Touching Holograms with Windows Mixed Reality: Renovating the Consumer Retailing Services

Abstract

Recent technological advances in wearable technologies, such as mixed-reality devices, have enabled consumers to interact with artificial three-dimensional visual environments. This presents an incredible opportunity for service retailers to present alternative ways of interacting with their services. This study empirically investigates the potential applications of Windows Mixed Reality devices, while specifically examining various forms of consumer perceptions and behavioural intentions. This research is among the first to empirically examine the effect of windows mixed reality experiences, enabled by the latest wearable devices, on intentions of users in a services retailing context. The results of this study help guide retailers who are looking to integrate Windows Mixed Reality devices in their practice to increase user satisfaction, trust, and utilitarian needs. The paper recommends specific theoretical and managerial implications.

Keywords: Windows Mixed Reality; Consumer experience; Services retailing; Perceived immersion; Hologram; Augmented Reality; Behavioural intention.

1. Introduction

Emerging technology devices have rapidly transformed the way customers interact with retailing services, encouraging retailers to seek dynamic ways to connect with users to become more customer-centric (Rauschnabel, Felix and Hinsch, 2019). In response, retailers have continued to seek ways to adopt unique solutions to minimize service interactions, as well as speed up services processes (Shareef et al., 2018; Dehghani et al., 2020).

Recently, there has been considerable interest within the retail sector on the potential use and application of wearable devices on experiential retailing. Notably, these technologies include Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). While similar in name, these three technologies are distinct in multiple ways. VR is an immersive, digital experience that mimics an interactive environment since it generates realistic images, sounds, and other sensations (Herz and Rauschnabel, 2019; Rebelo et al., 2012). In AR, the real World is not hidden from the user, but rather virtual objects are superimposed onto the real World to create an added overlay (Mütterlein, Kunz and Baier, 2019). MR covers both components of the real World (real objects and their conditions in a real-world space) with virtual components (virtual models and virtual conditions) in immersive applications (Tumkor, 2018). The growth in the capability of VR/AR/MR devices (e.g., HTC Vive, Microsoft HoloLens) has allowed them to be used as part of AR/MR-interfaces for efficiently providing remote expertise between geographically distributed users (Wang et al., 2020). According to PwC's Seeing is Believing report, similar to all cases related to digital reality, Mixed reality technology, alongside AR and VR, has the potential to add $1.5 trillion to the global economy by 2030 and augment more than 400,000 jobs, only in the UK. Indeed, from a US$ 15 Google Cardboard VR headset to US$ 5000 MR-based Microsoft Hololens, the industry has it all (PWC, 2020).

The boundaries between AR and MR technologies are still blurry, even within the industry itself. Thus, AR is a much more widely-used term and mainly incorporates both AR and MR (Foundry, 2017). Windows Mixed Reality (WMR) platform, integrated with Windows 10 functionality, released by Microsoft as a self-contained head-mounted computer (HMD). While Microsoft used the terminology of MR for its platform, the concept seems future-proofed. WMR allows users to render realistic 3D virtual objects (holograms) that allow for interaction with existing physical objects that are anchored in the virtual environment. WMR devices (e.g., HoloLens 2) are rapidly transforming as manufacturers such as ASUS, Acer, and Dell have launched their headsets for commercial devices with different capabilities over the more straightforward features that most existing AR devices support (Sluganovic et al., 2017; Theverge, 2019).

To create environments that can positively impact services retailing, HMD devices must be adequately immersive and stimulate the emotions and senses of the customers (Herz and Rauschnabel, 2019). Further, virtual environments should provide users with interaction, immersion, and imagination, all interconnected in a systematic manner that increases the sense of presence within the environment (Burdea and Coiffet, 2003; Cummings and Bailenson, 2016).

The majority of previous research has focused on providing the necessary technology to make MR a possibility over the past two decades. As MR devices mature like any other technology, will become more affordable and ubiquitous. Thus, the proliferation of these devices may necessitate different implications, such as privacy that may yet not be known (De Guzman Thilakarathna & Seneviratne, 2019). Moreover, the literature has underscored the relevance and impact of WMR. While the literature has significant momentum in VR and AR, there exists a gap in understanding how WMR differs and contributes to utilitarian-based services retailing. In response, this paper seeks to address the following research questions:

RQ1: How does WMR contribute to behavioural intentions in services retailing?

RQ2: What are consumers' drivers and barriers of using a WMR device in services retailing?

Together, these questions are essential in identifying the potential of future retail interactions and to predict better the viability and adoption of WMR applications among consumers. The remainder of this paper is organized as follows: a brief literature review of the main concepts is presented, followed by a presentation of several hypotheses related to the study. Then, a description of the methodology and expected results are presented, followed by a general discussion, implications, and limitations.

2. Literature Review

2.1. Overview of Windows Mixed Reality

Milgram and Kishino (1994) defined MR as a combination of physical and virtual elements that involves components of both virtual and augmented reality. When describing the role of participants' involvement in MR, Stapleton et al. (2002) identify three factors that contribute to their experience: physical, virtual, and imaginary. It is typical for MR experiences to involve multisensorial responses of both hearing (stereo audition) and sight (stereoscopic vision) (Konttinen et al., 2005). Unlike VR that completely replaces the real World, AR and MR augment the real environment with useful information (Wired, 2017). While some may believe the term MR was developed as a marketing strategy to provide a distinction between other virtual platforms (e.g., AR/VR platforms), the term WMR is now widely accepted by tech companies such as Microsoft (Tumkor, 2018; Theverge, 2019).

The main innovation of WMR over other platforms (i.e., AR) is considered to be a meticulous spatial mapping of the surrounding environment and inside-out position tracking. Inputs from two specialized environmental cameras positioned on each side of the users' headwear and three additional pieces of technology (a depth camera, a 2MP camera and an ambient light sensor) are amalgamated in one piece of technology; the holographic processing unit (HPU). The HPU builds and sustains a framework of the objects around the individual, which are used as reference points; it tracks users' heads and other objects. This allows users to experience immersive mixed reality whereby the position of virtual objects (holograms) is rigid in space with scale accuracy. As a result, it inherently responds to collisions with the physical World or stays at their location over numerous sessions (Sluganovic et al., 2017). There are two main categories of WMR that deliver two immersive experiences: 1- Holographic devices that position digital content in the real World as if it were there (e.g., Hololens). 2- Immersive devices that create a sense of presence; hiding the physical World by replacing it with a digital involvement (e.g., Acer) (Microsoft, 2018).

