | .567 | | | | | |
| PTr8 | | | | .751 | | | | |
| PTr10 | | | | .741 | | | | |
| PTR11 | | | | .739 | | | | |
| PTr7 | | | | .723 | | | | |
| PTr5 | | | | .674 | | | | |
| PTr4 | | | | .650 | | | | |
| PTr1 | | | | .541 | | | | |
| PTr2 | | | | .508 | | | | |
| PTr9 | | | | .501 | | | | |
| PBn8 | | | | | .863 | | | |
| PBn10 | | | | | .852 | | | |
| PBn9 | | | | | .805 | | | |
| PBn5 | | | | | .783 | | | |
| PBn4 | | | | | .727 | | | |
| PBr2c | | | | | | .873 | | |
| PBr1c | | | | | | .872 | | |
| PBr9c | | | | | | .843 | | |
| PBr4c | | | | | | .840 | | |
| PBn1 | | | | | | | .856 | |
| PBn2 | | | | | | | .827 | |
| PBn7 | | | | | | | .811 | |
| PBn3 | | | | | | | .625 | |
| WSQ5 | | | | | | | | .697 |
| WSQ6 | | | | | | | | .634 |
| WSQ7 | | | | | | | | .620 |
| WSQ10 | | | | | | | | .616 |
| WSQ4c | | | | | | | | .539 |
| Extraction Method: Principal Component Analysis<br>Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 13 iterations | | | | | | | | |

***Table 6.3: Rotated component matrix***

The rotated component matrix in Table 6.3 shows a clear structure with meaningful strong loadings of variables onto one component for most of these. The next step was to examine the items that loaded onto the factors and then to give each of these a meaningful label.

### 6.3.6 E-Government User Experience Scale

The factors, with their items and factor loadings, are shown in Table 6.4. Nine items were found to load onto the first factor, which was labelled ‘Security and Support’. Eight items loaded onto the second factor, which was labelled ‘Ease of Use’, nine onto the third factor, labelled ‘Information Quality’, nine items onto the fourth factor, labelled ‘Trustworthiness’, five onto the fifth factor, labelled ‘Benefits’, four onto the sixth factor, ‘Barriers’, four on the seventh factor, ‘Convenience’, and five onto the eighth factor, ‘Website Quality’. The factors were labelled in accordance with the items that loaded onto them and the ten items that did not

load sufficiently strongly onto any specific factor were removed. Table 6.4 presents the e-government user experience scale that was developed from this process.

| Factors | Items | Factor Loadings |
|---|---|---|
| Security and Support | I worry about safe transactions online | .876 |
| | I worry about my personal information being used by others | .866 |
| | I worry about my financial details being stolen | .809 |
| | I have no negative reason not to use NIS website | .621 |
| | The NIS website is well-designed compared to other e-government websites that I have used | .606 |
| | There is a lack of technical support when using the NIS website | .602 |
| | Technical support available at the NIS website is as good as on other e-government websites I have used | .601 |
| | The NIS website security policy is clearly stated and accessible to users of the website to read | .577 |
| | It is difficult to seek technical support from the NIS website team | .530 |
| Ease of Use | I find it easy to obtain information from the NIS website | .746 |
| | I find it easy to navigate the NIS website | .741 |
| | I find it easy to complete transactions on the NIS website | .741 |
| | I find that the NIS website is user-friendly | .738 |
| | The NIS website layout makes it easy for me to find things quickly | .631 |
| | I find it easy to use the services on the NIS website | .621 |
| | I feel comfortable using the NIS website | .591 |
| Information Quality | The NIS website provides detailed information on their services | .760 |
| | Information found on the NIS website is reliable | .742 |
| | The information on the NIS website meets the needs of both citizens and non-citizens | .706 |
| | The content of the NIS website is useful for my purpose | .702 |
| | There is sufficient information on the NIS website for me to make a transaction decision | .686 |
| | There is adequate information on the NIS website for me to process any transaction | .672 |
| | The information on the NIS website is up-to-date | .651 |
| | I do not consider information on the NIS website to be accurate | .584 |
| | The NIS website provides information in an appropriate format | .567 |
| Trustworthiness | I believe that the information relating to me on the NIS website is only accessed by authorised people | .751 |
| | I feel confident that I can rely on transactions conducted through the NIS website | .741 |
| | I feel confident that the NIS will meet their obligations for transactions conducted through their website | .739 |
| | The information I have given on the NIS website is only used for the reason for which it was submitted | .723 |
| | The NIS website protects my personal information | .674 |
| | I am happy to provide my personal information on the NIS website | .650 |
| | It is safe to conduct financial transactions on the NIS website | .541 |
| | The NIS website provides adequate measures to protect my financial details (credit or debit card details) | .508 |
| | The NIS website has a good reputation | .501 |

| | | |
|---|---|---|
| Benefits | I do not consider the NIS website to be of any benefit to me | .863 |
| | Making use of the NIS website simplifies my visa/passport application processing time | .852 |
| | Making use of the NIS website improves the effectiveness of my visa / passport application | .805 |
| | Making use of the NIS website reduces my queuing time | .783 |
| | Making use of the NIS website reduces my travelling expenses | .727 |
| Barriers | An intermittent electricity supply makes it difficult for me to use NIS e-services | .873 |
| | It is costly to have internet access in order to use government e-services | .872 |
| | Using the NIS website to apply for a passport or visa may cost me more | .843 |
| | Lack of access to a computer results in extra costs when using the NIS e-service | .840 |
| Convenience | I am able to use NIS e-services at a time that suits me | .856 |
| | I am able to use the NIS e-services anywhere in the world | .827 |
| | Making use of the NIS website allows me to conduct transactions out of normal working hours | .811 |
| | I am able to accomplish tasks more quickly using the NIS website compared to a face-to-face service | .625 |
| Website Quality | Using the NIS website is a pleasurable experience | .697 |
| | The NIS website allows me to interact with the government agency in a satisfactory manner | .634 |
| | I feel adequately informed when using the NIS website | .620 |
| | I feel empowered when using the NIS website | .616 |
| | I always face problems when using the NIS website | .539 |

***Table 6.4: E-government user experience scale***

### 6.3.7 Exploratory Factor Analysis for the User Satisfaction Dataset

The exploratory factor analysis (EFA) was conducted using SPSS on the user satisfaction variables separately from all other constructs, as user satisfaction did not form part of the e-government user experience scale. The scale used for the questionnaire was different from all other constructs, as explained in the methodology chapter. Prior to conducting the EFA, the suitability of the data for the test was checked using the KMO and Bartlett's tests, as detailed in this Chapter Section 6.3.7 (i.).

#### *(i.) Data Suitability*

The KMO and Bartlett's tests conducted showed a KMO Measure of Sampling Adequacy value of .705 (see Table 6.5) which confirmed that the dataset was acceptable for factor analysis. The Bartlett's test was .000 and was significant (see Table 6.5) meaning the null hypothesis was rejected and the correlation matrix was not an identity matrix, hence the dataset was appropriate for the factor analysis. On confirmation that data was suitable for the EFA, the data were

subjected to a principal components analysis (PCA) as shown in Section 6.3.7 (ii.) showing the total variance explained in the EFA.

| KMO and Bartlett's tests | | |
|---|---|---|
| KMO Measure of Sampling Adequacy | | .705 |
| Bartlett's test | Approx. Chi-Square | 930.507 |
| | df | 21 |
| | Sig. | .000 |

***Table 6.5: KMO and Bartlett's tests***

### *(ii.) Total Variance Explained*

The nine items in the satisfaction questionnaire were subjected to a principal components analysis (PCA) which revealed the presence of two components with eigenvalues exceeding 1, explaining 48.74% and 21.21% of the variance respectively. Table 6.6 shows the two components extracted from the analysis with their eigenvalues and the cumulative variance of the factors.

| Total Variance Explained | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| Component | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 4.386 | 48.735 | 48.735 | 4.386 | 48.735 | 48.735 | 4.273 | 47.481 | 47.481 |
| 2 | 1.909 | 21.211 | 69.946 | 1.909 | 21.211 | 69.946 | 2.022 | 22.465 | 69.946 |
| Extraction Method: Principal Component Analysis | | | | | | | | | |

***Table 6.6: Total variance explained***

### *(iii.) Scree Plot and Factors Extracted*

Due to the satisfaction with the total variance explained in Section 6.3.7 (ii.), in this analysis, the scree plot was not required as the extraction indicated only two components. In addition, the rotated component matrix indicated all nine items loaded onto these two components (see Table 6.7).

### *(iv.) Rotated Component Matrix*

The rotated component matrix identified items loading onto the same component, as shown in Table 6.7. The first six items loaded strongly on the first component while the second had three items that strongly loaded onto it. Both the first and second components were retained, as Steven (1986) recommends at least three items for a factor to ensure sufficient statistical analysis.

| Rotated Component Matrix[a] | | |
|---|---|---|
| | Component | |
| | 1 | 2 |
| SAT8 | .912 | |
| SAT9 | .909 | |
| SAT7 | .864 | |
| SAT4 | .794 | |
| SAT1 | .717 | |
| SAT2 | .528 | .422 |
| SAT5 | | .820 |
| SAT3 | .464 | .727 |
| SAT6 | .390 | .720 |
| Extraction Method: Principal Component Analysis<br>Rotation Method: Varimax with Kaiser Normalization | | |
| a. Rotation converged in 3 iterations | | |

***Table 6.7: Rotated component matrix***

### *(v.) User Satisfaction and Assurance Factors*

As shown in Table 6.7, of the nine extracted items the first six loaded on the first component, 'User Satisfaction', while three loaded on the second component, 'User Assurance' as shown in Table 6.8.

| Factors | Items | Factor Loadings |
|---|---|---|
| User Satisfaction | Overall, how satisfied are you with the e-service on the NIS website? | .912 |
| | Overall, how satisfied have you been with the NIS website? | .909 |
| | The extent to which the NIS website meets my expectations | .864 |
| | The usefulness of the information provided by the NIS website | .794 |
| | The cost of getting access to use the NIS e-services | .717 |
| | The ease of access to the NIS website | .528 |
| User Assurance | The security of transactions provided by the NIS website | .820 |
| | The technical support received when using the NIS website | .727 |
| | The convenience of access to the NIS website anywhere and anytime | .720 |

***Table 6.8: User satisfaction and assurance factors***

## 6.4 The Scale Reliability Testing

The Cronbach's Alpha for each factor was calculated to ensure that the scales were reliable and consistent, ensuring all the items measured the same underlying construct (Pallant, 2010). The Cronbach's Alpha coefficients recommended reliability benchmarks are < 0.6, meaning a poor strength of association, 0.6 to < 0.7, signifying a moderate strength of association, 0.7 < to 0.8 meaning a good strength of association, 0.8 to < 0.9 signifying a very good strength of association and >= 0.9 meaning an excellent strength of association. Table 6.9 shows the Cronbach's Alpha coefficients reliability benchmarks.

| Alpha Coefficient Range | Strength of Association |
|---|---|
| <0.6 | Poor |
| 0.6 to <0.7 | Moderate |
| 0.7 < to 0.8 | Good |
| 0.8 to <0.9 | Very Good |
| >=0.9 | Excellent |

***Table 6.9: Cronbach's Alpha coefficients reliability benchmarks***

The Cronbach's Alpha coefficients for the e-government user experience scale and user satisfaction ranged from 0.76 to 0.93 which shows each factor's scale to be either good or excellent, depicting good internal consistency. The user assurance factor had a Cronbach's Alpha coefficient of 0.27. Hair et al. (2007, p. 244) recommend that Cronbach's Alpha coefficients should be at least 0.6. Table 6.10 shows the scale of the Cronbach's Alpha coefficients; see Appendix 4.1 for the individual items.

| Factors | No. of items | Cronbach's Alpha |
|---|---|---|
| Security and Support | 9 | .91 |
| Ease of Use | 8 | .91 |
| Content and Information | 9 | .90 |
| Trustworthiness | 9 | .90 |
| Perceived Benefits | 5 | .89 |
| Perceived Barriers | 4 | .93 |
| Convenience | 4 | .86 |
| Website Quality | 5 | .76 |
| User Satisfaction | 6 | .88 |
| User Assurance | 3 | .27 |

***Table 6.10: Factors: Cronbach's Alpha***

The User Assurance factor was dropped from further statistical analysis as its Cronbach's Alpha coefficient was below the recommended value of 0.6 (Hair et al., 2007).

## 6.5 Insights From Descriptive Statistics on E-government Experience Scale Dimensions and Open Questions

This section contains a descriptive analysis based on the items retained after the exploratory factor analysis (EFA). This is presented alongside comments from the analysis of open questions, offering insights and information on users' attitudes towards the Nigeria Immigration Service (NIS) e-government services.

The respondents answered questions in the constructs by choosing a number on the Likert scale which best fitted their experiences, attitudes or beliefs: "1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree". In this analysis, the factors that emerged from the EFA were

security and support, trustworthiness, ease of use, website quality, information quality, benefits, convenience, barriers and user satisfaction. The responses in each of these categories are reported below. The insights from the descriptive statistics were further elucidated by comments drawn from responses to the open questions giving general views of the NIS e-government services.

### 6.5.1 Security and Support

The respondents showed a high level of negativity towards being required to use the NIS website, with most of their concerns stemming from issues associated with security and support. In the first instance, 86.6% indicated that they had a reason not to want to use the website. They were concerned about their financial details being stolen and their personal information being used by others, with 90.9% either agreeing or strongly agreeing with the statement *'I worry about my financial details being stolen',* whilst 92.3% either agreed or strongly agreed with the statement *'I worry about my personal information being used by others'*.

The participants were generally concerned about engaging in transactions on the site, with 92.8% either agreeing or strongly agreeing with the statement *'I worry about safe transactions online'*. This quantitative analysis was supported by the following responses to the open question:

> *'(The) service payment system is too risky considering you have to input a personal information which can make it easy for fraud activity to happen'.*
>
> *'When I use the website, I'm scared of making financial transactions, but I have no other choice but to do it and live in fear of not knowing what is going to happen next'.*
>
> *'I fear (my) data will be used by others, for other purposes other than that for which it was obtained by the immigration service'.*

The respondents also viewed the NIS website policy as not clearly stated or accessible. As one respondent commented:

> *'No clear policy on data protection and security of financial transactions is stated on the Nigeria Immigration website'.*

Given that items on security and support loaded onto the same factor, it seems the perception is that the level of technical support available is low, and specifically lower than for other e-government websites that the respondents have used, fuelling concerns about the *'safety'* of the website. 87.2% either strongly disagreed or disagreed with the statement that *'Technical support available on the NIS website is as good as other e-government websites I have used'*. Most users

either agreed or strongly agreed that *'There is a lack of technical support while using the NIS website'* (87.2%) or *'It is difficult to seek technical support from the NIS website team'* (87.4%).

| Factors | Items | Mean | S.D. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| Security and Support | I worry about safe transactions online. | 4.32 | 0.74 | 0.9 | 2.6 | 3.7 | 49.8 | 43.0 |
| | I worry about my personal information being used by others. | 4.31 | 0.751 | 0.9 | 3.1 | 2.8 | 50.4 | 42.8 |
| | I worry about my financial details being stolen. | 4.29 | 0.76 | 0.9 | 2.5 | 5.7 | 48.7 | 42.2 |
| | I have no negative reason not to use NIS website. | 1.88 | 0.907 | 35.9 | 50.7 | 4.8 | 6.8 | 1.8 |
| | The NIS website is well designed compared to other e-government websites that I have used. | 1.7 | 0.892 | 51.3 | 35.3 | 6.8 | 5.7 | 0.9 |
| | There is a lack of technical support available when using the NIS website. | 4.3 | 0.92 | 1.7 | 5.1 | 6.0 | 35.3 | 51.9 |
| | Technical support available at the NIS website is as good as on other e-government websites I have used. | 1.68 | 0.867 | 51.9 | 35.3 | 6.8 | 5.4 | 0.6 |
| | The NIS website security policy is clearly stated and accessible to users of the website to read. | 1.7 | 0.922 | 53.0 | 31.8 | 8.0 | 6.3 | 0.9 |
| | It is difficult to seek technical support from the NIS website team. | 4.34 | 0.869 | 1.4 | 3.4 | 7.8 | 35.0 | 52.4 |
| | **Overall Average** | **3.17** | **0.848** | **22.0** | **18.9** | **5.8** | **27.0** | **26.3** |

***Table 6.11: Security and Support***

This analysis is consistent with the answers to the open question:

> *'(One gets) no response when one sends a request to the immigration website'.*
>
> *'I struggle sometimes to get things done and there is nobody around to guide me on what to do'.*

In response to the open questions, some respondents specified their categories of concern with regard to technical support:

> *'The technical support for the website needs to be improved to offer users more assistance in difficult situations, especially during financial transactions'.*
>
> *'There is a need for technical support, especially for pensioners'.*

### 6.5.2 Trustworthiness

As trust was identified as a separate factor from security and support, the findings are independently reported here. They mainly serve to further emphasise issues raised in response to questions on security and support, suggesting that whilst trust is a separate factor it is tightly coupled with notions of security.

| Factors | Items | Mean | S.D. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| Trustworthiness | My information is only accessed by an authorised person. | 2.68 | 0.79 | 6.3 | 32.8 | 48.6 | 11.4 | 0.9 |
| | I feel confident that I can rely on transactions conducted through the NIS website. | 3.05 | 0.896 | 2.6 | 27.9 | 34.2 | 33.0 | 2.3 |
| | I feel confident that the NIS will meet their obligations for transactions conducted through their website. | 3.12 | 0.88 | 2.0 | 23.9 | 37.7 | 33.0 | 3.4 |
| | The information I give on the NIS website is only used for the reason for which it is submitted. | 2.72 | 0.781 | 5.4 | 31.3 | 50.8 | 11.4 | 1.1 |
| | The NIS website protects my disclosed personal information. | 2.38 | 0.909 | 16.5 | 40.5 | 31.8 | 10.3 | 0.9 |
| | I am happy to provide my personal information on the NIS website | 2.41 | 1.054 | 17.9 | 46.7 | 13.4 | 20.2 | 1.8 |
| | The NIS website is safe to conduct financial transactions.. | 2.08 | 0.975 | 29.8 | 45.6 | 12.3 | 11.4 | 0.9 |
| | The NIS website provides adequate measures to protect my financial details (credit or debit cards). | 1.88 | 0.896 | 38.7 | 41.9 | 12.5 | 6.3 | 0.6 |
| | The NIS website has a good reputation. | 3.04 | 0.544 | 0.3 | 11.1 | 73.7 | 14.0 | 0.9 |
| | **Overall Average** | **2.60** | **0.858** | **13.3** | **33.5** | **35.0** | **16.8** | **1.4** |

***Table 6.12: Trustworthiness***

In Table 6.12 for example, in response to the statement: '*The NIS website is safe to conduct financial transactions'* 75.4% either strongly disagreed or disagreed and in response to the question *'The NIS website provides an adequate measure to protect my financial details (credit or debit cards)'*, 80.6% either strongly disagreed or disagreed.

Whilst the responses to the questions on the protection and disclosure of personal information were also generally negative they were less so, perhaps suggesting a

lower level of concern regarding the risk associated with providing personal data than the risk associated with financial data. The respondents commented that:

> *'There is no evidence of (the) protection of confidential data.'*
>
> *'There is a lack of trust in using this website and I am fearful of my personal details (are) being misused.'*

The responses to some of the more general questions were ambivalent, with the overall means around three and significant percentages of the responses in the neither agree nor disagree category. For example, to the statement '*The information that I give on the NIS website is only used for the reason for which it is submitted'* 50.8% responded with 'neither agree nor disagree', and the statement *'My information is only accessed by an authorised person'* had 48.6% neither agreeing nor disagreeing. The statement with the highest level of non-commitment was *'The NIS website has a good reputation'* which had 73.7% neither agreeing nor disagreeing. Such ambivalence does not suggest any positive trust or confidence in the service. Example comments include:

> *'Assurance needs to be given to the user that their data will not be used for anything other than what they have submitted it for on the government website'.*
>
> *'The user needs to be happy that their information will be protected'.*

In addition, other respondents commented on the *'… lack of transparency…'* when making payments, as they believed that there was a *'fraudulent exchange rate for transactions as the exchange rate used by the third party company is outrageous'* and this further increased their *'… lack of trust…'* in the NIS e-service to the extent that one respondent said that an *'e-service by a government is meant to be transparent but this NIS website is the opposite'.*

### 6.5.3 Ease of Use

Responses to the statements on ease of use, with one exception, were much less polarised than the responses relating to security and support, and trust, indicating generally weaker feelings about this issue. The exception was the response to the question: *'I find it easy to complete transactions on the NIS website*, where 75.7% either strongly disagreed or disagreed. This contrasts with the responses to *'I find it easy to obtain information from the NIS website for my needs'*, where there was less negativity with only 2.8% strongly disagreeing and 55.3% disagreeing. It appears, then, that conducting transactions was regarded as more problematic than finding information. This is supported by the following comment: *'The NIS*

*needs to simplify their payment process while strengthening their website security policy'*. However, 41.4% of the respondents commented that they *'found the entire process easy and uncomplicated'.*

| Factors | Items | Mean | S.D. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| Ease of Use | I find it easy to obtain information from the NIS website. | 2.67 | 0.92 | 2.8 | 55.3 | 15.1 | 25.9 | 0.9 |
| | I find it easy to navigate the NIS website. | 2.71 | 0.95 | 2.3 | 56.1 | 10.5 | 30.2 | 0.9 |
| | I find it easy to complete transactions on the NIS website. | 2.23 | 0.98 | 19.0 | 56.7 | 8.3 | 14.0 | 2.0 |
| | I find that the NIS website is user-friendly. | 2.50 | 0.84 | 3.9 | 59.8 | 19.7 | 15.7 | 0.9 |
| | The NIS website's layout makes it easy for me to find things at first glance. | 2.33 | 0.77 | 3.4 | 73.8 | 10.3 | 11.4 | 1.1 |
| | I find it easy to use the e-services on the NIS website. | 3.01 | 0.95 | 0.9 | 40.5 | 16.5 | 40.7 | 1.4 |
| | I feel comfortable using the NIS website. | 2.98 | 0.94 | 1.4 | 39.6 | 20.5 | 36.8 | 1.7 |
| | **Overall Average** | **2.63** | **0.91** | **4.8** | **54.5** | **14.4** | **25.0** | **1.3** |

***Table 6.13: Ease of Use***

The two statements regarding whether using the e-services is easy, and whether the website is user-friendly, surprisingly attracted different patterns of responses. The responses to the statement *'I find it easy to use the e-services on the NIS website'* were split with the largest groups of respondents either agreeing (40.7%) or disagreeing (40.5%), and 16.5% being in the neutral category. Whereas, for the statement *'I find that the NIS website is user-friendly*', 15.7% agreed, 59.8% disagreed and 19.7% felt neutral. The contrast between the responses to these two statements is interesting, and reveal some level of satisfaction with the functionality or utility of the website but a higher level of negativity when invited to think of it as 'friendly'. The pattern clustering across the three middle categories also characterises the responses to most of the other statements in this section. In all instances other than those already discussed, the disagree group was larger than the agree group, leading to a group of statements with means below three, suggesting a pervading dissatisfaction with aspects of the website such as navigation, layout and ease of finding information quickly. However, it is important to observe that for several of these questions, most notably the one on navigation, sizeable numbers of respondents felt positive about aspects of the website. Some respondents commented that *'they struggle sometimes to get things done…'* and

mentioned the group of people who are particularly exposed: *'...non-frequent users of the internet…'*, as they have to find a way to use the website on their own when *'… there is nobody around to guide them on what to do.'*

### 6.5.4 Website Quality

Given the comments above on the ease of use of the NIS website, it is not surprising that when asked to give their opinions on website quality, the responses were also negative. All of the statements apart from the negative one *'I always have problems when using the NIS website'* had means below three. For this statement 48.7% agreed and 27.9% were neutral.

| Factors | Items | Mean | S.D. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| Website Quality | Using the NIS website is a very pleasant experience. | 2.45 | 0.809 | 4.0 | 62.4 | 18.5 | 14.5 | 0.6 |
| | The NIS website adequately meets my needs. | 2.64 | 0.927 | 5.1 | 51.3 | 19.1 | 23.6 | 0.9 |
| | I feel adequately informed when using the NIS website. | 2.46 | 0.827 | 5.1 | 59.8 | 19.1 | 15.7 | 0.3 |
| | I feel empowered when using the NIS website. | 2.66 | 0.952 | 7.1 | 45.9 | 22.5 | 23.4 | 1.1 |
| | I always have problems when using the NIS website. | 3.28 | 0.833 | 0.6 | 21.7 | 27.9 | 48.7 | 1.1 |
| | **Overall Average** | **2.70** | **0.870** | **4.4** | **48.2** | **21.4** | **25.2** | **0.8** |

***Table 6.14: Website quality***

For other statements, the pattern is similar to that for ease of use, with most responses lying in the middle three categories and the largest group being in the disagree category but with sizeable groups also in the neutral and agree categories. This means that the respondents generally did not feel that using the website was a pleasant experience, not did it adequacy meet their needs nor that they felt adequately informed or empowered when using these e-services.

