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Technological Innovations Transforming the Consumer Retail Experience: A Review of Literature

Natasha Moorhouse
M. Claudia tom Dieck
Timothy Jung

Faculty of Business and Law
Manchester Metropolitan University, United Kingdom
natasha.moorhouse@stu.mmu.ac.uk

Abstract

Technological advancements are largely responsible for the intensified competiveness within the industry and the shift in consumers shopping and buying behavior. Global trends such as mobile devices and social media have led to a revolutionary change that has driven the drastic decline in traditional 'brick and mortar' footfall, leading to the unfortunate failure of long-standing retailers that once dominated our high streets. Despite survival to date, current retail firms remain with high pressure to change strategy to connect with the digital natives of today. The integration of online and physical worlds must focus on promoting the experiential benefits that the in-store environment provides by integrating emergent technologies into the entire retail process. The following paper provides an insight into current technological innovations that are transforming the consumer experience in a myriad of ways. Then, recommendations for practitioners regarding strategic implementation of future Augmented Reality (AR) and Virtual Reality (VR) technologies are presented, followed by an overview of future implications of said technologies.

Keywords: retail; technology; augmented reality, virtual reality, consumer experience, innovation.

1. Introduction

Technological innovations have the potential to dramatically modify the retail landscape (Hopping, 2000; Pantano, 2016). The mobile revolution transformed the ways consumers search for, and purchase goods and services, and the retail sector is now characterised by exploration of innovative methods to amplify the consumer experience and consumer satisfaction through emergent technology integration into the entire retail process (Pantano et al., 2017). However, certain technological platforms present challenges for retailers when the technology becomes the central *foci* of the experience,

thus, implying that paradoxical experiences with technologies could potentially have adverse effects on retailers marketing efforts.

Therefore, the following study investigates the key opportunities and challenges of current technological innovations in terms of consumer response, including mobile, in-store, and emergent technologies. Followed by an exploration of how the challenges can be overcome, and such knowledge extended to strategically implement future Augmented Reality (AR) and Virtual Reality (VR) technologies to further enhance the consumer retail experience. The study contributes to the extensive research in the respective fields, and provides an overview for practitioners regarding consumer response of existing technological innovations and marketing efforts; further highlighting how future AR and VR technologies can be strategically implemented to create human-led, socially engaging and entertaining experiences, as demanded by the digitalised population. Finally, a number of forecasts and implications are presented regarding AR and VR developments, followed by recommendations for academia regarding future consumer research.

2. Literature Review

2.1 Current Technological Innovations Transforming the Consumer Retail Experience

Mobile Technologies

The mobile revolution has driven change from multi-channel to omni-channel retailing. This created a notable shift from the division of physical and online retailing, to the free movement amongst online, mobile and the physical store within a single transaction process (Piotrowicz and Cuthbertson, 2016). Few benefits of mobile devices include portability and ubiquity (Pantano et al., 2013). Consumers are no longer restricted by store opening hours due to the widespread adoption of mobile devices, shifting traditional space and time boundaries (Bourkalis et al., 2009), by empowering consumers with increased flexibility and control over when, where and how they select and purchase goods and services (Niemeier et al., 2013; Piotrowicz and Cuthbertson, 2016).

Nowadays, a staggering 80% of internet users worldwide use their mobile device to browse online (Chaffey, 2016), whilst global spending on mobile applications has risen from $4 billion to $35 billion from 2009-2015 (Statista, 2016a). Evidently, consumers want to use their own, personal devices to search for price comparison, search for offers and product information, execute payments seamlessly, and learn from previous customer reviews (Yarrow, 2014). Regarding the latter, social media and online retail websites that are easily accessible on mobile devices provide the ideal platform for social interaction, thus, providing a hub where consumer product and service reviews are shared and easily amplified to a wider audience (Niemeier et al., 2013).