Table 1. The definitions of Mixed-Reality over time

Author	**Year**	**Definitions**
Milgram & Kishino	1994	*"A physical to virtual continuum, encompassing augmented reality and augmented virtuality."*
Silva & Sutko	2009	*"Referred to as hybrid reality is the merging of real and virtual worlds to produce new environments and visualizations where physical and digital objects co-exist and interact in real time".*
Frank & Kapila	2017	*"By integrating vision-based control, AR, and touchscreen interaction, mobile devices can provide enhanced interactive experiences with laboratory equipment that may deepen conceptual understanding and improve learner engagement. Specifically, when the camera of a mobile device is pointed towards a laboratory test-bed, the device augments live video with graphics that learners can directly manipulate to control test-beds and perform experiments".*
Brigham	2017	*"Allows a person to see the real, physical world and objects but also see believable, and even responsive, virtual objects".*
Tumkor	2018	*"It covers combinations of some components of the real world (real objects and their conditions in a real-world space) with virtual components (virtual models and virtual conditions in a game space) in immersive applications".*
De Guzman Thilakarathna & Seneviratne	2019	*"MR devices allow users to interact with holographic augmentations in a more seamless and direct manner".*

2.2. HMD devices in Services Retailing

The use of HMD devices in retailing services is integrated at several touch-points of the consumer journey, often viewed as an experiential marketing strategy (Bulearca and Tamarjan, 2010; Javornik, 2016; Lavoie and Daim, 2020). For instance, users' exposure to AR interactive technology increases and is widely used in retail to convey sensory information via interactive demonstrations (Perannagari and Chakrabarti, 2019) and behavioral intention of consumers (Paulo et al., 2018). To highlight the impact of AR on customers' spending and choice, retailers have generated 360◦inspections (e.g., Mr. Spex) to provide customers with digital glasses; showing how customers appear while worn on their faces (Heller et al., 2019). In another example, IKEA's Place AR application encourages customers the option of digitally placing, recolouring, and moving realistic 3D models of furniture in their living room such as a coffee table (Joseph, 2017). The response to augmentation may vary according to the shopping orientation of the consumer. The application of experiential AR elements in retail enhances the sensory richness of the experience while boosting consumers' positive affective responses and their desire to purchase (Watson, Alexander, and Salavati, 2018).

VR technology has improved user experience in the context of online retailing; this creates opportunities for users to see and interact with items from home. To further enhance user experience, VR in online retailing is evolving to replace traditional input devices from items such as a mouse and keyboard to more natural gestures such as tapping or swiping (Alshaal et al., 2016). Findings from Mann et al. (2015) have shown that consumers have also responded positively to VR technology applications in offline retailing, such as physical stores. VR technology has created an improved and more enticing shopping experience than conventional stores. For example, the beauty retailer Sephora created a virtual "try-on feature app" in select stores that allow users to instantly try on cosmetics in 3D (Nesbit, 2014). Real estate agents and urban designers use VR to show properties to clients, without having to take them to the physical property (Sanchez-Sepulveda et al., 2019). Notwithstanding, immersive virtual retail has the potential to overcome some of the shortcomings associated with retail stores which are usually limited in many ways: expenses, number of visitors, space, and physical laws (Wölfel and Reinhardt, 2019).

The use of Smart Phone-based WMR Applications (SPMRA) is also gaining popularity among tech-savvy retailers (Meegahapola and Perera, 2018). SPMRAs have the advantage of being low cost and easy to use and allow retailers to create a gamified and unique in-store shopping experience for customers. Another use of WMR in physical stores relates to the optimization and improvement of business practices, such as returns or shelf placement (Hardy, 2019). For example, some retailers use WMR in order to test out different store layouts without the limitation of having to alter the physical environment. By creating a digital version of the store and letting customers engage with it via WMR, retailers can optimize the store layout and experience (Hardy, 2019). Zaczkiewicz (2018) encourages the use of WMR since it allows retailers to create, test and collaborate on ideas in a quicker, more precise manner with close to no commitment to results. The idea that MR enables retailers to virtually test consumer's responses to products, store layouts and signage before their actual physical production allows the retailer to make more confident and informed decisions (Zaczkiewicz, 2018). Retailers also use WMR technology in promotional campaigns to encourage customer loyalty as well as increase the number of touch-points between customer and retailer (Israeli start-up mixed place, 2019).

2.3. Theoretical Framework

According to the comprehensive systematic literature review by Chuah (2019), various methods and theories were used in previous research to understand users' adoption of HMD devices. Most prior practical studies chose participants based on potential use and exposure to experimental stimuli. The most popular method that has been to adopt the Technology Acceptance Model (TAM).

In a study by Rauschnabel et.al., (2019) relates AR gratifications to usage context (public vs. private) that the existence of other people subjects not only to the self-expression and socializing goal achievements, but also to make AR more comfortable to wear. Nevertheless, it is significant to state that Uses and gratification theory (U&GT) and TAM/UTAUT models are not very distinctive. For instance, what U&GT research names' utilitarian benefit' stands for 'perceived usefulness' in TAM and' performance expectancies' in UTAUT research (Chuah, 2019). Therefore, due to HMD devices' distinctive characteristics, established technology acceptance theories such as TAM might be inadequate in explaining users' reactions to WMR.

Embodied Social Presence Theory (ESP) is suggested on the notion that specific interactions and communication acts take place in the context of embodied states that create a sense of presence that is derivative of human cognitions allied with real and physical world Body to Body interactions (Mennecke et al., 2011, p. 425). ESP theory highlights that when social actors have a higher level of embodied interaction, they more influentially encode, convey, and decode individual and collective communicative acts. Among virtual environments, this embodies acting is considered as enabling the user to filter both verbal and nonverbal communication acts and cues (Mennecke et al., 2011). Since these emerging wearable devices (e.g., WMR) are designed to be physically attached to the body and provide a sense of presence for users, ESP considered exploring related constructs and an alternative model to capture the antecedents of WMR devices better.

Before tapping into each hypothesis, a summary of the research model is provided in Figure 1. The information in these models predicated by two main ideas. First, it allows researchers to identify important research findings from previous studies, identify what areas of research are abundant and what specific areas require further inquiry. Second, the reference models allow the identification of barriers and drivers of WMR devices.