These comments indicated potential areas for improvement:

*'To make the website more user-friendly'*

*'The design is poor and not very useable at all'.*

A number of respondents commented on the overall design of the website, commenting: *'(it) looks unprofessional'*, and *'the site is too plain'*. Similarly, they commented on the layout, suggesting that it was 'poor', and on navigation that it was:

*'Difficult to navigate and conduct a transaction'*

*'Not easy to find things and navigate'*

*'Hard to follow and difficult navigation until you find what you are looking for,*

*which is a waste of time and money especially when using (a) cybercafé to browse the internet.'*

However, there were positive comments:

*'(This) is one of the best websites amongst Nigerian websites.'*

*'(It is) good having this website, speeding up both application and visa processes'.*

*'Well, (I'm) happy that after all these years we have an immigration website that simplifies the passport application processes, kudos to the government'.*

### 6.5.5 Information Quality

In contrast to the negative or ambivalent responses given above, the majority of the respondents were positive when asked about the quality of the information provided on the NIS' website.

| Factors | Items | Mean | S.D. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| Information Quality | The NIS website provides detailed information on their services. | 3.4 | 0.894 | 1.1 | 21.9 | 15.7 | 58.7 | 2.6 |
| | The information on the NIS website is reliable. | 3.33 | 0.743 | 0.3 | 13.7 | 41.0 | 43.0 | 2.0 |
| | The information on the NIS website meets the needs of both citizens and non-citizens. | 2.93 | 0.957 | 4.6 | 33.0 | 29.6 | 30.2 | 2.6 |
| | The content of the NIS website is useful for my purpose. | 3.61 | 0.739 | 0.3 | 10.8 | 20.0 | 65.2 | 3.7 |
| | There is sufficient information on the NIS website for me to make a transaction decision. | 3.15 | 1.005 | 1.7 | 35.6 | 11.5 | 48.1 | 3.1 |
| | There is adequate information on the NIS website for me to process any transaction. | 3.41 | 0.933 | 1.1 | 23.4 | 13.6 | 57.3 | 4.6 |
| | The information on the NIS website is up to date. | 3.15 | 0.733 | 0.3 | 17.9 | 50.1 | 30.0 | 1.7 |
| | I do not consider the information on the NIS website to be accurate. | 2.8 | 0.863 | 4.0 | 36.5 | 36.1 | 22.5 | 0.9 |
| | The NIS website provides information in an appropriate format. | 2.69 | 0.829 | 1.4 | 48.7 | 30.5 | 18.0 | 1.4 |
| | **Overall Average** | **3.16** | **0.855** | **1.6** | **26.8** | **27.6** | **41.5** | **2.5** |

***Table 6.15: Information Quality***

As shown in table 6.15, the responses revealed that 61.9% of the respondents agreed or strongly agreed that *'There is adequate information on the NIS website*

*for me to process any transaction'* and 68.9% agreed or strongly agreed that *'The content of the website is useful for my purpose'.* Only 45% either agreed or strongly agreed that the content was reliable, although there was a large neutral group (41%). The responses to the statements on information accuracy and format were low at 2.8 and 2.69, respectively. The responses to the open questions provided additional insights. Some of the responses cited limitations:

> *'(There is) inadequate information to (enable me to) complete (my) passport application successfully'.*
>
> *'(The) government should provide accurate information.'*

Other respondents praised the e-services:

> *'The information provided was adequate for what I needed'.*
>
> *'It enabled me to process my e-passport application, and (gave me) the addresses of (the) consulates (which I needed)'.*

Timing and currency of the information on the website were also recognised as important. The respondents commented that *'information needs to be up to date and reliable'.*

### 6.5.6 Benefits

Table 6.16 shows the responses to the statements on the benefits of using the NIS e-services were mixed.

| Factors | Items | Mean | S.D. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| Benefits | I do not consider the NIS website to be of any benefit to me. | 2.07 | 0.763 | 19.1 | 61.5 | 13.7 | 5.1 | 0.6 |
| | Making use of the NIS website simplifies my visa / passport application processing time. | 3.22 | 1.041 | 4.3 | 27.4 | 16.2 | 46.7 | 5.4 |
| | Making use of the NIS website improves the effectiveness of my visa / passport application. | 3.41 | 1.038 | 4.1 | 20.8 | 14.2 | 52.1 | 8.8 |
| | Making use of the NIS website reduces my queuing time. | 3.07 | 1.173 | 9.4 | 29.6 | 13.7 | 39.6 | 7.7 |
| | Making use of the NIS website reduces my travelling expenses. | 2.79 | 1.253 | 15.1 | 37.5 | 8.3 | 31.1 | 8.0 |
| | **Overall Average** | **2.91** | **1.054** | **10.4** | **35.4** | **13.2** | **34.9** | **6.1** |

***Table 6.16: Benefits***

For example, statements such as *'I do not consider the NIS website to be of any benefit to me'* had 80% strongly disagreeing or disagreeing, which implies the

majority considered the e-services to be beneficial, while 60.9% either agreed or strongly agreed that using the NIS website had improved the effectiveness of their visa/passport application. However, the responses to some of the other statements were split, with, for instance, 37.5% disagreeing and 31.1% agreeing that *'Making use of the NIS website reduces my travelling expenses'* and 29.6% disagreeing and 39.6% agreeing that '*Making use of the NIS website reduces my queuing time'*. Two of the responses were:

> *'(It is) better than the face-to-face procedure used in the past'.*
>
> *'It helps when you have to do most (things) yourself rather than them wasting your time doing it'.*

However, other respondents expressed the desire to be able to access the service through their *'mobile anywhere and anytime.'*

### 6.5.7 Convenience

The responses to the statements on the specific benefits of the website associated with convenience of access generally received a very positive response, more than in any other category of the questionnaire.

| Factors | Items | Mean | S.D. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| Convenience | I am able to use the NIS' e-services at a time that suits me. | 4.22 | 0.756 | 0.3 | 4.8 | 3.7 | 55.0 | 36.2 |
| | I am able to use the NIS' e-services from anywhere in the world. | 4.32 | 0.676 | 0.0 | 2.6 | 4.3 | 52.1 | 41.0 |
| | Making use of the NIS website allows me to conduct transactions out of normal working hours. | 4.29 | 0.690 | 0.3 | 2.6 | 4.0 | 53.8 | 39.3 |
| | I am able to accomplish tasks more quickly using the NIS website compared to a face-to-face service. | 4.00 | 0.778 | 0.3 | 5.4 | 12.3 | 58.1 | 23.9 |
| | **Overall Average** | **4.21** | **0.725** | **0.2** | **3.9** | **6.1** | **54.7** | **35.1** |

***Table 6.17: Convenience***

The respondents commented positively on being able to use the NIS website how, where and when they wanted, with 90% agreeing or strongly agreeing with the statement *'I am able to use the NIS' e-services at a time that suits me'* and *'I am able to use the NIS' e-services from anywhere in the world'* and over 80% agreeing or strongly agreeing with the statement *'I am able to accomplish tasks more quickly using the NIS website compared to (a) face-to-face service'*. The comments included the following:

*'(The website) gives you an opportunity to do things at your own time'.*

However, some respondents made negative comments about the convenience of using the site, especially if they did not have easy access to the internet:

*'(If I need to use the site, I) have to travel to another city in order to use a cybercafé at a time and place that is not convenient for me'.*

*'(If I need to use the site, I) have to wait for a cybercafé to open.*

*'The government needs to provide facilities to make it possible to access e-services in libraries or special centres'.*

### 6.5.8 Barriers

The means for most of the questions relating to barriers were between three and four (between agree and disagree); however, the respondents' opinions were divided. For instance, 31.6% disagreed and 32.8% agreed that *'It is costly to have Internet access in order to use government services'*. For other statements, a divide is even more evident, with 32.8% disagreeing and 42.5% strongly agreeing that *'An intermittent electricity supply makes it difficult for me to use NIS e-services'*. In addition, 60.7% either agreed or strongly agreed that *'Lack of access to a computer results in extra costs of using the NIS' e-services'.* Comments in response to the open questions focused on the common impediments to effective use of NIS e-services.

| Factors | Items | Mean | S.D. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| Barriers | An intermittent electricity supply makes it difficult for me to use the NIS' e-services. | 3.38 | 1.548 | 10.7 | 32.8 | 6.3 | 7.7 | 42.5 |
| | It is expensive to pay for internet access in order to use the government's e-services. | 3.21 | 1.316 | 9.1 | 31.6 | 7.4 | 32.8 | 19.1 |
| | Using the NIS website to apply for a passport or a visa may cost me more. | 2.96 | 1.172 | 9.1 | 36.8 | 9.1 | 38.7 | 6.3 |
| | Lack of access to a computer results in extra costs when using the NIS e-service. | 3.55 | 1.357 | 6.8 | 25.7 | 6.8 | 27.4 | 33.3 |
| | **Overall Average** | **3.28** | **1.348** | **8.9** | **31.7** | **7.4** | **26.7** | **25.3** |

***Table 6.18: Barriers***

Some mentioned the intermittent electricity supply while some commented on the spiralling increase in the cost of *'... access to the internet…'* In addition, other respondents suggested that with the high rate of unemployment, it was difficult to

make use of the NIS e-service. Some respondents commented further on electricity supplies:

> *'Electricity needs to be improved, because despite having a computer and access to the internet, it is useless if there is no electricity supply'.*
>
> *'The cost of powering / fuelling (a) generator for electricity is too much for students and (people on a) low income'.*

Other respondents commented on the cost of travelling to use the NIS e-service:

> *'There is a need to help people living in rural areas by establishing an Internet centre rather than expecting them to travel a very long distance to a city where they can find the Internet'.*
>
> *'It costs a lot to travel (to use the internet), wasting precious time and (then) there may be no electricity even when you reach the city where you want to use the Internet at a cybercafé'.*

Finally, some respondents proposed that:

> *'The government needs to upgrade the infrastructure for both electricity and telephone(s) to pave (the) way for cheap affordable internet.'*

### 6.5.9 User Satisfaction

The participants responsed to the questions on user satisfaction by choosing the number on the scale which suited them: "1 = very unsatisfied, 2 = unsatisfied, 3 = neutral, 4 = satisfied and 5 = very satisfied". In this analysis, the responses to the open questions which create a perception of user satisfaction of the NIS e-services are presented.

Table 6.19 shows that user responses to the questions in this section shared similarities with data from the previous sections on ease of use, content and information, website quality, security and support, trustworthiness, perceived barriers and benefits. The data in this section suggests that while some users have a positive attitude to the NIS e-services the majority have had a more negative experience. When the respondents were asked how satisfied they were with "the ease of access to the NIS website", the mean (3.76) shows that the majority of the response were positive, with 74% indicating they had been satisfied or very satisfied with how easy it was to access the NIS website. Similarly, most of the responses (52.8%) to the question on levels of satisfaction with the cost of getting access to the NIS e-services were positive (mean = 3.17) confirming this is perceived as satisfactory or very satisfactory.

| Factor | Items | Mean | S.D. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| User Satisfaction | Overall, how satisfied are you with the e-service on the NIS website? | 2.55 | 1.194 | 22.5 | 34.2 | 10.5 | 31.1 | 1.7 |
| | Overall, how satisfying have your experiences of the NIS website been? | 2.54 | 1.216 | 24.5 | 31.6 | 11.1 | 30.8 | 2.0 |
| | To what extent does the NIS website meet your expectations? | 2.73 | 1.029 | 7.2 | 47.0 | 12.8 | 31.6 | 1.4 |
| | How useful is the information provided on the NIS website? | 3.17 | 1.026 | 5.1 | 26.5 | 18.8 | 45.9 | 3.7 |
| | How would you rate the cost of using the NIS e-services? | 3.17 | 1.318 | 11.6 | 28.8 | 6.8 | 36.8 | 16.0 |
| | How would you rate ease of access to the NIS website? | 3.76 | 0.904 | 1.2 | 12.0 | 12.8 | 57.8 | 16.2 |
| | **Overall Average** | **2.99** | **1.11** | **12.0** | **30.0** | **12.2** | **39.0** | **6.8** |

***Table 6.19: User satisfaction***

However, when they were asked the question on the usefulness of the information provided on the NIS website, less than half (49.6%) had a positive response, with such comments as:

> *"The information provided was at the time adequate for what I needed".*

There were also negative comments, such as:

> *"A lot of people find it difficult to get the forms completed" and "it is hard to find information on (the) NIS website".*

When the users were asked about their satisfaction in relation to the extent to which the NIS website meets their expectations, 54% replied they were either unsatisfied or very unsatisfied. Similarly, when they were asked how satisfied they were with the NIS website, 56.1% were either unsatisfied or very unsatisfied, while 56.7% responded that they were either unsatisfied or very unsatisfied with the e-service on the NIS website.

## 6.6 Revised Proposed Model

A revised proposed resulted from two new variables which emerged after conducting the exploratory factor analysis (EFA): convenience, and security and support. The revised proposed model used to guide the study is shown in Figure 3.2; the meaning and theories supporting the relationship in the model are also presented.

### 6.6.1 Information Quality, Convenience, Benefits

The content and information available on government websites disseminates information about the functions of specific government agencies. Users of these websites rely on the information presented on these sites to make informed decisions. According to Hazlett and Hill (2003), the government's success when using the internet to deliver its messages strongly depends on the content displayed on its website and such information being made available for users' convenience, anytime and anywhere. According to Carter and Bélanger (2005), the benefits received from the use of an e-government portal can result in the generation of users' loyalty and satisfaction. Carter and Bélanger (2005) assert that comprehensive and authentic content as well as quality information available on government websites increases users' confidence. Ramon Gil-Garcia, Chengalur-Smith and Duchessi (2007) note that the content available on such websites saves users' time and allows them to navigate and extract relevant information easily. A website with good, clear content and information prevents misunderstandings and enables users to be aware of correct information. Halaris et. al. (2007) points to the convenience of having access to good and accurate information on government websites as it enables users to make accurate decisions and reap the benefits of using such websites.

Rigg, Coleman and Malam (1998), Meuter et al. (2000), Szymanski and Hise (2000) and Zhu, Wymer and Chen (2002) refer to the term convenience in the context of e-government as the ability of users to access an e-government service at a time and in a place that suits them, such as in their offices and homes. The public can avail themselves of such services irrespective of location or time which is better than waiting in long queues to complete transactions. Welch, Hinnant and Moon (2004) assert that this convenient access has a significant effect on users' perceived benefits. According to Teo, Srivastava and Jiang (2008), convenient access to e-government services ensures and affirms citizens' perceptions of the benefits of e-government. Gilbert, Balestrini and Littleboy (2004) suggest that e-government services allow the provision of an efficient service to all citizens irrespective of any bias. This led to the following hypotheses:

***$H_{US}$: Information quality influences the convenience of the NIS portal***

***$H_{US}$: Convenience influences the benefits of the NIS portal.***

### 6.6.2 Website quality, Security and Support, Trustworthiness

The quality of a website, according to Aladwani and Palvia (2002), increases users' trust and engenders positive views of its security and reduces their reliance on technical support. It promotes user-friendliness and the protection of personal information (Aladwani, 2013). Researchers (Hoffman, Novak and Peralta, 1999; Aladwani and Palvia, 2002; DeLone and McLean, 2003) have stated that website quality includes multiple dimensions, such as security, ease of use, user satisfaction and trust. The website's quality strongly contributes to formulating individual perceptions and hence leads to a decreased reliance on support when using the site (Elling et al., 2012). According to Berkley and Gupta (1994), inadequate security and support may affect users' willingness to make frequent visits to a government's website as citizens' perceptions of website quality may affect their trust in an e-government service. Rigg, Coleman and Malam (1998) have asserted that e-government services must be secure with respect to entering both personal and financial details as well as the user having easy and quick access to support where necessary.

Citizens' trust in the government and the information available on e-government websites play an important role in e-government success. Government websites that ensure security of data enable users to feel more secure when sharing their information (Lean et al., 2009; Hazlett and Hill (2003). According to Lin, Fofanah and Liang (2011), effective security and efficient support can increase the number of citizens adopting and using e-government. Teo, Srivastava and Jiang (2008) suggest that users' trust levels determine whether they feel they can rely on online government services, and that effective support allows users to trust online government service. According to Bélanger and Carter (2008), the public's confidence in the technological platform provided by the government is identified as imperative in the adoption of e-government policies; it forms an important construct and catalyst for users in predicting their intentions in using e-government services.

According to Bannister and Connolly (2011), user satisfaction is directly associated with users' trust in e-government services. Al-Hakim (2007) states that user experience influences trust, enabling users to share their personal information online and to undertake transactions. The increase in e-government adoption has been identified with trust (Parent, Vandebeek and Gemino, 2005). Recent research by Alawneh, Al-Refai and Batiha, (2013) shows trust has a major

influence on barriers to e-government service adoption and satisfaction. They investigate e-satisfaction with Jordan's e-government services portal in their study, showing that trust increases or decreases the risk level perceived by users (Ibid.). In order to have control over the perceived trust levels of service users, it is necessary to focus on key criteria like trustworthiness, privacy, security and risks (Urciuoli, Hintsa and Ahokas, 2013). Other issues, such as confidentiality, trust, usability and quality of services, are interdependent, which severely influences satisfaction with and the adoption of e-government services (Kumar et al. 2007; Bwalya 2009). This discussions led to the following hypotheses:

***$H_{US}$: Website quality influences the NIS portal's security and support***

***$H_{US}$: Security and support influences the trustworthiness of the NIS portal***

### 6.6.3 Hypotheses Summary

The revised proposed hypotheses and model supporting the relationship are presented in Figure 6.7 and Table 6.20.

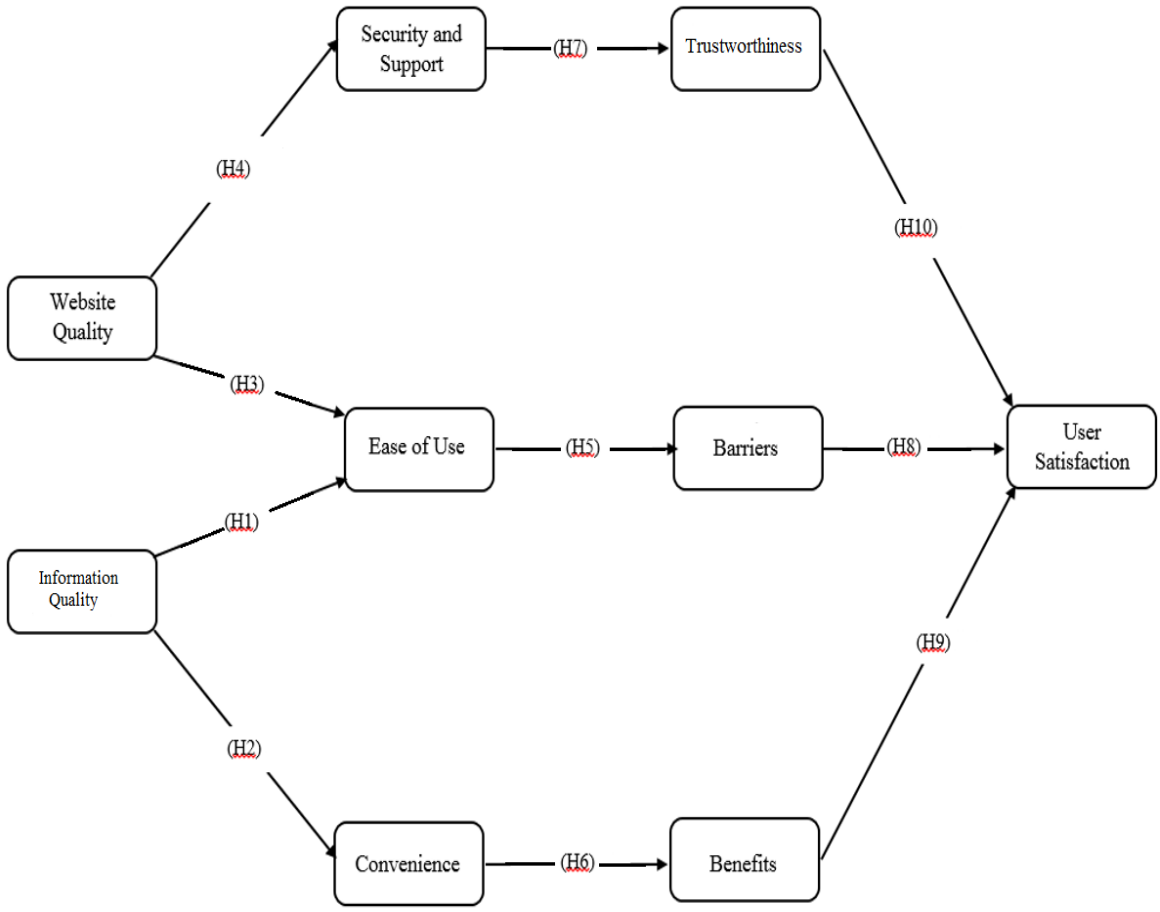


***Figure 6.7: Revised proposed e-government services user experience (EGSUE) model***

| | Hypotheses |
|---|---|
| $H_{US1}$ | Information quality influences the convenience of the NIS portal. |
| $H_{US2}$ | Information quality influences the ease of use of the NIS portal. |
| $H_{US3}$ | Website quality influences the ease of use of the NIS portal. |
| $H_{US4}$ | Website quality influences the security and support of the NIS portal. |
| $H_{US5}$ | Ease of use influences the barriers to the use of the NIS portal. |
| $H_{US6}$ | Convenience influences the benefits of the NIS portal. |
| $H_{US7}$ | Security and support influence the trustworthiness of the NIS portal. |
| $H_{US8}$ | Barriers influence users' satisfaction with the NIS portal. |
| $H_{US9}$ | Benefits influence users' satisfaction with the NIS portal. |
| $H_{US10}$ | Trustworthiness influences users' satisfaction with the NIS portal. |

***Table 6.20: Revised proposed hypotheses***

## 6.8 Developing the E-government Service User Experience Model

As discussed, the proposed model was revised as a result of the two new factors which emerged from the exploratory factor analysis (EFA). The two new factors were convenience and security and support (see Section 4.5 for further details). Nine factors: security and support, ease of use, information quality, trustworthiness, benefits, barriers, convenience, website quality and user satisfaction, were retained. These factors were now subjected to further analysis with a confirmatory factor analysis (CFA) and structural equation modelling (SEM) using Analysis of Moment Structures (AMOS), version 20. The initial stage was to analyse the measurement model, to detect the way in which the observed variables depended on the unobserved latent variables. The second stage was the SEM to detect the relationships between the latent and/or the other main variables (Arbuckle, 2008).

A CFA tests the reliability of the observed variables and provides an avenue for the construct validity test, which establishes the validity of the measurement items and strengthens the representativeness of the result in the existing population with the use of rigorous tests of convergent and discriminant validity (Kline, 2005). In addition, it establishes whether there is an interrelationship amongst the latent variables. Both the CFA and SEM must pass the model fit index benchmark as shown in Table 6.21.

| Model Fit Index | CMIN/DF $X^2$ | RMSR | IFI | TLI | CFI | RMSEA |
|---|---|---|---|---|---|---|
| Recommended Criteria / Value | < 5 | < 0.10 | > 0.90 | > 0.90 | > 0.90 | < 0.10 |
| Suggested Authors | Carmines and McIver, 1981; Kline 1998 | Hu and Bentler, 1999 | Bollen, 1989; Hu and Bentler, 1999 | Hu and Bentler, 1999 | Hu and Bentler, 1999 | Hu and Bentler, 1999; Hair et al., 1992 |

***Table 6.21: Model fit index***

**CMIN/DF $X^2$:** This is the relative chi-square or normal chi-square, calculated by dividing the chi-square fit index by degrees of freedom. Carmines and McIver (1981) and Kline (1998) recommend the chi-square should be less than five to be considered as an acceptable model fit.

**RMSR:** The root mean square residual (RMSR) is the mean absolute value of the co-variance residuals resulting from the difference between the model-estimated co-variances and the observed co-variances. Hu and Bentler (1999) recommend that the RMSR should not be more than 0.10 for an acceptable model fit.

**IFI:** The incremental fit index (IFI), also known as the Delta2 or BL89, is calculated using the formula IFI = (chi-square for the null model – chi-square for the default model) divided by (chi-square for the null model – degrees of freedom for the default model). Bollen (1989b) and Hu and Bentler (1999) recommend that the IFI should be at least 0.90 for an acceptable model fit.

**TLI:** The Tucker-Lewis index, also known as the non-normed fit index (NNFI), is relatively independent of sample size (Marsh, Hau and Wen, 2004). The TLI is calculated using the formula: (chi-square / dfn - chi-square / df) / (chi-squareN / dfn – 1), where the chi-square and the chi-squareN are the model chi-square for the given and null models respectively, and df and dfn are the associated degrees of freedom. Hu and Bentler (1999) have suggested that the TLI should not be less than 0.90 for a good model fit.

**CFI:** The comparative fit index (CFI) compares the existing model fit with a null model which assumes that indicator variables, including latent variables in the model, are uncorrelated. The CFI should not be less than 0.90 for an acceptable model fit. It is also known as the Bentler comparative fit index (Hu and Bentler, 1999).

**RMSEA:** The root mean square error of approximation (RMSEA) is also known as the discrepancy per degree of freedom. The RMSEA is calculated using the formula: ((chi-square / ((n – 1) df)) – (df / ((n – 1)df))) x 0.5, where the chi-square is the model chi-square, df is the degrees of freedom and n is the number of subjects. Hu and Bentler (1999); and Hair et al., (1992) have recommended that the RMSEA should not be more than 0.10 for an acceptable model fit.

### 6.8.1 Confirmatory factor analysis

The measurement model was tested using a confirmatory factor analysis (CFA) on 59 items to obtain a good measurement model fit. The first assessment of the measurement model produced a poor fit and indicated some items needed to be removed (see Appendix 4 for items that were removed during the CFA). Afterwards, the remaining 40 items were subjected to a further round of CFA to achieve a good e-government service user experience measurement model, as shown in Figure 6.8. The model fit statistics are shown in Table 6.22. Figure 6.8 was the final solution for the measurement model, showing the parameter estimates for each predicted relationship.

| Model Fit Index | CMIN/DF $X^2$ | RMSR | IFI | TLI | CFI | RMSEA |
|---|---|---|---|---|---|---|
| Recommended Criteria / Value | < 5 | < 0.10 | > 0.90 | > 0.90 | > 0.90 | < 0.10 |
| Model Result | 1.989 | 0.06 | 0.94 | 0.93 | 0.94 | 0.05 |
| Suggested Authors | Carmines and McIver, 1981; Kline (1998) | Hu and Bentler, 1999 | Bollen, 1989; Hu and Bentler, 1999 | Hu and Bentler, 1999 | Hu and Bentler, 1999 | Hu and Bentler, 1999; Hair et al., 1992 |

***Table 6.22: EGSUE measurement model fit result***

The first significant result of this measurement model assessment was that the model goodness of fit statistics/values obtained were all acceptable and demonstrated a good model fit. The CMIN/DF acceptable level was <5, this model's value was 1.989 and thus within acceptable limits; the RMR should be less than .10, and this model was .06. The other model goodness of fit reliable indicator is an incremental fit index (IFI) with an acceptable value of at least .90, and this model's was .94. The Tucker-Lewis index (TLI) acceptable value is .90, and this measurement model's value was .93. The comparative fit index (CFI) acceptable value is .90, and this model's result was .94. Finally, the RMSEA

acceptable fit model value should be less than .10, and this model's value was .05. These results show that the measurement model goodness of fit index demonstrated a good measurement model.