Popular social media sites such as Facebook and Twitter allow consumers to share and express thoughts and opinions on products and services at any point throughout the retail process (Niemeier et al., 2013). The ability to share satisfaction or dissatisfaction with the brand in real-time in-store presents challenges for retailers, who often lack control over the consumers social network influence (Piotrowicz and Cuthbertson,

2016); and negative reviews in an online community drastically affects brand credibility, brand perception, customer loyalty, sales and share price (Niemeier et al., 2013). Considering Facebooks somewhat 1.5 billion monthly active users (Statista, 2016b), it is crucial for firms to build online relationships with consumers to encourage positive promotion and product rating (Piotrowicz and Cuthbertson, 2016). This is because the customer "serves as a medium between herself or himself and the wider social media network, which is maintained even in in-store environment via mobile devices" (Piotrowicz and Cuthbertson, 2016, p. 9).

The moment of effective consumption is now separated from the moment of purchase because of services such as click-and-collect (Pantano et al., 2016). Consumers can complete transactions on their mobile device, via mobile application or web browser, later collecting in-store or at a collection point, thus, limiting the opportunity for human interaction and communication (Pantano et al., 2016). A ubiquitous network that consumers can access from anywhere at any time enables a high level of connectivity and ease of purchase, which is beneficial for both consumer and retailer (Pantano et al., 2016). However, Piotrowicz and Cuthbertson (2016) state that online and mobile solutions should be utilised to drive consumers to physical stores and encourage human interaction. In doing so, the retailer retains a sense of control over the experience, and can resolve any issues that may arise, prior to posting negative reviews which can be seen by the masses.

In-store Technologies

Retailers have notably integrated technologies in-store as a method to attract new and existing markets and create an efficient service process. For instance, the integration of self-service technologies (SST's) into the retail process i.e. self-scanning and self-checkout (SCO) that allow consumers to scan products and make payments themselves (Nathalie et al., 2016), have emerged as a method to support the retail process (Lai and Chuah, 2010), by reducing queuing time, and avoiding consumers becoming increasingly irritated and agitated (Yarrow, 2014). Retailers are continuously encouraging consumers to adopt emergent technologies (Pantano et al., 2016), to improve the consumer experience and ultimately, elevate the consumers image of the store (Yarrow, 2014). In addition, more modern payment solutions i.e. Samsung Pay and Apple Pay, and digital wallets providing seamless linkage between mobile devices and payment cards, are forecast for mainstream adoption (Taylor, 2016); with the number of global mobile payment users forecast to amount to 663.8 million by 2021 (Statista, 2016c).

However, whilst consumers enjoy the benefits that technologies such as SST's provide, they often experience a sense of annoyance and irritation when it fails to perform or problems are encountered (Johnson et al., 2008). This implies that paradoxical experiences with technologies could potentially have adverse effects on consumer satisfaction, impairing the effectiveness of firms marketing strategies and consumer loyalty (Johnson et al., 2008). Subsequently, raising concern and questioning the effectiveness of technologies on the consumer retail experience; thus, certain US-retailers have removed SCO's to promote human interaction and allow for a more enhanced, personalised customer experience (Nathalie et al., 2016).

Despite such efforts to attract and retain consumers, footfall in physical retail stores has drastically declined; and has seen leading retailers including BHS and American Apparel head into administration as they struggle for survival in the hugely competitive marketplace (Retail Research, 2016). Retailers rapidly need new methods to entice consumers back in-store, by engaging consumers in the co-creation of interactive and innovative, personalised experiences that integrates and synthesises physical retail settings with mobile opportunities (Pantano et al., 2016). Considering the digitalised population, it is inevitable that retailers are looking towards emergent technologies to attract consumers' in-store. The most recent technologies gaining recognition by retailers are AR and VR. AR is a new interactive technology that intertwines the physical environment and digital environment by overlaying virtual annotations such as information, images and audio in real time (Javornik, 2014); whilst VR fully immerses users into a digital world (McKone et al., 2016).

