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Augmented reality in retail: an analysis of this immersive technology through consumers' and retailers' perception

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La réalité augmentée dans le commerce de détail : une analyse de cette technologie immersive à travers la perception des consommateurs et des distributeurs

Avec l'avènement de l'Internet et du processus de digitalisation, le monde du commerce de détail a connu de nombreux changements. En fait, ce processus a incité tous les secteurs à intégrer la technologie dans leurs processus de vente. Dans le commerce de détail en particulier, ce processus a permis aux mondes physique et digital de commencer à se rencontrer. Dans ce scénario, on est passé de la vente multicanale, comprise comme un ensemble d'activités où les biens sont vendus par différents canaux (en ligne et hors ligne), à une omnicanale, où les deux canaux (en ligne et hors ligne) sont intégrés au cours du processus de vente. De cette manière, les barrières géographiques et physiques existantes ont été supprimées, laissant la place à une expérience complète pour le consommateur. Dans ce scénario se situe le travail de cette thèse de doctorat, qui découle de l'intérêt d'étudier la perception des consommateurs et des vendeurs dans l'utilisation des technologies immersives, avec un accent particulier sur ce qui est prédit par les rapports comme la technologie immersive la plus utilisée dans les cinq prochaines années : la réalité augmentée.

À travers trois études exploratoires (deux études qualitatives - un côté des consommateurs et l'autre côté des détaillants - et la dernière quantitative), le présent travail de thèse vise à étendre les connaissances sur le comportement des consommateurs et des vendeurs inhérents à cette technologie. Au chapitre 2, la perception qu'ont les consommateurs de la réalité augmentée pendant les phases d'un processus d'achat est analysée au moyen de 20 entretiens semi-structurés, qui décrivent les principaux avantages et inconvénients perçus. Le chapitre 3 analyse le côté des vendeurs à travers 4 études de cas, dans le but d'étudier leur perception de la préparation à l'adoption de cette technologie immersive. Enfin, le chapitre 5 vise à mesurer la relation entre l'implication d'un produit et son comportement de consommation, médiatisé par l'immersion dans l'expérience d'achat en réalité augmentée de 254 consommateurs italiens.

Les résultats mettent en évidence le rôle de la technologie immersive lorsqu'elle est associée à une implication émotionnelle avec un produit, sans laquelle elle reste un simple instrument hédonique. En fait, d'une part, les consommateurs perçoivent la technologie comme un outil supplémentaire et autonome, si elle n'est pas combinée avec des produits particuliers qui les intéressent. D'autre part, les vendeurs sont conscients des principaux avantages apportés par l'introduction de nouvelles technologies, mais sont réticents à les inclure. Cela est principalement dû à deux facteurs : la petite et moyenne taille des entreprises en Italie et une faible propension à éviter le risque et l'incertitude donnés par toutes les innovations non testées par leur secteur.

Les implications de la relation entre l'implication du produit et les intentions comportementales médiatisées par l'expérience immersive avec la réalité augmentée décrite dans le modèle développé dans cette thèse de doctorat ouvrent de nouveaux horizons managériaux pour toutes les entreprises qui sont conscientes des avantages de ces technologies et souhaitent les mettre en œuvre pour améliorer leurs performances.

Mots clés : Réalité augmenté ; Implication du produit ; Comportement du consommateur ; perception ; Omnicanal ; Commerce de détail.

Augmented reality in retail: an analysis of this immersive technology through consumers' and retailers' perception

With the advent of the internet and the digitisation process, the retail world has undergone numerous changes. As a matter of fact, this process has prompted all sectors to integrate technology into their sales processes. Particularly in retail, this process has meant that the physical and digital worlds have begun to find a meeting point. In this scenario there has been a shift from multi-channel, understood as a set of activities where goods are sold through different channels (online and offline), to a omnichannel retailing, where the two channels (online and offline) are integrated during the sales process. In this way, existing geographical and physical barriers are removed, leaving room for an all-round experience for the consumer. In this scenario is placed the work of this doctoral thesis, which stems from the interest of investigating the perception of consumers and sellers in the use of immersive technologies, with a particular focus on what is predicted by the reports as the most used immersive technology in the next five years: augmented reality.

Through three exploratory studies (two qualitative studies on the consumer and retailer side and the last quantitative one), the present work aims to extend knowledge on the consumers' and retailers' perception on this technology. In chapter 2 consumers' perception on augmented reality during the phases of a purchasing process is analysed through 20 semi-structured interviews, outlining the main perceived benefits and disadvantages. Chapter 3 analyses retailers' side through 4 case studies, with the aim of studying their perception and readiness to adopt this immersive technology. Finally, chapter 5 aims to measure the relationship between the involvement of a product and its consumption behaviour, mediated through the immersion in the augmented reality shopping experience by 254 Italian consumers.

Results highlight the role of immersive technology when combined with emotional product involvement, without which it remains a mere hedonic instrument. In fact, on the one hand consumers perceive technology as an

additional, stand-alone tool, if not combined with specific products of their interest. On the other, retailers are aware of the main benefits brought by the introduction of a new technology, but they are reluctant to adopt it into their business. This is mainly due to two factors: the small and medium size of companies in Italy and a high uncertainty avoidance given by all the innovations not tested by their sector.

The relationship between product involvement and behavioural intentions mediated by the immersive experience with augmented reality described in the model of this PhD thesis opens new managerial horizons for all those companies, which are aware of the benefits of these technologies and that would like to improve their performance using immersive tools.

Keywords: *Augmented Reality; Product Involvement; Consumer Behaviour; Perception; Omni-channel; Retailing.*

La realtà aumentata nel retail: un'analisi di questa tecnologia immersiva attraverso la percezione dei consumatori e dei rivenditori

Con l'avvento di internet e il processo di digitalizzazione, il mondo della vendita al dettaglio ha subito numerosi cambiamenti. Infatti, questo processo ha spinto tutti i settori ad integrare la tecnologia nei propri processi di vendita. In particolar modo, nella vendita al dettaglio questo processo ha fatto sì che il mondo fisico e quello digitale iniziassero a trovare un punto di incontro. In questo scenario si è assistito infatti al passaggio dalla vendita multicanale, intesa come un insieme di attività dove le merci vengono vendute attraverso diversi canali (online e offline), ad una vendita omnicanale, dove i due canali (online e offline) sono integrati durante il processo di vendita. In questo modo, le barriere geografiche e fisiche esistenti vengono eliminate, lasciando spazio ad un'esperienza a tutto tondo per il consumatore. In questo scenario si colloca il lavoro di questa tesi di dottorato, che nasce dall'interesse di investigare la percezione dei consumatori e dei venditori nell'utilizzo delle tecnologie immersive, con un particolare focus a quella che viene predetta dai report come la tecnologia immersiva più utilizzata nei prossimi cinque anni: la realtà aumentata.

Attraverso tre studi esplorativi (due qualitativi lato consumer e retailer e l'ultimo quantitativo), il presente lavoro ha l'obiettivo di estendere la conoscenza sul comportamento dei consumatori e dei venditori inerente a questa tecnologia. Nel capitolo 2 viene infatti analizzata attraverso 20 interviste semi-strutturate la percezione che hanno i consumatori della realtà aumentata durante le fasi di un processo di acquisto, delineando i principali benefici e svantaggi percepiti. Il capitolo 3 analizza il lato dei venditori attraverso 4 casi studio, con l'obiettivo di

studiare la loro percezione di preparazione ad adottare questa tecnologia immersiva. Infine, il capitolo 5 si pone l'obiettivo di misurare la relazione esistente tra il coinvolgimento di un prodotto e il relativo comportamento di consumo, mediato attraverso l'immersione nell'esperienza di acquisto con realtà aumentata da parte di 254 consumatori italiani.

I risultati mettono in evidenza il ruolo della tecnologia immersiva se affiancata dal coinvolgimento emotivo ad un prodotto, senza il quale resta un mero strumento edonico. Infatti, da un lato i consumatori percepiscono la tecnologia come uno strumento aggiuntivo, *stand alone*, se non abbinato a particolari prodotti di loro interesse. Dall'altro i venditori conoscono i principali benefici apportati dall'introduzione delle nuove tecnologie, ma sono poco propensi a inserirle. Questo è dovuto principalmente da due fattori: le piccole e medie dimensioni delle imprese in Italia e da una bassa propensione a evitare il rischio e l'incertezza dato da tutte le innovazioni non testate dal loro settore.

Le implicazioni della relazione tra coinvolgimento del prodotto e intenzioni di comportamento mediate dall'esperienza immersiva con realtà aumentata descritte nel modello sviluppato nella presente tesi di dottorato apre nuovi orizzonti manageriali per tutte quelle imprese che consce dei benefici di queste tecnologie, desiderano implementare per migliorare le loro performance.

Parole chiave: *Realtà aumentata; Coinvolgimento nel prodotto; Comportamento del consumatore; Percezione; Omnicanalità; Retailing.*

Table of abbreviations

Abbreviation	Meaning
AR	Augmented Reality
VR	Virtual Reality
QR-Code	Quick Response Code
RFID	Radio Frequency Identification
CP	Consumers' perception
RP	Retailers' perception
TAM	Technology acceptance model
IT	Internet Technology
TR	Technology readiness
CE	Consumer engagement
PU	Perceived usefulness
PEOU	Perceived ease of use
SME	Small and medium enterprise

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CHAPTER 1-Introduction

I am among those who think that science has great beauty. A scientist in his/her laboratory is not only a technician: he/she is also a child placed before natural phenomena which impress him/her like a fairy tale. We should not allow it to be believed that all scientific progress can be reduced to mechanisms, machines, gearings, even though such machinery has its own beauty.

(Marie Curie)

1.1. Synopsis

After the dot-com bubble in 1990s, Internet shaped all the boundaries between offline and online world. This disruptive digitalisation has pushed all sector to integrate in some ways online services. Specifically, retailing has strongly extended itself into online world, offering services such as e-commerce in a multi-channel world. Recently, technologies are becoming more and more immersive and present in consumers' everyday lives, offering new paradigm for retailers in term of services offered.