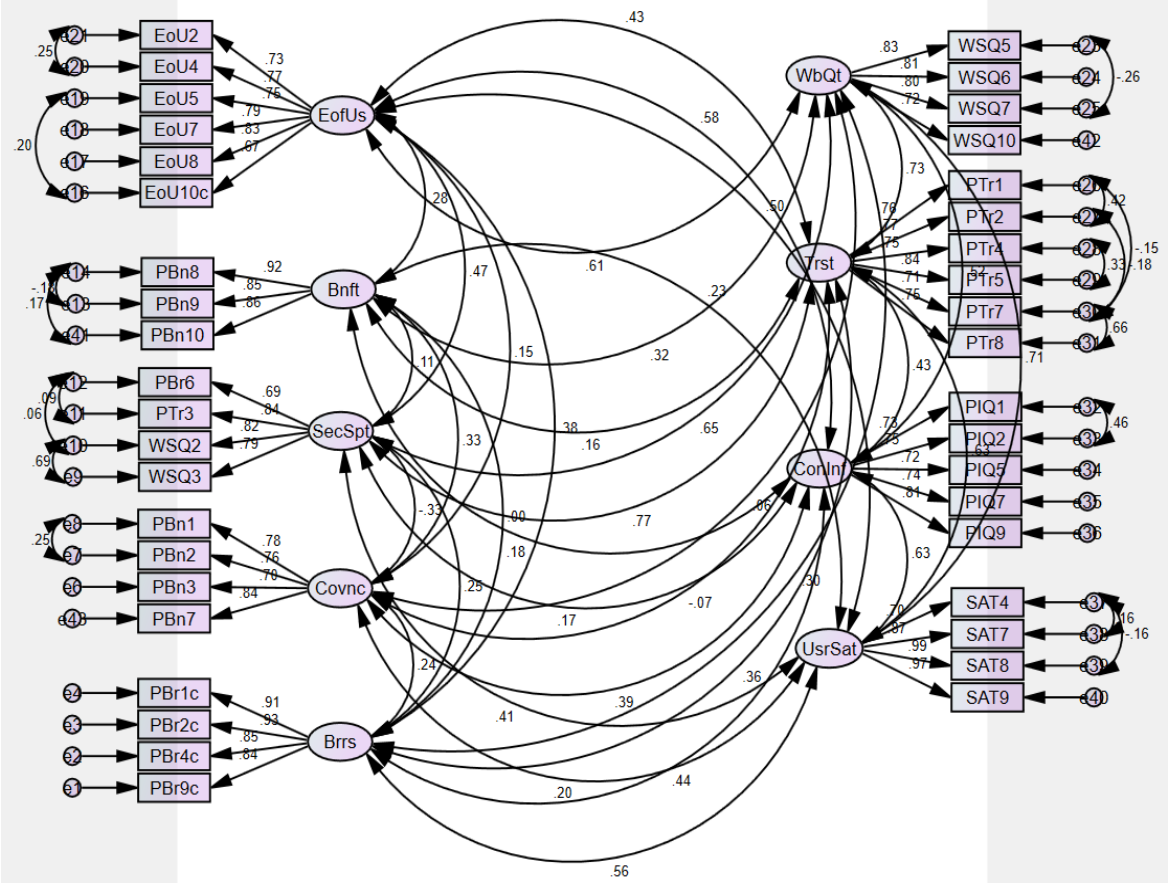


***Figure 6.8 E-government services user experience (EGSUE) measurement model***

The second key result of this measurement model was that all of the items showed strong loadings on their respective underlying latent variables with the lowest standardised regression weight/estimate loading of .672 being above the recommended threshold of .05 (Hair et al., 1992) (see Table 6:23). Another important result of this measurement model is that the significant critical ratio with the lowest 10.376 was above the recommended threshold of 1.96 (CR = t-value > 1.96) and all items' p-value (***) indicates a key relationship; this shows the significance of all the estimated variances (see Table 6:23).

| Structural Relation | | | Standardised Regression Weight / Estimate | Critical Ratio | P-Value |
|---|---|---|---|---|---|
| PBr9c | <--- | Brrs | 0.840 | | +++ |
| PBr4c | <--- | Brrs | 0.852 | 20.121 | *** |
| PBr2c | <--- | Brrs | 0.928 | 23.252 | *** |
| PBr1c | <--- | Brrs | 0.908 | 22.424 | *** |
| PBn3 | <--- | Covnc | 0.702 | 12.390 | *** |
| PBn1 | <--- | Covnc | 0.785 | 16.608 | *** |
| WSQ2 | <--- | SecSpt | 0.817 | | +++ |
| PTr3 | <--- | SecSpt | 0.840 | 16.382 | *** |
| PBr6 | <--- | SecSpt | 0.693 | 13.142 | *** |
| PBn9 | <--- | Bnft | 0.855 | | +++ |
| PBn8 | <--- | Bnft | 0.921 | 11.105 | *** |
| EoU10c | <--- | EofUs | 0.672 | | +++ |
| EoU8 | <--- | EofUs | 0.830 | 13.314 | *** |
| EoU7 | <--- | EofUs | 0.789 | 12.801 | *** |
| EoU5 | <--- | EofUs | 0.748 | 13.753 | *** |
| EoU4 | <--- | EofUs | 0.772 | 12.519 | *** |
| EoU2 | <--- | EofUs | 0.726 | 11.864 | *** |
| WSQ6 | <--- | WbQt | 0.806 | 16.871 | *** |
| WSQ7 | <--- | WbQt | 0.803 | 15.295 | *** |
| PTr1 | <--- | Trst | 0.760 | | +++ |
| PTr2 | <--- | Trst | 0.773 | 19.181 | *** |
| PTr4 | <--- | Trst | 0.749 | 13.709 | *** |
| PTr5 | <--- | Trst | 0.839 | 15.602 | *** |
| PTr7 | <--- | Trst | 0.706 | 12.105 | *** |
| PTr8 | <--- | Trst | 0.748 | 13.895 | *** |
| PIQ1 | <--- | ConInf | 0.725 | | +++ |
| PIQ2 | <--- | ConInf | 0.747 | 17.912 | *** |
| PIQ5 | <--- | ConInf | 0.718 | 12.464 | *** |
| PIQ7 | <--- | ConInf | 0.735 | 12.755 | *** |
| PIQ9 | <--- | ConInf | 0.805 | 13.844 | *** |
| SAT4 | <--- | UsrSat1 | 0.703 | | +++ |
| SAT7 | <--- | UsrSat1 | 0.866 | 16.873 | *** |
| SAT8 | <--- | UsrSat1 | 0.987 | 17.410 | *** |
| WSQ3 | <--- | SecSpt | 0.789 | 28.700 | *** |
| PBn10 | <--- | Bnft | 0.856 | 10.376 | *** |
| WSQ10 | <--- | WbQt | 0.724 | 14.707 | *** |
| SAT9 | <--- | UsrSat1 | 0.973 | 17.514 | *** |
| PBn2 | <--- | Covnc | 0.762 | | +++ |
| PBn7 | <--- | Covnc | 0.840 | 14.197 | *** |
| WSQ5 | <--- | WbQt | 0.829 | | +++ |

(*** indicates a significant relationship; +++ indicates a non-significant relationship)

***Table 6.23: Standardised regression weights***

### 6.8.2 Construct Validity

As stated in section 4.21.1 that construct validity helps to measure accuracy, measure the theory-based latent variable and to show that the variable actually reflect such a variable. In order to establish construct validity, the composite reliability value should not be less than 0.60 (Bagozzi and Yi, 1988), and the average variance extracted (AVE) benchmark recommended by Fornell and Larcker (1981) should be 0.5. In this confirmatory factor analysis (CFA), the

composite reliability values ranged from 0.86 to 0.94, which is above the benchmark recommended by Bagozzi and Yi (1988). The AVE for all items exceeded the threshold value of 0.5, the lowest being 0.557 (see Table 6.24).

| Factors | Composite Reliability | AVE |
|---|---|---|
| Content and Information | 0.863 | 0.557 |
| Perceived Barriers | 0.934 | 0.779 |
| Convenience | 0.856 | 0.599 |
| Security and Support | 0.866 | 0.619 |
| Perceived Benefits | 0.910 | 0.771 |
| Ease of Use | 0.890 | 0.574 |
| Website Quality | 0.870 | 0.626 |
| Trustworthiness | 0.893 | 0.583 |
| User Satisfaction | 0.937 | 0.791 |

***Table 6.24: Composite and average variance***

The measurement model shows a good model fit, thus was acceptable and adopted as the final model as the basis for the structural model.

### 6.8.3 Structural Equation Modelling

The final phase of the structural equation modelling (SEM) was testing the hypothesised relationships between the variables (see Figure 6.9: e-government services user experience structural model).

The results of this SEM produced acceptable model goodness of fit statistics/values and demonstrated a good model fit. The structural model CMIN/DF was 2.345 and the RMR 0.86. The other model goodness of fit reliable indicator was an incremental fit index (IFI) with a value of 0.92, a Tucker-Lewis index (TLI) of 0.91, a comparative fit index (CFI) value of 0.92 and a root mean square error of approximation (RMSEA) value of 0.06. These results show that the structural equation model goodness of fit index demonstrated a good model fit, as shown in Table 6.25.

| Model Fit Index | CMIN/DF $X^2$ | RMR | IFI | TLI | CFI | RMSEA |
|---|---|---|---|---|---|---|
| Recommended Criteria / Value | < 5 | < 0.10 | > 0.90 | > 0.90 | > 0.90 | < 0.10 |
| Model Result | 2.345 | 0.86 | 0.92 | 0.91 | 0.92 | 0.06 |
| Suggested Authors | Carmines and McIver, 1981; Kline, 1998 | Hu and Bentler, 1999 | Bollen, 1989; Hu and Bentler, 1999 | Hu and Bentler, 1999 | Hu and Bentler, 1999 | Hu and Bentler, 1999; Hair et al., 1992 |

***Table 6.25: E-government user experience structural model fit index***

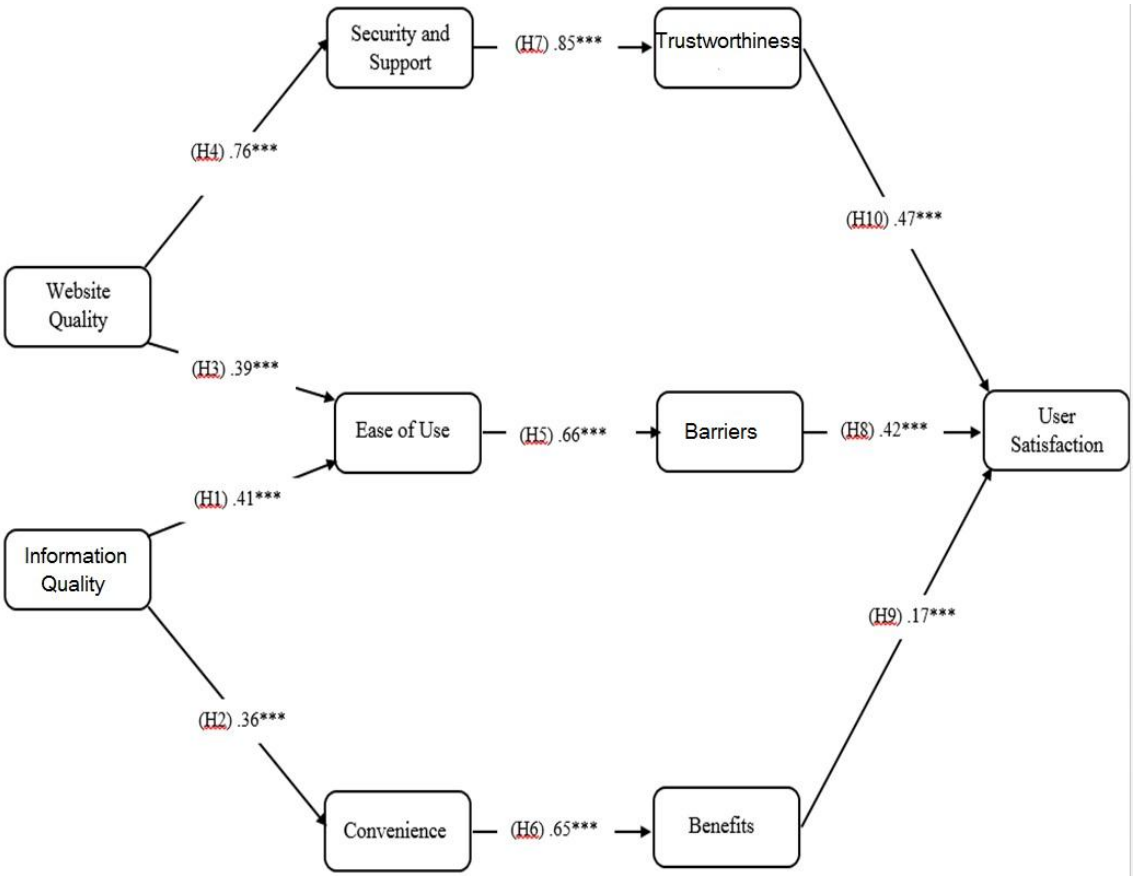


***Figure 6.9: E-government services user experience (EGSUE) structural model***

The structural model (shown in Figure 6.9) shows that all of the hypotheses were supported. Information quality had a significant effect on ease of use (H1, path coefficient of 0.41, $p < 0.001$) and convenience (H2, path coefficient of 0.36, $p < 0.001$). Website quality had a significant effect on both ease of use (H3, path coefficient of 0.39, $p < 0.001$) and security and support (H4, path coefficient of 0.76, $p < 0.001$). Furthermore, ease of use had a significant effect on barriers (H5, path coefficient of 0.66, $p < 0.001$), convenience had a significant effect on benefits (H6, path coefficient of 0.65, $p < 0.001$), security and support had a significant effect on trustworthiness (H7, path coefficient of 0.85, $p < 0.001$), barriers had a significant effect on user satisfaction (H8, path coefficient of 0.42, $p < 0.001$), benefits had a significant effect on user satisfaction (H9, path coefficient of 0.17, $p < 0.001$) and trustworthiness had a significant effect on user satisfaction (H10, path coefficient of 0.47, $p < 0.001$). Table 6.26 shows the e-government user experience structural model hypotheses testing.

| Hypothesis Path | | Path Coefficient | Results |
|---|---|---|---|
| $H_{US1}$ | Information quality ⟶ Ease of use | (0.41***) | Supported |
| $H_{US2}$ | Information quality ⟶ Convenience | (0.36***) | Supported |
| $H_{US3}$ | Website quality ⟶ Ease of use | (0.39***) | Supported |
| $H_{US4}$ | Website quality ⟶ Security and Support | (0.76***) | Supported |
| $H_{US5}$ | Ease of use ⟶ Perceived barriers | (0.66***) | Supported |
| $H_{US6}$ | Convenience ⟶ Perceived benefits | (0.65***) | Supported |
| $H_{US7}$ | Security and Support ⟶ Trustworthiness | (0.85***) | Supported |
| $H_{US8}$ | Barriers ⟶ User satisfaction | (0.42***) | Supported |
| $H_{US9}$ | Benefits ⟶ User satisfaction | (0.17***) | Supported |
| $H_{US10}$ | Trustworthiness ⟶ User satisfaction | (0.47***) | Supported |

****** p < 0.001***

***Table 6.26: E-government user experience structural model hypotheses testing***

### 6.8.4 Summary of EFA, scale constructs and e-government service user experience modelling

The e-government service user experience scale that emerged from the exploratory factor analysis (EFA) was conducted on 72 items used in the questionnaire. 13 items were eliminated due to not sufficiently loading onto any factor and the remaining 59 items loaded sufficiently with values from 0.5 to 0.9 approximately. The Cronbach's Alpha coefficients of all these remaining items ranged from 0.76 to 0.93 which shows each factor's scale to be either good to excellent and shows good internal consistency. The remaining 59 items were labelled in accordance with the items that loaded onto them and the following factors emerged: security and support, ease of use, information quality, trustworthiness, benefits, barriers, convenience, website quality and user satisfaction.

Detailed descriptive statistics were then presented and the comments from the open questions analysed based on these retained items to provide insightful information to attitudes towards the Nigeria Immigration Service (NIS) website and to ascertain general views of users' experience of the NIS e-government services. It emerged that respondents felt a high level of negativity towards being required to use the NIS website, and much of their concern stemmed from issues associated with security and support, which was further emphasised by users' lack of trust regarding the safeguarding of their personal and financial data. However, in contrast to the negativity mentioned earlier, the majority of the respondents were positive when asked about issues of information quality, convenience and benefits. The responses to the questions on the specific benefits associated with

convenience of access generally received a very positive response, more positive than in any other category of the questionnaire. The major barriers were felt to include an intermittent electricity supply and the high cost of internet access coupled with the high rate of unemployment, which caused users' difficulties when they needed to make use of the NIS e-service. Overall, the users were positive about their ability to access the website when and where they need to, and its potential convenience.

Nine factors were further subjected to analysis with a confirmatory factor analysis (CFA) and structural equation modelling (SEM) in which 19 items were removed due to poor model fit. The remaining 40 items produced a good model fit for the e-government service user experience measurement model. These items were then subjected to SEM to test the predicted hypotheses relationship between the variables, in which a good model fit was produced with significant effect. Finally, the e-government service user experience (EGSUE) structural model was created.

## 6.9 Digital Divide Descriptive Statistics

This section presents the descriptive statistics for each of the items in the questionnaire regarding access to computing facilities, and internet and e-government experience. In addition, it presents the result of the statistical tests undertaken to investigate the factors causing the digital divide amongst users of the Nigerian e-government service. The statistical analyses conducted include a t-test, and Anova and regression testing on the model of the factors.

### 6.9.1 Access to Computing Facilities

Access to computing facilities was measured using 11 items. The respondents indicated their level of access to computing facilities by choosing either "yes" or "no" for each statement. The 11 items are shown in Figure 6.10.

Figure 6.10 shows that 98.6% of the respondents had access to a mobile phone compared to 42.2% who had access to a landline telephone. Additionally, over 50% of the respondents had access to a computer and the internet in each of the suggested locations of home, work or school, and cyber cafes. However, only 49.3% said that they had access to an uninterrupted electricity supply.

Further analysis was conducted on access to computing facilities as shown in section 6.9.1 (i.).

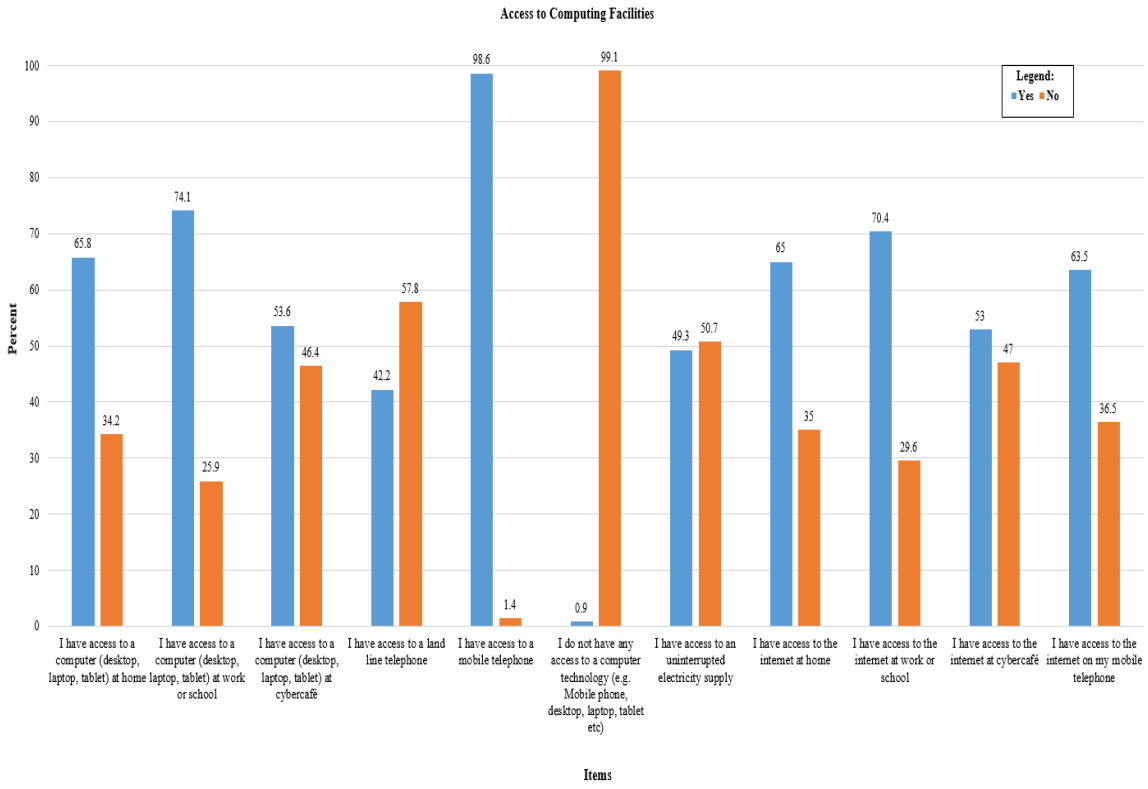


***Figure 6.10: Access to computing facilities***

***(i) Access to computing facilities (comparing Nigeria Rural, Nigeria Urban, Nigeria (Rural & Urban) and the UK & the USA)***

The comparisons of Nigeria Rural, Nigeria Urban, Nigeria (Rural & Urban) and the UK and the USA respondents' access to computing facilities is shown in Table 6.27; the respondents indicated their level of access to computing facilities by choosing either "yes" or "no" for each statement. The data analyses show that there was a significant use of mobile phones across the groups, as 92.6% of Nigeria Rural respondents confirmed they had access to a mobile telephone, while 100% of Nigeria Urban had access to a mobile phone and 99.1% of both the UK and the USA respondents confirmed they had access to a mobile phone.

In contrast, only 3.7% of respondents had access to a landline telephone in Nigeria Rural, while 11.4% of Nigeria Urban had access to a landline telephone and 79.3% of the respondents living in both the UK and the USA had access to one, showing the significant difference between Nigeria and the two developed nations.

Also, 93.7% and 83.8% of the respondents living in both the UK & the USA respectively had access to a computer (desktop, laptop and tablet) and the internet at home and work or school, compared to 39% and 65.5% of the respondents living in rural or urban Nigeria respectively.

| Variable | Items | Nigeria (Rural) | | Nigeria (Urban) | | Nigeria (Rural & Urban) | | UK & USA | |
|---|---|---|---|---|---|---|---|---|---|
| | | Percentage | | Percentage | | Percentage | | Percentage | |
| | | Yes | No | Yes | No | Yes | No | Yes | No |
| Access to Computing Facilities | I have access to a computer (desktop, laptop, tablet) at home. | 18.5 | 81.5 | 48.0 | 52.0 | 39.0 | 61.0 | 93.7 | 6.3 |
| | I have access to a computer (desktop, laptop, tablet) at work or school. | 42.6 | 57.4 | 75.6 | 24.4 | 65.5 | 34.5 | 83.8 | 16.2 |
| | I can access a computer (desktop, laptop, tablet) at a cybercafé. | 87.0 | 13.0 | 78.9 | 21.1 | 81.4 | 18.6 | 33.3 | 66.7 |
| | I have access to a landline telephone. | 3.7 | 96.3 | 11.4 | 88.6 | 9.0 | 91.0 | 79.3 | 20.7 |
| | I have access to a mobile phone. | 92.6 | 7.4 | 100.0 | 0.0 | 97.7 | 2.3 | 99.1 | 0.9 |
| | I do not have any access to computer technology (mobile phone, desktop, laptop, tablet). | 0.0 | 100.0 | 0.8 | 99.2 | 0.6 | 99.4 | 1.8 | 98.2 |
| | I have access to an uninterrupted electricity supply. | 1.9 | 98.1 | 8.9 | 91.1 | 6.8 | 93.2 | 93.7 | 6.3 |
| | I have access to the internet at home. | 18.5 | 81.5 | 45.5 | 54.5 | 37.3 | 62.7 | 91.9 | 8.1 |
| | I have access to the internet at work or school. | 44.4 | 55.6 | 69.9 | 30.1 | 62.1 | 37.9 | 82.0 | 18.0 |
| | I can access the internet at a cybercafé. | 87.0 | 13.0 | 79.7 | 20.3 | 81.9 | 18.1 | 31.5 | 68.5 |
| | I have access to the internet on my mobile phone. | 42.6 | 57.4 | 61.0 | 39.0 | 55.4 | 44.6 | 73.0 | 27.0 |
| | **Overall Average** | **39.9** | **60.1** | **52.7** | **47.3** | **48.8** | **51.2** | **69.4** | **30.6** |

***Table 6.27: Access to computing facilities (comparing Nigeria Rural, Nigeria Urban, Nigeria (Rural & Urban) and the UK and the USA)***

This analysis shows that 81.4% of the respondents living in Nigeria, in the rural and urban categories, had access to a computer at a cybercafe, compared to 33.3% of the respondents living in the UK and the USA. The poor level of access to computer facilities among the Nigerian respondents is reflected in their access to the internet, as at least 80% relied on cybercafes to access the internet, compared to 31.5% of the respondents living in the UK and the USA.

Over 50% of the respondents living in Nigeria in the rural and urban categories had access to the internet through their mobile telephones. However, only 6.8% of the respondents living in Nigeria in the rural and urban categories said that they had access to an uninterrupted electricity supply, compared to 93.7% of the respondents living in both the UK and the USA. This has a significant potential for difficulties and inconvenience in accessing e-government services.

### 6.9.2 Internet and E-government Experience

Internet and e-government experience was measured using nine items. The respondents indicated their internet and e-government experience by choosing a number on the scale: “never (1), rarely (2), occasionally (3), frequently (4) and very frequently (5)”. The nine items are shown in Figure 6.11.

An overall mean of 2.88 suggests that the respondents were occasional users of technology. However, this figure hides the higher level of specific experience and use, for example, “how often do you use the internet?” (mean = 4.02), and the percentage (100%) who said that they were occasional, frequent or very frequent users of the internet. This is similar for online shopping (53%) and online banking (71.5%); however, in each of these contexts, the largest groups were in the occasional category.

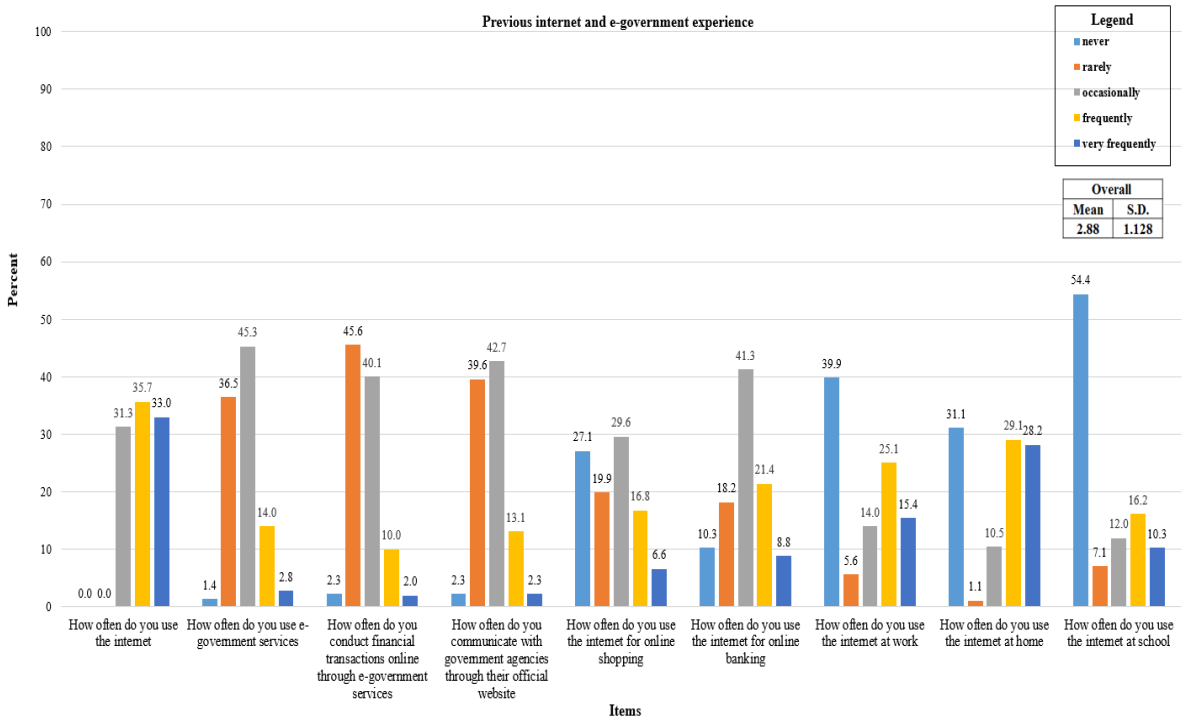


***Figure 6.11: Internet and e-government experience***

In terms of e-government services, there was evidence of relatively high use. When asked the question, “how often do you use e-government services?” 45.3%, 14.0% and 2.8% replied to being occasional, frequent and very frequent users of the e-government service, respectively.

Furthermore, the respondents’ use of the internet at school was relatively low (mean = 2.21) compared to their use at home (mean = 3.22) and work (mean = 2.70). Generally, the respondents use of the internet at work, home or school fell into the occasional category.

Further analysis was conducted on internet and e-government experience as shown in Section 6.9.2 (i.).

***(i.) Internet and E-government Experience (comparing Nigeria Rural, Nigeria Urban, Nigeria [Rural & Urban] and the UK and the USA)***

The comparison of Nigeria Rural, Nigeria Urban, Nigeria (Rural & Urban) and the UK and USA respondents' internet and e-government experience is shown in Table 6.28. The respondents indicated their internet and e-government experience by choosing a number on a scale of one to five which best applied to them: "never (1), rarely (2), occasionally (3), frequently (4) and very frequently (5)".