Emergent Technologies

Labelled as a 'disruptive' technology, similar to the disruption created by the smartphone and the internet, VR allows for a new form of worldwide communication through HMD (Head Mounted Displays) such as Oculus Rift, HTC Vive, and Samsung GearVR (Rosedale, 2017). Whilst the consumer market demands increased quality such as high-resolution displays, lightweight, compact, as well as reduced cost (Rosedale, 2017); VR has many barriers as consumers are not yet familiarised with wearing HMD's (McKone et al., 2016). Having said that, VR has been found useful in a wide range of industries including gaming, retail, business and education (Rosedale, 2017); and in tourism, VR has been found to engage tourists and encourage them to visit destinations (Jung et al., 2017). Finally, the revenue of VR products is projected to reach $5.2 billion by 2018 (Statista, 2016d).

In the retail context, the aim of AR is to create immersive brand experiences, interactive marketing campaigns, and innovative product experiences for consumers (Scholz et al., 2016). A popular method for AR is mobile devices, which makes it the ideal platform for retailers aiming to connect with consumers and the growing popularity of mobile devices. Currently, consumers utilise mobile devices in-store to perform price and product comparison to find a cheaper alternative whilst shopping in-store, via bar code scanning or internet search (Piotrowicz and Cuthbertson, 2016). However, by implementing mobile AR in-store, the shopping experience is drastically enhanced, as consumers can easily access enriched product information compared with both online and physical stores without AR (Poushneh et al., 2017). In addition, purchase certainty increases due to the ability to see virtual product demonstrations in-store, which is evidently the unique value of AR as perceived by consumers (Dacko, 2016). For example, Lego stores are using AR to project an animated version of the completed Lego set inside the box prior to purchasing to increase brand engagement and purchase certainty (Kipper and Rampolla, 2013). Overall, consumers are motivated to use AR applications to enhance real world shopping experiences and to access promotions; in turn, retailers benefit from increased profits and competitiveness in such a dynamic industry (Poushneh et al., 2017).

Beyond retail, AR is available to consumers in a multitude of ways such as mobile navigation applications, tour guides (Javornik et al., 2016), and language translation (Kipper and Rampolla, 2013), as well as an innovative learning tool in cultural heritage tourism (Moorhouse et al., 2017). Unsurprisingly, the AR market is forecasted to generate $90 billion in revenue by 2020 (Statista, 2016e).

Industry Applications of AR and VR

Furniture stores such as IKEA and Wayfair have adopted AR applications because of its ability to measure the physical environment and apply the graphic overlay accordingly (Young, 2016). By enhancing consumers' visualisation of furniture coordination the product experience and decision-making process is significantly enhanced (Oh et al., 2008). In addition, AR-enriched user experiences increases consumer satisfaction and willingness to purchase (Poushneh, 2017). Likewise, virtual try-ons such as the 'Magic Mirror' focus on a new form of AR that uses motion capture techniques to superimpose virtual annotations, such as make-up or accessories, over the users' real image, seeking to create a truly realistic visionary as opposed to a superimposed digital image (Javornik et al., 2016).

Moreover, car manufacturers such as BMW, Mini and Nissan, are leading the way in creative car advertisements by implementing AR into the company magazine, users can access a 3D projection of the car being advertised (Kipper and Rampolla, 2013). Such studies portray how technology is rapidly progressing and highlights the power of most recent developments in explaining, configuring and recommending products (Rese et al., 2016). Beyond consumer engagement, certain companies are using AR technology to evaluate the impact of marketing ads and campaigns by tracking user behaviour, location, and interaction patterns in real time (Liao, 2015). By analysing consumer browser and shopping behavior, practitioners gain valuable information for new product development and marketing strategies (Oh et al., 2008).