This scenario has offered a scientific interest in academical community, where scholars have addressed several studies, even if the level of technology diffusion in the retail industry is still at an early stage (Pantano and Vannucci, 2019).

Thus, in this disruptive scenario, this doctoral thesis comes up to investigate consumers' and retailers' perception and readiness to use these technologies during their shopping routines.

To reach this aim, I organized this thesis into three papers, which examines the role of immersive technologies, with a special focus on augmented reality (AR), from the two main stakeholders' standpoint in retailing: consumers and retailers.

So, the first paper investigates to what extent AR could enhance consumers' shopping journey. Then, the second one presents retailers' point of view, investigating their perceived readiness to adopt immersive technologies in-store.

Finally, the last paper highlights the existing relationship between product involvement and different behavioural intentions mediated by the flow state in an AR try-on experience.

Subsequently, research questions will be explained and analysed, along with conclusions. In this last section an emphasis is given in discussion of managerial and theoretical implication of this work, explaining main limitations and main research suggestions for further research.

1.2. Theoretical background

1.2.1. A theoretical overview on technologies adopted in retailing: from a multi-channel to an omni-channel experience

With the advent of internet and the ongoing digitalisation, the world has changed dramatically. In specific, in retailing the online channel has become dominant and it has blurred boundaries with the physical world (Christensen and Raynor, 2003). If we think of Amazon as one of the bigger online retailers and its support during the COVID-19 crisis, it could be easy to understand the level of disruption of digital technologies in the retail word.

In recent years, the biggest challenge was to introduce digital technologies, in particular with the dawn of the mobile channel, tablets and social media in-store (Leeflang et al., 2014).

But before to analyse the introduction of new technologies in-store, the aim is to briefly described the differentiation between multi-channel, cross-channel and omni-channel retailing, giving a short sum up of the technological adoption in-store from the past to the present in retailing.

Levy et al. (2013) proposed three concepts of channels, namely Multi-, Cross- and Omni-channel retailing. We refer to **Multi-channel** retailing as "*a set of activities involved in selling merchandise or services through more than one channel or all widespread channels*" (Beck and Rygl, 2015). Here consumers cannot trigger

channel interaction, while retailers cannot control channel integration. In **Cross-channel** retailing, consumers can trigger partial channel interaction, whereas also retailers have a partial control of channel integration. The difference between a Multi- and Cross-channel is in the consumers' interaction (absent in multi-channel and partial in cross-channel) and in retailers' control (absent in multi- and partial in cross-channel).

Finally, **Omnichannel retailing** is defined as a set of activities involved in selling merchandise or services through all the existing channels (online and offline). Here interaction is full for consumers and retailers can exercise a full control on channel integration (Beck and Rygl, 2015).

Omnichannel is a sort of "world into a showroom without walls" (Verhoef, Kannan and Inman, 2015, p. 2), where barriers such as geography boundaries and consumers ignorance are broken down, creating a more compelling world.

In this new world we should make a differentiation between different channels used by consumers. As a matter of fact, for some authors (Verhoef et al, 2015; Li and Kannan, 2014) search, displays, e-mails, websites and affiliates are considered as separate and different channels, because they can support a one-way or a two-way different communication. The same happens with brand mobile applications, which are considered as a separately channel.

Here the main challenge for retailers in the near future is to offer a similar experience in all of these channels (Verhoef et al., 2015), in particular for those touchpoints which are used by consumers daily such as smartphones.

This is an interesting and huge problematisation, and this thesis is focusing on understanding consumers' and retailers' perception of the new shopping experience using a specific emerging and immersive technology: Augmented Reality (AR). As a matter of fact, according to the Perkinscoie report (2020), in the next five years augmented reality will be the technology more useful in physical shops, due to its cheaper cost than virtual reality or artificial intelligence and its easiness to use it. Also, during the COVID-19 crisis, many companies has experienced augmented reality applications to show consumers their products

staying safe at home (e.g. Lamborghini, Prada, L'Oreal, Lancome, Mac Cosmetics).

Keeping these important definitions in mind, I would like to focalise readers' attention on the history of technological introduction in-store. Inman and Nikolova (2017) found five technological tools which have changed the retailing store. We are referring to the barcode, the videocart, the in-store coupon dispensers and Walmart smart network.

In 1974 in Ohio the pioneer of the QR-Code was launched: The Barcode. This technology was first used to sell a pack of chewing gum, scanning the product. As a matter of fact, the possibility to scan products provide retailers with both real time information and relevant data such as shelf space allocation, price and feature advertising. Thus, estimate sales was easier. In 1988 one of the first "location-base" technology was used: the *Videocart*. It consists in a shopping cart display mounted on the handle, able to receive and show promotions with the respective location.

In 1992 the *in-store coupon dispensers* was created to dispense individual coupon (Kringel, 1992). In 2007, the process was revisited, distributing coupons to regular shoppers, based on their previous purchase history (Muldoon, 2007).

In 1985 the first Florshiem Shoes' *kiosk* was installed in over 600 locations, using a touchscreen technology to deliver information, promotions or to sell products and services to consumers. It is normally installed in public spaces, such as stores, hotels, airports and malls. Then, the last innovative technology introduced in the near past in retail was the *Walmart Smart Network*, a digital tool able to communicate shoppers the nearest point of purchase in term to increase sales in-store.

Thus, all these technologies let retailers intensify the use of digital contents in-store, along with the enhancing services offered to shoppers and consumers. Nowadays, during a shopping journey (Lemon and Verhoef, 2016) retailers are faced up with many digital and sophisticated technologies (Inman and Nikolova, 2017). As a matter of fact, traditional point of sales has been dramatically modified by retail practices. Self-service technologies have been introduced by

several stores during their digitalization process (Pantano and Timmermans, 2014).

Radio Frequency Identification (RFID), self-cash desks, interactive touch points, mobile applications, QueVision, gravity feed shelving systems, personalized promotions and pricing and the *scan and go* are just some of the most common self-service technologies used in-store, which are able to offer a better shopping experience to the customers.

Thus, this context shows how retailing is becoming more and more an omnichannel environment, where retailers interact with customers using different technological and physical ways, such as stores, kiosk, websites, social networks, mobile devices and so on (Rigby, 2011).

This revolution is affecting also consumers' shopping habits, where their expectations on the experience offered in-store is higher and higher. Thus, retailers have a big challenge: increasing their level of preparedness on digital technologies to satisfy consumers' attendance while shopping, offering immersive, engaging and moreover unique experience.

1.2.2. Digitalisation: Augmented reality technology

Before to continue with our analysis, I would like to provide the reader a high comprehension of the immersive technology this thesis is based on, which is a phenomenon still in its infancy even if promises in next years are vast (Grewal, Roggeveen and Nordfält, 2017a). Augmented reality was firstly applied in gaming, medicine, navigation and education contexts (Bonetti, Warnaby and Quinn, 2018), as a new form of digital customer experience in retail, which was able to "*facilitate omnichannel behaviour throughout the customer's journey*" (Hilken et al., 2018, p. 511). This facilitation is possible, because it involves computer generated virtual images on the reality, let the user (e.g. a consumer) interact with the virtual content in real time (Dey et al., 2018; Azuma, 1997). This technology could supplement reality without replacing it thanks to the use of non-wearables devices, as smartphone or tablets, blurring the boundaries between

online and offline channels, where the customer experience assumes the three attributes theorised by the situated cognition theory (Robbins and Aydede, 2009; Semin and Smith, 2013): embedded, embodied and extended experiences. In this context of digital embeddedness, this theory suggests that customers live more realistic and compelling experience when they are: (a) *embedded*, id est they use their surroundings to evaluate products (Wilson, 2002), (b) *embodied*, that means both the simulation of physical interactions (e.g. touchscreens) and the physical one (touching and seeing the product) could evoke affective reactions on customers (Grohmann et al., 2007; Rosa and Malter, 2003) and (c) *extended*, id est the natural tendency of sharing experiences, so customers rely on other people to make an evaluation on a product/service (Echterhoff et al., 2009).

The same immersion could be experienced by consumers introducing VR, which is a technology, where "*the user is effectively immersed in a responsive virtual world, implying a dynamic control of viewpoint*" (Brooks, 1999, p. 1). Thus, the main difference between these two technologies (AR vs VR) is the immersive view, where in AR is enhanced by the use of a tool such as the smartphone, whereas in VR this one is total, using helmets or visors.

So, mobile application using AR could advance the reality, adding information in term of contents such as Pokémon GO, able to combine these virtual creatures with the real-world locations or Ikea Places referring to the superimposition of virtual furniture in the real space (Grewal, Roggeveen and Nordfält, 2017b)

Thus, AR could enhance customer experience, offering a "*touch-and-feel*" experience, using "*vivid, customized and connected digital content*" (Hilken et al., 2018, p. 512). As a matter of fact, this technology blends real and virtual world (Huang and Liao, 2015), offering virtual try-ons, additional contents and digitalized information to customers (Yim et al., 2017; Olsson et al., 2013).

Its participation in both the online and offline settings (Hilken et al., 2018) lets the customer experiencing its functional and hedonic aspects. Here the importance for retailers to stress the adoption of immersive technologies such as AR, focusing both on customers' experiences in-store and off-store and their engagement (Bonetti, Warnaby and Quinn, 2018). Despite this benefit to connect digital and

physical world, companies' readiness to integrated digital experience in their business is still scarce (Hilken et al., 2018). This is due to the lack of preparedness, the lack of knowledge of generated profits with the introduction of AR in companies' business (Bonetti, Warnaby and Quinn, 2018), the scarce promotion of this tool when used (Zagel, 2016) and sometimes a scarce consumers level of cognitive innovativeness. As a matter of fact, consumers experience problems on interfacing with augmented reality, where less than 50% of the studied group had heard of AR before (longitudinal study conducted on a panel of 56 Polish and 56 Mexican students from 2014 and 62 Polish students from 2016) (Grzegorczyk, Sliwinski and Kaczmarek, 2019).

1.2.3. Consumers' and retailers' perception of immersive technologies in store

In marketing a specific differentiation is made between sensation and perception. Krishna (2012) defines sensation as an external stimulus, which involves all physical receptors, transferring to the brain an idea of an item, whereas perception is the awareness of a sensory information, reached by sensation or feelings.