Key: Never (1), Rarely (2), Occasionally (3), Frequently (4), Very frequently (5)

| | | | Nigeria (Rural) | | | | | | | Nigeria (Urban) | | | | | | | Nigeria (Rural & Urban) | | | | | | | UK & USA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Percentage | | | | | | | Percentage | | | | | | | Percentage | | | | | | | Percentage | | | | | | |
| Variable | Item Codes | Items | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | Mean | S.D. | 1 | 2 | 3 | 4 | 5 |
| Previous Internet and E-government Experience | PIEE1 | How often do you use the internet | 3.33 | 0.614 | 0.0 | 0.0 | 74.1 | 18.5 | 7.4 | 3.79 | 0.771 | 0.0 | 0.0 | 42.3 | 36.6 | 21.1 | 3.65 | 0.755 | 0.0 | 0.0 | 52.0 | 31.1 | 16.9 | 4.38 | 0.661 | 0.0 | 0.0 | 9.9 | 42.3 | 47.7 |
| | PIEE2 | How often do you use e-government services | 2.39 | 0.564 | 3.7 | 53.7 | 42.6 | 0.0 | 0.0 | 2.58 | 0.690 | 0.8 | 49.6 | 42.3 | 5.7 | 1.6 | 2.52 | 0.658 | 1.7 | 50.8 | 42.4 | 4.0 | 1.1 | 3.10 | 0.873 | 1.8 | 21.6 | 47.7 | 22.5 | 6.3 |
| | PIEE3 | How often do you conduct financial transaction online through e-government services | 2.31 | 0.507 | 1.9 | 64.8 | 33.3 | 0.0 | 0.0 | 2.46 | 0.656 | 2.4 | 55.3 | 37.4 | 4.1 | 0.8 | 2.41 | 0.616 | 2.3 | 58.2 | 36.2 | 2.8 | 0.6 | 2.89 | 0.898 | 3.6 | 30.6 | 43.2 | 18.0 | 4.5 |
| | PIEE4 | How often do you communicate with government agencies through their official website | 2.46 | 0.573 | 1.9 | 51.9 | 44.4 | 1.9 | 0.0 | 2.46 | 0.656 | 3.3 | 52.8 | 39.8 | 3.3 | 0.8 | 2.46 | 0.630 | 2.8 | 52.5 | 41.2 | 2.8 | 0.6 | 2.97 | 0.909 | 2.7 | 28.8 | 42.3 | 20.7 | 5.4 |
| | PIEE5 | How often do you use the internet for online shopping | 1.41 | 0.765 | 72.2 | 18.5 | 5.6 | 3.7 | 0.0 | 2.01 | 1.156 | 43.1 | 30.1 | 15.4 | 5.7 | 5.7 | 1.82 | 1.086 | 52.0 | 26.6 | 12.4 | 5.1 | 4.0 | 3.41 | 0.928 | 1.8 | 12.6 | 41.4 | 31.5 | 12.6 |
| | PIEE6 | How often do you use the internet for online banking | 2.19 | 1.100 | 35.2 | 24.1 | 31.5 | 5.6 | 3.7 | 2.80 | 0.966 | 11.4 | 21.1 | 47.2 | 17.1 | 3.3 | 2.61 | 1.045 | 18.6 | 22.0 | 42.4 | 13.6 | 3.4 | 3.50 | 1.043 | 2.7 | 12.6 | 37.8 | 26.1 | 20.7 |
| | PIEE7 | How often do you use the internet at work | 1.85 | 1.379 | 68.5 | 3.7 | 9.3 | 11.1 | 7.4 | 2.62 | 1.523 | 40.7 | 6.5 | 16.3 | 23.6 | 13.0 | 2.38 | 1.519 | 49.2 | 5.6 | 14.1 | 19.8 | 11.3 | 3.21 | 1.415 | 21.6 | 8.1 | 16.2 | 36.0 | 18.0 |
| | PIEE8 | How often do you use the internet at home | 1.72 | 1.379 | 75.9 | 1.9 | 5.6 | 7.4 | 9.3 | 2.60 | 1.598 | 45.5 | 2.4 | 13.8 | 22.8 | 15.4 | 2.33 | 1.584 | 54.8 | 2.3 | 11.3 | 18.1 | 13.6 | 4.11 | 1.107 | 8.1 | 0.0 | 7.2 | 42.3 | 42.3 |
| | PIEE9 | How often do you use the internet at school | 1.65 | 1.102 | 68.5 | 9.3 | 14.8 | 3.7 | 3.7 | 2.12 | 1.316 | 52.0 | 8.9 | 17.1 | 18.7 | 3.3 | 1.98 | 1.270 | 57.1 | 9.0 | 16.4 | 14.1 | 3.4 | 2.59 | 1.654 | 46.8 | 5.4 | 9.0 | 19.8 | 18.9 |
| | **Overall Average** | | **2.15** | **0.887** | **36.4** | **25.3** | **29.0** | **5.8** | **3.5** | **2.60** | **1.037** | **22.1** | **25.2** | **30.2** | **15.3** | **7.2** | **2.46** | **1.018** | **26.5** | **25.2** | **29.8** | **12.4** | **6.1** | **3.35** | **1.054** | **9.9** | **13.3** | **28.3** | **28.8** | **19.7** |

***Table 6.28: Internet and e-government experiences (comparing Nigeria Rural, Nigeria Urban, Nigeria [Rural & Urban] and the UK and the USA)***

The overall mean of 2.46 suggests that the respondents living in both the Nigeria rural and urban categories are occasional users of technology. However, this figure conceals the highest level of experience, and use, for example, "how often do you use the internet?" (Mean = 3.65) of the Nigeria rural and urban respondents, and the percentage (100%) who are occasional, frequent or very frequent users of the internet. However, the percentage of Nigeria rural and urban respondents who used the internet for online shopping (when asked question, "how often do you use the internet for online shopping"') dropped to 53%.

However, a greater number of respondents used the internet for online banking 71.5%.

In terms of e-government services, there was evidence of fair use in the answers to the question, “how often do you use e-government services?” (mean = 2.52). The Nigeria rural and urban respondents’ use of the internet at school was relatively low (mean = 1.98) compared to their use at home (mean = 2.33) and work (mean = 2.38). Generally, the respondents use of the internet at work and home fell into the frequent category, while their use of the internet at school fell into the occasional category.

### 6.9.3 Summary of the Digital Divide Descriptive Statistics

In summary, there was considerable evidence that respondents had substantial access to mobile phones compared to landline telephones. However, the percentage of respondents who had access to a computer and the internet in each of the suggested locations of home, work or school, and cybercafés was considerably lower than those who had access to mobile phones. Similarly, the majority of the respondents were occasional users of both internet and e-government services including internet banking and online shopping. This result shows that despite them being relatively well-educated, there is still evidence of a digital divide amongst this group as the majority of respondents did not have easy access to computing facilities. This evidence of a digital divide is further investigated in the next section (6.9.4) of this study.

### 6.9.4 Hypotheses Testing on the Demographic Effect of the Digital Divide Dimensions

This study used an independent t-test and one-way analysis of variance (ANOVA). An independent sample t-test is used to compare mean scores when there are only two different groups of respondents or conditions, to identify if there is a statistically significant difference in their mean scores (Pallant, 2010).

An ANOVA test is used in hypotheses testing to compare mean scores when there are more than two groups or populations (Pallant, 2010). A one-way ANOVA statistical test compares group variance and within-group variance to determine if a real difference exists, with a post-hoc test that identifies where significance difference exist between these groups (Ibid.). In conducting both an independent t-test and an ANOVA test, the magnitude of the effect size is important; this is

explained in Section 6.9.4 (i.) and in Levene's test for the equality of variances in Section 6.9.4 (ii.).

***(i.) Calculating T-Test and Anova Effect Size***

Effect size is calculated to provide an indication of the magnitude of differences between groups in both the t-test and ANOVA, to ensure the difference in mean scores has not occurred by chance (Pallant, 2010). The eta squared and Cohen's d are the most commonly used effect size formulas and benchmarks (Ibid.). The Cohen's d effect size guidelines were used to interpret values of effect size (Cohen, 1988). Table 6.29 shows the Cohen's d effect size guidelines.

| Value | Effect Size |
|---|---|
| 0.01 to < 0.06 | Small |
| 0.06 to < 0.14 | Medium |
| 0.14 and above | Large |

***Table 6.29: Cohen's d effect size guidelines***

In a t-test, the effect size of the statistical difference in the two groups' mean scores is calculated using the eta Squared formula: $t^2$ / $t^2$ + (df). In ANOVA, the effect size of the statistical difference in the groups' mean score is calculated using the eta formula: the sum of the squares (between groups)/the total sum of the squares.

***(ii) Levene's Test for the Equality and Homogeneity of Variances***

In a t-test, the result of Levene's test for the equality of variances needs to be checked to determine the spread of group data, as well as whether data are identical. If the sig. value for Levene's test is larger than 0.05, it shows that the group data tends to be close to the mean and the assumption of variance is assumed. As a result, data in the first line of the t-test table, which refers to "equal variances assumed", need to be used (Pallant, 2010). However, if the result of Levene's test is less than 0.05, it shows that the group data tend to spread out around the mean. As a result, data in the second line of the t-test table, which refers to "equal variances not assumed" need to be used to interpret the t-test result (Ibid.).

In an ANOVA test, if the sig. value for Levene's test is larger than 0.05, its assumption of the homogeneity of variance has not been violated. As a result, the Tukey HD post-hoc test is used for the multiple comparisons of the group to determine the statistically significant difference in the mean scores between each

pair of groups. However, if the sig. value for Levene's test is less than 0.05, then its assumption of homogeneity of variance has been violated and the Games-Howell post-hoc test should be used as a result (Morgan et al., 2013).

### 6.9.5 Hypotheses on Location

**$H_{DD1}$: Location (Rural/Urban) Affects Access to Computing Facilities**

**Research question:** Is there a significant difference in access to computing facilities between the Nigeria urban and the Nigeria rural users?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference in access to computing facilities between the Nigeria urban and the Nigeria rural users.

**Ha (alternative hypothesis):** There is a significant difference in access to computing facilities between the Nigeria urban and the Nigeria rural users.

| **Group Statistics** | | | | | |
|---|---|---|---|---|---|
| Nigeria: Urban/Rural | | N | Mean | Std. Deviation | Std. Error Mean |
| Access to Computing Facilities | Urban | 123 | 5.7967 | 1.85083 | .16688 |
| | Rural | 54 | 4.3889 | 1.59500 | .21705 |

***Table 6.30: Group statistics for Nigeria urban / rural access to computing facilities***

| **Independent Samples Test** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | T-test for Equality of Means | | | | | | |
| | | | | | | | | | 95 % Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Access to Computing Facilities | Equal variances assumed | .343 | .559 | 4.853 | 175 | .000 | 1.40786 | .29012 | .83527 | 1.98045 |
| | Equal variances not assumed | | | 5.142 | 116.497 | .000 | 1.40786 | .27379 | .86561 | 1.95011 |

***Table 6.31: Independent samples test for Nigeria urban/rural access to computing facilities***

**T-test result:** An independent sample t-test was conducted to compare the access to computing facilities scores. There was a significant difference in the scores for the two groups: t (175) = 4.853, p = 0.00, two-tailed for the Nigeria urban users (M = 5.60, SD = 1.851) and the Nigeria rural users (M = 4.39, SD = 1.595). Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference in access to computing

facilities between the Nigeria urban and rural users. The magnitude of difference in the means is (mean difference = 1.408, 95% confidence interval (CI): 0.835 to 1.980). The eta squared statistic (0.12) indicates a medium effect size. These results suggest that users in the Nigeria urban category had significantly better access to computing facilities than those in the Nigeria rural category.

### $H_{DD2}$: Location (Rural/Urban) Affects Internet Experience

**Research question:** Is there a significant difference in internet experience between the Nigeria urban and rural users?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference in the Nigeria urban and the Nigeria rural groups' experience of the internet.

**Ha (Alternative hypothesis):** There is a significant difference in the Nigeria urban and the Nigeria rural groups' experience of the internet.

| **Group Statistics** | | | | | |
|---|---|---|---|---|---|
| | Nigeria-Urban/Rural | N | Mean | Std. Deviation | Std. Error Mean |
| Internet Experience | Urban | 123 | 15.9350 | 5.52600 | .49826 |
| | Rural | 54 | 12.1481 | 5.12267 | .69711 |

***Table 6.32: Group statistics for Nigeria urban/rural internet experience***

| **Independent Samples Test** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | T-test for Equality of Means | | | | | | |
| | | | | | | | | | 95 % Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Internet Experience | Equal variances assumed | 2.166 | .143 | 4.290 | 175 | .000 | 3.78681 | .88267 | 2.04477 | 5.52885 |
| | Equal variances not assumed | | | 4.419 | 108.665 | .000 | 3.78681 | .85687 | 2.08847 | 5.48516 |

***Table 6.33: Independent samples test for Nigeria urban/rural internet experience***

**T-test result:** An independent sample t-test was conducted to compare the scores for internet experience. There was a significant difference in the two groups' scores: t (175) = 4.290, p =0.00, two-tailed for the Nigeria urban users (M = 15.94, SD = 5.526) and the rural users (M = 12.15, SD = 5.123). Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference in internet experience between the Nigeria urban and rural

users. The magnitude of difference in the means is (mean difference = 3.787, 95% CI: 2.045 to 5.529). The eta squared statistic (0.10) indicates a moderate effect size. These results suggest that urban users in Nigeria have more internet experience than rural users.

### $H_{DD3}$: Location (Rural/Urban) Affects E-government Experience

**Research question:** Is there a significant difference in Nigerian urban and rural users' e-government experience?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference in Nigerian urban and rural users' e-government experience.

**Ha (Alternative hypothesis):** There is a significant difference in Nigerian urban and rural users' e-government experience.

| **Group Statistics** | | | | | |
|---|---|---|---|---|---|
| | Nigeria-urban / rural | N | Mean | Std. deviation | Std. error mean |
| E-government experience | Urban | 123 | 7.4878 | 1.85263 | .16705 |
| | Rural | 54 | 7.1667 | 1.48895 | .20262 |

***Table 6.34: Group statistics for Nigeria urban/rural e-government experience***

| **Independent Samples Test** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's test for equality of variances | | T-test for equality of means | | | | | | |
| | | | | | | | | | 95 % CI of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean difference | Std. error difference | Lower | Upper |
| e-government experience | Equal variances assumed | 4.078 | .045 | 1.124 | 175 | .263 | .32114 | .28576 | -.24283 | .88511 |
| | Equal variances not assumed | | | 1.223 | 124.537 | .224 | .32114 | .26260 | -.19860 | .84088 |

***Table 6.35: Independent samples test for Nigeria urban/rural e-government experience***

**T-test result:** An independent sample t-test was conducted to compare e-government experience scores. There was no significant difference the two groups' scores: t (124.537) = 1.223, p = 0.22, two-tailed for the Nigeria urban users (M = 7.49, SD = 1.853) and rural users (M = 7.17, SD = 1.489). Thus, there is significant evidence to accept the null hypothesis and conclude that there is no statistically significant difference in internet experience between the Nigeria urban and rural users.

These results suggest that both urban and rural users in Nigeria have similar e-government experience, thus showing that their place of residence has no bearing on their e-government experience.

### $H_{DD4}$: Location (developing/developed) Affects Access to Computing Facilities

**Research question:** Is there a significant difference in access to computing facilities between Nigeria urban and the UK plus the USA users?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference in access to computing facilities between the Nigeria urban and the UK plus the USA users.

**Ha (alternative hypothesis):** There is a significant difference in access to computing facilities between the Nigeria urban and the UK plus the USA users.

| **Group Statistics** | | | | | |
|---|---|---|---|---|---|
| Nigeria urban vs UK & USA | | N | Mean | Std. deviation | Std. error mean |
| Access to computing facilities | Nigeria urban | 123 | 5.7967 | 1.85083 | .16688 |
| | UK & USA | 111 | 7.6306 | 1.63445 | .15513 |

***Table 6.36: Group statistics for Nigeria urban/the UK & the USA access to computing facilities***

| **Independent Samples Test** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | T-test for equality of means | | | | | | |
| | | | | | | | | | 95 % CI of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean difference | Std. error difference | Lower | Upper |
| Access to computing facilities | Equal variances assumed | .916 | .340 | -7.997 | 232 | .000 | -1.83388 | .22931 | -2.28568 | -1.38209 |
| | Equal variances not assumed | | | -8.049 | 231.896 | .000 | -1.83388 | .22785 | -2.28281 | -1.38496 |

***Table 6.37: Independent samples test for Nigeria urban/the UK & the USA access to computing facilities***

**T-test result:** An independent sample t-test was conducted to compare access to computing facilities scores. There was a significant difference in the scores for the two groups of users: t (232) = -7.997, p = 0.00, two-tailed for the Nigeria urban respondents (M = 5.60, SD = 1.851) and the UK plus the USA respondents (M = 7.63, SD = 1.634). Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference in the access to computing facilities for the Nigeria urban and UK plus USA users. The magnitude

of difference in the means is (mean difference = -1.834, 95% CI: -2.286 to -1.384). Further, the eta squared statistic (0.29) indicates a large effect size.

These results suggest that users from the UK plus the USA had significantly better access to computing facilities than those in the Nigeria urban category. This supports the findings in Table 6.27 which shows that 93.7% and 83.8% of users living in the UK and the USA have access to a computer (desktop, laptop and tablet) and to the internet at home and work or school respectively, compared to 48% and 75.6% of Nigerian users living in the urban category who had access to a computer at home and work or school respectively. These results show that the users living in the UK and the USA users had more access to computing facilities than the urban users in Nigeria.

**$H_{DD5}$: Location (developed/developing) affects internet experience**

**Research question:** Is there a significant difference in internet experience between the Nigeria urban and the UK plus the USA users?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference in internet experience between the Nigeria urban and the UK plus USA users.

**Ha (alternative hypothesis):** There is a significant difference in internet experience between the Nigeria Urban and the UK plus USA users.

| **Group Statistics** | | | | | |
|---|---|---|---|---|---|
| | Nigeria urban vs UK & USA | N | Mean | Std. deviation | Std. error mean |
| Internet experience | Nigeria Urban | 123 | 15.9350 | 5.52600 | .49826 |
| | UK & USA | 111 | 21.1802 | 5.00036 | .47461 |

***Table 6.38: Group statistics for Nigeria urban/the UK & the USA according to internet experience***

| **Independent Samples Test** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | T-test for equality of means | | | | | | |
| | | | | | | | | | 95% CI of the difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean difference | Std. error difference | Lower | Upper |
| Internet Experience | Equal variances assumed | 3.399 | .067 | -7.583 | 232 | .000 | -5.24522 | .69167 | -6.60798 | -3.88246 |
| | Equal variances not assumed | | | -7.622 | 231.998 | .000 | -5.24522 | .68813 | -6.60100 | -3.88944 |

***Table 6.39: Independent samples test for Nigeria urban/the UK & the USA, according to internet experience***

**T-test result:** An independent sample t-test was conducted to compare internet experience scores. There was a significant difference in the scores for the two groups of users: t (232) = -7.583, p = 0.00, two-tailed for the Nigeria urban users (M = 15.94, SD = 5.526) and the UK plus USA users (M = 21.18, SD = 5.000). Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference in the internet experience between the Nigeria urban and the UK plus USA users. The magnitude of difference in the means is (mean difference = -5.245, 95% CI: -6.608 to -3.882). Furthermore, the eta squared statistic (0.31) indicates a large effect size. These results suggest that the UK and the USA users had more internet experience than the urban users in Nigeria.

**$H_{DD6}$: Location (developing/developed) affects e-government experience**

**Research question:** Is there a significant difference in e-government experience for the Nigeria urban and the UK the plus USA users?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference in e-government experience between the Nigeria urban and the UK plus the USA users.

**Ha (alternative hypothesis):** There is a significant difference in e-government experience between the Nigeria urban and the UK plus the USA users.

| **Group Statistics** | | | | | |
|---|---|---|---|---|---|
| | Nigeria urban vs UK & USA | N | Mean | Std. deviation | Std. error mean |
| E-government experience | Nigeria urban | 123 | 7.4878 | 1.85263 | .16705 |
| | UK & USA | 111 | 8.9640 | 2.51515 | .23873 |

***Table 6.40: Group statistics for Nigeria urban/the UK and the USA, according to e-government experience***

| **Independent Samples Test** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for equality of variances | | T-test for equality of means | | | | | | |
| | | | | | | | | | 95% CI of the difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean difference | Std. error difference | Lower | Upper |
| E-government experience | Equal variances assumed | 1.588 | .209 | -5.144 | 232 | .000 | -1.47616 | .28695 | -2.04152 | -.91080 |
| | Equal variances not assumed | | | -5.066 | 200.706 | .000 | -1.47616 | .29137 | -2.05069 | -.90163 |

***Table 6.41: Independent samples test for Nigeria urban/the UK & the USA, according to e-government experience***

T-test result: An independent sample t-test was conducted to compare the e-government experience scores. There was a significant difference in the scores for the two groups of users: t (232) = -5.144, p = 0.00, two-tailed for the Nigeria urban users (M = 7.49, SD = 1.853) and the UK plus the USA users (M = 8.96, SD = 2.515). Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference in the e-government experience of the Nigeria urban and the UK plus the USA users. The magnitude of difference in the means is (mean difference = -1.476, 95% CI: -2.042 to -0.911). However, the eta squared statistic (-0.12) indicates a small effect. These results suggest that the users from the UK and the USA had more e-government experience than the urban users in Nigeria, showing that living in a developed or a developing country affects e-government experience.

### 6.9.6 Hypotheses on Gender

**$H_{DD7}$: Gender affects access to computing facilities**

**Research question:** Is there a significant difference between male and female users in their access to computing facilities?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference between male and female users in their access to computing facilities.

**Ha (alternative hypothesis):** There is a significant difference between male and female users in their access to computing facilities.

| **Group Statistics** | | | | | |
|---|---|---|---|---|---|
| | Gender | N | Mean | Std. deviation | Std. error mean |
| Access to computing facilities | Males | 176 | 6.5966 | 2.11978 | .15978 |
| | Females | 175 | 6.1257 | 1.80872 | .13673 |

***Table 6.42: Group statistics for access to computing facilities by gender***

| **Independent Samples Test** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for equality of variances | | T-test for equality of means | | | | | | |
| | | | | | | | | | 95% CI of the difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean difference | Std. error difference | Lower | Upper |
| Access to computing facilities | Equal variances assumed | 4.905 | .027 | 2.238 | 349 | .026 | .47088 | .21039 | .05708 | .88467 |
| | Equal variances not assumed | | | 2.239 | 341.146 | .026 | .47088 | .21030 | .05723 | .88452 |

***Table 6.43: Independent samples test for access to computing facilities by gender***

**T-test result:** An independent sample t-test was conducted to compare the scores for access to computing facilities by gender. There was a significant difference in the two groups of users' scores: t (341.146) = 2.239, p = 0.03, two-tailed for the male users (M = 6.60, SD = 2.120) and the female users (M = 6.13, SD = 1.809).

Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference in the access that men and women have to computing facilities. The magnitude of difference in the means is (mean difference = 0.471, 95% CI: 0.057 to 0.885). The eta squared statistic (0.01) indicates a very small effect. These results suggest that male users have better access to computing facilities than female users, thus showing that gender affects access to computing facilities, but with a very small effect.

### $H_{DD8}$: Gender affects internet experience

**Research question:** Is there a significant difference in internet experience between male and female users?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference in male and female users' internet experience.

**Ha (alternative hypothesis):** There is a significant difference in male and female users' internet experience.

| **Group Statistics** | | | | | |
|---|---|---|---|---|---|
| | Gender | N | Mean | Std. deviation | Std. error mean |
| Internet experience | Male | 176 | 18.3523 | 6.12263 | .46151 |
| | Female | 175 | 17.0686 | 5.70903 | .43156 |

***Table 6.44: Group statistics for internet experience according to gender***

| **Independent Samples Test** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's test for equality of variances | | T-test for equality of means | | | | | | |
| | | | | | | | | | 95% CI of the difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean difference | Std. error difference | Lower | Upper |
| Internet experience | Equal variances assumed | .557 | .456 | 2.031 | 349 | .043 | 1.28370 | .63198 | .04074 | 2.52667 |
| | Equal variances not assumed | | | 2.032 | 347.571 | .043 | 1.28370 | .63185 | .04097 | 2.52644 |

***Table 6.45: Independent samples test for internet experience according to gender***

**T-test result:** An independent sample t-test was conducted to compare the scores for internet experience. There was a significant difference in the scores for the two groups of users: t (349) = 2.031, p = 0.04, two-tailed for the male users (M = 18.35, SD = 6.123) and the female users (M = 17.07, SD = 5.709). Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference in the internet experience according to gender. The magnitude of difference in the means is (mean difference = 1.284, 95% CI: 0.041 to 2.527). The eta squared statistic (0.01) indicates a small effect size. These results suggest that male users have more internet experience than female users thus showing that gender affects internet experience, but with a very small effect.

### $H_{DD9}$: Gender affects previous e-government experience

Research question: Is there a significant difference in e-government experience according to gender?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference in e-government experience according to gender.

**Ha (alternative hypothesis):** There is a significant difference in e-government experience according to gender.

| **Group Statistics** | | | | | |
|---|---|---|---|---|---|
| | Gender | N | Mean | Std. deviation | Std. error mean |
| E-government experience | Male | 176 | 8.3295 | 2.24103 | .16892 |
| | Female | 175 | 8.0229 | 2.22306 | .16805 |

***Table 6.46: Group statistics for e-government experience by gender***

| **Independent Samples Test** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's test for equality of variances | | T-test for equality of means | | | | | | |
| | | | | | | | | | 95% CI of the difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean difference | Std. error difference | Lower | Upper |
| E-government experience | Equal variances assumed | .010 | .921 | 1.287 | 349 | .199 | .30669 | .23828 | -.16196 | .77534 |
| | Equal variances not assumed | | | 1.287 | 348.998 | .199 | .30669 | .23828 | -.16195 | .77533 |

***Table 6.47: Independent samples test for e-government experience by gender***

**T-test result:** An independent sample t-test was conducted to compare e-government experience scores. There was no significant difference in the scores for the two groups of users: t (349) = 1.287, p = 0.20, two-tailed for the male users (M = 8.33, SD = 2.241) and the female users (M = 8.02, SD = 2.223). Thus, there is significant evidence to accept the null hypothesis and conclude that there is no statistically significant difference in the male and female users' e-government experience.

### 6.9.7 Hypotheses on Age

**$H_{DD10}$: Age affects access to computing facilities**

**Research question:** Is there a significant difference between young, middle-aged and older people regarding their access to computing facilities?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference between young, middle-aged and older people regarding their access to computing facilities.

**Ha (alternative hypothesis):** There is a significant difference between young, middle-aged and older people regarding their access to computing facilities.

| Descriptive | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Access to computing facilities | | | | | | | | |
| | | | | | 95% Confidence Interval for Mean | | | |
| | N | Mean | Std. Deviation | Std. Error | Lower Bound | Upper Bound | Minimum | Maximum |
| Young people | 99 | 6.0909 | 1.70288 | .17115 | 5.7513 | 6.4305 | 3.00 | 11.00 |
| Middle-aged people, | 184 | 6.7337 | 2.04318 | .15063 | 6.4365 | 7.0309 | 3.00 | 11.00 |
| Older people | 68 | 5.7500 | 2.00280 | .24287 | 5.2652 | 6.2348 | 2.00 | 10.00 |
| Total | 351 | 6.3618 | 1.98210 | .10580 | 6.1537 | 6.5699 | 2.00 | 11.00 |

***Table 6.48: Descriptives for access to computing facilities by age group***

| Test for homogeneity of variances | | | |
|---|---|---|---|
| Access to computing facilities | | | |
| Levene statistic | df1 | df2 | Sig. |
| 3.651 | 2 | 348 | .027 |

***Table 6.49: Test for homogeneity of variances for access to computing facilities according to age group***

| ANOVA | | | | | |
|---|---|---|---|---|---|
| Access to computing facilities | | | | | |
| | Sum of squares | df | Mean square | F | Sig. |
| Between groups | 58.166 | 2 | 29.083 | 7.685 | .001 |
| Within groups | 1316.883 | 348 | 3.784 | | |
| Total | 1375.048 | 350 | | | |

***Table 6.50: ANOVA for access to computing facilities by age***

Post-hoc tests

| Multiple Comparisons | | | | | | | |
|---|---|---|---|---|---|---|---|
| Dependent variable: access to computing facilities | | | | | | | |
| | | | Mean | | | 95% CI | |
| | (I) Age group | (J) Age group | difference (I-J) | Std. error | Sig. | Lower bound | Upper bound |
| Games-Howell | Young people | Young people | -.64279* | .22799 | .014 | -1.1806 | -.1050 |
| | | | .34091 | .29712 | .487 | -.3636 | 1.0454 |
| | Middle-aged people | Middle-aged people | .64279* | .22799 | .014 | .1050 | 1.1806 |
| | | | .98370* | .28579 | .002 | .3056 | 1.6618 |
| | Older people | Older people | -.34091 | .29712 | .487 | -1.0454 | .3636 |
| | | | -.98370* | .28579 | .002 | -1.6618 | -.3056 |
| *. The mean difference is significant at the 0.05 level | | | | | | | |

***Table 6.51: Post-hoc tests for multiple comparisons for access to computing facilities according to age group***

**Results:** An ANOVA test was conducted to explore the difference between young, middle-aged and older people regarding their access to computing facilities. The respondents were divided into three groups according to their age (young people: 18 to 30 years; middle-aged people: 31 to 50 years; older people: 51 years and above).