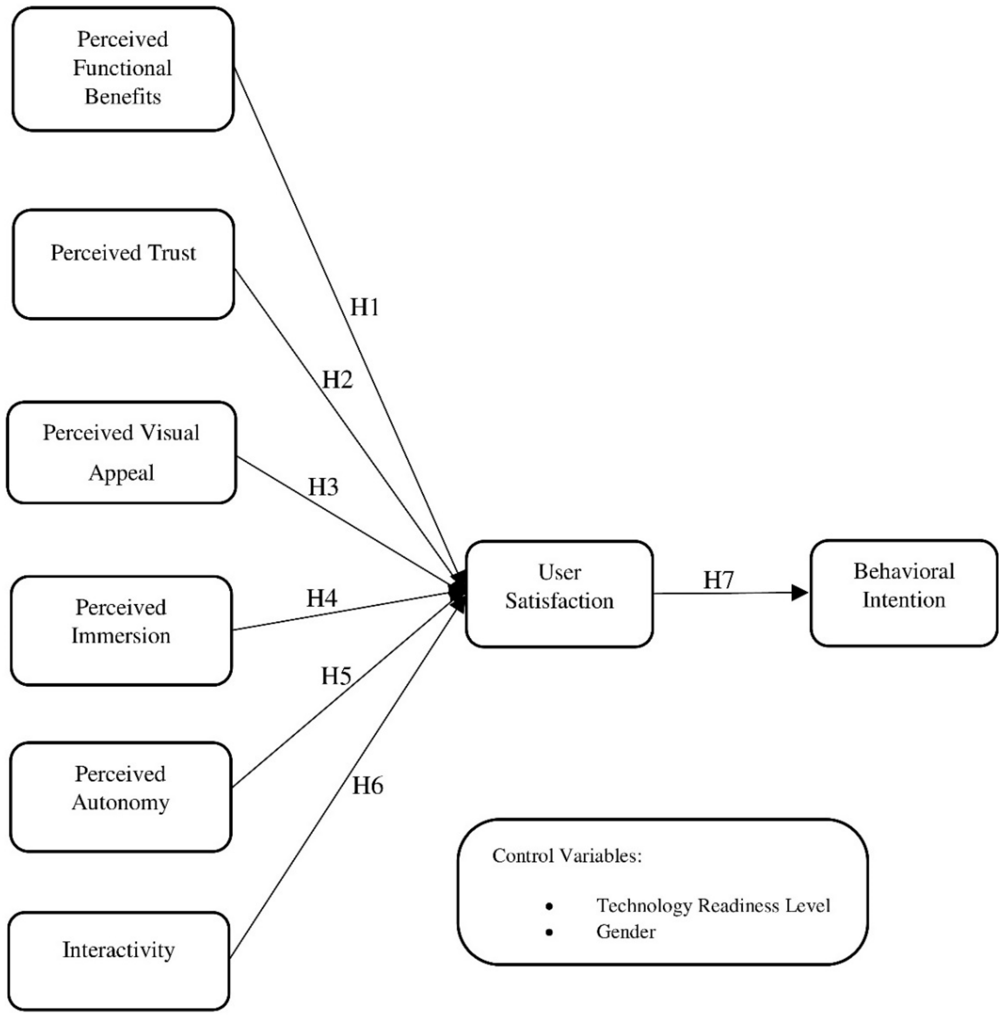


Figure 1: The overview of the conceptual model

3. Development of hypotheses

3.1. Perceived Functional Benefits (PFB)

Perceived functional benefits are defined as the consumers' perception of the technology's utilitarian benefits while factoring in costs, proficiency, and effectiveness (Shareef et al., 2018). It reflects the superiority of functions and abilities that the technology is capable of (Adukaite et al., 2013). Prior studies show that although the technology itself is advanced, functionality is usually measured based on essential functions, such as location tracking and quality of operating systems (Tarute et al., 2017; Magrath and McCormick, 2013). Two previous studies (Rauschnabel et al., 2015; Rauschnabel and Ro, 2016) have found that there is a positive influence of the functional benefits of AR technologies in purchase intention towards using smart glasses. Also, Chung, Pagnini and Langer, (2016) found that perceived control and engagement can enhance the functionality and navigation experience of AR devices. Since no previous study considers the role of functionality for WMR devices, the following hypothesis is proposed:

H1: Perceived Functional Benefit (PFB) has a positive relation with user satisfaction towards WMR in service retailing.

3.2. Perceived Trust (PT)

Perceived trust is defined as the attitudinal confidence for reliability, safety and credibility of mobile applications as well as the empathetic and valuable customer service when necessitated (Shareef et al., 2018). The continuous advancement of technology can establish a threatened consumer perception of privacy (Collier, 1995; Mason, 1986). When considering HMDs, for example, multiple privacy risks arise as individuals illegally attempting to access information that could provide insight into a user's private interests and activities. Threats may arise from application developers who monitor user trends, from manufacturers of emerging technologies, and from criminal hackers who aim to gain access to valuable private information. That being said, privacy remains paramount importance since it directly influences the perceived trust of a given technology and creates psychological influences on insecurity and vulnerability (Connolly and Bannister, 2007; Al-Saedi et al., 2017). Since these feelings are associated with negativity, technologies with high perceived risk will lead to negative attitudes and distrust of that technology. Kalantari and Rauschnabel (2018) found that low perceived trust of AR will negatively influence intentions to use. However, to the best of the authors' knowledge, WMR's perceived trust has not yet been studied. In light of these considerations, we formulate our second hypothesis as follows:

H2: Perceived Trust (PT) has a positive relation with user satisfaction towards WMR in service retailing.

3.3. Perceived Visual Appeal (PVA)

Perceived visual appeal (PVA) speaks to how much a user finds the technology interface to be aesthetically appealing (Chung et al., 2015). Visual appeal refers to the attractiveness of the visual components, such as fonts and graphics, which heightens interest in the information system (Liu, Li, and Hu, 2013; Dehghani and Kim, 2019). It also satisfies consumer desire in terms of emotional appeal, and it manifests in its shape, colour, and screen layout (Hsiao, 2018). There is research that supports the idea that visual appeal plays an essential role in technology-mediated tourism experiences (Mehmetoglu and Engen, 2011; Oh et al., 2007). As wearable technology is a form of 'fashnology' that can be considered for practical and beautification reasons, the device should meet the sense of touch; the wearable device should be capable of eliciting acoustic senses and visual (Rauschnabel, 2018). A study by Chung et al. (2015) supports that visually pleasing AR applications increase positive perceptions of usefulness and ease of use, which in turn, increases the likelihood of interest and intention to travel to the actual destination. Further, Marasco et al., (2018) found that perceived visual appeal of the VR experience enabled by HMDs has a positive effect on behavioural intentions of visitors in the tourist places. Similarly, providing customers with a rich visual experience may theoretically decrease returns and increase customer satisfaction. Therefore, we believe that as WMR's become more visually appealing, the content may positively influence the image of the retailer. Hence, the following hypothesis is proposed:

H3. Perceived Visual Appeal (PVA) has a positive relation with user satisfaction towards WMR in service retailing.

3.4. Perceived Immersion (PI)

Immersion is defined as the deep involvement of users with virtual systems that allow them to feel encompassed by and absorbed in the virtual stimuli (Palmer, 1995) and a sense that they are disconnected from the stimuli of the real World (Biocca and Delaney, 1995). Perceived immersion is originally derived from the concept of cognitive absorption and, in particular, it encompasses total engagement with technology where other attentional demands are ignored (Agarwal and Karahanna, 2000). Also, it describes the level of engagement with any immersive media that facilitates deep absorption, interaction, and involvement in the virtual stimuli while disconnecting one from the real World (Palmer, 1995; Biocca and Delaney, 1995).

To get a sense of immersion, users need to feel that they can freely and realistically interact with virtual items (Yim et al., 2017). Also, the study found that immersion mediates the relationship between interactivity, enjoyment and usefulness in the AR condition compared to the web condition. HMD users commonly feel immersed, focused, and free from disruption when wearing the HMD (Chessa et al., 2019; Slater et al., 1996) and AR users are expected to experience an identical, if not higher, sense of immersion. Perceived focused immersion is another term that users can feel focused, and free from disruption when wearing HMDs (Slater et al., 1995; Agarwal and

Karahanna, 2000). The dynamic role played by immersion in VR, in which viewers feel they are part of the action, is not well presented by HMDs; however, it is reconstructed via user cognition (Shin, 2018). The sense of immersion strongly depends on the users' personalities and contexts and that the function of immersion is robustly affected by the users' intentions and cognition (Shin and Bioca, 2017). Immersion is one of the most often recorded consumer reactions to virtuality. Given that AR retains some of its elements, however, varies from it by being much closer to the physical environment (Javornik, 2016). Also, different technological stimuli may convey a sense of immersion and presence in different conditions, which cannot be captured by a unidimensional approach (Chuah, 2019).

Notwithstanding, the current literature regarding the perceived immersion is too fragmented and does not provide a precise measurement to consider its relationship to user satisfaction or behavioural intention. Therefore, in light of these arguments and since the role of perceived immersion has not yet been tested for WMR devices, we propose the following:

H4. Perceived Immersion (PI) has a positive relation with user satisfaction towards WMR in service retailing.