Retailing literature divides studies on perception into two categorisations: (a) the ones under the label "*consumers' perception*" and (b) the other on "*retailers' perception*".

I have done a deep analysis on literature to find the main topic covered by scholars under this steam of literature and we found 201 results on Web of Science referring to "customers' perception" and only 2 results on "retailers' perception", published in the last five years.

Then, these results were filtered, selected articles only about "management" and "business" fields, founded 59 articles for the first steam of literature and the 2 abovementioned referring to retailers.

On retailers' perception, I have searched on Google Scholars, to amplifying the analysis and the understanding on what has been done on retailing before, founded five subjects of analysis: (1) retailers' perception on store attributes in the

wine sector (Reizenstein and Barnaby, 1980), (2) on impacts of technological adoption (Eiriz, Barbosa and Ferreira, 2017), (3) on online and mobile technologies (Kaatz, Brock and Figura, 2019), (4) on innovativeness perception (Lin, 2019) and on the so called "dark side" between the reputation and the perception (Riqueline et al., 2019).

Table 1 shows the main interesting results on the two topics, referring on results founded on Web of Science database.

Table 1: Main literature on customers' and retailers' perception

Consumers' perception main studies	
Authors	**Topic covered**
Google Scholar search	
Bilgihan et al. (2016)	CP in knowledge-sharing via social networks
Park and Stoel, 2018	CP in background music in physical places
Lowe and Alpert, 2015	CP in innovativeness
Wunderlich and Gatto, 2015	CP in Genetically modified organisms
Deliza and Ares, 2018	CP in novel technologies
Kunz and Moore, 2019	CP in sustainability
Hazen et al., 2012	CP in products perception
Oppewal and Timmermans, 1999; Dholakia and Uusitalo, 2002	CP in shopping experience in physical store
Lee and Lin, 2005; Jiang, Yang and Jun, 2013	CP in online shopping
Ha and Stoel, 2009; Zhou, Dai and Zhang, 2007	CP in e-shopping acceptance
Lowe, Dwivedi and d'Alessandro, 2019	CP in relationship between consumer and technology
Singh and Rana, 2019	CP in digital payment
Web of Science search	
Chen et al., 2016	CP in luxury products
Ma, Shang and Wang, 2017; Chaudary et al., 2016	CSR to improve customer perception

Brida et al., 2016	CP in service quality
Shareef et al., 2015	Perception vs expectation in online purchase
Litter and Melanthiou (2006)	CP in risk and uncertainly in retail
Sreejesh et al., 2018	CP in customer-brand relationship
Retailers' perception main studies	
Authors	**Topic covered**
Google Scholar search	
Reizenstein and Barnaby (1980)	RP in wine sector
Elriz, Barbosa and Ferreira, 2019	RP on impacts of technological adoption
Kaatz, Brock and Figura, 2019	RP in online and mobile technologies
Lin, 2019	RP in innovativeness perception
Riquelme et al., 2019	RP on the "dark side" between the reputation and the perception
Web of Science search	
Lee et al., 2019	RP on platform-based mobile payment
Suhartanto et al., 2018	RP on shopping destination image
Comparison between retailers and consumers perspectives	
Bäckström and Johansson (2006)	Comparison between retailers' and consumers' perspectives

Source: personal elaboration

Perception literature is particularly prompt in psychology and human behaviour. Here literature has two main approaches: (a) the Von Helmholtz (1867) approach of the unconscious inference and (b) the ecological approach by Gibson (1966).

Von Helmholtz's approach describes perception as an intellectual decision-making process, which is assimilated to thought. This approach is formulated on the basis of incomplete sensory data, i.e. we decide what to see on the basis of probabilistic reasoning. The elements are organized and unified in such a way as to produce the perception of the most probable object in that context (principle of plausibility) (Von Helmholtz, 1867).

Gibson's approach states perception of the environment as a completely specified

psychological aspect due by the information available on the retina (or other senses) of a moving organism that actively explores the environment without the mediation of internal processes or representations (Gibson, 1966).

Normally, in management studies when scholars refer to technological perception, they normally applied a famous and criticized model, which the technology acceptance model by Davis (1985), more known as the "TAM" model.

This model has capturing attention of scientific communities, which have created different implementations, trying to enhance it more and more with additional variables.

The first version of TAM shows users' motivation explained by perceived ease of use the technology, perceived usefulness of the technology and attitude towards using it. The idea was that users' attitude was a major determinant to use or reject the technology. In addition, perceived ease of use was not only a predictor of attitude, but it has also a direct effect on perceived usefulness.

This model was refined some years later by many scholars, coming to the last version, which was designed by Verkantesh and Davis (1996), known as the TAM2.

Here additional variables were proposed as antecedents to the perceived usefulness. Their results indicated that this enhanced model was more performing in both voluntary and mandatory settings (Chuttur, 2009).

Notwithstanding these very robust and powerful implementations, TAM is a very criticised model in management research. Hence, when scholars decided to apply this model is very simple to be criticised. In particular, researchers highlighted three important limitation, which are the following: (a) the methodology used to testing the TAM model is self-reported use data (Yousafzai, Foxall and Pallister, 2007), so generalisation is really hard (Lee, Kozar and Larsen, 2003), (b) variables and relationships present within the model are very discussed in term of impact between them (Yang and Yoo, 2003) and (c) some scholars argue a poor theoretical foundation in the formulation of the model, highlighted than behavioural intention could not be considered as a terminal goal (Bagozzi, 2007).

1.2.4. Flow experience using augmented reality

In 1975 Csikszentmihalyi described the full immersion of consumers into a highly absorbing activity as a flow state. This immersion can improve consumers' experience, learning and create distortion in time perception and behavioural control (Javornik, 2016). Thus, flow become a mediator for consumer responses such as attitude towards the website (Gao et al., 2009), cognitive responses, behavioural intention to use the website again and to repurchase (van Noort et al., 2012).

This psychological state has two main components, which are concentration and enjoyment (Ghani and Deshpande, 1994). Research refers to concentration to state the full immersion into the activity, which is accompanied by the sense of fun and enjoyment in experience a particular activity. In addition, during this absorption, consumer loose time control, which is perceived as particularly fast, intensified the immersion and consumers' willingness to invest time in experiencing immersive technologies (Hsu and Lu, 2004).

A study conducted by Hoffman and Novak (1996) reveals that once consumers enter a flow state, they will be more subjective to live a positive experience, promoting exploratory desires. So, more consumers are immersed in the experience, the higher will be their willingness to reuse the technology in the near future. Thus, this finding is very powerful in retailing, making companies understand all the benefits of immersive technologies into a business.

1.3. Research objectives and aim

Research on the level of technology diffusion in the retail industry is still at an early stage (Pantano and Vannucci, 2019).
As showed, literature on digital retail is very vast and sometimes boundaries are difficult to find.
Thus, the aim of this thesis is to investigate consumers' and retailers' perception of digitalisation in retailing trough a specific immersive technology (Augmented

Reality), which could become a powerful and easy technological instrument to facilitate behavioural intentions (purchase, recommendations, creation of online and offline traffic).

Then, this aim interweaves with the analysis of impacts that AR could bring in term of advantages and disadvantages for both consumers and retailers, developing some interesting managerial implications and suggestions to go over with technological research and innovating in term of purchase service offered.

To sum up, this thesis has three specific objectives.

First, to investigate the process of introducing an emerging technology (AR) into companies' business as online channel to depict to what extent AR could enhance consumers' experience while shopping.

Secondly, to explore retailers' preparedness perception of digital channels to enhance in-store environments for a more involving experience.

Finally, to measure the impact of AR in consumers' flow state from their involvement in a specific product and their future behavioural intentions.

1.4. Epistemological positioning

Consumer behaviour literature has been dominated for many years by a positivist approach, characterized by the theoretical strands of microeconomics and cognitive psychology. This approach analysed reality as a tangible, measurable and unique entity. The role of the researcher was to predict and control consumer behaviour in the purchasing phases, with purely quantitative models (Nosi, 2014)

At the end of the last century, some strands of thought began to follow one another, including the interpretivist approach, which saw reality as the result of a social and contextual construction (Dalli and Romani, 2011; Fabris, 1995, Petruzzellis and Chebat, 2010). Through qualitative investigation methodologies, the researcher becomes an intermediary, capable of describing this reality (Hudson and Ozanne, 1988).

The progressive affirmation in the field of Consumer Behaviour of the interpretivist approach is due to the excessive rigidity and structuring of the

previous approach, leaving room for an analysis of the consumer as an individual who is not entirely rational, but capable of constructing his own personality according to the context in which he is placed (e.g. geographical, social, cultural) and of acting in the spaces surrounding him (Askegaard and Linnet, 2010).

Given that goods are purely of utilitarian value, but with cultural meanings (such as clothing) (McCraken, 1986), in the post-modern era this takes on a completely different connotation, shifting the focus to the experiential factor (Batat, 2011). In this way, consumption is charged with emotional, hedonistic (Addis and Holbrook, 2011), ideological and ethical content (Singh, 2011). New technologies are the master in this context, where the diffusion of devices penetrates in an increasingly pervasive way into the daily life of individuals. In this context the consumer actively participates in the purchasing process, helped by the immersion of new technologies that implement the number of touch-points, moving from a multi-channel to an omnichannel perspective, where virtual and physical world actively interact (Vargo and Lusch, 2004; Beck and Rygl, 2015).

Thus, starting with the idea that phenomena could be described and investigated related to the context of analysis (Avenier, 2011), this doctoral thesis positions its findings in the brand of interpretivism (Heidegger et al., 1962; Sandberg, 2005; Yanow, 2006). As a matter of fact, the objective of this doctoral thesis is to understand consumers' and retailers' perception on their previous experience with immersive technologies, with a special focus on augmented reality.

So, consumers and retailers can interpret reality through their personal experience using the technology (Husserl, 1970). Thus, my aim is interpreting their experiences, starting from a deep understanding of literature about consumer behaviour and omnichannel retailing.