The assumption of homogeneity of variances was tested using Levene's test and violated as the sig. value was 0.027. The ANOVA was significant, F (2, 348) =7.685, p = 0.001. Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference between young, middle-aged and older people regarding their access to computing facilities. However, the actual difference in the mean scores between groups was small at 0.04.

The Games-Howell post-hoc tests indicated that the mean score for the middle-aged people (M = 6.73, SD = 2.043) was significantly different from that for the younger (M = 6.09, SD = 1.703), p = 0.01 and the older age groups: (M = 5.75, SD = 2.003), p = 0.00. There is thus no significant difference between the young and the older people's access to computer facilities.

**$H_{DD11}$: Age affects previous experience**

**Research question:** Is there a significant difference between young, middle-aged and older people regarding internet experience?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference in young, middle-aged and older people's internet experience.

**Ha (alternative hypothesis):** There is a significant difference in young, middle-aged and older people's internet experience.

| Descriptives for Internet experience | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 95% confidence interval for mean | | | |
| | N | Mean | Std. deviation | Std. error | Lower bound | Upper bound | Minimum | Maximum |
| Young people | 99 | 16.6869 | 5.52110 | .55489 | 15.5857 | 17.7880 | 8.00 | 30.00 |
| Middle-aged people | 184 | 18.8533 | 5.90408 | .43525 | 17.9945 | 19.7120 | 8.00 | 30.00 |
| Older people | 68 | 16.1176 | 6.09999 | .73973 | 14.6411 | 17.5942 | 8.00 | 30.00 |
| Total | 351 | 17.7123 | 5.94641 | .31740 | 17.0880 | 18.3365 | 8.00 | 30.00 |

***Table 6.52: Descriptives for internet experience according to age***

| Test for homogeneity of variances for Internet experience | | | |
|---|---|---|---|
| Levene statistic | df1 | df2 | Sig. |
| .725 | 2 | 348 | .485 |

***Table 6.53: Test for homogeneity of variances for internet experience according to age***

| ANOVA | | | | | |
|---|---|---|---|---|---|
| Internet experience | | | | | |
| | Sum of squares | df | Mean square | F | Sig. |
| Between groups | 516.548 | 2 | 258.274 | 7.579 | .001 |
| Within groups | 11859.390 | 348 | 34.079 | | |
| Total | 12375.937 | 350 | | | |

***Table 6.54: ANOVA tests for internet experience according to age group***

Post–hoc tests

| Multiple comparisons | | | | | | |
|---|---|---|---|---|---|---|
| Dependent variable: internet experience using Tukey HSD | | | | | | |
| | | Mean | Std. | | 95% CI | |
| (I) Age group | (J) Age group | difference (I-J) | error | Sig. | Lower bound | Upper bound |
| Young people | Middle-aged people | -2.16639* | .72763 | .009 | -3.8791 | -.4537 |
| | Older people | .56922 | .91945 | .810 | -1.5950 | 2.7334 |
| Middle-aged people | Young people | 2.16639* | .72763 | .009 | .4537 | 3.8791 |
| | Older people | 2.73561* | .82847 | .003 | .7856 | 4.6857 |
| Older people | Young people | -.56922 | .91945 | .810 | -2.7334 | 1.5950 |
| | Middle-aged people | -2.73561* | .82847 | .003 | -4.6857 | -.7856 |
| *. The mean difference is significant at the 0.05 level | | | | | | |

***Table 6.55: Post-hoc tests – multiple comparisons for internet experience according to age group***

**Results:** A one-way analysis of variance test was conducted to explore the difference between young, middle-aged and older people regarding internet experience. The respondents were divided into three groups according to their age (young age group: 18 to 30 years; middle-aged group: 31 to 50 years; older age group: 51 years and above).

The assumption of homogeneity of variances was tested using Levene's Test and not violated as the sig. value was 0.485. The ANOVA was significant: F (2, 348) =7.579, p = 0.001. Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference between young, middle-aged and older people regarding internet experience. However, the actual difference in the mean scores was small at 0.042.

The Tukey HSD post-hoc tests indicated that the mean score for the middle-aged group (M = 18.85, SD = 5.904) was significantly different from that for the younger age group (M = 16.69, SD = 5.521) and the older age group (M = 16.12, SD = 6.100), p = 0.01 and 0.00 respectively. There was no significant difference between the young and older age groups.

### $H_{DD12}$: Age affects previous e-government experience

**Research question:** Is there a significant difference between young, middle-aged and older people regarding e-government experience?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference between young, middle-aged and older people regarding e-government experience.

**Ha (alternative hypothesis):** There is a significant difference between young, middle-aged and older people regarding e-government experience.

| Descriptives | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| E-government experience | | | | | | | | |
| | | | | | 95% CI for mean | | | |
| | N | Mean | Std. deviation | Std. error | Lower bound | Upper bound | Minimum | Maximum |
| Young people | 99 | 7.8081 | 2.18845 | .21995 | 7.3716 | 8.2446 | 3.00 | 15.00 |
| Middle-aged people | 184 | 8.2337 | 2.20896 | .16285 | 7.9124 | 8.5550 | 3.00 | 15.00 |
| Older people | 68 | 8.5588 | 2.32046 | .28140 | 7.9972 | 9.1205 | 5.00 | 15.00 |
| Total | 351 | 8.1766 | 2.23418 | .11925 | 7.9421 | 8.4112 | 3.00 | 15.00 |

***Table 6.56: Descriptives for age groups' e-government experience***

| Test for homogeneity of variances | | | |
|---|---|---|---|
| E-government experience | | | |
| Levene statistic | df1 | df2 | Sig. |
| .331 | 2 | 348 | .719 |

***Table 6.57: Test for homogeneity of variances for e-government experience according to age***

| ANOVA | | | | | |
|---|---|---|---|---|---|
| E-government experience | | | | | |
| | Sum of squares | df | Mean square | F | Sig. |
| Between groups | 23.979 | 2 | 11.990 | 2.421 | .090 |
| Within groups | 1723.069 | 348 | 4.951 | | |
| Total | 1747.048 | 350 | | | |

***Table 6.58: ANOVA for e-government experience according to age group***

**Results:** A one-way analysis of variance was conducted to explore the difference between young, middle-aged and older people regarding their e-government experience. The respondents were divided into three groups according to their age (younger age group: 18 to 30 years; middle-aged group: 31 to 50 years; older age group: 51 years and above).

The assumption of the homogeneity of variances was tested using Levene's test and not violated as the sig. value was 0.719. The ANOVA was not significant: F (2, 348) = 2.421, p = 0.090. Thus, there is significant evidence to accept the null hypothesis and conclude that there is no statistically significant difference between young, middle-aged and older people's e-government experience.

### 6.9.8 Hypotheses on Education

**$H_{DD13}$: Education affects access to computing facilities**

**Research question:** Is there a significant difference between well-educated, moderately educated and fairly educated groups regarding access to computing facilities?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference between well-educated, moderately educated and fairly educated people regarding access to computing facilities.

**Ha (alternative hypothesis):** There is a significant difference between well-educated, moderately educated and fairly educated people regarding access to computing facilities.

| Descriptives | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Access to computing facilities | | | | | | | | |
| | N | Mean | Std. deviation | Std. error | 95% CI for mean Lower bound | 95% CI for mean Upper bound | Minimum | Maximum |
| Well-educated | 90 | 7.6222 | 1.49590 | .15768 | 7.3089 | 7.9355 | 4.00 | 10.00 |
| Moderately educated | 202 | 6.2178 | 1.85871 | .13078 | 5.9599 | 6.4757 | 2.00 | 11.00 |
| Fairly educated | 59 | 4.9322 | 1.91963 | .24991 | 4.4319 | 5.4325 | 3.00 | 11.00 |
| Total | 351 | 6.3618 | 1.98210 | .10580 | 6.1537 | 6.5699 | 2.00 | 11.00 |

***Table 6.59: Descriptives for access to computing facilities according to level of education***

| Test for homogeneity of variances | | | |
|---|---|---|---|
| Access to computing facilities | | | |
| Levene statistic | df1 | df2 | Sig. |
| 2.401 | 2 | 348 | .092 |

***Table 6.60: Test for homogeneity of variances for access to computing facilities according to level of education***

| ANOVA | | | | | |
|---|---|---|---|---|---|
| Access to Computing Facilities | | | | | |
| | Sum of Squares | df | Mean Square | F | Sig. |
| Between Groups | 267.748 | 2 | 133.874 | 42.074 | .000 |
| Within Groups | 1107.300 | 348 | 3.182 | | |
| Total | 1375.048 | 350 | | | |

***Table 6.61: ANOVA for access to computing facilities according to level of education***

Post-hoc tests

| Multiple Comparisons | | | | | | |
|---|---|---|---|---|---|---|
| Dependent variable: access to computing facilities | | | | | | |
| Tukey HSD | | | | | | |
| (I) Education groups | (J) Education groups | Mean difference (I-J) | Std. error | Sig. | 95% CI Lower bound | 95% CI Upper bound |
| Well-educated | Moderately educated | 1.40440* | .22607 | .000 | .8723 | 1.9365 |
| | Fairly educated | 2.69002* | .29881 | .000 | 1.9867 | 3.3933 |
| Moderately educated | Well-educated | -1.40440* | .22607 | .000 | -1.9365 | -.8723 |
| | Fairly educated | 1.28562* | .26397 | .000 | .6643 | 1.9070 |
| Fairly Educated | Well-educated | -2.69002* | .29881 | .000 | -3.3933 | -1.9867 |
| | Moderately educated | -1.28562* | .26397 | .000 | -1.9070 | -.6643 |
| *. The mean difference is significant at the 0.05 level | | | | | | |

***Table 6.62: Post-hoc tests – multiple comparisons for access to computing facilities according to level of education***

**Results:** A one-way analysis of variance was conducted to explore the difference between well-educated, moderately educated and fairly educated people regarding their access to computing facilities. The respondents were divided into three groups according to their educational status (well-educated: respondents

with a doctorate or master's degree; moderately educated: respondents with a bachelor's degree or a higher national diploma (HND) and those who were fairly educated: respondents with a diploma, technical, secondary, primary or no formal certificate).

The homogeneity of variances assumption was tested using Levene's test and not violated as the sig. value was 0.092. The ANOVA was significant: F (2, 348) = 42.074, p = 0.000. Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference between well-educated, moderately educated and fairly educated people regarding their access to computing facilities. Furthermore, the actual difference in the mean scores between the groups was large, with an effect size of 0.19.

The post-hoc tests conducted using Tukey HD showed that the three groups were significantly different. The results were as follows: the well-educated group (M = 7.62, SD = 1.496), the moderately educated group (M = 6.22, SD = 1.859) and the fairly educated group (M = 4.93, SD = 1.920); p = 0.00.

**$H_{DD14}$: Education affects internet experience**

**Research question:** Is there a significant difference between well-educated, moderately educated and fairly educated people regarding internet experience?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference between well-educated, moderately educated and fairly educated people regarding internet experience.

**Ha (alternative hypothesis):** There is a significant difference between well-educated, moderately educated and fairly educated people regarding internet experience.

| Descriptives | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Internet experience | | | | | | | | |
| | | | | | 95% CI for mean | | | |
| | N | Mean | Std. deviation | Std. error | Lower bound | Upper bound | Minimum | Maximum |
| Well-educated people | 90 | 21.6000 | 4.47163 | .47135 | 20.6634 | 22.5366 | 10.00 | 30.00 |
| Moderately educated people | 202 | 17.2426 | 5.64149 | .39693 | 16.4599 | 18.0253 | 8.00 | 30.00 |
| Fairly educated people | 59 | 13.3898 | 5.40120 | .70318 | 11.9823 | 14.7974 | 8.00 | 30.00 |
| Total | 351 | 17.7123 | 5.94641 | .31740 | 17.0880 | 18.3365 | 8.00 | 30.00 |

***Table 6.63: Descriptives for internet experience according to level of education***

| Test for homogeneity of variances | | | |
|---|---|---|---|
| Internet experience | | | |
| Levene statistic | df1 | df2 | Sig. |
| 5.591 | 2 | 348 | .004 |

***Table 6.64: Test for homogeneity of variances for internet experience according to level of education***

| ANOVA | | | | | |
|---|---|---|---|---|---|
| Internet experience | | | | | |
| | Sum of squares | df | Mean Square | F | Sig. |
| Between groups | 2507.190 | 2 | 1253.595 | 44.205 | .000 |
| Within groups | 9868.748 | 348 | 28.358 | | |
| Total | 12375.937 | 350 | | | |

***Table 6.65: ANOVA for internet experience according to level of education***

Post-hoc tests

| Multiple Comparisons | | | | | | | |
|---|---|---|---|---|---|---|---|
| Dependent variable: internet experience | | | | | | | |
| | (I) education groups | (J) education groups | Mean difference (I-J) | Std. error | Sig. | 95% CI | |
| | | | | | | Lower bound | Upper bound |
| Games-Howell | Well-Educated | Moderately Educated | 4.35743* | .61622 | .000 | 2.9030 | 5.8119 |
| | | Fairly Educated | 8.21017* | .84654 | .000 | 6.1983 | 10.2220 |
| | Moderately Educated | Well-Educated | -4.35743* | .61622 | .000 | -5.8119 | -2.9030 |
| | | Fairly Educated | 3.85274* | .80747 | .000 | 1.9311 | 5.7744 |
| | Fairly Educated | Well-Educated | -8.21017* | .84654 | .000 | -10.2220 | -6.1983 |
| | | Moderately Educated | -3.85274* | .80747 | .000 | -5.7744 | -1.9311 |
| *. The mean difference is significant at the 0.05 level | | | | | | | |

***Table 6.66: Post-hoc tests – multiple comparisons for internet experience according to level of education***

**Results:** A one-way analysis of variance was conducted to explore the difference between well-educated, moderately educated and fairly educated people regarding their internet experience. The respondents were divided into three groups according to their educational level (well-educated: respondents with a doctorate or master's degree; moderately educated: respondents with a bachelor's degree or a higher national diploma (HND) and fairly educated: respondents with a diploma, technical, secondary, primary or no formal certificate).

The homogeneity of variances assumption was tested using Levene's test and violated as the sig. value was 0.004. The ANOVA was significant: F (2, 348) = 44.205, p =.000. Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference between well-educated, moderately educated and fairly educated people regarding their internet experience. The actual difference in the mean scores between group effect size was large, at 0.20.

The post-hoc Games-Howell tests found that the three groups were significantly different, giving these results: the well-educated group (M = 21.6000, SD = 4.47163), the moderately educated group (M = 17.2426, SD = 5.64149) and the fairly educated group: (M = 13.3898, SD = 5.40120), p =0.000.

**$H_{DD15}$: Education affects e-government experience**

**Research question:** Is there a significant difference between well-educated, moderately educated and fairly educated people's e-government experience?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference between well-educated, moderately educated and fairly educated people's e-government experience.

**Ha (alternative hypothesis):** There is a significant difference between well-educated, moderately educated and fairly educated people's e-government experience.

| Descriptives | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| E-government experience | | | | | | | | |
| | | | | | 95% CI for mean | | | |
| | N | Mean | Std. deviation | Std. error | Lower bound | Upper bound | Minimum | Maximum |
| Well-educated people | 90 | 9.0111 | 2.36308 | .24909 | 8.5162 | 9.5060 | 5.00 | 15.00 |
| Moderately educated people | 202 | 7.9109 | 2.14452 | .15089 | 7.6134 | 8.2084 | 3.00 | 15.00 |
| Fairly educated people | 59 | 7.8136 | 2.03821 | .26535 | 7.2824 | 8.3447 | 3.00 | 15.00 |
| Total | 351 | 8.1766 | 2.23418 | .11925 | 7.9421 | 8.4112 | 3.00 | 15.00 |

***Table 6.67: Descriptives for e-government experience according to level of education***

| Test for homogeneity of variances | | | |
|---|---|---|---|
| E-government experience | | | |
| Levene statistic | df1 | df2 | Sig. |
| .379 | 2 | 348 | .685 |

***Table 6.68: Test for homogeneity of variances for e-government experience according to level of education***

| ANOVA | | | | | |
|---|---|---|---|---|---|
| E-government experience | | | | | |
| | Sum of squares | df | Mean square | F | Sig. |
| Between groups | 84.714 | 2 | 42.357 | 8.867 | .000 |
| Within groups | 1662.334 | 348 | 4.777 | | |
| Total | 1747.048 | 350 | | | |

***Table 6.69: ANOVA for e-government experience according to level of education***

Post-hoc tests

| Multiple Comparisons | | | | | | |
|---|---|---|---|---|---|---|
| Dependent variable: e-government experience | | | | | | |
| Tukey HSD | | | | | | |
| (I) Education groups | (J) Education groups | Mean difference (I-J) | Std. error | Sig. | 95% CI | |
| | | | | | Lower bound | Upper bound |
| Well-educated people | Moderately educated people | 1.10022* | .27699 | .000 | .4482 | 1.7522 |
| | Fairly educated people | 1.19755* | .36611 | .003 | .3358 | 2.0593 |
| Moderately educated | Well-educated people | -1.10022* | .27699 | .000 | -1.7522 | -.4482 |
| | Fairly educated people | .09733 | .32344 | .951 | -.6640 | .8586 |
| Fairly educated | Well-educated people | -1.19755* | .36611 | .003 | -2.0593 | -.3358 |
| | Moderately educated people | -.09733 | .32344 | .951 | -.8586 | .6640 |
| *. The mean difference is significant at the 0.05 level | | | | | | |

***Table 6.70: Post-hoc tests – multiple comparisons for e-government experience according to level of education***

**Results:** A one-way analysis of variance was conducted to explore the difference between well-educated, moderately educated and fairly educated people regarding their e-government experience. The respondents were divided into three groups according to their educational level (well-educated people: respondents with a doctorate or master's degree; moderately educated people: respondents with a bachelor's degree or a higher national diploma (HND) and fairly educated people: respondents with a diploma, technical, secondary, primary or no formal certificate).

The homogeneity of variances assumption was tested using Levene's test and not violated as the sig. value was 0.685. The ANOVA was significant: F (2, 348) = 8.867, p = 0.000. Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference between well-educated, moderately educated and fairly educated people regarding their e-government experience. However, the actual difference in the mean scores between the groups is small, at 0.05.

The Tukey HD post-hoc tests indicated that the well-educated group (M = 9.01, SD = 2.363) significantly differed from the moderately educated group (M = 7.91, SD = 2.145) and the fairly educated group (M = 7.81, SD = 2.038) at p = 0.00. The moderately educated group was not significantly different from the fairly educated group.

### 6.9.9 Hypotheses on Employment

**$H_{DD16}$: Employment affects access to computing facilities**

**Research question:** Is there a significant difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding their access to computing facilities?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding their access to computing facilities.

**Ha (alternative hypothesis):** There is a significant difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding their access to computing facilities.

| Descriptives | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Access to computing facilities | | | | | | | | |
| | | | | | 95% CI for mean | | | |
| | N | Mean | Std. deviation | Std. error | Lower bound | Upper bound | Minimum | Maximum |
| Government employees | 58 | 6.3621 | 1.90749 | .25047 | 5.8605 | 6.8636 | 3.00 | 11.00 |
| Private employees | 115 | 7.2783 | 1.86165 | .17360 | 6.9344 | 7.6222 | 3.00 | 11.00 |
| Self-employed people | 84 | 6.0119 | 2.10275 | .22943 | 5.5556 | 6.4682 | 2.00 | 10.00 |
| Unemployed people / retirees | 25 | 4.4800 | 1.68622 | .33724 | 3.7840 | 5.1760 | 2.00 | 8.00 |
| Students | 69 | 5.9420 | 1.38143 | .16630 | 5.6102 | 6.2739 | 3.00 | 8.00 |
| Total | 351 | 6.3618 | 1.98210 | .10580 | 6.1537 | 6.5699 | 2.00 | 11.00 |

***Table 6.71: Descriptives for access to computing facilities according to type of employment***

| Test for the homogeneity of variances | | | |
|---|---|---|---|
| Access to computing facilities | | | |
| Leven statistic | df1 | df2 | Sig. |
| 4.180 | 4 | 346 | .003 |

***Table 6.72: Test for the homogeneity of variances for access to computing facilities according to type of employment***

| ANOVA | | | | | |
|---|---|---|---|---|---|
| Access to computing facilities | | | | | |
| | Sum of squares | df | Mean square | F | Sig. |
| Between groups | 207.560 | 4 | 51.890 | 15.378 | .000 |
| Within groups | 1167.488 | 346 | 3.374 | | |
| Total | 1375.048 | 350 | | | |

***Table 6.73: ANOVA for access to computing facilities according to type of employment***

Post-hoc tests

| Multiple Comparisons | | | | | | | |
|---|---|---|---|---|---|---|---|
| Dependent variable: access to computing facilities | | | | | | | |
| | (I) Employment groups | (J) Employment groups | Mean difference (I-J) | Std. error | Sig. | 95% CI | |
| | | | | | | Lower bound | Upper bound |
| Games-Howell | Government employees | Private employees | -.91619* | .30475 | .027 | -1.7612 | -.0712 |
| | | Self-employed people | .35016 | .33966 | .841 | -.5895 | 1.2898 |
| | | Unemployed people/retirees | 1.88207* | .42008 | .000 | .6944 | 3.0698 |
| | | Students | .42004 | .30065 | .631 | -.4150 | 1.2550 |
| | Private employees | Government employees | .91619* | .30475 | .027 | .0712 | 1.7612 |
| | | Self-employed people | 1.26636* | .28771 | .000 | .4729 | 2.0599 |
| | | Unemployed people/retirees | 2.79826* | .37930 | .000 | 1.7121 | 3.8844 |
| | | Students | 1.33623* | .24040 | .000 | .6735 | 1.9989 |
| | Self-employed people | Government employees | -.35016 | .33966 | .841 | -1.2898 | .5895 |
| | | Private employees | -1.26636* | .28771 | .000 | -2.0599 | -.4729 |
| | | Unemployed/retirees | 1.53190* | .40789 | .004 | .3762 | 2.6876 |
| | | Students | .06988 | .28336 | .999 | -.7129 | .8527 |
| | Unemployed people / retirees | Government employees | -1.88207* | .42008 | .000 | -3.0698 | -.6944 |
| | | Private employees | -2.79826* | .37930 | .000 | -3.8844 | -1.7121 |
| | | Self-employed people | -1.53190* | .40789 | .004 | -2.6876 | -.3762 |
| | | Students | -1.46203* | .37602 | .004 | -2.5410 | -.3831 |
| | Students | Government employees | -.42004 | .30065 | .631 | -1.2550 | .4150 |
| | | Private employees | -1.33623* | .24040 | .000 | -1.9989 | -.6735 |
| | | Self-employed people | -.06988 | .28336 | .999 | -.8527 | .7129 |
| | | Unemployed people/retirees | 1.46203* | .37602 | .004 | .3831 | 2.5410 |
| *. The mean difference is significant at the 0.05 level | | | | | | | |

***Table 6.74: Post-hoc tests – multiple comparisons for access to computing facilities according to type of employment***

**Results:** A one-way analysis of variance was conducted to explore the difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding their access to computing facilities.

The homogeneity of variances assumption was tested using Levene's Test and violated as the sig. value was 0.003. The ANOVA was significant: F (4, 346) = 15.378, p = 0.000. Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding their access to computing facilities. The actual difference in the mean scores was large, at 0.15.

The Games-Howell post-hoc tests indicated that the mean score for the private employees (M = 7.28, SD = 1.862) was significantly different from that for the self-employed people (M = 6.01, SD = 2.103), the unemployed people/retirees (M = 4.48, SD = 1.686), the students (M = 5.94, SD = 1.381) at p = 0.00 and the government employees (M = 6.36, SD = 1.907) at p = 0.03. The unemployed/retirees group was significantly different from the government employees, self-employed people and the students, p = 0.00. The students were not significantly different from the government employees or the self-employed people. The self-employed people were not significantly different from the government employees.

**$H_{DD17}$: Employment affects internet experience**

**Research question:** Is there a significant difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding their internet experience?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding internet experience.

**Ha (Alternative hypothesis):** There is a significant difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding their internet experience.

| Descriptives | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Internet experience | | | | | | | | |
| | | | | | 95% CI for mean | | | |
| | N | Mean | Std. deviation | Std. error | Lower bound | Upper bound | Minimum | Maximum |
| Government employees | 58 | 17.6552 | 5.62748 | .73892 | 16.1755 | 19.1348 | 8.00 | 30.00 |
| Private employees | 115 | 19.8174 | 5.41373 | .50483 | 18.8173 | 20.8175 | 8.00 | 30.00 |
| Self-employed people | 84 | 17.3095 | 6.53623 | .71316 | 15.8911 | 18.7280 | 8.00 | 30.00 |
| Unemployed people/retirees | 25 | 12.1200 | 4.62169 | .92434 | 10.2123 | 14.0277 | 8.00 | 26.00 |
| Students | 69 | 16.7681 | 5.15108 | .62012 | 15.5307 | 18.0055 | 8.00 | 27.00 |
| Total | 351 | 17.7123 | 5.94641 | .31740 | 17.0880 | 18.3365 | 8.00 | 30.00 |

***Table 6.75: Descriptives for internet experience according to employment***

| Test for the homogeneity of variances: internet experience | | | |
|---|---|---|---|
| Levene statistic | df1 | df2 | Sig. |
| 3.678 | 4 | 346 | .006 |

***Table 6.76: Test for the homogeneity of variances for internet experience based on type of employment***

| ANOVA: Internet Experience | | | | | |
|---|---|---|---|---|---|
| | Sum of squares | df | Mean square | F | Sig. |
| Between groups | 1366.786 | 4 | 341.697 | 10.739 | .000 |
| Within groups | 11009.151 | 346 | 31.818 | | |
| Total | 12375.937 | 350 | | | |

***Table 6.77: ANOVA for internet experience based on type of employment***

| Post-hoc Tests: Multiple Comparisons | | | | | | | |
|---|---|---|---|---|---|---|---|
| Dependent variable: internet experience | | | | | | | |
| | (I) Employment groups | (J) Employment groups | Mean difference (I-J) | Std. Error | Sig. | 95% CI | |
| | | | | | | Lower bound | Upper bound |
| Games-Howell | Government employees | Private employees | -2.16222 | .89491 | .119 | -4.6441 | .3196 |
| | | Self-employed people | .34565 | 1.02694 | .997 | -2.4943 | 3.1856 |
| | | Unemployed people / retiree | 5.53517* | 1.18339 | .000 | 2.1977 | 8.8727 |
| | | Students | .88706 | .96465 | .889 | -1.7858 | 3.5599 |
| | Private employees | Government employees | 2.16222 | .89491 | .119 | -.3196 | 4.6441 |
| | | Self-employed people | 2.50787* | .87376 | .037 | .0967 | 4.9190 |
| | | Unemployed people / retirees | 7.69739* | 1.05321 | .000 | 4.6883 | 10.7065 |
| | | Students | 3.04928* | .79963 | .002 | .8411 | 5.2574 |
| | Self-employed people | Government employees | -.34565 | 1.02694 | .997 | -3.1856 | 2.4943 |
| | | Private employees | -2.50787* | .87376 | .037 | -4.9190 | -.0967 |
| | | Unemployed people / retirees | 5.18952* | 1.16748 | .000 | 1.8977 | 8.4814 |
| | | Students | .54141 | .94506 | .979 | -2.0680 | 3.1508 |
| | Unemployed people/ retirees | Government employees | -5.53517* | 1.18339 | .000 | -8.8727 | -2.1977 |
| | | Private employees | -7.69739* | 1.05321 | .000 | -10.7065 | -4.6883 |
| | | Self-employed people | -5.18952* | 1.16748 | .000 | -8.4814 | -1.8977 |
| | | Students | -4.64812* | 1.11308 | .001 | -7.8051 | -1.4911 |
| | Students | Government employees | -.88706 | .96465 | .889 | -3.5599 | 1.7858 |
| | | Private employees | -3.04928* | .79963 | .002 | -5.2574 | -.8411 |
| | | Self-employed people | -.54141 | .94506 | .979 | -3.1508 | 2.0680 |
| | | Unemployed people / retirees | 4.64812* | 1.11308 | .001 | 1.4911 | 7.8051 |
| *. The mean difference is significant at the 0.05 level | | | | | | | |

***Table 6.78: Post-hoc tests – multiple comparisons for internet experience based on type of employment***

**Results:** A one-way analysis of variance was conducted to explore the difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding their internet experience.