3.5. Perceived Autonomy (PA)

Perceived Autonomy speaks to the degree to which a person feels that his or her actions were solely influenced by themselves without any external involvement. Creating an environment that nurtures autonomy allows individuals to believe that their choices are entirely theirs and creates a sense of freedom and intrinsic motivation that leads to continuance intention (Deci and Ryan, 1985). An individual who feels autonomous has increased positive emotion and motivation to carry out tasks (Deci and Ryan, 1985). Perceived autonomy has also recommended being relevant in explaining individuals' inventiveness (Sheldon, 1995), individuals' general health (Sheldon et al., 1996), and in students' intention to learn in academic settings (Hardre and Reeve, 2003). Jun (2011) purports that perceived autonomy has a positive effect on user satisfaction while they are in virtual life. Rauschnabel, He and Ro (2018) have investigated the effect of loss of autonomy on consumers' intention to adopt AR smart glasses; however, the results were non-significant. Despite users' perception of unlimited freedom given by HMD devices, they can do a few things that make them unsatisfied in their virtual life and enormously diminish their responses to satisfy (Jung, 2011). We accordingly formulate our fifth hypothesis as follows:

H5. Perceived Autonomy (PA) has a positive relation with user satisfaction towards WMR in service retailing.

3.6. Perceived Interactivity

Newhagen, Corders, and Levy (1995) introduced the concept of perceived interactivity. Perceived interactivity is based on "efficacy" which is composed of two dimensions: firstly, the users' sense or perception of efficacy and secondly, the users' sense of interactivity provided by the media. Previous studies have identified a third dimension called "direction of communication", which is the level of two-way communication that the site or device facilitates. Pantano et al. (2018) studied the role of interactivity in enhancing the decision-making process by using AR devices. The study concludes that interactivity has a direct effect on ease of use and enjoyment and an indirect effect on behavioural intention. Interaction in AR should consider users' natural body gestures is significant in interaction in AR, and therefore, it should follow the similar approach of interaction with everyday objects (Datcu, Lukosch, and Brazier, 2015).

Further, AR interactivity is predominantly space- and machine-related and less linked with two-way communication, which is typical for web interactivity. AR interactivity may lead to consumer responses that vary from reactions to web interactivity (Javornik, 2016). To pinpoint the determinants of interactivity perception, we can assume that perceived interactivity is arbitrated by the effect of WMR technology effectiveness, and therefore, we formulate the sixth hypothesis as follows:

H6. Perceived Interactivity (PI) has a positive relation with user satisfaction towards WMR in service retailing.

3.7. User Satisfaction

Hunt (1977, p.459) defines satisfaction as "the pleasurableness of the [consumption] experience, it is the evaluation rendered that the experience was at least as good as it was supposed to be". Behavioural intention is a result of user satisfaction and is one's conscious intention to achieve something or not. The lack of congruence between expectation and reality usually results in dissatisfaction (e.g., Oliver, 1981). In AR, the goal is to satisfy shoppers by simplifying their decision-making process (Kim and Forsythe, 2008a, 2008b) and minimizing their anxiety levels. In the case of AR devices, users are often unaware of the internal processes of software and as a result, base their assessment solely on the quality of the output. If the output is high grade, then users will find the experience satisfactory (Wang and Chen, 2011) and are likely to recommend its use to others (Jung et al., 2015). However, if the AR is considered low quality, users will not be satisfied (Poushneh, 2018). In terms of technology adoption, it is known that satisfaction and positive past experiences are the most influential determinants (Wixom and Todd, 2005). Shin (2018) found that user satisfaction of VR users is positively associated to adopt and continued use. Following this finding, Tom Dieck, Jung and Rauschnabel (2018) found that user satisfaction through AR has a positive effect on intention engagement. Multiple studies have explored technology use intention for AR technology that has been recently introduced to the market (Rauschnabel and Ro, 2016) as well as user satisfaction (Prayag et al., 2017). In line with these studies, we propose the following:

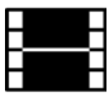
H7. WMR user satisfaction positively and significantly impacts user behavioural intention.

4. Methodology and Research Design

Drawing from our literature review, we developed the survey, as shown in Appendix 1. The survey instruments were adapted from established scales with slight modifications. To further strengthen the survey quality, two academic professionals, and two industry experts with a background in wearable technology were asked to review the questionnaire items. A sequence of exploratory and confirmatory factor analyses was later carried out to evaluate the psychometric properties of the measurement model.

Ninety-eight participants (50 female and 48 male) were recruited via a university-sanctioned participant pool for bonus course credits. All the participants were based in Toronto, and the data was collected from April to July 2019. We employed a scenario-based task in a WMR environment and allowed users to use a WMR headset to interact with a fictitious service setting as it is following the procedure of previous studies (Rauschnabel et al., 2019; Rese et al., 2014). Today, there are no devices that can provide experiences that run through the entire spectrum between physical reality and digital reality; however, WMR operates in a common mixed reality platform (Microsoft, 2018). Each participant was given approximately 5 minutes to watch a tutorial video, followed by an opportunity to interact with the mixed reality device for approximately 15 minutes. Next, a structured questionnaire was presented to ask for their opinions towards using the device. While the aim of this research was not to provide an experimental study, a wide range of WMR content parameters were provided for each participant; which is meant to measure the research questions realistically. Also, all of the participants had no previous experience of usage with WMR. The description of the research design and contents have been provided in Table 2 and 3.

Table 2: The description of phases of research design

Research Design	**Description**	**Time Lasted** (minutes)
	For each participant, the objective of the research was described in detail and Mixed-Reality was defined accordingly.	3m
	Two movies were shown to participants including some instructions about how to use WMR and its applicability in retail services with some customer shopping experiences.	5m40s
	Each participant was given the opportunity to interact with the device and carry out some related tasks. These tasks include use of Holograms, opening and closing related pages with voice recognition command, interaction with virtual objects (smaller bigger, rotation, etc.) and walking within the 3D environment, watching the MR movie.	15m
	The structured survey was provided at the end of the experiment to each student.	15m

Icons made by 'Good Ware'. All right reserved to [www.flaticon.com.](http://www.flaticon.com)

Table 3. Overview of WMR experience's contents

No	Content parameters
Phase 1	The participants interacted with objects on the windows home screen. Each participant picked up objects, executed rotation command, interacted with holograms and their surroundings. The responsiveness of their voice was also captured. Maneuvering the space by different available methods (leaping, walking etc.)
Phase 2	The participants interacted with a virtual office enabling them to have control based eye-tracking capabilities, engaging real-time discussion with individuals dispersed geographically. This phase gave them a better orientation of their virtual embodiment experience and virtual experience in an office environment. Further, participants were able to jump between the VR and the AR experience.
Phase 3	The participants were immersed as if they were part of directing a movie. Participants were given commentary to look around, fully stimulated within the WMR environment. Participants also found themselves to have a spatial relationship with the characters within the environment.

4.1.Data Analysis

This study utilizes PLS-SEM through SmartPLS 3.2.8 to assess the research model to analyze the measurement model and the structural model (Hair et al., 2017). Smart PLS is well suited to analyze the data. First, with limited sample sizes, PLS is advantageous for highly complex predictive models. Second, PLS can test complex cause-effect relationships (Ringle, 2015; Chin et al., 2003) and is, therefore, more appropriate than other statistical applications for this study. This study also utilized procedural and statistical remedies to eliminate the influence of common method bias (CMB) that stems from data that is self-reported and obtained from a single source (Podsakoff et al., 2012). In terms of procedure, clearness and brevity were maintained during the 19-items questionnaire design stage. Moreover, respondents were informed that no specific answers were preferred and considered correct during the administration of the questionnaire and that anonymity and discretion of respondents were guaranteed. In terms of statistics, Harman single-factor test was used to test whether a single factor appears from the factor analysis or if a general construct accounts for the majority of covariance among all constructs.