1.5. Outline of this doctoral thesis

To reach the proposed abovementioned objectives, this doctoral thesis is a collection of three papers, where each of them contribute to one of the research objectives highlighted. More in details, the first paper (presented by Chapter 2)

examines to what extent AR could enhance consumers' shopping journey. Using an exploratory qualitative methodology, based on 20 semi-structured interviews created in according with literature, the paper shows how consumers are not still engaged with immersive technologies, due firstly to a lack of adoption of the instrument by retailers and secondly to lack of physicality, which show still a reluctance to switch or combined tradition and digital channels. This is in line with Hofstede's uncertainty avoidance compass, which is still high in Italy. As a matter of fact, according to Hofstede culture compass, Italy has 75% of score on uncertainty avoidance, which means Italian people do not like new situations (Hofstede Insights, 2011).

The second paper (Chapter 3) presents retailers' point of view, investigating their readiness perception to adopt immersive technologies in-store. Using a multi-case study methodology, this study reveals how SMEs in Italy are conscious of all the benefits omnichannel experience can offer to consumers, even if they use still primordial immersive technologies, such as QR-Code. This is due to high uncertainty avoidance in introducing technologies not tested before. So, innovation is adopted little by little to minimize risk taking in SMEs companies, which have low financial resources than bigger ones.

The last paper (Chapter 4) highlights actionable and interesting insight on the mediation effect of flow state in an AR virtual try-on experience between consumers' product involvement and different behavioural responses (willingness to buy the item, to visit the physical store, to visit the website and to recommend the experience). Throw a path analysis, the study reveals the potential of AR experience to stimulate consumers in behavioural reactions.

Finally, Chapter 5 sums up interesting conclusions from the findings of each chapter, along with theoretical and managerial implications. In this final chapter, final contributions of this thesis are highlighted, answering the research questions delineated at the beginning.

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CHAPTER 2- Consumers' perception of Augmented Reality: an application to the "Made in Italy" brand

Abstract

The increasing potential of augmented reality (AR) for advertising strategies and for studies on consumer perception and behaviour are still scarce and fragmented.

Thus, the aim of this exploratory study is to investigate how consumers perceive AR as an additional service to shop and how AR could enhance their purchase journey in term of additional benefits perceived.

This study refers to two frameworks, which are Rogers' classification on adopters of a new technology and Lemon and Verhoef's study on customer purchase journey.

Methodology consists in 20 semi-structured interviews with consumers with the scope to examine their potential shopping journey with AR technology.

Preliminary results show a lack of consumers' knowledge on AR and the difficulty to be engaged with a new digital technology. The paper ends arguing academical and managerial implications along with its limitations and further research.

Keywords: Augmented Reality; Consumer journey; Devices; Consumers' perception.

2.1. Introduction

The increasing digitalisation shows how fast products, services and moreover advertising strategies could been obsolete (Zott and Amit, 2017).

In this scenario companies are implementing technologies more and more to be active on the market and effort any type of threats.

One of them is augmented reality (AR), that is a smart technology, able to add value to retailers by being able to influence customer engagement (Pantano, 2009; Liao, 2018) as well as purchasing decisions (Pantano, 2014). AR can be varyingly used in-store and out-of-store including at home (Valkynnen et al., 2011). AR is not only a smart technology, but also an emerging form of experience in which the real world is augmented by computer-generated media, such as images and videos (Altinpulluk, 2017).

For these reasons, AR can play a valuable role in integrating marketing strategies (Scholz and Smith, 2016; Hilken et al., 2017; Remondino, 2018); indeed, many firms such as McDonalds, General Electrics and Coca-Cola have embraced AR technology in their marketing plans to create a unique and innovative experience for customers. As a matter of fact, many brands as IKEA and Sephora have introduced mobile AR shopping apps that allow consumers to virtually "try-on" products on their own bodies (e.g. Sephora make-up) or in their own houses (Sholz and Duffy, 2018; Olsonn et al., 2013). Moreover, AR ability to combine physical and digital world lets this technology to reach a wider number of consumers, using mobile application on personal smartphone (Perkinscoie Report, 2018). Several studies show the significative value that AR can provide both for customers and retailers (Schmalstieg and Hollerer, 2016), for mobile services (Saarijärvi et al., 2014) and for experiential customer value (Huang and Liu, 2014; Mathwick et al., 2001; Salo et al., 2013).

Some scholars believe AR as an ideal technology to create a link between the physical and digital channel (Sholz and Smith, 2016). Other studies examined consumers' motivations for and their reaction to using AR technology (e.g., Beck and Crié, 2018; Hilken et al., 2017; Javornik, 2016; Poushneh, 2018; Poushneh and Vasquez-Parraga, 2017; Yim et al., 2017). However, there is still a lack of works on consumer perspective and how AR impacts in their decision-making process.

Therefore. the paper aims to contribute in omnichannel literature by focusing on customers perception in using AR during their shopping journey, investigating if

the adoption of this technology could enhance their engagement with online channels, blurring the boundaries between physical and digital channel.

In particular, the present study offers an exploratory analysis on a concentrated well-aggregated sample of consumers. These consumers are interviewed by a semi-structural interview with the scope to examine their shopping journey through the leverage of AR technology in the main "4F" sectors of the "Made in Italy" brand: "Fashion", "Food and Beverage", "Furniture" and "Ferrari/Automotive".

The structure of the present paper is as follow: first the existing literature on augmented reality is analysed, defining its meaning, its characteristics and how hedonistic and utilitarian aspects could influence customers' perception by using this technology during a potential shopping journey.

As noted, the literature gap is the fragmented literature about customer's perception on AR during their shopping journey. Therefore, as aforementioned, to extend this gap and contribute to the existing marketing literature, a qualitative analysis was conducted. This is described and analysed in the methodology and finding section. Followed by a discussion between findings and literature. The paper ends arguing academic and managerial implications along with its limitation and further research.

2.2. Literature review

2.2.1. Augmented reality: definitions and characteristics

Augmented reality interests many fields, such as cinematography (Carmigniani et al., 2011), 3D graphics projection, aviation industry, medicine, industry, gaming, military, art, navigation, education, tourism and architecture (Javornik, 2016). In literature, it is defined as an emerging form of experience, able to expand and amplify real world virtually (Altipulluk, 2017). This technology is expected to surpass virtual reality by the two thirds of the sample of a Perkinscoie's survey (2018). Thus, many definitions have given to AR by scholars: according to

Azuma (1997) augmented reality is able to supplement the real world virtually, whereas Zhou et al. (2008) state that AR is a type of technology, where computers generate virtual images able to overlay real object in real time.

Reitmayr and Drummond (2006, p.2) define "*Augmented Reality as a promising user interface technique for mobile, wearable computing and location-based system*".

Carmigniani and Furht (2011) describe AR as an instrument able to enhance or augment physical real-world environment by adding virtual computer-generated information.

Here attention is pointing out on the visual alignment of virtual content with the real-world contexts, but recently scholars' contribution in define AR has moved into a deeper analysis in consumer perception and in customer experience. As a matter of fact, Scholz and Duffy (2018) state that AR has the potential to reshape the mobile shopping experience and create more meaningful consumer-brand relationship, analysing their motivations and reactions to using AR applications (Beck and Crié, 2018; Hilken et al., 2017; Poushneh, 2018; Poushneh and Vasquez-Parraga, 2017; Yim et al., 2017; Javornik, 2016; Dacko, 2017).

The co-existence of virtual and real world in the same space and the embeddedness of AR in the real time let Azuma's definition the most accepted one (Javornik, 2016), even if in this study we amplified this definition with the ability of AR to be portable and wearable (Carmigniani et al., 2011) thanks to the support of mobile devices (smartphones and tablets) (Scholz and Duffy, 2018).

For this reason, Javornik (2016) describes the relevant characteristics of AR expressed in the form of: *(a) interactivity, (b) virtuality, (c) geolocation, (d) mobility, (e) connectivity.*

Interactivity: an umbrella term to define machine and personal correlation, composed of control, responsiveness and two-way communication (Song and Zinkhan, 2008), e.g. e-mail, hyper-text technologies, web browsers, etc. (Javornik, 2016).

Virtuality: the combination of virtual elements with the relative immersion in an environment constructed by computer graphics and digital videos (Lister et al., 2008; Blascovich and Bailenson, 2011), e.g. gaming apps, virtual simulations (Javornik, 2016; Jennett et al., 2008; Blascovich and Bailenson, 2011).

Geolocation: ability to tracking of the user location through personal devices (Javornik, 2016).

Mobility: Portability and wearability that allow a mobile use (Shankar and Balasubramanian, 2009; Varadarajan et al., 2010).

Connectivity: technological capability of expanding and sustaining a model of network, where many users can be connected among themselves (Lister et al., 2008; Varadarajan et al., 2010).

These features were put in a model to show augmented reality as an interactive technology, which maintain the specificity to not be disruptive, just because the coexistent between physical and virtual world is possible (Javornik, 2016).

Technology plays a relevant role in implementing geolocated interactive mobile and virtual word (Altipulluk, 2017). In this term four technologies are employed:

(1) *Market based devices,* which uses a camera and some type of visual marker, such as a QR-Code or a PopCode, to produce a result only when the marker is sensed by a reader; (2) the *Marketless AR*, which uses GPS, digital compass, velocity meter, or accelerometer embedded in the device to provide data on user's location. It is most used for mapping directions, finding nearby businesses, and other location-centric mobile applications.

Then (c) *Projection based AR*, which works by projecting artificial light onto real world surfaces (called "Holograma"), sensing the human interaction (i.e. touch) of that projected light. It could be used to make factory floors smarter, safer and more efficient, eliminating the need for hard copy or monitor-based work instructions by creating a digital operating canvas on virtually any work surface[1].

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[1] Data available on: https://lightguidesys.com/blog/projector-based-augmented-reality-new-form-enterprise-ar/ (Retrieved on 19th November 2018).

Finally, (d) *Superimposition based augmented reality*, a technology which replaces partially or fully the original view of an object with a newly augmented view of that same object. Here the application cannot replace the original view with an augmented one if it cannot determine what the object is, i.e. a sofa or a lamp in the "Ikea place" mobile app.