With regards to VR, leading fashion retailers have recently adopted VR applications with an aim to provide memorable and innovative experiences for consumers for both at-home and in-store use. For instance, Balenciaga broadcast its Autumn-Winter 2016 show in VR, whilst Dior has created its own VR headset (Young, 2016). Moreover, VR has opened up new horizons for online furniture retailers, which was one industry found to be lagging behind following the rapid growth of e-commerce, as VR allows consumers to experience products in a realistic environment, as well as collect efficient information prior to visiting a physical store (Oh et al., 2008).

The present use of VR is enabling 360-degree view mainly for entertainment; however, it also provides the opportunity to create virtual worlds that allows users to interact with one another in an incredibly lifelike manner due to the ability to capture eye-movement and facial expressions (Rosedale, 2017). Such developments could see virtual business meetings with international colleagues made accessible through HMD's; a disruptive change that could impact global change by minimising business travel which currently accounts for 30% global energy use (Rosedale, 2017). Despite the unfamiliarity of consumers wearing VR headsets (McKeone, 2016), the social aspect of VR could be the trigger for mainstream adoption.

3. Challenges and Opportunities for Integrating Technological Innovations

The rapid progression of technological innovations, in particular the explosive growth of mobile devices, has evidently transformed the retail industry in numerous ways. The shift in consumer shopping and buyer behavior has presented new challenges and invaluable opportunities for retailers to connect with the digitalised population. From reviewing the success and consumer response of existing technological platforms, a number of prerequisites of successfully employing future AR and VR technologies into the retail experience have arisen.

Social Engagement and Connectivity

First, the proliferation of mobile devices and social media platforms have retracted firms power and control of marketing and advertising, and consumers are more likely to listen to previous customer reviews over the firm. As Yarrow (2014) previously identified, online browser and social media behaviour is a key determinant in understanding individuals' feelings and beliefs. Therefore, firms must build on their social media presence and interact with consumers through mobile and social platforms, and a number of retailers have recognised the opportunity of AR in doing so. Thus, it is critical that new AR developments offer mobility and sociability, as well as provide direct linkage to social media applications, in order to establish a positive relationship with the digitalised population. In doing so, retailers will strategically utilise consumers as a form of marketing and advertising, whilst maintaining a strong social media presence and connectivity to the broader population, thus attracting new markets.

Furthermore, Dacko (2016) found that retail valuations increase substantially the more mobile AR applications are used in-store due to the creation of experiential shopping benefits. For example, mobile AR in-store encourages consumers to instantly share personalised experiences to the online community, is perceived as 'playful' and 'credible', and has the potential to be a driver for future behaviour (Javornik, 2016). The sharing of enchanting experiences online promotes positive brand image to the online community, and will attract new markets in-store to try the innovative technology. Finally, the additional information and virtual product demonstration will contribute to increased sales and purchase certainty (Dacko, 2016).

Human Interaction and Communication

Secondly, the need for human interaction and communication is clearly needed when integrating emergent technologies, as unfamiliarity with said technologies often leaves consumers apprehensive about trying them due to fear of incapability and usage complexity. Drawing on consumer response to previous technologies employed to support the retail process, marketers, technology developers and retailers can learn a vast amount in terms of future AR and VR developments. Neuhofer et al., (2015) argues that it remains critical for businesses to exploit and integrate emergent technologies into its entire strategy, although, substituting human encounters with technologies should be avoided. For example, friendly salespersons should remain available to assist less-experienced consumers with the use of SST's; to extend the consumer experience rather than act as a barrier (Nathalie et al., 2016; Piotrowicz and Cuthbertson, 2016). Similarly, future AR and VR technologies should refrain from being "an isolated screen

in a dark corner", rather, such technologies should fully interact consumers and employees (Piotrowicz and Cuthbertson, 2016, p. 5).