5. Results

5.1. Measurement Model Assessment

The evaluation of measures involves an analysis of internal consistency reliability, convergent validity, and discriminant validity. We can deduce the presence of internal consistency reliability since, as Table 4 illustrates, composite reliability (CR) values of all constructs exceed the benchmark value 0.70 (Hair et al., 2017). Moreover, since the standardized factor loadings exceed the 0.70 cut-offs (Hair et al., 2017) and the average variance extracted (AVE) is well above the 0.50 threshold (Fornell and Larcker, 1981), we can infer that convergent validity is sustained. Furthermore, Table 5 shows that the heterotrait-monotrait ratio of correlations (HTMT) ratios are lower than the conservative threshold of 0.85 (Kline, 2011) and confidence intervals do not include 1.0 (Franke and Sarstedt, 2019), validating the discriminant nature of all constructs. The overall fit indices of (SRMR = 0.079) model was satisfactory. Another method to assess the PLS path model's predictive accuracy is by calculating the Q2 value which is based on the blindfolding procedure that removes single points in the data matrix, assigns the removed points with the mean and estimates the model parameters (Rigdon, 2014b; Sarstedt et al., 2014). As a guideline, Q2 values should be more significant than zero for a specific endogenous construct to imply the predictive accuracy of the structural model for that construct (Hair et al., 2019). Given that Q2 was found to be 0.035, the predictively of the model was observed accordingly. When considering all factors, the results provide a supportive indication that the constructs are reliable and valid.

Table 4. Reliability and validity of the measurements.

Constructs	Items	**Reliability and validity**			
		Factor loading	**Cronbach' α**	**CR**	**AVE**
Behavioral Intention to use (BI)	BI1 BI2 BI3	0.91 0.90 0.81	0.84	0.90	0.76
Perceived Immersion (PI)	PI1 PI2 PI3 PI4 PI5	0.77 0.65 0.78 0.81 0.82	0.83	0.88	0.59
Interactivity (INT)	INT1 INT2 INT3	0.82 0.90 0.84	0.82	0.89	0.73
Perceived Autonomy (PA)	PA1 PA2 PA3	0.86 0.88 0.84	0.83	0.90	0.75
Perceived Functional Benefit (PFB)	PFB1 PFB2 PFB3	0.81 0.83 0.83	0.80	0.86	0.68
Perceived Trust (PT)	PT1 PT2 PT3	0.89 0.88 0.51	0.73	0.81	0.53
Perceived Visual Appeal (PVA)	PVA1 PVA2 PVA3 PVA4	0.88 0.71 0.89 0.87	0.86	0.90	0.71
User Satisfaction (US)	US1 US2 US3	0.93 0.95 0.93	0.93	0.95	0.88

Table 5. Heterotrait-Monotrait Ratio for the model

	Behavioral Intention	Immersion	Interactivity	Autonomy	Functional Benefit	Trust	Visual Appeal	User Satisfaction
Behavioral Intention								
Immersion	0.64							
Interactivity	0.58	0.76						
Autonomy	0.37	0.54	0.48					
Functional Benefit	0.53	0.45	0.57	0.27				
Trust	0.60	0.70	0.70	0.57	0.66			
Visual Appeal	0.59	0.67	0.66	0.47	0.40	0.52		
User Satisfaction	0.87	0.77	0.67	0.41	0.41	0.55	0.68	

5.2. Structural model

Standard assessment criteria, which should be measured, consists of the statistical significance and relevance of the path coefficients, the coefficient of determination (R2), and the blindfolding-based cross-validated redundancy measure Q2. Also, researchers should consider their model's out-of-sample predictive power by using the PLS predict procedure (Shmueli et al., 2016). The structural model was calculated for collinearity among the set of constructs, the coefficient of determination, and the significance of path coefficients. To study the significance of the hypothesized links among the proposed construct, t-statistics and standard errors were calculated by utilizing a bootstrapping procedure with 5,000 bootstrap subsamples (Vinzi et al., 2010). Figure 2 shows the results of the structural model analysis with path coefficients for the research model.

Perceived trust was found to be a positive determinant of user satisfaction of retailing services in WMR ($\beta = 0.24$, $t = 2.50$, $p < 0.012$). The two relationships between perceived visual appeal and user satisfaction, and perceived functional benefit and user satisfaction were found the most significant determinants towards usage of WMR devices ($\beta = 0.54$, $t = 4.90$, $p < 0.000$; $\beta = 0.77$, $t = 17.70$, $p < 0.000$) respectively. Lastly, there was a positive effect of perceived immersion on user satisfaction of WMR, which was discovered in this study ($\beta = 0.36$, $t = 3.29$, $p < 0.001$). With regards to non-significant relationships, perceived autonomy and interactivity were non-significant on user satisfaction towards MR ($\beta = 0.019$, $t = 0.13$, $p > 0.892$; $\beta = 0.14$, $t = 1.00$, $p > 0.317$), respectively. The final hypothesis was supported, indicating there was a positive relationship between user satisfaction and behavioural intention of users towards WMR ($\beta = 0.78$, $t = 18.00$, $p < 0.000$). Figure 2 shows the path coefficients, R-square, and p values. The results of hypothesis testing among the constructs are reported in Table 6.

Table 6. Summary of hypotheses testing

Hypothesis	Path	Coefficient	T-value	P-values	Result
H1	Functional Benefit → User Satisfaction	0.77	17.7	0.000	**Supported**
H2	Trust→ User Satisfaction	0.24	2.50	0.012	**Supported**
H3	Visual Appeal → User Satisfaction	0.54	4.90	0.000	**Supported**
H4	Immersion → US	0.36	3.29	0.001	**Supported**
H5	Autonomy → User Satisfaction	0.019	0.13	0.892	Not supported
H6	Interactivity → User Satisfaction	0.14	1.00	0.317	Not supported
H7	User Satisfaction → Behavioural Intention	0.78	18.0	0.000	**Supported**