2.2.2. Utilitarian versus hedonistic values in AR literature and perceived usefulness

As abovementioned, augmented reality is an interactive technology (Javornik, 2016), able to give a unique experience to the consumers (Altinpulluk, 2017), adding virtual computer-generated information (Camigniani and Furht, 2011). If we applied this technology during a shopping journey, on one hand, it could reflect a potential entertainment and enjoyment of the customer during the purchase (Hirschman and Holbrook, 1982). In addition, giving further information generated virtually, AR concerns consumers with purchases in a timely and more efficient way to achieve their goals with a minimum of irritation (Childers et al., 2001).

So, for the reasons discussed above, we can affirm that in a same AR experience coexists both the hedonic element and the utilitarian one. As a matter of fact, in 2004 Van der Heijeden differentiated Internet Technology (IT) system into hedonic and utilitarian, because it offers a duality interaction regarding user acceptance and experience (Hassenzahl et al., 2010).

Then, Babin, Darden and Griffin (1994) create a two-dimensional scale of perceived personal shopping value, where value is perceived as a combination between the two terms.

In fact, in Babin et al.'s point of view consumer behaviour is not only directed in satisfying functional and economical needs (p. 653), but also hedonistic ones.

As a matter of fact, their study suggests consumers are supported by utilitarian element during the fulfilment of a goal, whereas when they feel pleasure and fun

during the execution of an action, here comes the hedonic element (Hassenzahl et al., 2010, p. 357).

On one hand, the impact of this last aspect in the decision-making process could be particularly strong moreover when consumers are searching online a product or a service of their interest in mobile advertising. As a matter of fact, they could be more tempted to finalize an impulsive purchase, due to the present of a hedonic aspect of the product of interest (Park et al., 2012; Pescher et al., 2014).

On the other, if the consumer is searching for information of a utilitarian product, the impulse to buy decrease (Jvornik, 2016).

Recent research show AR might be more hedonic technology than utilitarian one, especially during the preliminary phases, where the role of affective choices is particularly strong (Javornik, 2016; Perkinscoie Report, 2018).

Notwithstanding, scholars believe in both utilitarian and hedonic values in augmented reality technology (Hilken et al., 2017; Yim et al., 2017) to drive consumers' attitudes and reactions to augmented reality, even if researches on the acceptance of AR app show that the hedonic elements are more investigated than the utilitarian one.

2.2.3. Consumers' perception and technology readiness of AR

Literature on customers' perception of new technologies is very poor and fragmented. According to scholars, perception is "*consumers' belief concerning the service received or experienced*" (Teas, 1993, p. 1; Parasuraman, Zeithaml and Berry, 1988; Brown and Swartz, 1989). Moreover, perception of products and services is often discussed along with expectations. In this vein, expectations are defined as "*desires or wants of consumers*" (Parasuraman, Zeithaml and Berry, 1988). Referring to perceived service quality (SQi), in their SERVQUAL model, Parasuraman, Zeithaml and Berry (1988) suggests that SQi increases as the differences between performance perception (Pij), whereas service quality expectation (Eij) increase across attributes.

This model show how customers are very sophisticated in their interactions between performance perception and their expectations. Thus, they could be influenced not only by performance of a service, but moreover by its expectations (Bitner, 1990). Moreover, also price and environment could inference about what the service should be in customers' mind (Zeithaml, Berry, and Parasuraman 1993). This is line with Sharma and Stafford (2000), who stated that the environment-based perceptions of a retail store can influence the idea of types of people who work there.

The same happens referring to technologies. Lin and Hsieh (2006) found a very sophisticated interaction between customers and the use of technology. As a matter of fact, an individual could present both favourable and unfavourable technological beliefs (Rosenbaum & Wong, 2015) at the same time. The balance between the two aspects determinate customers' predisposition to accept or reject this kind of technology.

Thus, marketing literature refers to technology readiness (TR) to describe an "*individual's propensity to embrace and use new technologies*" (Parasuraman, 2000, p. 308). So, when individuals have a positive belief on the technology, they tend to be more receptive about the technology itself (Roy et al., 2018).

Moreover, technology readiness affects customers' perceived ease of use, having a direct impact on it, as well as perceived usefulness, attitude and behaviour (Lin and Chang, 2011; Ferreira, Da Rocha, and Da Silva, 2014).

In 2000 Parasuraman classified technology belief and perceptions into four district dimensions: (a) optimism, the belief that a technology offers customers control, efficiency and flexibility, (b) innovativeness, the belief that customers become pioneer if they adopt a new technology, (c) discomfort, i.e. customers' perception to lose the control of a technology and then (e) insecurity, customers' distrust in technology ability to achieve a goal (Parasuraman, 2000; Roy et al., 2018).

These four TR drivers could be categorized as positive (optimism and innovativeness), encouraging customers to have a positive towards technology, and negative (discomfort and insecurity), making customers reluctant towards technology (Lin and Hsieh, 2006)

So, in this term it is interesting analysis customers' perception referring to the introduction of digital innovation, with a particular attention to augmented reality, covering the gap existing in the literature review referring customers' perception of this technology.

2.2.4. Consumers engagement in AR during the purchase journey

Recent research pointed a specific attention on customer engagement (CE) in particular referring to brands (Lemon and Verhoef, 2016).

In defining customer engagement, we can point attention of the active coproduction of value for the firm. As a matter of fact, Brodie et al. (2011) define CE as a psychological state, where customers co-create experience, pointing attention on synergic and motivational state in collaborating with firms. On the other hand, Vivek, Beatty and Morgan (2012, p.133) declare CE is "*the intensity of an individual's participation in and connection with an organization's offerings or organizational activities, which either the consumer or the organization initiates*".

These definitions can be better understood if analysed in the customer journey, where each phase of the purchasing is analysed. Thus, as shown in figure 1 below, there are three stages in the customer journey: the pre-purchase, the purchase and the post-purchase step. Each of these stages represent a moment during the three phases of the customer journey, id est the previous experience, when the customer is in time "t-n", the current customer experience in the present at time "t", and the future experience at time "t+n". The first stage of each of these phases is the (a) pre-purchase analyses, where all the aspects of the customer interaction with the brand, category and environment before the transaction (Lemon and Verhoef, 2016) are manifested. Here the customer is moved by three psychological aspects, which are the need of recognition, search and consideration. Then, we pass on the second step of each phase, which is the (b) purchase. Here all customer interactions with brand and its environment during the purchase is analysed, where behavioural such as choice, ordering and payment are dominant.

The last step is (c) post-purchase, where researches focus their attention on the consumption experience (Holbrook and Hirschman, 1982), service recovery (Kelley and Davis, 1994), decision to return products (Wood, 2001), repurchase (Bolton, 1998), seek variety (McAlister and Pessemier, 1982) and nonpurchase behaviour due to negative word of mouth and other form of engagement (Van Doorn et al., 2010).

Figure 1: Customer journey stages

Previous experience (t-n)
- Prepurchase stage
- Purchase stage
- Postpurchase stage

Current customer experience (t)
- Prepurchase stage
- Purchase stage
- Postpurchase stage

Future experience (t+n)
- Prepurchase stage
- Purchase stage
- Postpurchase stage
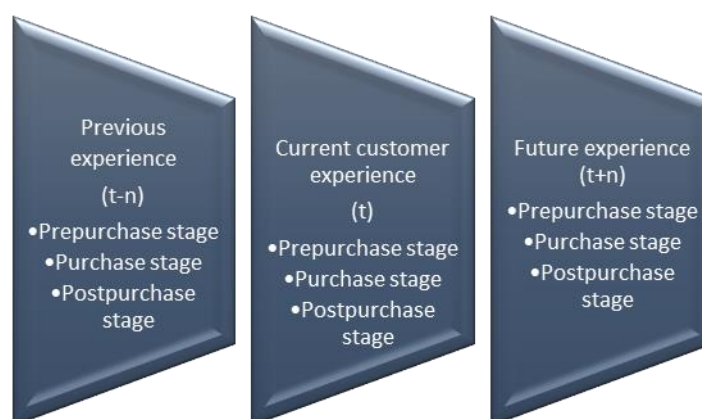
Source: Revised Lemon and Verhoef, 2016

So, augmented reality could have an impact on each of these three steps described by Lemon and Verhoef's study (2016). As a matter of fact, in the pre-purchase step virtual world gives the possibility to consumers to try on clothes, make-ups and other products in a more flexible way, sometimes using an avatar (Scholz and Duffy, 2018) and eradicating any type of distinction between real and re-embodied self (Bartle, 2004; Belk, 2013), dissolving boundaries between consumers, others, objects and brands (Scholz and Duffy, 2018).

During the purchase step was established how boundaries between digital and real world are destroyed thanks to the interest of consumers in try this new technology first and then creating a fidelity with the brand, showing the importance of a complete consumer journey and moreover of time to create a new type of consumption (Scholz and Duffy, 2018).

Then the post-purchase step, consumers could participate in online communities (Kozinets et al., 2010), B2C and C2C interactions through social media (Kaplan

and Haenlein, 2010), engaging with immersive augmented reality (Nah et al., 2011). In 1983, Rogers states all the potential adopter of a new product do not decide to adopt it at the same time. Thus, he studies a classification, based on the degree to which an individual is earlier in adopting it. The importance of this model is to three aspects, described by the literature. Firstly, it assists in targeting prospects for a new product (Kotler and Zaltman, 1986), then it let to develop marketing strategies to penetrate each of these categories (Engel, Blackwell and Miniard, 1986) and lastly it analyses the acceptance of this new product constantly (Mahajan and Muller, 1979; Bass, 1969).

The results are five categories of adopter, where a particular attention is due on the percentage of risk taken, the age of the adopter and the social class, assuming a noncumulative distribution with the form of a bell-shaped curve (Mahajan, Muller and Srivastava, 1990). Each of these five categories of adopter are discussed in turn, associated with the percentage of distribution in the normal curve as shown in figure 2 below:

Innovators (2.5%) are the first to adopt an innovation. As a matter of fact, their characterization is focus on the willingness to take risks, the young age, the highest social class, great financial lucidity, very social temperament and closest contact to scientific sources and interaction with other innovators (Rogers 1962 5th ed, p. 282).