The homogeneity of variances assumption was tested using Levene's test and violated as the sig. value was 0.006. The ANOVA was significant: F (4, 346) = 10.739, p = 0.000. Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding internet experience. The actual difference in the mean scores between was moderate, at 0.11.

The Games-Howell post-hoc tests indicated that the mean score for unemployed people / retirees (M = 12.12, SD = 4.622) was significantly different from that for the other groups: government employees (M = 17.66, SD = 5.627), private employees (M = 19.82, SD = 5.414), self-employed people (M = 17.31, SD = 6.536) and students (M = 16.77, SD = 5.151), p =0.00. The private employee group was significantly different from the self-employed group: p= 0.04 and the student group: p = 0.00. However, the government employee group was not significantly different from the private employee group, the self-employed group or the student group. Additionally, the self-employed group was not significantly different from the private employees or the students.

**$H_{DD18}$: Employment affects e-government experience**

**Research question:** Is there a significant difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding their e-government experience?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding their e-government experience.

**Ha (alternative hypothesis):** There is a significant difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding their e-government experience.

| Descriptives | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| E-government experience | | | | | | | | |
| | | | | | 95% CI for mean | | | |
| | N | Mean | Std. deviation | Std. error | Lower bound | Upper bound | Minimum | Maximum |
| Government employees | 58 | 8.4655 | 2.26503 | .29741 | 7.8700 | 9.0611 | 4.00 | 15.00 |
| Private employees | 115 | 8.3391 | 2.42388 | .22603 | 7.8914 | 8.7869 | 3.00 | 15.00 |
| Self-employed people | 84 | 8.5833 | 2.21826 | .24203 | 8.1019 | 9.0647 | 6.00 | 15.00 |
| Unemployed people / retiree | 25 | 6.9600 | 1.36870 | .27374 | 6.3950 | 7.5250 | 5.00 | 9.00 |
| Students | 69 | 7.6087 | 1.91908 | .23103 | 7.1477 | 8.0697 | 3.00 | 15.00 |
| Total | 351 | 8.1766 | 2.23418 | .11925 | 7.9421 | 8.4112 | 3.00 | 15.00 |

***Table 6.79: Descriptives for e-government experience based on type of employment***

| Test for Homogeneity of Variances | | | |
|---|---|---|---|
| E-government experience | | | |
| Levene statistic | df1 | df2 | Sig. |
| 1.594 | 4 | 346 | .175 |

***Table 6.80: Test for homogeneity of variances for e-government experience based on type of employment***

| ANOVA | | | | | |
|---|---|---|---|---|---|
| E-government experience | | | | | |
| | Sum of squares | df | Mean square | F | Sig. |
| Between groups | 81.032 | 4 | 20.258 | 4.207 | .002 |
| Within groups | 1666.016 | 346 | 4.815 | | |
| Total | 1747.048 | 350 | | | |

***Table 6.81: ANOVA for e-government experience based on type of employment***

**Results:** A one-way analysis of variance was conducted to explore the difference between the e-government experience of government employees, private employees, self-employed people, unemployed people/retirees and students.

The homogeneity of variances assumption was tested using Levene's test and not violated as the sig. value was 0.175. The ANOVA was significant: F (4, 346) = 4.207, p = 0.002. Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference between government employees, private employees, self-employed people, unemployed people/retirees and students regarding their e-government experience. However, there was a small (0.05) actual difference in the mean scores.

The Tukey HD post-hoc tests indicated that the mean score for the unemployed people/retirees (M = 6.96, SD = 1.369) was significantly different than for the other groups: government employees (M = 8.466, SD = 2.265) and private employees

(M = 8.34, SD = 2.424) at p = 0.04 and self-employed people (M = 8.58, SD = 2.218) at p = 0.01. The student group did not significantly differ from the other groups, and the other groups (government employees, private employees and self-employed people) were not significantly different.

Post-hoc Tests

| Multiple Comparisons | | | | | | |
|---|---|---|---|---|---|---|
| Dependent variable: e-government experience | | | | | | |
| Tukey HSD | | | | | | |
| (I) Employment groups | (J) employment groups | Mean difference (I-J) | Std. error | Sig. | 95% CI | |
| | | | | | Lower bound | Upper bound |
| Government employees | Private employees | .12639 | .35340 | .996 | -.8427 | 1.0955 |
| | Self-employed people | -.11782 | .37462 | .998 | -1.1451 | .9095 |
| | Unemployed people / retirees | 1.50552* | .52500 | .035 | .0659 | 2.9452 |
| | Students | .85682 | .39090 | .185 | -.2151 | 1.9288 |
| Private employees | Government employees | -.12639 | .35340 | .996 | -1.0955 | .8427 |
| | Self-employed people | -.24420 | .31495 | .938 | -1.1079 | .6195 |
| | Unemployed / retiree | 1.37913* | .48422 | .037 | .0513 | 2.7070 |
| | Students | .73043 | .33415 | .187 | -.1859 | 1.6467 |
| Self-employed | Government employees | .11782 | .37462 | .998 | -.9095 | 1.1451 |
| | Private employees | .24420 | .31495 | .938 | -.6195 | 1.1079 |
| | Unemployed people / retirees | 1.62333* | .49993 | .011 | .2524 | 2.9942 |
| | Students | .97464 | .35652 | .051 | -.0030 | 1.9523 |
| Unemployed/retirees | Government employees | -1.50552* | .52500 | .035 | -2.9452 | -.0659 |
| | Private employees | -1.37913* | .48422 | .037 | -2.7070 | -.0513 |
| | Self-employed people | -1.62333* | .49993 | .011 | -2.9942 | -.2524 |
| | Students | -.64870 | .51224 | .712 | -2.0534 | .7560 |
| Students | Government employees | -.85682 | .39090 | .185 | -1.9288 | .2151 |
| | Private employees | -.73043 | .33415 | .187 | -1.6467 | .1859 |
| | Self-employed people | -.97464 | .35652 | .051 | -1.9523 | .0030 |
| | Unemployed people/retirees | .64870 | .51224 | .712 | -.7560 | 2.0534 |
| *. The mean difference is significant at the 0.05 level | | | | | | |

***Table 6.82: Post-hoc tests – multiple comparisons for e-government experience based on type of employment***

### 6.9.10 Hypotheses on Income

**$H_{DD19}$: Income affects access to computing facilities**

**Research question:** Does income make a significant difference to people's access to computing facilities?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference between low, medium and high income groups regarding their access to computing facilities.

**Ha (alternative hypothesis):** There is a significant difference between low, medium and high income groups regarding their access to computing facilities.

| Descriptives | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Access to computing facilities | | | | | | | | |
| | | | | | 95% CI for mean | | | |
| | N | Mean | Std. deviation | Std. error | Lower bound | Upper bound | Minimum | Maximum |
| Low income | 155 | 5.3677 | 1.73587 | .13943 | 5.0923 | 5.6432 | 2.00 | 10.00 |
| Medium income | 117 | 7.0513 | 1.98636 | .18364 | 6.6876 | 7.4150 | 2.00 | 11.00 |
| High income | 79 | 7.2911 | 1.50343 | .16915 | 6.9544 | 7.6279 | 3.00 | 11.00 |
| Total | 351 | 6.3618 | 1.98210 | .10580 | 6.1537 | 6.5699 | 2.00 | 11.00 |

***Table 6.83: Descriptives for access to computing facilities based on level of income***

| Test for Homogeneity of Variances | | | |
|---|---|---|---|
| Access to computing facilities | | | |
| Leven statistic | df1 | df2 | Sig. |
| 3.095 | 2 | 348 | .047 |

***Table 6.84: Test for homogeneity of variances for access to computing facilities based on level of income***

| ANOVA | | | | | |
|---|---|---|---|---|---|
| Access to computing facilities | | | | | |
| | Sum of squares | df | Mean Square | F | Sig. |
| Between groups | 277.014 | 2 | 138.507 | 43.897 | .000 |
| Within groups | 1098.035 | 348 | 3.155 | | |
| Total | 1375.048 | 350 | | | |

***Table 6.85: ANOVA for access to computing facilities based on level of income***

Post-hoc Tests

| Multiple Comparisons | | | | | | | |
|---|---|---|---|---|---|---|---|
| Dependent variable: access to computing facilities | | | | | | | |
| | | | Mean | | | 95% CI | |
| | (I) Income status | (J) Income status | difference (I-J) | Std. error | Sig. | Lower bound | Upper bound |
| Games-Howell | Low Income | Medium Income | -1.68354* | .23057 | .000 | -2.2274 | -1.1396 |
| | | High Income | -1.92340* | .21921 | .000 | -2.4415 | -1.4053 |
| | Medium Income | Low Income | 1.68354* | .23057 | .000 | 1.1396 | 2.2274 |
| | | High Income | -.23986 | .24967 | .603 | -.8296 | .3499 |
| | High Income | Low Income | 1.92340* | .21921 | .000 | 1.4053 | 2.4415 |
| | | Medium Income | .23986 | .24967 | .603 | -.3499 | .8296 |
| *. The mean difference is significant at the 0.05 level. | | | | | | | |

***Table 6.86: Post-hoc tests – multiple comparisons for access to computing facilities based on level of income***

**Results:** A one-way analysis of variance was conducted to explore the difference between people grouped according to their incomes into low, medium and high income categories, regarding their access to computing facilities.

The homogeneity of variances assumption was tested using Levene's test and violated as the sig. value was 0.047. The ANOVA was significant: F (2, 348) = 43.897, p = 0.000. Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference between the low, medium and high income groups regarding their access to computing facilities. The actual difference in the mean scores was large at 0.20.

The Games-Howell post-hoc tests indicated that the mean score for the low income group (M = 5.38, SD = 1.734) was significantly different from that for the medium income group (M = 7.05, SD = 1.986) and the high income group (M = 7.29, SD = 1.503) at p = 0.00. The medium income group was not significantly different from the high income group.

**$H_{DD20}$: Income affects internet experience**

**Research question:** Is there a significant difference between people earning low, medium and high incomes regarding their internet experience?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference between people earning low, medium and high incomes regarding their internet experience.

**Ha (alternative hypothesis):** There is a significant difference between people earning low, medium and high incomes regarding their internet experience.

| Test for Homogeneity of Variances | | | |
|---|---|---|---|
| Internet experience | | | |
| Levene statistic | df1 | df2 | Sig. |
| 8.056 | 2 | 348 | .000 |

***Table 6.87: Test for homogeneity of variances for internet experience based on level of income***

| Descriptives | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Internet experience | | | | | | | | |
| | | | | | 95% CI for Mean | | | |
| | N | Mean | Std. deviation | Std. error | Lower bound | Upper bound | Minimum | Maximum |
| Low income | 155 | 14.7548 | 5.26856 | .42318 | 13.9189 | 15.5908 | 8.00 | 28.00 |
| Medium income | 117 | 19.7949 | 6.07218 | .56137 | 18.6830 | 20.9067 | 8.00 | 30.00 |
| High income | 79 | 20.4304 | 4.20221 | .47279 | 19.4891 | 21.3716 | 10.00 | 30.00 |
| Total | 351 | 17.7123 | 5.94641 | .31740 | 17.0880 | 18.3365 | 8.00 | 30.00 |

***Table 6.88: Descriptives for internet experience based on level of income***

| ANOVA | | | | | |
|---|---|---|---|---|---|
| Internet experience | | | | | |
| | Sum of squares | df | Mean square | F | Sig. |
| Between groups | 2446.809 | 2 | 1223.405 | 42.878 | .000 |
| Within groups | 9929.128 | 348 | 28.532 | | |
| Total | 12375.937 | 350 | | | |

***Table 6.89: ANOVA for internet experience based on level of income***

Post-hoc Tests

| Multiple Comparisons | | | | | | | |
|---|---|---|---|---|---|---|---|
| Dependent variable: internet experience | | | | | | | |
| | | | Mean difference (I-J) | Std. error | Sig. | 95% CI | |
| | (I) Income status | (J) Income status | | | | Lower bound | Upper bound |
| Games-Howell | Low Income | Medium Income | -5.04003* | .70301 | .000 | -6.6984 | -3.3816 |
| | | High Income | -5.67554* | .63451 | .000 | -7.1743 | -4.1767 |
| | Medium Income | Low Income | 5.04003* | .70301 | .000 | 3.3816 | 6.6984 |
| | | High Income | -.63551 | .73394 | .662 | -2.3690 | 1.0979 |
| | High Income | Low Income | 5.67554* | .63451 | .000 | 4.1767 | 7.1743 |
| | | Medium Income | .63551 | .73394 | .662 | -1.0979 | 2.3690 |
| *. The mean difference is significant at the 0.05 level | | | | | | | |

***Table 6.90: Post-hoc tests – multiple comparisons for internet experience based on level of income***

**Results:** A one-way analysis of variance was conducted to explore the difference between low, medium and high income groups regarding their internet experience. The homogeneity of variances assumption was tested using Levene's test and violated as the sig. value was 0.000. The ANOVA was significant: F (2, 348) = 42.878, p = 0.000. Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference between low, medium and high income groups regarding their internet experience. The actual difference in the mean scores was large at 0.20. The Games-Howell post-hoc tests indicated that the mean score for the low income group (M = 14.75, SD = 5.269) was significantly different from that for the medium income group (M = 19.79, SD = 6.072) and the high income group (M = 20.43, SD = 4.202) at p = 0.00. The medium income group was not significantly different from the high income group.

**$H_{DD21}$: Income affects e-government experience**

**Research question:** Is there a significant difference between low, medium and high income groups' e-government experience?

**Hypotheses:**

**Ho (null hypothesis):** There is no significant difference between low, medium and high income groups' e-government experience.

**Ha (alternative hypothesis):** There is a significant difference between low, medium and high income groups' e-government experience.

| Descriptives | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| E-government experience | | | | | | | | |
| | | | | | 95% CI for mean | | | |
| | N | Mean | Std. deviation | Std. error | Lower bound | Upper bound | Minimum | Maximum |
| Low income | 155 | 7.3419 | 1.85318 | .14885 | 7.0479 | 7.6360 | 3.00 | 15.00 |
| Medium income | 117 | 8.4872 | 2.32533 | .21498 | 8.0614 | 8.9130 | 4.00 | 15.00 |
| High income | 79 | 9.3544 | 2.15453 | .24240 | 8.8718 | 9.8370 | 6.00 | 15.00 |
| Total | 351 | 8.1766 | 2.23418 | .11925 | 7.9421 | 8.4112 | 3.00 | 15.00 |

***Table 6.91: Descriptives for e-government experience based on level of income***

| Test for Homogeneity of Variances | | | |
|---|---|---|---|
| E-government experience | | | |
| Levene statistic | df1 | df2 | Sig. |
| 1.590 | 2 | 348 | .205 |

***Table 6.92: Test for homogeneity of variances for e-government experience according to level of income***

| ANOVA | | | | | |
|---|---|---|---|---|---|
| E-government experience | | | | | |
| | Sum of squares | df | Mean square | F | Sig. |
| Between groups | 228.864 | 2 | 114.432 | 26.230 | .000 |
| Within groups | 1518.184 | 348 | 4.363 | | |
| Total | 1747.048 | 350 | | | |

***Table 6.93: ANOVA for e-government experience based on level of income***

Post-hoc Tests

| Multiple Comparisons | | | | | | |
|---|---|---|---|---|---|---|
| Dependent variable: e-government experience | | | | | | |
| Tukey HSD test | | | | | | |
| | | | | | 95% CI | |
| (I) Income status | (J) Income status | Mean difference (I-J) | Std. error | Sig. | Lower bound | Upper bound |
| Low Income | Medium income | -1.14524* | .25580 | .000 | -1.7473 | -.5431 |
| | High income | -2.01249* | .28874 | .000 | -2.6921 | -1.3329 |
| Medium income | Low income | 1.14524* | .25580 | .000 | .5431 | 1.7473 |
| | High income | -.86725* | .30415 | .013 | -1.5832 | -.1513 |
| High income | Low income | 2.01249* | .28874 | .000 | 1.3329 | 2.6921 |
| | Medium income | .86725* | .30415 | .013 | .1513 | 1.5832 |
| *. The mean difference is significant at the 0.05 level | | | | | | |

***Table 6.94: Post-hoc tests – multiple comparisons for e-government experience based on level of income***

**Results:** A one-way analysis of variance was conducted to explore the difference between low, medium and high income groups regarding their e-government experience.

The homogeneity of variances assumption was tested using Levene's test and not violated as the sig. value was 0.205. The ANOVA was significant: F (2, 348) = 26.230, p = 0.000. Thus, there is significant evidence to reject the null hypothesis and conclude that there is a statistically significant difference between low, medium and high income groups regarding their e-government experience. There was a medium actual difference in the groups' mean scores.

The Tukey HD post-hoc tests indicated that the mean score for the low income group (M = 7.34, S.D. = 1.853) was significantly different from that for the medium income group (M = 8.49, SD = 2.325) and for the high income group (M = 9.35, SD = 2.155), at p = 0.00. Meanwhile, the medium and high income groups were significantly different at p = 0.01.

### 6.9.26 Summary of Digital Divide Statistics

In summary, in the context of a sample who had used the NIS' e-government service it can be seen that demographic (age, education, gender and income), social-economic (employment) and geographical (rural and urban locations, developing and developed countries) factors affect the extent to which the digital divide affects these users. Table 6.95 and Figure 6.12 are a digital divide dimensions hypotheses summary and model respectively.

| Hypotheses Path | | Path Coefficient | Results |
|---|---|---|---|
| $H_{DD1}$ | Location (rural / urban) affects access to computing facilities | .000 | Supported |
| $H_{DD2}$ | Location (rural / urban) affects internet experience | .000 | Supported |
| $H_{DD3}$ | Location (rural / urban) affects e-government experience | .263 | Not supported |
| $H_{DD4}$ | Location (inter-country) affects access to computing facilities | .000 | Supported |
| $H_{DD5}$ | Location (inter-country) affects internet experience | .000 | Supported |
| $H_{DD6}$ | Location (inter-country) affects e-government experience | .000 | Supported |
| | | | |
| $H_{DD7}$ | Gender affects access to computing facilities | .026 | Supported |
| $H_{DD8}$ | Gender affects internet experience | .043 | Supported |
| $H_{DD9}$ | Gender affects e-government experience | .199 | Not supported |
| | | | |
| $H_{DD10}$ | Age affects access to computing facilities | .001 | Supported |
| $H_{DD11}$ | Age affects internet experience | .001 | Supported |
| $H_{DD12}$ | Age affects e-government experience | .090 | Not supported |
| | | | |
| $H_{DD13}$ | Education affects access to computing facilities | .000 | Supported |
| $H_{DD14}$ | Education affects internet experience | .000 | Supported |
| $H_{DD15}$ | Education affects e-government experience | .000 | Supported |
| | | | |
| $H_{DD16}$ | Employment affects access to computing facilities | .000 | Supported |
| $H_{DD17}$ | Employment affects internet experience | .000 | Supported |
| $H_{DD18}$ | Employment affects e-government experience | .002 | Supported |
| | | | |
| $H_{DD19}$ | Income affects access to computing facilities | .000 | Supported |
| $H_{DD20}$ | Income affects internet experience | .000 | Supported |
| $H_{DD21}$ | Income affects e-government experience | .000 | Supported |

***Table 6.95: Digital divide dimensions hypotheses summary***

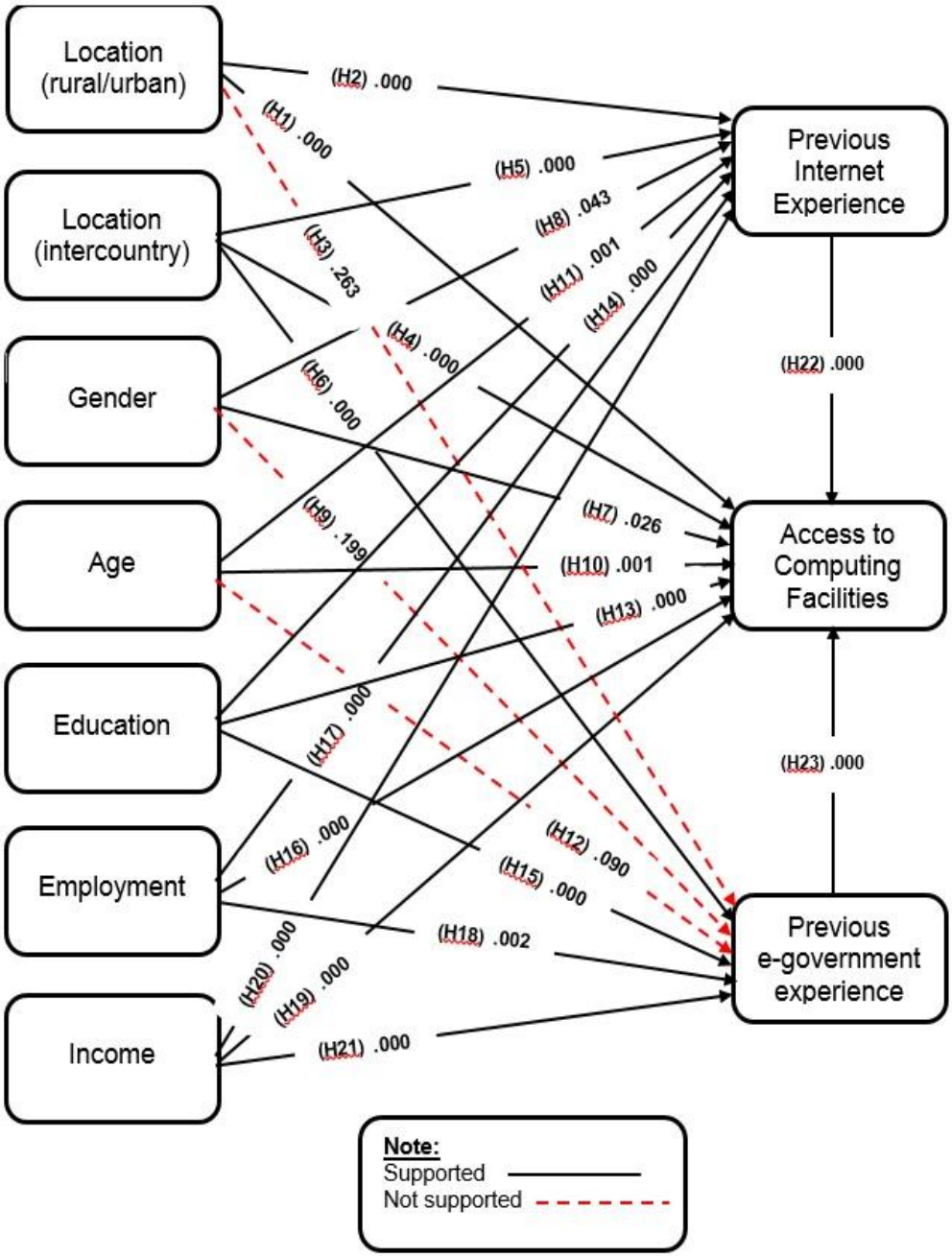


***Figure 6.12: Digital divide dimensions model (3DsM)***

# Chapter 7: Discussion

## 7.1 Introduction

This chapter discusses the results presented in Chapter Six, in which a comparison is made between the findings of the empirical study and the literature reviewed in Chapter Three. The aim of this research is to advance knowledge and theory regarding user experience of e-government in developing countries, through the study of the Nigeria Immigration Service (NIS) e-government service. Additionally, to advance theoretical conceptualisation and understanding of the nature of the digital divide. This discussion refers back to this dissertation's research objectives, which are:

(i.) To develop an understanding of the conceptual and theoretical foundations relevant to the users' experience of e-government services. To this effect, the previous research and literature on e-government services, service quality, e-government adoption and satisfaction was discussed. Based on these studies and on models, a rich bank of variables and items for measuring aspects of user experience associated with e-government were generated. Upon selection of the variables, a research framework was developed to identify the factors contributing to users' experience of the NIS e-government service.

(ii.) To review research on the digital divide in the context of e-government services. The previous research and the literature on the digital divide in the context of both developing and developed countries were discussed. The research discussed the dimensions dividing e-government users and the demographic factors influencing these digital divide dimensions. The extent to which e-government users vary within these dimensions confirmed the digital divide exists amongst NIS portal users. A research framework to explore the relationship between demographic factors and digital divide dimensions was developed.

(iii.) To identify factors contributing to users' experience of the NIS e-government service.

(iv.) To generate insights into the users' experience with the NIS e-government service. An analysis of descriptive statistics and responses to open questions was conducted to ascertain the factors contributing to user experience of the NIS e-government service. This analysis suggest that the respondents to this research's survey had a low level of satisfaction with the NIS website, with much of their concerns stemming from issues regarding security, support, trustworthiness and

privacy. The insight into these factors reveals the significant effects of inadequate infrastructural facilities which include an intermittent electricity supply and the high cost of internet access, both of which pose a particular challenge given the high rate of unemployment in Nigeria.

(v.) To develop and test a conceptual model of users' experience of the NIS e-government service.

(vi.) To explore the relationship between demographic factors and digital divide variables.

(vii.) To offer recommendations for further research and practice.

Objectives (iii.), (v.) and (vi.) were discussed in Sections 7.2, 7.3 and 7.4 respectively. Objective (vii.) is discussed in Chapter Eight.

The following research questions drove this project:

(i.) What factors influence users' experiences and the benefits associated with the e-government services provided by the NIS?
(ii) What are the interrelationships between these factors?
(iii) What is the relationship between user demographics and digital divide variables, such as access to computing facilities, user internet experience and user e-government experience?

The answers to research questions (i.), (ii.) and (iii.) are suggested in Sections 7.2, 7.3 and 7.4 respectively.

## 7.2 Discussion of the factors contributing to users' experience of the Nigeria Immigration Service e-government service

To assist in answering the third objective and the first research question, an exploratory factor analysis was conducted. The factors that emerged from this were: security and support, trustworthiness, ease of use, website quality, information quality, benefits, convenience and barriers. These factors were confirmed as the user experience dimension scale and demonstrate the value of taking a holistic perspective to users' experience of e-government. The scale embedded factors from different perspectives on e-government websites' evaluation. For example, factors, barriers and benefits have primarily been discussed in the technology adoption literature.

Factors such as ease of use and website quality, typically associated with the service quality literature, were also shown to be important. Two new and one re-affirmed dimensions of e-government user experience emerged: security and support, convenience and information quality, and the initial two drew items from sets previously associated with other factors. In each case, there was evidence to suggest these factors' importance, but they were not consistently included in scales for measuring user experience.