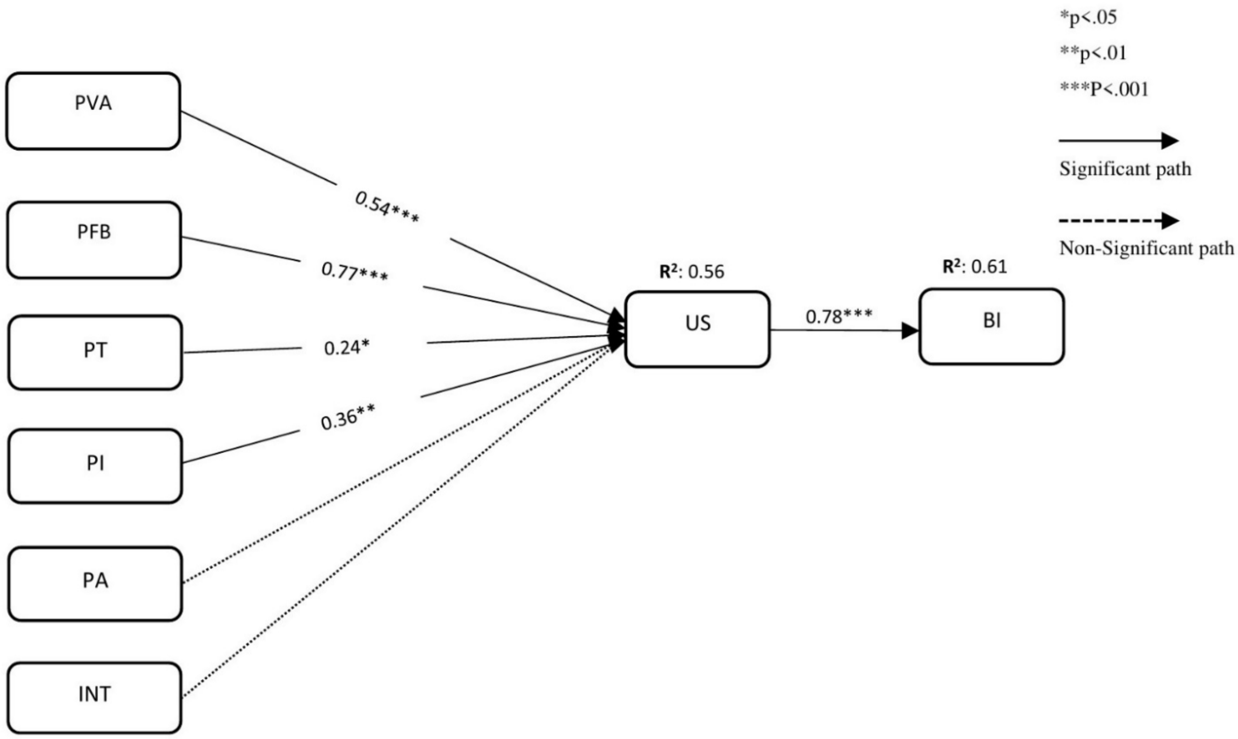


Figure2: PLS Structural model with path coefficients

6. Discussion

There is a clear trend in the market that favours a shift from traditional methods of communication and collaboration into one that is highly interactive (Kunkel and Soechtig, 2017). This goes to show that HMD devices have the potential to grow exponentially within a short period in services retailing. As different industries will implement the infrastructure of their retailing service experience based on WMR, a new platform for customers to distinguish their needs and perceptions has emerged. Accordingly, WMR is capable of blurring the lines between what is imagined and what is real by removing the barriers that interfere with the user's decision making, information processing, and ability to visualize likely scenarios before acting.

The objective of this study was to present a new theoretical model for understanding users' drivers and barriers toward the continuous usage of WMR devices. By doing so, this study provides insight into the mechanisms that elucidate users' responses and perceptions of this new platform in the context of service retailing. From the constructs that we examined, some significantly influenced user satisfaction while others had minimal influence. First, Perceived Trust (PT), Perceived Visual Appeal (PVA), and Perceived Functional Benefit (PFB) positively influenced user satisfaction. Perceived Immersion also had a positive influence on user satisfaction, and this may be due to the novelty of this feature when compared to other types of HMD devices. Therefore, we conclude that engagement, engrossment, and total immersion will increase the quality of user satisfaction during the use of WMR devices. The final hypothesis tested was also supported here since we were able to determine a positive relationship between user satisfaction and behavioural intention of WMR devices usage. Concerning non-significant relationships, perceived autonomy and interactivity were revealed not to affect user satisfaction when using WMR. The findings are in line with the previous studies as users do not expect complete autonomy over a technology (Rauschnabel, He and Ro, 2018).

Regarding interactivity, one reason could be that the responsiveness of WMR devices is more individualistic and depends on the environment that appeals to the user. Therefore, this may explain the non-significant relationship on user satisfaction. Also, users need to feel that they can freely and realistically interact with virtual items to get a sense of immersion, (Yim et al., 2017). Therefore, the effect of interactivity on immersion would probably indicate an indirect effect of interactivity on satisfaction.

6.1.Theoretical Contribution

This study could be used as a reference for future studies that intend to explore the ongoing developments of WMR devices. This is among the first studies to design research based on a WMR device and includes a wide range of interactivity parameters such as voice responsiveness, eye-tracking, immersion in different spatial conditions, etc. The theoretical contributions of this study are two-fold. First, this is among the pioneering research that presents the application of WMR in a service retailing setting. It highlights the factors that affect user attitude towards using WMR, thereby extending the literature on wearable devices. Second, this research extends the literature on service retailing by analyzing WMR as apposed to VR or AR independently. Thus, the presented conceptual model provides a new avenue of research for the use of WMR in service retailing. Also, Embodied Social Presence Theory was applied in the adoption model to understand the better higher level of embodied interaction of users toward WMR as a whole.

Further, the effectiveness of perceived immersion for WMR was measured. Since there is a different interplay between perceived immersion of holographic devices and immersive devices, and users' interaction in hologram experiential, and since WMR does not entirely replace the real World like VR, therefore, the presented construct can help researchers to measure users' immersion with WMR environments.

6.2.Managerial Contribution

There are two pathways for WMR technologies. First, there is a shift in the use of the device from one that is commercial to one that is enterprise-focused with manufacturers, like Microsoft, catering specifically to the enterprise sector. This is a result of the use of WMR in enterprises that aids in all levels of operation. One current example of this would be Renault Trucks' use of the HoloLens to aid in quality control and decision-making when complex situations arise (Rogers, 2019). By integrating WMR in this particular way, Renault Trucks can utilize the functional benefits of this advanced technology to optimize efficiency. Second, there is an expansion of interest in integrating MR as a retail experiential strategy. WMR users may see and interact with items in their spatial, providing an alternative reality that allows them to experience a perceived virtual environment as being more sensual than the perceived immersion in reality (real environment). This can be due to the wide variety and potential customizability of environments when using WMR, which gives users a sense of control and autonomy. As a necessary implication for retailing service applications, WMR technology should be used in a way that is appealing, functional, and immersive. For example, content creators can develop more immersive feelings with a live narrative to appeal to WMR users, in particular, while they have service interactions. An elegant WMR related app can not only enhance the arousal of positive emotions (e.g., pleasure) but also in the delivery of accurate and clear information. For example, service providers can emphasize hologram mannequins in different scenarios to their customers during a virtual shopping experience; this may engage consumers in a more personalized way, paving opportunities for enhanced customer relationship management. Also, sensory-motoric immersion can be considered by haptic imagery that conveys a sense of touch but not by the visual display that produces a sense of sight.

Increasing Functional Benefit and Trust are two critical considerations for the mass adoption of WMR devices in retail services. For example, developers can add advanced features that take advantage of WMR devices in the real estate industry, and agents can use WMR as a form of virtual approval system between landlords and tenants for transactions. This helps increase accountability for damages and theft. Unlike the current system that requires agents to observe the unit in person to inspect for any possible damages, WMR can help the agents to verify the check-in and check-out dates of the unit; providing a fair and accurate system for both landlords and tenants. Hospitality service companies (e.g., hotels) can also benefit from the device's features in the same ways landlords and tenants do to minimize moral hazards.

Further, MR developers should consider customization of devices for service retailing over time, enhancing more perceived digital reality elements. As WMR devices beings to integrate more holographic and more immersive elements into their programs, this disrupts the traditional consumption experience. Based on our findings, interactivity did not contribute to satisfaction. Going forward, WMR developers may include modification parameters that facilitate interactions. For example, developers can design a platform where the WMR environment changes in unpredictable ways to increase a user's sense of interactivity.

6.3.Limitation and Future Research

Since the sample of Canadian consumers offers a general overview regarding WMR and the way it is being studied, the inability to get more detailed insights into cross-country analysis remains a limitation. Finally, WMR devices are still in the innovation stage of the product life cycle; thus, there is more to know about how technology can disrupt retail. To date, Windows Mixed Reality has minimal features. Therefore, future studies should consider launching new products in this industry as the market becomes mature. The second limitation relates to the generalizability of the results. We acknowledge that the sample is compromised a homogenous subset of the population (student participation pool); thus, caution is noted when interpreting how these results may generalize to others (e.g., elderly, children). The third limitation is the measurement of WMR content interactions to find the difference in consumer responses in the related environments. Therefore, a future experimental study can consider consumer responses for WMR contents and compare its characteristics against AR.