Early Adopters (13.5%) are the second fastest category who adopt an innovation. They have the highest degree of opinion leadership among the other adopter categories. Their characteristics are younger in age, higher social status, more financial lucidity, advanced education, and more socially forward than late adopters. More discrete in adoption choices than innovators (Rogers 1962 5th ed, p. 283).

Early Majority (34%) adopt an innovation after a varying degree of time. This time of adoption is significantly longer than the innovators and early adopters. As a matter of fact, they tend to be slower in the adoption process, have above

average social status, contact with early adopters, and seldom hold positions of opinion leadership in a system (Rogers 1962 5th ed, p. 283)

Late Majority (34%) will adopt an innovation after the average member of the society. Their approach to an innovation is sceptic and late.

Laggards (16%) are the last to adopt an innovation. Unlike some of the previous categories, individuals in this category show little to no opinion leadership. They are against change-agents and tend to be advanced in age. Typically focused on "traditions", likely to have lowest social status, lowest financial fluidity, be oldest of all other adopters, in contact with only family and close friends, very little to no opinion leadership[2].

Figure 2: Normal curve of adopters
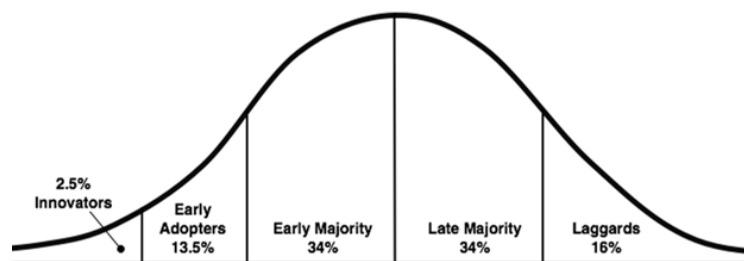
Source: Revisited Rogers' research (1962)

So, introducing Rogers 'model in the present study, it becomes more and more interesting analysed the interaction between consumer perception of reality with AR and how this one could affect decision-making process in order to define a new framework of analysis and development in the 4F of "Made in Italy" brand, with the following research questions:

RQ1: How Augmented reality would affect a consumer's purchase journey?

RQ2: What are the benefits perceived by consumers during an AR experience?

RQ3: How AR is perceived referring to different kinds of sectors by consumers?

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[2] Data access on 8th February 2019 and available at the following link:
https://ondigitalmarketing.com/learn/odm/foundations/5-customer-segments-technology-adoption/

Next section explain methodology used to choose the sample of customer, the sector of analysis and, moreover, scientific methodology used to analyse data gathered in this study.

2.3. Methodology

The aim of this research is to evaluate the impact of AR on customer perception through qualitative research, using an inductive approach. Data has been collected in Italy. For the collection of Data, we chose four different sectors that represent the 4F of "Made in Italy" brand, that means "Food", "Fashion", "Furniture" and "Ferrari/Automotive"[3].

This exploratory study took place in the city of Turin and Cuneo in Piedmont Region (North-West Italy) under the use of a mobile application, created by a company of Padova (North-East Italy). Consumers used this mobile app thanks the use of Author personal smartphone (a Samsung Galaxy S3 Duos) in a quiet and cosy room, to avoid any kind of external influences and noises.

Piedmont was chosen because many excellent companies in the "4F" sector are or were settled there, as "Fiat" (now "Fiat Chrysler Automobiles") and "Carrozzeria Ghia" for the Automotive sector, "Ferrero", "Martini and Rossi" and "Lavazza" for the Food sector, "Borsalino" for the "Fashion" and "Alessi" and "Bialetti" for the Furniture sector.

The sample have been selected in the two cities, and it consists in twenty Piedmont consumers.

Thus, we have interviewed twenty customers in the North-West Italy from the 19th of November 2018 to the 30th January 2019. The choice of interview 20 people comes from Glaser, Barney, Strauss and Anselm (1967)' s study, where they have suggested to interview 20 or so people as a qualitative guideline for interviews.

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[3] 4F definition comes from an English translation from the "4A" sectors, which are "Alimentare" (Food), "Abbigliamento" (Fashion), "Arredamento" (Furniture) and "Automotive" (Ferrari/Automotive). Explaination available at the following link: https://www.ilsole24ore.com/art/commenti-e-idee/2014-04-08/quel-nuovo-made-italy-protagonista-mondo-085636.shtml?uuid=ABoVqD9 (Access on 29th October 2018).

70% of the interviewed are women, 40% of them aged between "18-25" years (Table 1).

Table 1: Preliminary sample of analysis

Gender	14 female, 6 men
Age	8 "18-25" y, 3 "26-29"y, 1 "35-39"y, 1 "45-49"y, 4 "50-54"y, 1 "55-59"y, 2 "60-65"y
Status	7 Not married, 7 Married, 4 Cohabitant, 2 Widow/er
Education	6 Secondary school, 1 Professional qualification, 4 Diploma, 7Undergraduated degree, 2 Postgraduated degree
Residence	North-West Italy
Professional condition	8 Employed, 3Entrepreneur/self-employed, 5 Students, 4 No professional condition
Average number of smartphones	1.1
Average number of tablets	1.45

Source: Personal elaboration

After the collection of data, we coded them into the variables used by Mahajan, Muller and Srivastava (1990), id est age, profession, education and income[4], Then we stated 7 interviewees as "Innovators", 7 as "Early adopters", 4 as "Early majority" and 2 as "late majority". The choice of using Rogers' study is mainly due to understand consumers' readiness to adopt innovative technologies (Parasuraman, 2000). Then, Rogers' classification claims of three characteristics,

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[4] Occupation is reported as a nominal variable.
 Age: 1 = <25, 2 = 25-34, 3 = 35-44, 4 = 45-54, 5 = >55.
 Education = <high school, 2 = high school, 3 = some college, 4 = college graduate, 5 = master's, 6 = PhD.
 Income €'000: 1 = <15, 2 = 15-24, 3 = 25-34, 4 = 35-49, 5 = 50-74, 6 = 75-99, 7 = 100-149, 8 = 150+.
 Profession: 1 = Professional, 0 = Non professional condition
 Source: Mahajan, Muller and Srivastava, 1990

which allows its usability in research: (a) first of all, it is simple and easy to use, then (b) it offers standardized categories, comparable and replicable across research. Then (c) the normal curve can be linked and predicted to the adopters' categories (Mahajan, Muller and Srivastava, 1990).

The mobile application used is market based, and respondents follow a semi-structured interview, where firstly it had asked them to answer some questions about their use of mobile internet in their daily routine, and then to start with the scanning of some pictures, using Pop-Code technology (Choi, Lim and Jeong, 2014), using the mobile app by one of the Author personal smartphone.

Then the interview is divided into six parts: first of all, it was analysed the perceived use of AR technology by respondents (Javornik, 2016; Fortin and Dholakia, 2005; Petty, Cacioppo and Goldman, 1981; Van Noort, Voorveld and Van Reijmersdal, 2012; Poushneh, 2018), passing in analysing each sector of "Made in Italy", using the mobile application before to answer the questions. Then the consumer engagement and experience using AR technology was investigated (Lemon and Verhoef, 2016; Kang and Zhou, 2017) to understand the comprehension and hypothetical usage of AR by consumers. The fifth section was focus on the consumer resistance to innovation (Ram and Sheth, 2015) to try to understand if he/she was (a) disinclined to adopt innovations (inertia), (b) not risk taker, postponing the adoption (active resistance) and (c) unsuitable of innovation, deciding to launch an attack against its adoption (very active resistance).

Then the purchase decision was analysed, divided in the consumer journey theorized by Lemon and Verhoef (2016, p. 73), that means the pre-purchase, the purchase and the post-purchase stage.

At last, the demographics section clusters consumers by ages (Brace, 2018), status, education (Siamagka and Balabanis, 2015), residence, income (Siamagka and Balabanis, 2015) and professional condition.

Interviews lasted around 40 minutes and they were tape-recorded, verbatim transcript and translated into English.

They took place in the city of Turin and Cuneo from the 19th of November 2018 to the 30th January 2019. As a part of the research, respondents' experience an AR market based mobile application, before reply to 42 questions.

Next section wants to analysis the preliminary findings of the present research.

2.4. Discussion of results

In the present study, we conducted an inductive data analysis where thanks to the classification of innovation adopters by Rogers (1983) we could find three main aspects referring to customers' perception of AR technologies, which extend knowledge on omnichannel adoption

1) In line with Rosenbaum and Wong's study (2015), individual presents both favourable and unfavourable belief on AR. As a matter of fact, all of them are curious in trying for the first time this technology, even if they don't trust it at all, for instance:

"It is curious, let's see what they invented this time, I am a little reluctant to use all this technology, because it detaches us from reality, we lose the horizon. It could be useful for work or during a break, but the problem remains that we are subject to using too much technology" (Simona, 24 years).

2) Consumers are influenced by their expectations referring to their belief on AR technology (Roy et al., 2018), for example:

"I think the technology has gone much further than a few years ago. It may be interesting about online sales, but you must already have a bit of knowledge about the product, in the sense that you are already a customer of that brand, and you just want to understand what effect it can give you, perhaps with a different colour" (Diego, 50 years).

3) If consumers are optimistic and present innovativeness regarding AR technology, they are more receptive and interesting in try it (Parasuraman, 2000).

As a matter of fact, those who present discomfort and insecurity are less participative during the experiment with the AR mobile application, for instance:

"I don't care about this technology and I don't know if consumers could be interested" (Marita, 61 years)

"I have no resistance to innovation. If a technology interests me and intrigues me, as soon as possible I try it immediately" (Sarah, 24 years).

Moreover, three conceptual categories have been designed, to discuss the following aspects:

1. Degree of consumers engagement with AR
2. Benefits of AR purchase
3. Customer perception about the more appropriate sector for AR

1. Degree of consumers engagement with AR

Vivek, Beatty and Morgan (2012, p.133) describe consumers engagement (CE) as "*the intensity of an individual's participation in and connection with an organization's offerings or organizational activities, which either the consumer or the organization initiates*". In this term, Data gathered show how there is not yet an engagement between customer and augmented reality, moreover due to the lack of knowledge and comprehension of this technology.