In the case of security and support, the responses to the questionnaire (see Chapter 6) supported previous evidence that the technical support provided by e-government websites can significantly affect users' experience of these websites (Kotamraju and van der Geest, 2012). More specifically, the provision of technical support affects citizens' perceptions of the credibility of these services (Bertot et al. 2008) and may therefore link to trust and perceptions of security. Support may be another incarnation of service reliability, and this identified by Halaris et al. (2007) as being present in many scales associated with e-government or e-service quality. Concerns over the security of e-government services, particularly in the areas of privacy, use of personal data and financial transactions, have been mentioned by various authors (Dibbell, 2012; Gilbert, Balestrini and Littleboy, 2004 and Parker, 2011). Others have commented on the users of e-government websites' perceptions of risks in undertaking online financial activities (Dibbell, 2012). Halaris et al. (2007) and Rowley (2006) also identify security as being included in a number of existing scales. Colesca (2009) suggests that security and privacy issues have negatively affected users' experience of e-government websites, and this study affirms this theory. Security and privacy are of particular concern in the context of Nigerian e-government services (Kazeem, 2011; Mundy and Musa, 2010).

In Nigeria and other developing countries, the successful implementation of e-government demands political, social and cultural changes to re-shape the trust that the public is prepared to place in their government and to eradicate suspicions of poor governance and corruption (Ciborra, 2005). This study echoes the findings of Mundy and Musa (2010) and Kazeem (2011) that Nigerian e-government websites lack security and privacy policies. Perhaps the most interesting outcome of this study is the loading onto one factor of security and support.

The other new factor is convenience. This emerged as a separate factor, but composed entirely of items which had previously been clustered under the more

general dimension of benefits. Again, other authors have commented on the importance of convenience and the need for users to be able to access e-government services how, when and where they want (Meuter et al., 2000; Zhu, Wymer and Chen, 2002). According to Kim, Kim and Lennon (2006), convenience has a significant effect on customers' satisfaction with e-government experience and should not be ignored.

Overall, the evidence from these responses is that users of the NIS perceive the availability of the service to be beneficial. They were particularly positive about the anytime, anywhere nature of the service, and the convenience that it has the potential to deliver. However, convenience and other benefits such as cost-saving are not always delivered due to various issues such as intermittent electricity supply, high cost of access to computers and the internet.

Given the scarcity of prior studies on users' experience of Nigerian websites, it is difficult to know whether generally ambivalent comments from the users about ease of use and website quality in this study are unique. Mundy and Musa (2010) suggest that the implementation of e-government in Nigeria could be more user-centric; in their limited study based on a content analysis of selected Nigerian websites these authors (2010) conclude that these sites have a low usability. Overall, this study provides evidence that the design of the NIS website could be improved, although it has to be acknowledged that the relative complexity of e-government websites and the inexperience of some users might make this challenging.

Taken alongside the data discussed in the previous chapter on benefits (see Chapter 6), it seems that the NIS e-services work better for some users than for others. In the context of barriers, there is a need for a major focus on internet access and reliable electricity supplies by the government. This is not surprising, as many authors have suggested that this is a major issue for e-government in developing countries (Dimitrova, 2006; Christian Schaupp and Carter, 2005).

What is more interesting is that this study sample is relatively well-educated and affluent, yet many still face difficulties in relation to e-government access. This is consistent with the findings of Asogwa (2013) which identify obsolete ICT infrastructure, an intermittent electricity supply, a lack of privacy and protection of users' data and poor internet access as hindrances to the adoption and use of e-government services in Nigeria.

Finally, information quality reflects wider issues around the presence of information and content than is suggested by the term. This stance is consistent with work by DeLone and McLean (1992) who have highlighted the importance of information quality to users of e-government services and others who have commented on the desirable features of websites' content (Bertot et al., 2008; Yoon, Laffey and Oh, 2008). In addition, Halaris et al. (2007) and Rowley (2006) have noted that some studies include this as a criterion in their scales. Accordingly, we have viewed this dimension as important and re-affirm the importance of information quality.

## 7.3 Developing and Testing a Conceptual Model of Users' Experience of the Nigeria Immigration Service E-government Service

In answering the fifth objective and the second research question, a number of hypotheses were developed which comprised the research model proposed based upon the theoretical discussions in Chapters Three and Four. These hypotheses were tested during the empirical part of the study. The findings that followed from the analysis (see chapter six) and discussion (this chapter) are presented according to the research question that was formulated (see chapter one).

### 7.3.1 Hypotheses on Information Quality

***$H_{US1}$*: Information quality influences the convenience of the NIS portal**

***$H_{US2}$*: Information quality influences the ease of use of the NIS portal**

Hypothesis 1 is supported by the data from the analysis. The relationship between information quality and convenience was found to be significant in this context. Ranganathan and Ganapathy (2002) have referred to it as information content with attributes which include timeliness, reliability and relevance (McKinney, Yoon and Zahedi, 2002). This means that in the NIS e-government service context, information quality directly influences users' perceptions of it as convenient to use. This finding is supported by previous studies. According to Hazlett and Hill (2003), the success of a government's use of technology strongly depends on the information displayed on its website and such content being made available for users' convenience, anytime and anywhere. According to DeLone and McLean (2004), information quality includes the relevance, timeliness and accuracy of content made available to e-government website users and influences their perceptions of it as being convenient to use. Carter and Bélanger (2005) have asserted that comprehensive and authentic content as well as high-quality information available on government websites increases the confidence of users.

The information on government websites enables users to become aware of various government services and availing themselves of these services online provides the idea of convenience to users. Ramon Gil-Garcia, Chengalur-Smith and Duchessi (2007) have noted that the quality of information available on the websites saves users' time and allows them to navigate and extract relevant information easily thus providing a convenient facility for them.

In Hypothesis 2, the relationship between information quality and ease of use was found to be significant in this context. Previous studies have found that the quality of the information on an e-government site is judged through accuracy, reliability, relevancy and ease of use (Papadomichelaki and Mentzas, 2012). This result represents how information quality offered on an e-government website interface is capable of benefiting and promoting users' perceptions of its ease of use (Detlor et al., 2013). According to Gilbert, Balestrini and Littleboy (2004), the more users see relevant, accurate and up-to-date information on e-government websites, the easier it becomes to use these sites.

### 7.3.2 Hypotheses on Website Quality

***$H_{US3}$*: Website quality influences the ease of use of the NIS portal**

***$H_{US4}$*: Website quality influences the security and support of the NIS portal**

From the data analysed, the relationship between website quality and ease of use was found to be significant. A relationship was found between the NIS website's quality and the participants' ease of use which is consistent with the findings of other researchers (Chuan-Chuan Lin and Lu, 2000, Lucas and Spitler, 1999 and Bwalya and Healy, 2010). According to Maheshwari et al. (2007), website quality includes system accessibility and response time, and the overall impression of quality influences the ability to use a site easily. Website quality has a positive effect on the repeated use of a website's services (Elling et al., 2012). According to Kaisara and Pather (2011), an e-government service website's quality promotes ease of use, better delivery of services, improved interactions and greater convenience for its users. A high quality website is easy to use (Almahamid et al., 2005) because with an easy-to-learn, controllable, clear and understandable design, website users can easily perceive it as reliable, responsive and as delivering a high performance.

There is a strong correlation between website quality and security and support. The data analysis shows a significant relationship between website quality and security and support. Berkley and Gupta (1994) and Rigg, Coleman and Malam

(1998) have asserted that an e-government service must be secure with respect to entering both personal and financial details as well as the user having prompt access to support where necessary. According to Aladwani and Palvia (2002), the quality of a website increases users' trust, engenders a positive view of the website's security and reduces users' reliance on support to use the website. Hoffman, Novak and Peralta (1999), Aladwani and Palvia (2002) and DeLone and McLean (2003) have all declared that website quality includes multiple dimensions, such as security, ease of use, user satisfaction and trust. According to Lin, Fofanah and Liang (2011), an effective security system and efficient support can increase the number of citizens adopting and using e-government. The website's quality makes a key contribution to the formulation of individual perceptions and hence leads to a decreased reliance on support when using the site (Elling et al., 2012). Website quality promotes user-friendliness and the protection of personal information (Aladwani, 2013).

### 7.3.3 Hypothesis on Ease of Use

**$H_{US5}$: Ease of use influences barriers to use the NIS portal**

In hypothesis 5, there is a strong and significant relation between the ease of use of and the barriers to the use of an e-government service. According to Davis, Bagozzi and Warshaw (1989) and Wangpipatwong, Chutimaskul and Papasratorn (2005), ease of use is the extent to which a user believes that using a specific system will be free of any effort or difficulty. Ease of use is a vital factor upon which the adoption and satisfaction of e-government services is reliant (Wangpipatwong, Chutimaskul and Papasratorn, 2008). The perceived ease of use of e-government websites improves citizens' persistence in using websites through the concept of perceived usefulness (Ibid.). The effects of the idea of ease of use on the take-up of e-government services can be examined in the context of relative advantages such as the degrees of economic profitability, time and effort saving and reward (Shyu and Huang, 2011). When government services on electronic platforms are easily used, then the users' trust in those services also increases (Beldad et al., 2012). If users can complete and perform a transaction effectively on the NIS portal with relative ease, then they will probably be interested in using the online service. Difficulties in using a system or website can be an active barrier as it portrays the e-government website as unsuitable to users (Kumar et al., 2007).

### 7.3.5 Hypothesis on Convenience

**$H_{US6}$: Convenience influences the benefits of the NIS portal**

The result of hypothesis 6 is that there is a strong and significant relationship between convenience and benefits in the context of the NIS portal. Rigg, Coleman and Malam (1998), Meuter et al. (2000), Szymanski and Hise (2000) and Zhu, Wymer and Chen (2002) use the term convenience in the context of e-government as the ability of users to access an e-government service at the time and/or in the place they want. Gilbert, Balestrini and Littleboy (2004) suggest that e-government services allow the provision of an efficient service to all citizens and irrespective of any bias, users see this as a benefit. Welch, Hinnant and Moon (2004) assert that this convenient access has a significant effect on users' perceived benefits. Halaris et. al. (2007) point to the convenience of having adequate content and proper information on government websites as it enables users to make accurate decisions and to reap the benefits of using them. According to Teo, Srivastava and Jiang (2008), convenient access to e-government services ensures and affirms citizens' beliefs of the benefits of e-government.

### 7.3.6 Hypothesis on Security and Support

**$H_{US7}$: Security and support influences the trustworthiness of the NIS portal**

There is a strong and significant relationship between security and support and trustworthiness in the context of the NIS portal. Berkley and Gupta (1994) and Rigg, Coleman and Malam (1998) have asserted that an e-government service must be secure with respect to entering both personal and financial details as well as the user having prompt access to support where necessary. Citizens' trust in the government and the information available on e-government websites plays an important role in e-government success. The government websites that ensure the security of data are the most positively regarded by the public as users feel more secure and convenient to share their information (Lean et al., 2009). According to Lin, Fofanah and Liang (2011), effective security and efficient support systems can increase the number of citizens adopting and using e-government. Teo, Srivastava and Jiang (2008) suggest that users' trust levels determine whether they will rely on online government services; they add that effective support allows users to trust an online government service. According to Bélanger and Carter (2008), citizens' confidence in the technological platform provided by their government is identified as imperative in adoption of e-government policy.

### 7.3.7 Hypothesis on Barriers

**$H_{US8}$: Barriers influence users' satisfaction with the NIS portal**

There is a strong and significant relationship between the barriers to using an e-government website and users' satisfaction with it. One of the barriers to using an e-government website includes the perceived risks which also play a huge role in user satisfaction (Gilbert, Balestrini and Littleboy, 2004). Barriers to using an e-government service include financial constraints, lack of staffing, lack of knowledge, lack of support, staff resistance, lack of community interest, privacy issues, security issues and technological needs (Wangpipatwong, Chutimaskul and Papasratorn, 2008; Schwester, 2009). Recent research by Alawneh, Al-Refai and Batiha, 2013) shows trust has a major influence on barriers to e-government service adoption and user satisfaction. They investigate satisfaction with Jordan's e-government services portal in their study, finding that trust increases or decreases the risk level perceived by users (Ibid.). This view has been supported by Bélanger and Carter (2008). In order to have control over the perceived trust level of service users, it is necessary to focus on key criteria such as trustworthiness, privacy, security and risks (Urciuoli, Hintsa and Ahokas, 2013).

### 7.3.8 Hypothesis on Benefits

**$H_{US9}$: Benefits influence users' satisfaction with the NIS portal**

In this study, satisfaction refers to users' perceived expectations of, and the contentment or pleasure derived from using the NIS portal/e-government services. Previous research suggests that end-user satisfaction is significant in measuring user experience (Davis, 1993; Zhang and Prybutok, 2005; Olorunniwo, Hsu and Udo, 2006). In this research, satisfaction is considered significant in users' decisions in the overall use of e-government services. User satisfaction with e-government services is related to experience of online service convenience (transactions), the reliability of the information available (transparency) and engagement with electronic services (interactivity) (Hu et al., 2009; Udo, Bagchi and Kirs, 2010; Welch, Hinnant and Moon, 2004). According to Kassim and Asiah Abdullah (2010), benefits affect users' satisfaction.

### 7.3.9 Hypothesis on Trustworthiness

**$H_{US10}$: Trustworthiness influences users' satisfaction with the NIS portal**

In hypothesis 10, the relationship between trustworthiness and user satisfaction is found to be significant. Harrison McKnight, Choudhury and Kacmar (2002) refer to the term trust in relation to e-government services as users' perceptions of

reliability, reliance and safety. The increase in e-government adoption has been identified with high-perceived trust (Parent, Vandebeek and Gemino, 2005). Al-Hakim (2007) states that user experience influences trust, meaning that users will share their personal information online and engage in online transactions. Citizens' confidence in the technological platform provided by their government is imperative in the adoption of e-government policies (Bélanger and Carter, 2008). According to Bannister and Connolly (2011), user satisfaction is directly associated with users' trust in e-government services. Recent research by Alawneh, Al-Refai and Batiha (2013) shows that trust has a key influence on barriers to e-government service adoption and satisfaction.

## 7.4 Exploring the Relationship between Demographic Factors and Digital Divide Variables

In addressing the sixth objective and answering the third research question, a number of hypotheses were formulated based upon the theoretical discussion in Chapters Three and Four. These hypotheses were tested during the empirical part of the study. The findings that followed from the analysis (see chapter six) and discussion (this chapter) are presented according to the research question that was formulated (see chapter one).

### 7.4.1 Hypotheses on Location

**$H_{DD1}$: Location (rural/urban) affects access to computing facilities**

**$H_{DD2}$: Location (rural/urban) affects internet experience**

**$H_{DD3}$: Location (rural/urban) affects e-government experience**

**$H_{DD4}$: Location (developing/developed country) affects access to computing facilities**

**$H_{DD5}$: Location (developing/developed country) affects internet experience**

**$H_{DD6}$: Location (developing/developed country) affects e-government experience**

For hypotheses 1 and 2, there is significant evidence to suggest that location affects access to computing facilities and the internet experience of NIS portal users in urban and rural areas. According to Hindman (2000), there has been a surge in internet usage in urban areas and a decline in its use in rural areas. Graham (2002) and Bonfadelli (2002) have found that technology usage is more common amongst urban users than their rural counterparts. However, hypothesis 3 suggests that location does not affect NIS portal users in terms of their e-

government experience irrespective of whether they are living in urban or rural areas. The analysis of hypotheses 4, 5 and 6 (looking at NIS portal users' locations in terms of whether they were in developed or developing countries) reveals that location affects NIS portal users with regards to their access to computing facilities, and their internet and e-government experience. According to Madon (2000), only one-third of the world's population has access to the internet and the majority of them are from developed countries. Madon has further stated that the percentage of internet usage is significantly lower in developing countries. According to Petrazzini and Kibati (1999), developing countries face hurdles of limited access to the internet due to a lack of the resources required for this service. Rouvinen (2006) has argued that people in developed countries enjoy free and easy availability to the internet as compared to people in developing countries. Cresci, Yarandi and Morrell (2010), Sitawa-Ogutu and Rege (2010) and Warschauer (2012) all note that nothing has changed a decade later regading the digital divide. The results suggest that users in the Nigeria urban category had significantly better access to computing facilities and had more internet experience than those in the Nigeria rural category. Additionally, the results of hypotheses 4, 5 and 6 show that NIS portal users from developed countries (UK and USA specifically) had better access to computing facilities, and more internet and e-government experience than the urban users in Nigeria.

However, as hypothesis 3 was not supported, it should be said that the NIS portal users residing in both urban and rural Nigeria had the same levels of e-government experience. This is in accordance with Aneke's findings (2009) that NIS e-government service use is mandatory; if someone wishes to move in and out of Nigeria there is no option but to use it. Hypothesis 6 shows that NIS portal users in developed countries (the UK and the USA specifically) had more e-government experience than urban users in Nigeria. This is because NIS portal users in developed countries are exposed to more advanced and voluntary e-government services than Nigeria urban users and this explains the differences in their experience of them.

### 7.4.2 Hypotheses on Gender

***$H_{DD7}$*: Gender affects access to computing facilities**

***$H_{DD8}$*: Gender affects internet experience**

***$H_{DD9}$*: Gender affects e-government experience**

Hypotheses 7 and 8 were supported with regards to gender's effect on NIS portal users' access to computing facilities and their e-government experience. According to Morahan-Martin's (1998) study, men claimed to know more about the internet than women; additionally, women were found to be less technological adept than men. Also, men's technologically sound knowledge makes them more experienced users of the internet than women. Howard, Rainie and Jones (2001) have reported that a greater percentage of men use the internet to communicate in work environments as compared to women. According to Durndell and Haag (2002), women's lack of interest in the technology has a crucial impact on internet usage. This view has been supported by Idowu and Adagunodo (2004). Wasserman and Richmond-Abbott (2005) have revealed that more men than women use the internet. Recent research by Antonio and Tuffley (2014) has found that the number of women participating in technology in the developing world is low. This has resulted in a digital divide. However, hypothesis 9 was not supported which means there is no evidence to suggest gender affects NIS portal users' e-government experience.

### 7.4.3 Hypotheses on age

**$H_{DD10}$: Age affects access to computing facilities**

**$H_{DD11}$: Age affects experience**

**$H_{DD12}$: Age affects e-government experience**

The results of both hypotheses 10 and 11 suggest NIS portal users' access to computing facilities and their internet experience was affected by their age. This view has been supported by previous researchers: Nwalo (2000) and Idowu and Adagunodo (2005). According to Thayer and Ray (2006), people's ability to use websites declines each year of their life between the ages of 25 and 60. They have stated further that this cause of decline is due to the navigation issues they face while searching the internet. Lenhart at al.'s (2010) report reveals the websites people visit are quite different and that this is determined by their age. Young adults, ranging from 18 to 25 years, visit non-professional social networking sites more frequently in large numbers than the other age groups. Older age groups tend to have less access to computing facilities compared to this younger age group. This is because older people tend to be less enthused by technology than younger people. Heart and Kalderon (2013) also find that older age groups lag behind their younger counterparts in ICT adoption. However, the results of hypothesis 12 suggest that age did not have an effect on the NIS portal users' e-government experience.

### 7.4.4 Hypotheses on Education

***$H_{DD13}$*: Education affects access to computing facilities**

***$H_{DD14}$*: Education affects internet experience**

***$H_{DD15}$*: Education affects e-government experience**

Education was found to have a significant effect on the digital divide in the context of e-government services. Hypotheses 13, 14 and 15 were all supported and this shows that their education has affected NIS portal users' access to computing facilities, internet and e-government experience. Education has significant impacts in all areas of life; it reshapes, polishes and grooms people's thinking capabilities. According to Kiiski and Pohjola (2002), education is the most consistent global predictor in measuring experience and access to internet technology. People with high levels of education are likely to have computers and broadband connections, thus have internet access at home and spend a lot of their time on the web. Therefore, levels of education can have an impact on ability to take advantage of the internet in varying ways. According to Wilson, Walin and Reiser (2003) and Chinn and Fairlie (2006), highly educated people keep up with technology, enjoy easy access to the internet and are way ahead in terms of technology as compared to people who have a low level of education. This also suggests that people with a high level of education tend to have more experience of the internet because of their increased knowledge. Vicente and López (2011) argue that society needs information for its growth and development and hence must realise that education is an important aspect of this. According to Zhong (2011), the gap in accessing the internet and computers is influenced by levels of education.

### 7.4.5 Hypotheses on Employment

***$H_{DD16}$*: Employment affects access to computing facilities**

***$H_{DD17}$*: Employment affects internet experience**

***$H_{DD18}$*: Employment affects e-government experience**

The results of hypotheses 16, 17 and 18 suggest that different employment statuses have an impact on internet access, and internet and e-government experience. According to Goldberg, Wagner and Brewer (1997), government employees use the internet for the purpose of office communications and work; most of them use it to download information to perform routine tasks. Moreover, self-employed people use the internet for carrying out online transactions, such as online banking. According to Rustad and Paulsson (2005), private employees mostly use the internet for communicating within the office. Most of them enjoy

unlimited access to the internet but their use of it depends greatly on their level of work. If their work is internet-related, then they have more experience regarding its use than others. Fountain (2005) suggests that unemployed people normally use the internet to search for jobs. Some of them do face issues regarding internet access as they have limited resources but that does not relate to their internet experience. According to Anderson (2001), most students use the internet for searching out reading materials, completing their assignments and preparing for exams. Students also use the internet for social networking. Therefore, this implies that employment status would impact on NIS portal users' access to computing facilities, and their internet and e-government experience.

### 7.4.6 Hypotheses on Income

**$H_{DD19}$: Income affects access to computing facilities**

**$H_{DD20}$: Income affects internet experience**

**$H_{DD21}$: Income affects e-government experience**

Hypotheses 19, 20 and 21 suggest that income would have an effect on NIS portal users' access to computing facilities, and their internet and e-government experience. According to Warschauer (2002), people with low levels of income cannot afford high-tech fast processing computers, and the use of lower performance computers also affects internet access. According to van Dijk and Hacker (2003), individual incomes may have a significant effect on internet access. Chakraborty and Bosman (2005) suggest that individuals with high incomes have better access to computing facilities and are significantly greater users of the internet than people on low incomes. This view is supported by Servon and Nelson (2001), who have pointed out that technological facilities are available to people with high-income levels to gain access to the internet. Fuchs and Christian (2008) have mentioned that people with low incomes face affordability issues when it comes to internet access. Internet access is available on lower rates, but due to their low living standards people on low incomes still often cannot afford to pay these.

## 7.5 Conclusion

The aim of this thesis is to advance knowledge of both e-government in developing countries and the theoretical conceptualisation of digital divide, through the study of the Nigeria Immigration Service (NIS) e-government service. This study has sought to determine which factors influence the perceived user experience and benefits associated with the e-government services provided by

the NIS and the interrelationships between these factors. Additionally, it has tried to determine the relationship between user demographics and digital divide variables, such as access to computing facilities, internet experience and e-government experience.

The results indicate that e-government services have revolutionised the way in which government agencies interact with the public. Responsiveness, efficiency and transparency in the public sector are improved by e-government services. Users' experience of an e-government service is influenced by: security and support, trustworthiness, ease of use, website quality, information quality, benefits, convenience and barriers. The hypotheses show all these factors were supported and interrelated, thereby contributing to users' satisfaction with e-government services.

There are two aspects to the digital divide: access and skills. This research sheds light on the effects of the digital divide on e-government services by its analysis of a group of users to identify the demographic features that affect their use of it. E-government services are significantly impacted by location (urban city/rural area; developing/developed country), gender, age, education, employment and income, access to computing facilities and internet and e-government experience, which in turn affects users' satisfaction with e-government services.

# Chapter 8: Conclusions and Recommendations

## 8.1 Introduction

This chapter presents the concluding arguments on the research findings; a contribution statement reflects on its limitations and provides recommendations for future practice and research.

## 8.2 Research Aim and Objectives Revisited

This research has sought to advance knowledge and theory regarding user experience of e-government in developing countries, through the study of the Nigeria Immigration Service (NIS) e-government service. Also, to advance theoretical conceptualisation and understanding of the nature of the digital divide, with the following objectives:

(i.) To develop an understanding of the conceptual and theoretical foundations relevant to the users' experience of e-government services.
(ii.) To review research on the digital divide in the context of e-government services.
(iii.) To identify the factors contributing to users' experience of the NIS e-government service.
(iv.) To generate insights into the users' experience with the NIS e-government service.
(v.) To develop and test a conceptual model of users' experience of the NIS e-government service.
(vi.) To explore the relationship between demographic factors and digital divide variables.
(vii.) To offer recommendations for research and practice.

### How the Study has met its Objectives

Objective (i.) was to develop an understanding of the conceptual and theoretical foundations relevant to the users' experience of e-government services. This objective was addressed by reviewing the literature on e-government services; service quality, e-government adoption and satisfaction were also discussed (see Chapter 3).

Objective (ii.) was to review prior research on the digital divide in the context of e-government services. This objective was addressed by reviewing previous

research on the digital divide in the context of both developing and developed countries (see Chapter 3).

Objective (iii.) was to identify factors contributing to user experience of the Nigeria Immigration Service (NIS) e-government service. This objective was met through a large-scale online-based survey conducted in the context of the NIS e-government service, and subsequent data analyses using SPSS and an exploratory factor analysis (EFA). For the EFA's outcome and the factors identified, see Chapter 6.

Objective (iv.) was to generate insights into the users' experience with the NIS e-government service. This objective was met through the provision of descriptive statistics on e-government experience scale dimensions and open questions as detailed in Chapter 6, Section 6.5.

Objective (v.) was to develop and test a conceptual model of users' experience with the NIS e-government service. This objective was met through the use of SEM; for the model generated by this, see Chapter 6.

Objective (vi.) was to explore the relationship between demographic factors and digital divide variables. This objective was met through various statistical hypotheses testing conducted using t-testing and ANOVA. For the hypotheses outcomes and the model generated, see Chapter 6.

Objective (vii.) was to offer recommendations for future research and practice. This was met by discussing the research findings and drawing conclusions, as presented in this chapter.

### 8.3 Major Findings and Models

As stated in Chapter 6, the following factors influence users' experience of e-government services: security and support, ease of use, information quality, trustworthiness, benefits, barriers, convenience, website quality and user satisfaction. This research has provided detailed descriptive statistics to generate insightful information on users' attitudes towards the NIS e-government services.

One of the key and unanticipated findings from this research relates to users' level of negativity towards being required to use the NIS website, as a result of issues associated with security and privacy. At the centre of this is likely to be a lack of trust regarding the safeguarding of users' personal and financial data. Users perceptions of risk are likely to be informed by their experiences in using

information technology based systems in Nigeria and by their perceptions of the trustworthiness of politicians and public adminstrations.

The other major barriers that emerged include the intermittent electricity supply, the high cost of internet access and its affordability is likely to be as a result of high rate of unemployment, which make it difficult for users to make use of the NIS e-service. Regarding the user experience model, all of the hypotheses were supported with a strong significant relationship between security and support and trustworthiness, website quality and security and support, ease of use and barriers, convenience and benefits. As stated in Chapter 7, the previous evidence shows that security and support is an important factor, but it is not consistently included in scales for measuring user experience, although it can significantly affect users' experience of e-government services and appears to be of particular concern in the context of Nigerian e-government services. The findings regarding the digital divide show that demographic, social-economic and geographical factors have had an effect on the users of Nigeria Immigration e-government services. This digital divide has two aspects: access and skills, and these affect users' satisfaction with e-government services.

**Academic Implications**

Based on the researcher's knowledge, this is one of a very few significant studies to explore users' experience of an e-government portal in a major developing country (Nigeria). Users' concerns regarding security, privacy and trustworthiness as they relate to the use of personal information by the government through their e-services have been brought to light. Additionally, this research compares users residing both inside and outside of Nigeria, thereby offering unique insights on the digital divide and e-government.