References:

Agarwal, R. and Karahanna, E., 2000. Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. MIS quarterly, pp.665-694.

Al-Saedi, K., Al-Emran, M., Ramayah, T., & Abusham, E. (2020). Developing a general extended UTAUT model for M-payment adoption. Technology in Society, 101293.

Burdea, G.C. and Coiffet, P., 2003. Virtual reality technology. John Wiley & Sons.

Citibank. (2018). https://www.citi.com/.../insights/...of.../The%20Bank%20of%20the%20Future.pdf

Chessa, M., Maiello, G., Borsari, A. and Bex, P.J., 2019. The perceptual quality of the oculus rift for immersive virtual reality. Human–computer interaction, 34(1), pp.51-82.

Chin, W.W., Marcolin, B.L. and Newsted, P.R., 2003. A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. Information systems research, 14(2), pp.189-217.

Chung, J., Pagnini, F., & Langer, E. (2016). Mindful navigation for pedestrians: Improving engagement with augmented reality. Technology in Society, 45, 29-33.

Chung, N., Han, H. and Joun, Y., 2015. Tourists' intention to visit a destination: The role of augmented reality (AR) application for a heritage site. *Computers in Human Behavior*, *50*, pp.588-599.

Dehghani, M. and Kim, K.J., 2019. The effects of design, size, and uniqueness of smartwatches: perspectives from current versus potential users. *Behaviour & Information Technology*, pp.1-11.

Dehghani, M., Abubakar, A. M., & Pashna, M. (2020). Market-driven management of start-ups: The case of wearable technology. Applied Computing and Informatics.

De Guzman, J. A., Thilakarathna, K., & Seneviratne, A. (2019). Security and privacy approaches in mixed reality: A literature survey. ACM Computing Surveys (CSUR), 52(6), 1-37.

e Silva, A.D.S. and Sutko, D.M. eds., 2009. Digital cityscapes: Merging digital and urban playspaces (Vol. 57). Peter Lang.
Foundry (2017), "VR? AR? MR? Sorry, I'm confused.", https://www.foundry.com/industries/virtualreality/ vr-mr-ar-confused 2Wired, The Untold Story of

Hair, J.F., Risher, J.J., Sarstedt, M. and Ringle, C.M., 2019. When to use and how to report the results of PLS-SEM. European Business Review, 31(1), pp.2-24.

Hardy, M. (2018). Retailcustomerexperience.com: How mixed reality can help the brick-and-mortar keep up with amazon (2018). . Chatham: Newstex. Retrieved from http://ezproxy.lib.ryerson.ca/login?url=https://search-proquest com.ezproxy.lib.ryerson.ca/docview/2131348530?accountid=13631

Herz, M. and Rauschnabel, P.A., 2019. Understanding the diffusion of virtual reality glasses: The role of media, fashion and technology. Technological Forecasting and Social Change, 138, pp.228-242.

Heller, J., Chylinski, M., de Ruyter, K., Mahr, D. and Keeling, D.I., 2019. Let me imagine that for you: transforming the retail frontline through augmenting customer mental imagery ability. Journal of Retailing.

Hsiao, K.L., 2017. What drives smartwatch adoption intention? Comparing Apple and non-Apple watches. Library Hi Tech, 35(1), pp.186-206.

Huang, C.D., Goo, J., Nam, K. and Yoo, C.W., 2017. Smart tourism technologies in travel planning: The role of exploration and exploitation. Information & Management, 54(6), pp.757-770.

Israeli startup mixed place integrates mixed reality content at two of Europe's largest retail chains. (2019, Mar 01). M2 Presswire Retrieved from http://ezproxy.lib.ryerson.ca/login?url=https://search-proquest-com.ezproxy.lib.ryerson.ca/docview/2187088043?accountid=13631

Javornik, A., 2016. Augmented reality: Research agenda for studying the impact of its media characteristics on consumer behaviour. Journal of Retailing and Consumer Services, 30, pp.252-261.

Joseph, S. (2017).' How IKEA is using augmented reality. digiday UK.

Jung, Y., 2011. Understanding the role of sense of presence and perceived autonomy in users' continued use of social virtual worlds. Journal of Computer-Mediated Communication, 16(4), pp.492-510.

Kwon, R.H., Kim, K.J., Kim, K.H., Hong, Y.S. and Kim, B., 2015. Evaluating servicescape designs using a VR-based laboratory experiment: A case of a Duty-free Shop. Journal of Retailing and Consumer Services, 26, pp.32-40.

Hughes, C.E., Konttinen, J. and Pattanaik, S.N., 2004. The future of mixed reality: Issues in illumination and shadows. Proceedings of I/ITSEC 2004, pp.6-9.

Lavoie, J. R., & Daim, T. (2020). Towards the assessment of technology transfer capabilities: An action research-enhanced HDM model. Technology in Society, 60, 101217.

Leader, J.F., 2016. Mixed Reality Therapy: Presentation & Experience In Applied Psychology. Annual Review of Cybertherapy and Telemedicine 2016, p.215.

Marasco, A., Buonincontri, P., van Niekerk, M., Orlowski, M. and Okumus, F., 2018. Exploring the role of next-generation virtual technologies in destination marketing. Journal of Destination Marketing & Management, 9, pp.138-148.

Meegahapola, L. and Perera, I., 2017, September. Enhanced in-store shopping experience through smart phone based mixed reality application. In 2017 Seventeenth International Conference on Advances in ICT for Emerging Regions (ICTer) (pp. 1-8). IEEE.

Microsoft (2018). What is mixed reality? Retrieved from: https://docs.microsoft.com/en-us/windows/mixed-reality/mixed-reality

Milgram, P. and Kishino, F., 1994. A taxonomy of mixed reality visual displays. IEICE TRANSACTIONS on Information and Systems, 77(12), pp.1321-1329.

Mütterlein, J., Kunz, R.E. and Baier, D., 2019. Effects of lead-usership on the acceptance of media innovations: A mobile augmented reality case. Technological Forecasting and Social Change, 145, pp.113-124.

Paulo, M.M., Rita, P., Oliveira, T. and Moro, S., 2018. Understanding mobile augmented reality adoption in a consumer context. Journal of Hospitality and Tourism Technology, 9(2), pp.142-157.

Prayag, G., Hosany, S., Muskat, B. and Del Chiappa, G., 2017. Understanding the relationships between tourists' emotional experiences, perceived overall image, satisfaction, and intention to recommend. Journal of Travel Research, 56(1), pp.41-54.

Perannagari, K.T. and Chakrabarti, S., 2019. Factors influencing acceptance of augmented reality in retail: insights from thematic analysis. International Journal of Retail & Distribution Management.

Phillips, D.C., 1995. The good, the bad, and the ugly: The many faces of constructivism. Educational researcher, 24(7), pp.5-12.

Poushneh, A., 2018. Augmented reality in retail: A trade-off between user's control of access to personal information and augmentation quality. Journal of Retailing and Consumer Services, 41, pp.169-176.

PWC (2020). Seeing is believing. Accessed : https://www.pwc.com/gx/en/industries/technology/publications/economic-impact-of-vr-ar.html

Rauschnabel, P.A., Brem, A. and Ivens, B.S., 2015. Who will buy smart glasses? Empirical results of two pre-market-entry studies on the role of personality in individual awareness and intended adoption of Google Glass wearables. Computers in Human Behavior, 49, pp.635-647.