As a matter of fact, none of the respondents have ever bought using AR before this interview and never of them have any friends or relatives, who have bought using AR (RQ1). Only one of the respondents has experimented AR during her shopping journey, without conclude the purchase of this know and famous perfume. She has been attracted by the QR-Code technology on the window of a perfumery about the advertising of this product.

In addition, the use of innovative technologies such as AR in consumers' shopping journey could save time and money, even if many tools penetrate consumers' privacy:

"*We live in a world where we have little time for ourselves. My thought about this situation of being controlled by technology is that from the point of view of consumption it helps to purchase. I'm glad of being controlled by companies, because it speeds up the buying process, making me save time for other activities*" (Ingrid, 26 years).

But this use is not the only one of AR gathered by interviews. As a matter of fact, AR could be implemented for projects and work activities:

"*I see augmented reality very useful for advertising purposes, for example to personalize objects and location. To play instead I would use more advanced technologies such as the PlayStation 5 or virtual video games*". (Andrea, 24 years)

"*Personally, I would use augmented reality for jobs or projects and not for leisure*". (Silvia, 24 years)

In this term, companies which develop mobile applications have a high power to show what they want to consumers (Liao, 2014, p. 323).

As a matter of fact, some respondents have affirmed the following statements during the interview:

"*I would not like augmented reality to bring the consumer into deception, being an illusion!*" (Silvia, 24 years)

"*Augmented reality could help in the decision-making process, but it remains that it is always someone else who shows you what and how to see it*". (Simona, 24 years)

"*This program has been studied by someone and I see what he has imagined. So, companies create it as they think, influencing the thoughts of the end customer*". (Monica, 39 years)

Even that, technical problems during the use of the mobile application during the interviews have peeved many of the interviewed. This situation has destroyed

their beginning "WOW" effect, let us understand an important relationship between this psychological effect and the use of augmented reality during a purchase. As a matter of fact, for many of the interviewed, the try of this new technology and their curiosity about AR were more important than the purchase aspect of this technology:

"A brand can tempt consumer in purchasing with AR. In fact, people come to you only to try on the new technology rather than making a purchase of a product". (Marta, 25 years)

"Augmented reality can give me an idea of the product, helping to see it better, but I would never buy it online. It is nice to see, such a catalogue". (Laura, 60 years)

Notwithstanding, this technology is not easy to understand in consumers first touch:

"What do I do now?" (Luana, 50 years)

"I don't understand its use" (Giuseppe, 54 years)

"With this app I do not see great added value" (Matteo, 23 years)

"I do not understand it so much, I do not understand the usefulness and what it is for" (Laura, 60 years)

These data show how consumer engagement is not so deep in augmented reality technology, moreover due to a lack of knowledge of this instrument and its infancy stage. As a matter of fact, many implementations could be done to create a more involving experience from the consumers, starting from the implementation of the mobile app using during the exploratory stage. Indeed, this application has been recognized as "too sensitive to touch" and it often disconnected the image for technical reasons.

So, interviewees are not satisfied with the experience, wanting to deepen more even if the mobile application does not allow it.

2. *Benefits of AR purchase*

Stated the absence of engagement in this preliminary phase of the research, data was gathered about those elements, able to tempt the purchase with AR. So, the characteristics (RQ2) declares by customers during the interview stated as benefits are the followings:

"*The rapidity to receive the product at home and moreover in try on before*" (Ingrid, 26 years)

"*The free of choice during the decision-making process, where there is not a vendor, who tries to sell you anything she/he can*". (Myriam, 25 years)

"*The possibility to personalize how you prefer the product, try on at home*". (Ludovica, 24 years)

Only one of the statements refers to the technology itself:

"*The curiosity to use a mobile application to see what there is not on the sheet of paper*". (Monica, 39 years)

So, in a preliminary phase, customers focus moreover on the physically aspect of products, make a comparison in their mind with online purchase and not focus their attention on all the possibilities given by this new type of technology, which is a little unknown and not used yet.

Moreover, many of the interviewees declare distrust in technological methods of purchase, stating the possibility to buy a product with AR only if it has a little dimension:

"*I would try to make a purchase out of curiosity, maybe something small*" (Marta, 25 years)

"*I would try at the beginning with something small and not too expensive, because I do not have opinions of other people*" (Ludovica, 24 years)

As a matter of fact, in this respondent's mind a little object could avoid risk to occur in a fraudulent sale.

In addition, to the question "What element could you convince to make a purchase with AR?", the quotes above could be categorized into six different benefits, coming from the use of AR in purchase: (a) evocative capacity, id est augmented reality helps in the decision making process offering more details for the purchase, (b) giving additional information, (c) more comfort purchase, (d) personalization process, (e) freedom of choice, (f) reviews of other consumers. Evocative capacity is characterized by terms such as "help", "details", "aesthetic"

"Augmented reality helps you to choose the product" (Rosa, 53 years)

"Accuracy in details helps you choose the product that show you" (Simona, 24 years)

"It can give me a more detailed idea to see the product" (Laura, 60 years)

"It helps me to eliminate aesthetic doubts" (Alberto, 27 years)

"Approach the reality. A 3D shoe seems aesthetically more real to me" (Sarah, 24 years)

"Augmented reality creates new stimuli and new ideas, helping me in the decision" (Roberta, 28 years)

Moreover, augmented reality could also offer to the customer pre-purchase stage more information *"The augmented reality sees additional information and characteristics, which cannot be seen from the simple sheet"* (Monica, 39 years), not only in the typical shop, but also at home: *"The element that could convince me to use augmented reality to make a purchase and the convenience of trying it easily from home, without going to a physical store"* (Giuseppe, 54 years).

In addition, the high possibility to personalize products and the freedom of choice, make this technology particularly useful for those consumers who wants more from the standardized product:

"The aspect that most interests me is personalization. In fact, this element could bring people closer to a company, because you can buy a self-made object. Furthermore, by making it online, the service is expected to be faster" (Andrea, 24 years)

"The high degree of choice could approach the purchase with augmented reality. There I choose, there is no influence from anyone else" (Myriam, 24 years)

Finally, for those customers who don't feel too much in touch with digital technologies, the introduction of other customers' review could facilitate the interaction with augmented reality, as stated by some of the interviewees: *"I think that reviews from other consumers, their personal stories, could approach me to make a purchase with this technology"* (Daniela, 45 years)

So, data gathered show how many benefits this technology has, notwithstanding it is still in its infancy. As a matter of fact, the above exploratory findings suggest some implementations of this tool to be more adaptive to all the categories of customers analysed in this study, in particular referring to the "4F" of the "Made in Italy" brand, as shown in the following section.

3. *Customer perception about the more appropriate sector for AR*

In all the word, "Made in Italy" brand is immediately associated with the connotation of a beautiful product and tasteful and genuine ingredients (Paulicelli, 2014; Bertoli and Resciniti, 2013; Aiello and Donvito, 2011; Temperini, Gregori and Palango, 2016).

Referring to the question "What are the thought that came in your mind when you used AR?", the perception of AR in the "4F" of the "Made in Italy" brand (RQ3), responses are balanced between the significance of this technology to be "an additional service" and the "incomprehension of this tool", as emerged from the quotes below:

"This technology could be an added service for a company, but it has still many limits to go over, as the curiosity at the beginning, which may diminish over time.

It must enter into the daily routine or there must be a considerable number of people adopting it so that other consumers also make it their own". (Ingrid, 26 years)

"I would like to see better inside the individual rooms for example if there are toys on the floor or hanging pictures, but I do not do it. For this reason, my initial curiosity is not satisfied". (Rosa, 53 years)

"I'm curious to know what they invented this time, but I remain reluctant to these technologies that move us further and further from reality. Furthermore, the connection loss count is unnerving." (Simona, 24 years)

"I'm curious to explore the house, but it creates dissatisfaction because it loses contact." (Andrea, 24 years)

"I don't immediately understand its use" (Giuseppe, 54 years)

"Interesting! You can try a moment for curiosity but not that much" (Laura, 60 years)

"Satisfactory, even if I wonder how I can interact with this room, for example change it or if it's just a way to visualize the interior" (Ingrid, 24 years)

"Interesting now that I understand what it is for" (Matteo, 23 years)

Moreover, two of the respondents have noticed annoyance to the eyes during the experiment, rejected the smartphone in a first moment.

This data points a particular attention on the "Wow" effect described by Cohen (1997) assumes a double role: firstly, it could be a marketing strategy to attract customers to try a new experience of purchase in a first moment, but on the other hand it could be a barrier to retain them in a long view as stated by the quotes above, where technical problems loose this attracting element, creating frustration and dissatisfaction.

Notwithstanding, data gathered illustrate as the most attractive sector to make a purchase the "Food and Beverage" one, because respondents stated this video is both particular "evocative" of personal infancy and helpful to whom want to start cooking particular dishes. This result is followed by the "Furniture" one, which is "*easy to test*", giving the possibility to the more scared about digital payments to "*buy little objects to test this new type of purchasing*" and the Ferrari sector, due to the usability about companies and professionals.

On the other hand, the less attractive sector is the "Fashion" one, because in respondents' point of view here is both the lack of touch in materials and the lack of trying physically a cloth:

"*There is not the possibility to touch the material of clothes*" (Paolo, 59 years)

"*Virtual mirrors let others see how what I am wearing…They must do their business! Why don't use virtual mirrors in cabins to maintain a greater privacy!*". (Ingrid, 26 years)

"*I cannot find the utility. It's like having a clothing site*" (Simona, 24 years)

"*I would not buy a dress with augmented reality. I like to try them*" (Alberto, 27 years)

"*It seems to me all too fake as it is structured now. If it were more realistic it could be useful, but I still think that clothes and shoes should be tried*" (Silvia, 24 years)

Furniture sector is the second one, whose consumers dislike in augmented reality purchase. As a matter of fact, they state to *"not see the usefulness, it's like a flyer"* (Sarah, 24 years), and *"do not understand what situation you could use, placing the furniture in space"* (Matteo, 23 years).