Additionally, clear instructions, video demonstrations and payment compatibility are crucial determinants of consumers' perceptions of their ability and willingness to use SST's (Nathalie et al., 2016), which could further be applied to AR and VR, as relatively new forms of technology, consumers are not yet familiarised with using the devices, which may refrain consumers from adoption as previously mentioned. Likewise, Javornik (2016) found that the success of new AR technologies depends on consumers comfortability with trying the device, and that employees must understand how to entice consumers to the application and encourage them to use it (Javornik, 2016). The solution is to strategically implement technologies by equipping employees with AR and VR technologies that enhance human-led service and experience creation processes (Neuhofer et al., 2015).

4. Discussion and Conclusion

Many retail firms waste time and monetary value on their marketing division due to lack of consumer understanding. This research creates insights into the prerequisites of new technology development by distinguishing the need for social engagement and human interaction and communication via mobile and in-store technologies; further highlighting the importance of ubiquitous connectivity when developing and integrating future technologies. The elements have been determined by reviewing current technologies that continue to transform the retail industry, and have provided a number of recommendations for practitioners aiming to integrate AR and VR. Finally, a review of scholarly predictions of AR and VR usage have been proposed, followed by recommendations for academia in terms of future consumer research.

Both AR and VR have the potential to create a more differentiated and personalised consumer retail experience (McKone et al., 2016). The majority of internet users worldwide are expected to be utilisng VR headsets on a daily basis within the next 7-10 years (Rosedale, 2017). The ability to interact with one another in virtual worlds has the potential to open up a plethora of opportunities for retailers to connect with consumers from the comfort of their own home (Rosedale, 2017). The future could see retail departments, such as customer service, providing an outstanding level of customer care and assistance through personalised VR experiences, whereby arising concerns can be immediately resolved in novel ways, limiting the risk of negative exploitation to the masses via web or social media. In turn, firms gain back an element of control over the consumer experience, which was initially superseded by the proliferation of mobile devices and the empowerment of consumers increased flexibility and control (Niemeier et al., 2013; Piotrowicz and Cuthbertson, 2016).

Clearly, AR is favored for in-store use which is evident by the adoption of leading brands IKEA, Lego, BMW, Nissan and Micra (Young, 2016; Kipper and Rampolla, 2013); which is due to its ability to synthesise personal mobile devices with the existing retail setting (Pantano et al., 2016). Unsurprisingly, the marketing investment in AR is expected to grow exponentially as marketers configure innovative ways to deploy the technology (Liao, 2015). In order to further the power of AR, new developments should interact the consumer and the employee and serve to deliver unique and personalised

experiences (McKone et al., 2016); which will ensure avoidance of paradoxical experiences occurring.

Furthermore, AR and VR are forecast for mainstream adoption within the next five years (Dacko, 2016; Rosedale, 2017); and are expected to replace desktop and mobile displays for the majority of tasks completed on them today (Rosedale, 2017). The future could see physical retail stores transform to acting as a 'hub' integrating all technologies and sales channels (Piotrowicz and Cuthbertson, 2016). The development and implementation of a mixed realities (AR and VR) model has the power to significantly change consumers' view of retailers in the future (McKone et al., 2016).

The present review makes a number of contributions. First, it provides a critical insight into the most powerful technological innovations that are drastically transforming the retail industry and consumers shopping and purchase behaviour. This highlights the importance of understanding consumer response to emergent technologies, and offers practitioners the opportunity to further extend and apply such knowledge in the development of future technologies. In addition to this, the review provides a projection of future AR and VR developments, which indicates the importance of firms in rapidly configuring a mixed realities model. Secondly, the identification of two crucial elements that future technologies must entail if they are to be accepted by the digitalised population are discussed, and recommendations have been established for practitioners' implementation.

Furthermore, it is crucial to continuously conduct consumer research and monitor response to new technologies to limit firms wasted marketing efforts. This is particularly importance considering that there is only limited evidence with regards to successful business models and return on investments. Finally, field experiments regarding AR and VR are needed to test new concepts and identify new prerequisites as consumer demands continue to change. Research should therefore investigate the topic from the technology acceptance perspective by exploring consumers' willingness to purchase.

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