Rauschnabel, P.A. and Ro, Y.K., 2016. Augmented reality smart glasses: An investigation of technology acceptance drivers. International Journal of Technology Marketing, 11(2), pp.123-148.

Rauschnabel, P.A., 2018. A conceptual uses & gratification framework on the use of augmented reality smart glasses. In Augmented reality and virtual reality (pp. 211-227). Springer, Cham.

Rauschnabel, P.A., Felix, R. and Hinsch, C., 2019. Augmented reality marketing: How mobile AR-apps can improve brands through inspiration. Journal of Retailing and Consumer Services, 49, pp.43-53.

Rauschnabel, P.A., He, J. and Ro, Y.K., 2018. Antecedents to the adoption of augmented reality smart glasses: A closer look at privacy risks. Journal of Business Research, 92, pp.374-384.

Rebelo, F., Noriega, P., Duarte, E. and Soares, M., 2012. Using virtual reality to assess user experience. Human Factors, 54(6), pp.964-982.

Rese, A., Schreiber, S., & Baier, D. (2014). Technology acceptance modeling of augmented reality at the point of sale: Can surveys be replaced by an analysis of online reviews?. Journal of Retailing and Consumer Services, 21(5), 869-876.

Ringle, C.M., Wende, S. and Becker, J.M., 2015. SmartPLS 3. Boenningstedt: SmartPLS GmbH.

Rogers, S. (2019, May 10). How VR, AR And MR Are Making A Positive Impact On Enterprise. Retrieved from https://www.forbes.com/sites/solrogers/2019/05/09/how-vr-ar-and-mr-are-making-a-positive-impact-on-enterprise/#3e6c16155253

Schott, C. and Marshall, S., 2018. Virtual reality and situated experiential education: A conceptualization and exploratory trial. Journal of computer assisted learning, 34(6), pp.843-852.

Shareef, M.A., Baabdullah, A., Dutta, S., Kumar, V. and Dwivedi, Y.K., 2018. Consumer adoption of mobile banking services: An empirical examination of factors according to adoption stages. Journal of Retailing and Consumer Services, 43, pp.54-67.

Shin, D. and Biocca, F., 2018. Exploring immersive experience in journalism. New media & society, 20(8), pp.2800-2823.

Shin, D., 2018. Empathy and embodied experience in virtual environment: To what extent can virtual reality stimulate empathy and embodied experience?. Computers in Human Behavior, 78, pp.64-73.

Slater, M., Usoh, M. and Steed, A., 1995. Taking steps: the influence of a walking technique on presence in virtual reality. ACM Transactions on Computer-Human Interaction (TOCHI), 2(3), pp.201-219.

Sluganovic, I., Serbec, M., Derek, A. and Martinovic, I., 2017, December. HoloPair: Securing shared augmented reality using microsoft hololens. In Proceedings of the 33rd Annual Computer Security Applications Conference (pp. 250-261). ACM.

Stapleton, C., Hughes, C., Moshell, M., Micikevicius, P. and Altman, M., 2002. Applying mixed reality to entertainment. Computer, 35(12), pp.122-124.

Song, J.H. and Zinkhan, G.M., 2008. Determinants of perceived web site interactivity. Journal of marketing, 72(2), pp.99-113.

Shoolapani, B. and Jinka, P., 2011, December. Virtual simulation and augmented interfaces for business models with focus on banking and retail. In 2011 Fourth IEEE International Conference on Utility and Cloud Computing (pp. 469-473). IEEE.

Theverge, (2019). The Microsoft HoloLens 2 ships today for $3,500. Retrieved from: https://www.theverge.com/2019/11/7/20946589/microsoft-hololens-2-mixed-reality-headset-preorder-shipping-price-upgrade

tom Dieck, M.C., Jung, T.H. and Rauschnabel, P.A., 2018. Determining visitor engagement through augmented reality at science festivals: An experience economy perspective. Computers in Human Behavior, 82, pp.44-53.

Tumkor, S., 2018. Personalization of engineering education with the mixed reality mobile applications. Computer Applications in Engineering Education, 26(5), pp.1734-1741.

Venkatesh, V., Thong, J.Y. and Xu, X., 2012. Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. MIS quarterly, 36(1), pp.157-178.

Yim, M.Y.C., Chu, S.C. and Sauer, P.L., 2017. Is augmented reality technology an effective tool for e-commerce? An interactivity and vividness perspective. Journal of Interactive Marketing, 39, pp.89-103.

Zaczkiewicz, A. (2018, May 16). In focus: Business insights: Retail: Five tips to jump-start A retail business: From "mixed reality" to better use of location data, retailers and fashion brands have a lot of tools to choose from to boost sales. Wwd , 23.

Watson, A., Alexander, B. and Salavati, L., 2018. The impact of experiential augmented reality applications on fashion purchase intention. International Journal of Retail & Distribution Management.

Wang, P., Bai, X., Billinghurst, M., Zhang, S., Han, D., Sun, M., ... & Han, S. (2020). Haptic Feedback Helps Me? A VR-SAR Remote Collaborative System with Tangible Interaction. International Journal of Human–Computer Interaction, 1-16.

Wired (2017), The Untold Story of Magic Leap, the World's: Most Secretive Startuphttps://www.wired.com/2016/04/magic-leap-vr/

Wölfel, M. and Reinhardt, A., 2019. Immersive Shopping Presentation of Goods in Virtual Reality. In CERC (pp. 119-130).

Appendix 1. Questionnaire items

Perceived Trust (PT) - Adapted from Shareef et al., (2018)
Service experience based on WMR is reliable.
Services carried out while using WMR are guaranteed.
The service providers take full responsibility for any insecurity while using WMR.
Legal and technological policies from the service provider adequately protect me from problems on WMR.
Perceived Functional Benefit (PFB) - Adapted from Shareef et al., (2018)
The ability to access WMR service from anywhere is convenient for me.
The ability to access WMR service at any time is convenient for me.
I find WMR services more efficient than traditional (in person) services.
Perceived Visual Appeal (PVA) - Adapted from Marasco et al., (2018) – Dehghani & Kim, (2019)
While using WMR services I find the experience visually attractive.
WMR experience presents a way to experience a virtual physical presence while receiving services.
Overall, the WMR experience is visually appealing.
WMR enhances my visual experience while receiving services.
Interactivity – adapted by Huang et al., (2017)
A lot of customers' questions and relevant concerns, in the service interaction, can be addressed by using WMR.
The presented information in WMR is highly responsive to users.
Overall, it is convenient to share and find information while using WMR.
Perceived Autonomy (PA) - Adapted from Jung, (2011)
While using WMR, I could choose freely what I wanted to do.
While using WMR I had control over my experience.
While using Mixed-Reality, my actions lead to expected experiences.
Perceived Immersion (PI) – Inspired from Yim (2017)
I felt that I am genuinely in a physical service branch while using WMR.
While using WMR, I had a sense of presence with my surroundings.
While using WMR, I felt that I absorbed in the environment.
While using WMR, I felt fully immersed in the virtual environment.
While using WMR, I felt as if I were in a real service experience.
User Satisfaction (US) - Adapted from Tom Dieck, Jung, and Rauschnabel, (2018)
I was satisfied with the overall WMR experience.
I was content with the overall WMR experience.
I was delighted with the overall WMR experience.
Behavioural Intention (BI) – Adapted from Venkatesh et al., (2012)
I will use WMR in the near future.
I will recommend WMR to others.
I intend to find out more information about WMR.