Future researchers can use the validated scale to measure and improve user experience of e-government services. In addition, they should note the importance of the dimensions of security and support, convenience and information quality and take this into account when conducting research involving users' experience of e-government services. Nevertheless, it has to be acknowledged that this scale has thus far only been tested in one context; studies bringing an inter-disciplinary perspective to exploring e-government users' experience should be undertaken in different contexts, including on different types of e-government applications and in

different countries. There is scope for further research into demographics and other factors which can affect users' experience.

### Practical Implications

The findings of this research shed light on important issues pertaining to users' experience of e-government services, such as their concerns regarding security, privacy and trustworthiness as they relate to personal information. E-government practitioners and governments should note the importance of security and support, convenience and information quality and take this into account when designing their systems.

## 8.4 An Overview of the Research Process and Methodology

In order to achieve the stated aim and objectives, this research began with a review of the literature and progressed with a gradual development of the conceptual framework. This was followed by a discussion of the questionnaire used to collect the data for this study; the questionnaire was informed by previous research and theory in the fields of customer satisfaction, service quality, technology adoption and digital divide, to identify factors contributing to users' experience within the context of the Nigeria Immigration Service (NIS) e-government service.

351 people completed questionnaires, with all respondents identifying themselves as having used the NIS portal, 50% reporting their main place of residence as being Nigeria, and the remainder being resident in various other countries. The data was then analysed using SPSS and AMOS for both exploratory and confirmatory factor analyses respectively which were used to generate an e-government user experience scale that confirmed the importance of dimensions identified by other researchers, as well as identifying new factors. The factors identified were: security and support, content and information, ease of use, benefits, barriers, convenience, trust and website quality.

The analysis of the descriptive statistics and the responses to the open questions and statements in the questionnaire suggest that the respondents had a low level of satisfaction with the NIS website, with much of their concern stemming from issues regarding security, privacy, support and trustworthiness. The participants also raised concerns regarding the safety of their personal and financial data. There were also significant issues cited relating to the ease of use of the website and its quality. Nonetheless, these users valued the content and information

available through the portal, and were positive about its convenience and potential to deliver benefits. In terms of usage barriers, the most significant was reported as the intermittent electricity supply, closely followed by the high cost of internet access, both of which pose a particular challenge given the high rate of unemployment in Nigeria.

SEM was used to investigate the relationships between these factors. Content and information had a significant effect on the portal's ease of use and convenience. Website quality had a significant effect on the ease of use, security and support. Ease of use had a significant effect on perceived barriers while convenience had a significant effect on perceived benefits. Meanwhile, security and support had a significant effect on trustworthiness. Perceived barriers and benefits as well as trustworthiness all had a significant effect on user satisfaction. The outcome of the SEM generated an e-government service user experience (EGSUE) model.

The respondents' demographic statistics supported the hypotheses testing on the digital divide in the use of e-government services. Demographic (age, education, gender and income), social-economic (employment) and geographical (location: rural and urban, developing and developed countries) factors were found to affect the extent to which e-government users' internet and e-government experience varied, as well as their access to computing facilities, confirming a digital divide does exist among NIS portal users. The outcome of the demographic statistics hypotheses testing on the digital divide in the use of e-government services generated the digital divide dimensions model (3DsM).

## 8.5 Contribution Statements

This study generally seeks to contribute to the knowledge of e-government with a focus on developing countries, particularly Africa. This is valuable as there is limited prior research on e-government use, adoption and experience. Additionally, it will enable e-government practitioners and governments to improve the e-government services they provide. Other specific contributions are as follows:

### *Generation of New Knowledge in the E-government Field*

This research is one of only a very few significant studies to explore user experience of an e-government portal in a major developing country. Users' concerns regarding security, privacy and trustworthiness as they relate to their personal information have been brought to light.

Secondly, this study is unique in that the data has been gathered from users accessing the e-government service both inside and outside of Nigeria, thus offering valuable insights on e-government and the digital divide.

***Identifying Factors that Contribute to User Experience of the Nigeria Immigration Service E-government Service***

This research has identified the factors contributing to users' experience of the Nigeria Immigration Service (NIS) e-government service (see Chapter 6). The results indicate that e-government services revolutionise the way government agencies interact with people. The responsiveness, efficiency and transparency of the public sector are improved by e-government services. Users' experience of e-government service is influenced by these factors: security and support, trustworthiness, ease of use, website quality, information quality, benefits, convenience and barriers.

***Developing and Validating an E-government User Experience Dimension Scale***

This research has developed and validated dimensions of users' experience of e-government services, creating a measurement scale for evaluating this (see Chapter 6). This scale demonstrates the value of taking a holistic perspective to users' experience of e-government, in that this scale embeds factors from different perspectives on the evaluation of e-government websites. For example, factors, barriers and benefits have previously been discussed in the technology adoption literature but in this study, factors such as ease of use and website quality, typically associated with the service quality literature, are also shown to be important. However, this research has also brought to light two new (security and support, convenience) and one re-affirmed (information quality) dimensions of e-government user experience, a re-affirmation of the importance of information and content. In each case, there is previous evidence to suggest the importance of these factors, but they have not consistently been included in scales for measuring user experience. In addition, this research has shown that security and support should be of particular concern in the context of Nigerian e-government services.

***Generating an E-government User Experience Model***

The research findings have revealed that users' experience of an e-government service is influenced by: security and support, trustworthiness, ease of use, website quality, information quality, benefits, convenience and barriers. The hypotheses have shown that all of these factors are supported and interrelated,

thereby contributing to users' satisfaction with an e-government service. This suggests that e-government services revolutionise the way government agencies interact with people, and that the responsiveness, efficiency and transparency of the public sector can be improved by these e-government services.

***Originality***

Originality in this research is claimed on the basis that all prior similar work has been conducted in a Western context.

## 8.6 Research Limitations

This research has a number of limitations. Although the research has developed and validated a conceptual model of user experience with the Nigeria Immigration Service (NIS) e-government service, it has to be acknowledged that this scale has thus far only been tested in one context; studies bringing an inter-disciplinary perspective to exploring e-government users' experience should be undertaken in different contexts, including on different types of e-government applications and in different countries.

The study adopted snowball sampling as the researcher was not able to obtain a record of users of the NIS portal due to privacy concerns, and the limitations of snowball sampling means no random sample was used. The sampled populations might be unrepresentative and there could be a possibility of bias towards certain professional groups and those that are familiar with computing technology. Sampling errors are also difficult to determine.

It has to be acknowledged that the online survey method adopted for data collection has a number of limitations. These include the fact that it is unclear who has accessed the online survey, which might mean participants could complete the questionnaire even if they had not used the NIS portal. In addition, the issues of partially completed questionnaires and questions that may be interpreted differently can lead to unclear data. The issue of unclear who has accessed the online survey, make it even more difficult to conducting interview with the participants.

Privacy, trust and security surfaced in this study as major issues in the use of the NIS portal. Such concerns might also transfer to a study regarding the portal, and thereby impact on the willingness to participate and the openness and honesty of the responses to the questionnaire might have implications for the data provided as respondents may not feel confident in answering the questions honestly.

## 8.7 Future Research Directions

The findings and limitations of this study enable the following suggestions for future research. There is evidence to suggest that the majority of respondents living in developing countries do not have easy access to computing facilities. Morris and Morris (2013) suggest that the digital divide is felt more in developing countries because they do not have the resources to invest in the latest technologies. It is worth noting, however, that a significant amount of the respondents in the sample owned a mobile phone. These findings are supported by NCC (2015) statistics that show that active connected mobile telephone lines in Nigeria stand at 186 million, in a population of around 177 million (The World Factbook, 2015). In the future, e-government services are likely to make increasing use of mobile platforms; therefore, future studies should focus on mobile e-government channels.

Second, there should be more research comparing users who are both inside and outside country, with a focus on rural dwellers as these areas of the community are rarely studied, to offer more insights on the digital divide.

Finally, there should be more research on the potential role of social media in e-government, as this could be a new means of engaging users with e-government services.

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## Appendices

### Appendix 1: Sample Survey Questionnaire

**Survey on User Experience of the Nigeria Immigration Service (NIS) e-Government Services**

Dear Participant,

I am a PhD Research Degree student with Manchester Metropolitan University, Manchester, United Kingdom.

You have been invited to participate in my survey on User Experience of e-Government Services. In this survey, approximately 400 people will be asked to complete this survey that ask questions about their experience of using the Nigeria Immigration Service (NIS) as provided through their website at: https://portal.immigration.gov.ng/

It will take between 5 to 10 minutes to complete this survey. Your participation in this study is completely voluntary. There are no foreseeable risks associated with this survey. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. It is very important for me to learn your opinions. Your survey responses will be strictly confidential.

If you have questions at any time about this survey or the procedures, you may contact me (Olaseni Okunola) through my email: olaseni.m.okunola@stu.mmu.ac.uk

Thank you very much for your time.

**Please start with the survey now by clicking on the Continue button below:**
***(Note: percentage of completion over 100% will display on top of the screen to the participant, to guide them on the progress of their participation)***

**(1.) Have you ever visited Nigeria Immigration Service (NIS) website at: https://portal.immigration.gov.ng/**

Yes ❑
No ❑

***(Question 1 logic) If participant selected 'Yes', question (2) will display. But if 'No' is selected, then question (19) will display.***

**(2.) All questions in this section are about your access to computing facilities.**

| | Yes | No |
|---|---|---|
| I have access to a computer (desktop, laptop, tablet) at home | ❑ | ❑ |
| I have access to a computer (desktop, laptop, tablet) only at work or school | ❑ | ❑ |
| I have access to a computer (desktop, laptop, tablet) only at cyber-café | ❑ | ❑ |
| I have access to a landline telephone | ❑ | ❑ |
| I have access to a mobile telephone | ❑ | ❑ |
| I do not have any access to a computer technology (e.g mobile phone, desktop, laptop, tablet etc) | ❑ | ❑ |
| I have access to uninterrupted electricity supply | ❑ | ❑ |
| I have access to the internet at home | ❑ | ❑ |
| I have access to the internet only at work or school | ❑ | ❑ |
| I have access to the internet only at cyber-café | ❑ | ❑ |
| I have access to the internet only on my mobile telephone | ❑ | ❑ |

**(3.) All questions in this section are about your previous internet and e-service experience**

| | Never | Rarely | Occasionally | Frequently | Very frequently |
|---|---|---|---|---|---|
| How often do you use the internet | ❑ | ❑ | ❑ | ❑ | ❑ |
| How often do you use e-government services | ❑ | ❑ | ❑ | ❑ | ❑ |
| How often do you conduct financial transaction online through e-government services | ❑ | ❑ | ❑ | ❑ | ❑ |
| How often do you communicate with government agencies through their official website | ❑ | ❑ | ❑ | ❑ | ❑ |
| How often do you access the internet | ❑ | ❑ | ❑ | ❑ | ❑ |
| How often do you use the internet for online shopping | ❑ | ❑ | ❑ | ❑ | ❑ |
| How often do you use the internet for online banking | ❑ | ❑ | ❑ | ❑ | ❑ |
| How often do you use the internet at work | ❑ | ❑ | ❑ | ❑ | ❑ |
| How often do you use the internet at home | ❑ | ❑ | ❑ | ❑ | ❑ |
| How often do you use the internet at school | ❑ | ❑ | ❑ | ❑ | ❑ |

**(4.) The following questions ask you to think about the ease of use while using Nigeria Immigration Service (NIS) website**

| | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| I find that I can use NIS e-services without any form of technical support | ❑ | ❑ | ❑ | ❑ | ❑ |
| I find that using e-services at the website of the NIS is easy | ❑ | ❑ | ❑ | ❑ | ❑ |
| I find that information on the NIS website enough to process my transactions | ❑ | ❑ | ❑ | ❑ | ❑ |
| I find that navigating around the NIS website is easy | ❑ | ❑ | ❑ | ❑ | ❑ |
| I find that the NIS website is user friendly | ❑ | ❑ | ❑ | ❑ | ❑ |
| I find that the information on the NIS website is easy to understand | ❑ | ❑ | ❑ | ❑ | ❑ |
| I feel comfortable using the NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| I find that obtaining information from the NIS website for my needs is easy | ❑ | ❑ | ❑ | ❑ | ❑ |
| I find that completing transactions on the NIS website is easy for me | ❑ | ❑ | ❑ | ❑ | ❑ |
| **I do not consider NIS website to be user friendly** | ❑ | ❑ | ❑ | ❑ | ❑ |

**(5.) The following questions ask you to think about the information on the Nigeria Immigration Service (NIS) website**

| | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| There is adequate information on the NIS website for me to process any transaction | ❑ | ❑ | ❑ | ❑ | ❑ |
| The content of the NIS website is useful for my purpose | ❑ | ❑ | ❑ | ❑ | ❑ |
| The information on the NIS website is up to date | ❑ | ❑ | ❑ | ❑ | ❑ |
| The NIS website layout makes it easy for me to find things at first sight | ❑ | ❑ | ❑ | ❑ | ❑ |
| The NIS website provides detailed information on the services available | ❑ | ❑ | ❑ | ❑ | ❑ |
| I do not consider the information on the NIS website as accurate | ❑ | ❑ | ❑ | ❑ | ❑ |
| The information on the NIS website are reliable | ❑ | ❑ | ❑ | ❑ | ❑ |
| The NIS website provides information in an appropriate format | ❑ | ❑ | ❑ | ❑ | ❑ |
| There is sufficient information on the NIS website for me to make a transaction decision | ❑ | ❑ | ❑ | ❑ | ❑ |
| The information on the NIS website meets the needs of both citizen and non-citizen | ❑ | ❑ | ❑ | ❑ | ❑ |

**(6.) The following questions ask you to consider the benefits you derived while using Nigeria Immigration website:**

| | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| I am able to use NIS e-services at a time that suits me | ❑ | ❑ | ❑ | ❑ | ❑ |
| I am able to use NIS e-services from anywhere in the world | ❑ | ❑ | ❑ | ❑ | ❑ |
| I am able to accomplish tasks more quickly using NIS website compare to face-to-face service | ❑ | ❑ | ❑ | ❑ | ❑ |
| Making use of the NIS website reduces my travelling expenses | ❑ | ❑ | ❑ | ❑ | ❑ |
| Making use of the NIS website reduces my queuing time | ❑ | ❑ | ❑ | ❑ | ❑ |
| I do not consider NIS website of any benefit to me | ❑ | ❑ | ❑ | ❑ | ❑ |
| Making use of the NIS website allows me to conduct transaction out of normal working hours | ❑ | ❑ | ❑ | ❑ | ❑ |
| Making use of the NIS website reduces my visa / passport application process time | ❑ | ❑ | ❑ | ❑ | ❑ |
| Making use of the NIS website improves the effectiveness of my visa / passport application | ❑ | ❑ | ❑ | ❑ | ❑ |
| Making use of the NIS website simplifies my visa / passport application processing time | ❑ | ❑ | ❑ | ❑ | ❑ |
| Making use of the NIS website reduces the time associated with my initial enquiry | ❑ | ❑ | ❑ | ❑ | ❑ |

**(7.) The following questions ask you to consider barriers to your effective use of the Nigeria Immigration Service (NIS) website**

| | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| It is costly to have internet access in order to use government e-services | ❑ | ❑ | ❑ | ❑ | ❑ |
| An intermittent electricity supply makes it difficult for me to use NIS e-services | ❑ | ❑ | ❑ | ❑ | ❑ |
| It is difficult to seek technical support from NIS website team | ❑ | ❑ | ❑ | ❑ | ❑ |
| Lack of access to a computer results in extra cost in using NIS website e-service | ❑ | ❑ | ❑ | ❑ | ❑ |
| I worry about my financial details being stolen | ❑ | ❑ | ❑ | ❑ | ❑ |
| I have no negative reason not to use NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| I worry about safe transactions online | ❑ | ❑ | ❑ | ❑ | ❑ |
| I worry about my personal information being used by others | ❑ | ❑ | ❑ | ❑ | ❑ |

| | | | | | |
|---|---|---|---|---|---|
| Using NIS website to apply for passport or visa may cost me more | ❑ | ❑ | ❑ | ❑ | ❑ |
| There is lack of technical support while using NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| NIS website is too complex to use | ❑ | ❑ | ❑ | ❑ | ❑ |

**(8.) The following questions ask you to consider the trust and confidence you have in using Nigeria Immigration Service (NIS) website**

| | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| The NIS website is safe to conduct financial transactions | ❑ | ❑ | ❑ | ❑ | ❑ |
| The NIS website provides adequate measure to protect my financial details (credit or debit card) | ❑ | ❑ | ❑ | ❑ | ❑ |
| The NIS website security policy is clearly stated and accessible to the users of the website to read | ❑ | ❑ | ❑ | ❑ | ❑ |
| I am happy to provide my personal information at the NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| The NIS website protect my disclosed personal information | ❑ | ❑ | ❑ | ❑ | ❑ |
| I have fear for my confidential details on NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| The information that I give on the NIS website is only used for the reason for which it is submitted | ❑ | ❑ | ❑ | ❑ | ❑ |
| My information would only be accessed by the authorised person | ❑ | ❑ | ❑ | ❑ | ❑ |
| The NIS website has a good reputation | ❑ | ❑ | ❑ | ❑ | ❑ |
| I feel confident that I can rely on transactions conducted through the NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| I feel confident that the NIS will meet their obligations for transactions conducted through their website | ❑ | ❑ | ❑ | ❑ | ❑ |

**(9.) The following questions ask you to think about the qualities of the Nigeria Immigration Service (NIS) website:**

| | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| Completing forms online on the NIS website has been made easy for me | ❑ | ❑ | ❑ | ❑ | ❑ |
| Technical support available at the NIS website is as good as other e-government website used | ❑ | ❑ | ❑ | ❑ | ❑ |
| The NIS website well designed compared to other e-government website that I have used | ❑ | ❑ | ❑ | ❑ | ❑ |

| | | | | | |
|---|---|---|---|---|---|
| I always have problem using NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| It is a very pleasant experience using NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| The NIS website adequately meet my needs of interaction with the government agency | ❑ | ❑ | ❑ | ❑ | ❑ |
| I feel adequately informed when using the Nigeria Immigration website | ❑ | ❑ | ❑ | ❑ | ❑ |
| I always know how to find things when using the NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| I feel confident that I understand the language used on NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| I feel empowered when using the NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |

**(10.) How satisfied are you with the following aspects of your experience of using Nigeria Immigration Service (NIS) website:**

| | Very Unsatisfied | Unsatisfied | Neutral | Satisfied | Very Satisfied |
|---|---|---|---|---|---|
| The cost of getting access to use the NIS e-services | ❑ | ❑ | ❑ | ❑ | ❑ |
| The ease of access to the NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| The technical support received while using the NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| The usefulness of the information provided at the NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| The security of transactions provided at the NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| The convenience of access the NIS website anywhere and anytime | ❑ | ❑ | ❑ | ❑ | ❑ |
| How the NIS website meets your expectation entirely | ❑ | ❑ | ❑ | ❑ | ❑ |
| Overall, how satisfy are you, with ease of use while using the NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |
| Overall, how satisfy are you with the NIS e-services experience. | ❑ | ❑ | ❑ | ❑ | ❑ |
| Overall, how satisfy is your experience with NIS website | ❑ | ❑ | ❑ | ❑ | ❑ |

**(11.) Abode: Area of permanent residence**

| | Yes | No |
|---|---|---|
| Are you permanently residing in Nigeria | ❑ | ❑ |

***(Question 11 Logic)***

***If 'Yes' is selected, then questions 13 will display to the participant to confirm their permanent residence categorisation as either: Urban/City Or***

***Rural or Countryside area. But if 'No' is selected, then question 12 will display requesting for the participant to confirm their country of permanent residence.***

**(12.) Please confirm your permanent residence (Country):**

***Drop down box with a list of countries in the world and the participant will be able to make a selection of a country as their permanent residence (Country)***

**(13.) Please confirm your permanent residence categorisation (this will apply to all participants)**

| | Urban / City | Rural / Countryside |
|---|---|---|
| Please select appropriate categorisation for the area you currently residing | ❑ | ❑ |

(**14.) Demographic Factors**

**Please select the appropriate answers as applied to you**

***Please confirm your gender:***

Male ❑
Female ❑

***Please confirm your age range:***

18 – 25 years ❑
26 – 30 years ❑
31 – 35 years ❑
36 – 40 years ❑
41 – 45 years ❑
46 – 50 years ❑
51 – 55 years ❑
56 – 60 years ❑
61 – 65 years ❑
Over 65 years ❑

***Please confirm your highest level of education:***

Doctorate Degree ❑
Master's Degree ❑
Bachelor's Degree ❑
HND ❑
ND / NCE ❑
Technical College ❑
Secondary ❑
Primary School ❑
Not Formally Educated ❑

***Please confirm your employment status:***

Government employee❑
Private employee ❑
Self-employed ❑
Unemployed ❑
Retiree ❑
Student ❑

***Please confirm your household income level:***

Low income ❑
Medium income ❑
High income ❑

**(15) Please select any of the e-services you have used through the Nigeria Immigration Service (NIS) website:**

Visa Applications❑
Passport Applications❑
Information Enquiries❑
Other❑

**(16.) Please explain when you last used the Nigeria Immigration Service (NIS) website and the e-services you use in the box below:**

**(17.) Please write any other comment you may have on the Nigeria Immigration Service (NIS) website and their e-services in the box below:**

**(18.) If you would like me to contact you in future with regards to this survey interview, could you please leave your contact email address in the box below:**

***(Question 18) The user will be able to leave their email contact. Whether leave insert email contact or not, the user will be able to click next button and the end the questionnaire and a thank you note message will display and to let the user know that the questionnaire is now completed.***

**(19.) Your Contribution Still Needed**

Sorry, the survey requires you to have visited Nigeria Immigration Service (NIS) website at: https://portal.immigration.gov.ng/ in order to be able to provide your experience with the e-government service as provided by the Nigeria Immigration through its website at: https://portal.immigration.gov.ng/

But you can still participate in this survey by visiting Nigeria Immigration Service (NIS) website, then come back to participate in the survey.

Thank you for showing interest and looking forward to your contribution in this survey.

Best regards,

Olaseni Okunola

**(20.) Thank You Note**

You have now completed the Nigeria Immigration Service (NIS) e-Government service survey.

If you require any further information with regards to this survey, feel free to contact me (Olaseni Okunola) through my email: olaseni.m.okunola@stu.mmu.ac.uk

Thank you

**Appendix 2: Sample Email Invitation**

Dear Participant,

I am a PhD Research Degree student with Manchester Metropolitan University, Manchester, United Kingdom. You have been invited to participate in my survey on User Experience of the Nigeria Immigration Service (NIS) e-Government Services.

All responses will remain confidential and secure.

Thank you in advance for your valuable insights.

Please click on this link to complete the survey:

<SURVEY_LINK>

Please contact olaseni.m.okunola@stu.mmu.ac.uk if you have any questions.

Thank you.

Olaseni Okunola

**Appendix 3: A Comprehensive List of Measurement Items Extracted From Previous Researches**

| Dimensions | Research Conducted By |
|---|---|
| Access / Accessibility | Ching-Wen Chen (2010); Agrawal, A., Shah, P., & Wadhwa, V. (2008) |
| Accuracy | Ching-Wen Chen (2010); Mohamed, N., Hussin, H. and Hussein, R. (2009) |
| Assistance | HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010) |
| Assurance | Eduard Cristobal,E., Flavián,C. and Guinalíu,(2007) |
| Availability | Verdegem,P. and Verleye, G. (2009) |
| Avoidance of personal interaction | HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010) |
| Awareness | HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010); Verdegem,P. and Verleye, G. (2009) |
| Behavioural Intentions | G.J. Udo, K.K. Bagchi & P.J. Kirs (2010) |
| Citizen Support / Empathy./ Interaction | Ching-Wen Chen (2010) |
| Compatibility | HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010) |
| Convenience | HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010) |
| Convenience of Service | G.J. Udo, K.K. Bagchi & P.J. Kirs (2010) |
| Cost | Verdegem,P. and Verleye, G. (2009) |
| Customer friendliness | Verdegem,P. and Verleye, G. (2009) |
| Customer service | Eduard Cristobal,E., Flavián,C. and Guinalíu,(2007) |
| Customization | Abhichandani, T. and Horan, T. (2006) |
| Ease of use | Ching-Wen Chen (2010); Mohamed, N., Hussin, H. and Hussein, R. (2009) |
| Efficiency | Abhichandani, T. and Horan, T. (2006) |
| Effort expectancy | HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010) |
| Facilitating conditions | HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010) |
| Flexibility | HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010) |
| Information Quality / Information | Ching-Wen Chen (2010); Mohamed, N., Hussin, H. and Hussein, R. (2009) |

| | |
|---|---|
| Infrastructure | Verdegem,P. and Verleye, G. (2009) |
| Loyalty scale | Eduard Cristobal,E., Flavián,C. and Guinalíu,(2007) |
| Order management | Eduard Cristobal,E., Flavián,C. and Guinalíu,(2007) |
| PC Skills | G.J. Udo, K.K. Bagchi & P.J. Kirs (2010) |
| Perceived Risk | G.J. Udo, K.K. Bagchi & P.J. Kirs (2010) |
| Performance expectancy | HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010) |
| Reliability | Ching-Wen Chen (2010) |
| Responsiveness | Ching-Wen Chen (2010) |
| Satisfaction | Ching-Wen Chen (2010); G.J. Udo, K.K. Bagchi & P.J. Kirs (2010); HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010); Abhichandani, T. and Horan, T. (2006) |
| Satisfaction / User satisfaction | Eduard Cristobal,E., Flavián,C. and Guinalíu,(2007) |
| Security / Privacy | Verdegem,P. and Verleye, G. (2009); |
| Self-efficacy | HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010) |
| Service Interaction/ Interaction | Ching-Wen Chen (2010) |
| Social influence | HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010) |
| Technical aspect / Technical quality | Verdegem,P. and Verleye, G. (2009) |
| Timeliness | Mohamed, N., Hussin, H. and Hussein, R. (2009) |
| Trust | HU, P., & F. Chan, J. Thong, V. Venkatesh, S. Brown (2010) |
| Usability | Verdegem,P. and Verleye, G. (2009) |
| Utility | Abhichandani, T. and Horan, T. (2006) |
| Web design | Eduard Cristobal,E., Flavián,C. and Guinalíu,(2007) |
| Web service quality | G.J. Udo, K.K. Bagchi & P.J. Kirs (2010) |
| Web Site Content / Content | G.J. Udo, K.K. Bagchi & P.J. Kirs (2010); Verdegem,P. and Verleye, G. (2009); Mohamed, N., Hussin, H. and Hussein, R. (2009) |

**Appendix 4: Items Removed During CFA.**

| Items Code | Items |
|---|---|
| EoU9 | I find that completing transactions on the NIS website is easy for me |
| PIQ3 | The information on the NIS website is up to date |
| PIQ4 | The NIS website layout makes it easy for me to find things at first sight |
| PIQ6c | I do not consider the information on the NIS website as accurate |
| PIQ8 | The NIS website provides information in an appropriate format |
| PIQ10 | The information on the NIS website meets the needs of both citizen and non-citizen |
| PBn4 | Making use of the NIS website reduces my travelling expenses |
| PBn5 | Making use of the NIS website reduces my queuing time |
| PBr3c | It is difficult to seek technical support from the NIS website team |
| PBr5c | I worry about my financial details being stolen |
| PBr7c | I worry about safe transactions online |
| PBr8c | I worry about my personal information being used by others |
| PBr10c | There is a lack of technical support while using the NIS website |
| PTr9 | The NIS website has a good reputation |
| PTr10 | I feel confident that I can rely on transactions conducted through the NIS website |
| PTR11 | I feel confident that the NIS will meet their obligations for transactions conducted through their website |
| WSQ4c | I always have problems using the NIS website |
| SAT1 | The cost of getting access to use the NIS e-services |
| SAT2 | The ease of access to the NIS website |