Nevertheless, this disinclination in the usage of augmented reality in these two sectors seems to be embedded in the Italian traditional culture, where the sense of beauty of the "Made in Italy" brand ought to be physically seen or touch.

In this term, we believe augmented reality could be not so useful in this brand, due to the traditional characteristics of chic, beauty and genuineness that distinguish it.

Despite that, by data and observation during the interview we state a big interesting in using AR technology in try on different products, focalize the hedonic aspect of this technology, at the expense of the utilitarian one, referred by only two of the interviews as just argued.

2.5. Conclusion, implications and further research

The aim of our research was to evaluate to what extent customers perception of the using of digital channel via AR application during their customer journey.

Our research shows how the use of augmented reality is still scarce in consumers' purchase journey during their purchases, because they often don't understand well the function of this technology even if the majority of them could be classified as ready to adopt innovative technologies.

Data gathered brings to light that some sectors in the "Made in Italy" context are more performing than others.

Notwithstanding some graphical limitations of the app used, consumers agree that both the "Furniture" and "Ferrari-Automotive-Industry" are the sector where AR could be more attractive. Here personalisation of contents could be a valid solution to allow consumers in an omnichannel world, where they can experience the try-on at home and finalize the purchase everywhere (online or offline). This integration of channels shapes boundaries between technology and consumers, combining the two worlds into the same shopping journey (Scholz and Duffy, 2018).

Conversely, the impossibility to touch the materials of clothes and to taste foods reduce attractivity in the "Fashion" and "Food" sector of "Made in". For this reason, we believe interesting managerial contributions comes thanks to the knowledge of this context limitations.

In terms of theoretical implication, this study contributes in omnichannel retailing literature, enhancing knowledge on consumers' perception on immersive technologies in a virtual purchase (Teas, 1993; Brown and Swartz, 1989; Parasuraman, Zeithaml and Berry, 1988). Results confirm how consumers are sophisticated in their interactions between product-experience-expectations on a technology (Parasuraman, Zeithaml and Berry, 1988) and that they can express both favourable and unfavourable beliefs (Rosenbaum and Wong, 2015). This is due to their TR, that is their propensity to embrace or not an innovative tool (Parasuraman, 2000). Referring to AR, consumers are not still ready to adopt the technology, even if they understand the main benefits. Thus, also consumers' engagement during the three steps of the purchase journey (Lemon and Verhoef, 2016) is still low.

Then, in the dynamic business environment data gathered brings significant managerial implications for companies. Instead, depending of which sectors they are, companies could be more attractive for consumers in term of channels offered while shopping. Hence, companies could implement an omnichannel environment, offering monitor screen or tablets in-store moreover in those sectors where material and taste is not predominant to finalise the purchase.

The present analysis would advise retailers to better exploit AR technology to create enhancing consumers' experiences. For instance, this immersive technology could be used to constantly interact with consumers, enhancing their purchase expectations and get them confident about their purchase decision thanks to the virtual try-on. In this case, retailers could reduce the phenomena of showrooming, because experiencing the product before the purchase could reduce their uncertainty on the product. Then, collecting constantly feedbacks and information from them to understand their trends and needs, retailers could start to implement AR in "Fashion" and "Furniture", which are the two sectors more attractive for consumers under investigation, creating sensorial experience with sounds and smells to enhance consumers' emotional feelings while shopping. Finally, this study is not without any limitations. Firstly, it focuses on a subset of the possible determinants of AR adoption during a purchase. Thus, this

preliminary stage of the research has shown first of all the graphics of the mobile application used to the semi-structural interviews wasn't so realistic as the customers' expectancies, destroying the initial curiosity. So, in this case the coming "WOW" effect consumers have at the beginning of the interviewed was destroyed, creating incomprehension of this technology and unwillingness to use the AR technology during their purchase.

Then another technical limit was the dimension of the smartphone screen. As a matter of fact, it was not big enough to involve totally the respondents in the experience. For this reason, we believe that the same interview conducted with a tablet or a bigger monitor screen could receive different answers and bigger implementations in the analysis.

About the sample, it was on twenty consumers in North-West Italy, so it could be expanded, reproducing the same interview also to other countries, making comparison between the cultural context of this analysis.

In terms of futures research this study could be replied with a bigger sample of analysis, which considers a congruent number of adopters, following Rogers' classification (1983) and making a cross-sectional analysis between different sample interviews in term of cultural mindset.

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CHAPTER 3: ARe you ready to use it?: A study through retailers' readiness perception on technological adoption in-store

Abstract

Recently, the importance of adopting digital technologies in retailing increased. Thus, many scholars focalize their attention on the relationship between consumers' behaviour in moving from a multi-channel retail to an omni-channel one. Notwithstanding, literature on retailers' preparedness perception of digital technologies is very few and fragmented.

Thus, the present study aims to explore how SMEs' perception on their preparedness in adopting immersive technologies, with a focus of the most easiness one: Augmented reality (AR). Building on qualitative data from multi-case study, findings reveals than retailers are conscious of benefits of adopting AR, although their use is still primordial (QR-Code). The paper ends summing up these results, which contribute in expanding knowledge on omnichannel retailing literature. Managerial implications for practitioners are argued, in term of benefits and inhibitors to introduce AR in-store.

Keywords: Augmented reality; Immersive technology; Retailing; Perceived readiness; Omni-channel.

3.1. Introduction

Interactions between retailers and customers are changed with the introduction of digital technologies (Poushneh, 2018; Pantano, Rese and Baier, 2017) and the involvement of multi-channel model during purchases (Verhoef, Kannan and Inman, 2015). As a matter of fact, online retail marketing channels (e.g. ATM/Kiosk, mobile phone, Internet, and interactive television) and offline ones (e.g. in-store, telephone, mail order and direct selling) have shaped their boundaries (Beck and Rygl, 2015; Barlow, Siddiqui and Mannion, 2004), integrating online into the physical space and moving from a multi-channel to an omni-channel retailing model (Rigby, 2011).

Omni-channel model refers to the transaction from a *"brick-and-mortar retail stores"* where consumers were allowed *"to touch and feel merchandise and provide instant gratification"* to a more evolving experience where *"distinctions between physical and online will vanish, turning the world into a showroom without walls"* (Brynjolfsson, Hu, and Rahman, 2013, p. 23).

In the academic world there is a great research interest on customers' perception and behaviour on the introduction of digital and immersive technologies in-store, whereas few studies analyses retailers' preparedness perception to adopt or not these advancements, going deeper on their perception in this new retailing approach (Lee et al., 2019).

Retailers' preparedness refers to their perception to be ready to introduce an advanced technology in their business. It could depend from their knowledge on the technology (Yu and Tao, 2009), on technology consistency with the core competence, structure, value and culture of the organisation (Liang et al., 2007), with prior adoption of other "fresh" technologies (Hoffman and Klepper, 2000) and on perceptions of its benefits (Beatty et al., 2001).

On this way, Cruz et al.'s (2019), Scholz and Duffy's (2018) and Baier, Rese and Schreiber (2015) studies show some examples of big companies (i.e. Sephora and Ikea), which have introduced immersive technologies both to adapt their business to this incoming new type of consumers (Hilken et al., 2018). But what about Small and Medium Enterprises (SMES), which are worldwide very significant in term of innovating activities in the economy? (Perry and Towers, 2009). Do retailers perceive to be prepared for this adoption? Have they really understood benefits and inhibits of immersive and "fresh" technologies?

To answer to these questions, we decide to focus on just one immersive technology, augmented reality (AR). Our choice is made by its
 easiness to use everywhere, just using a smartphone or a tablet to scan an image or a QR-Code, without any specific instrumentation as Virtual Reality (VR) needs.

So, the present paper is organised as follow: first part is devoted to analyse literature on AR adoption and retailers' perception to be prepared to adopt or not "fresh" technologies.

Then, methodology used is discussed, analysing four case studies in the Furniture and Interior design sector. The paper ends highlighting the main theoretical and managerial contributions, arguing main limitations and suggestions for further research on this topic.

3.2. Literature review

3.2.1. Augmented reality in retailing: from a multi-channel to an omni-channel experience

Innovations are changing the game of retailing, enhancing consumers' shopping experience in-store with digital contents (Grewal, Roggeveen and Nordfält, 2017). The introduction of digital technologies in-store revolutionized retailers' work from the early 2000s, when retailers introduced new technologies in both physical and online stores to offer a more digitized environment, where consumers could implement their purchase, creating a more involving omni-channel experience (Pantano, 2010: 2015; Vanheems, 2015). Hence, AR is indeed a prominent immersive technology, able to connect digital and physical world, whose promises of adoption in the next few years are vast (Grewal, Roggeveen and Nordfält, 2017a; Perkinscoie report, 2019). On this omni-channel context (Rigby, 2011), researchers are divided into two different approaches: (a) the first one is a "positive" approach to problematisation of AR (Alvesson and Sandberg, 2011), whereas (b) the second one is a disruptive approach, perceived technological adoption as a moment of break in science (Kostoff, Biylan and Simons, 2004; Knights, 1992).

In this third wave of IT-driven transformation (the Internet of Things and smart connected products) (Porter and Heppelmann, 2014), AR assumes a "positive" function as an interactive and persuasive technology (Grzegorczyk, Sliwinski and

Kaczmarek, 2019), which could be particularly attractive in retailing to facilitate consumers to live an omnichannel experience during their purchase journey in-store (Hilken et al., 2018). This is possible involving computer-generated virtual images on reality, letting consumers interact with virtual contents in real time (Dey et al., 2018). So, boundaries between online and offline are blurred (Huang and Liao, 2015) and consumers could experience an embedded, embodied, and extended experience (Robbins and Aydede, 2009; Semin and Smith, 2013).

The second approach analyses AR as a *disruptive* tool for companies' business, which triggers big changes in consumer behaviour and industry dynamics (Spreer and Kallweit, 2014). For instance, AR could destroy the dominance of in-store promotions and packaging (Hilken et al., 2018), enhancing customer experience in an omni-channel environment (Spreer and Kallweit, 2014).

Here, researcher perceive a break between traditional and online retailing in using AR technologies in-store, in particular due to a small sample of consumers attracted by this technology on the market and a short-term high financial and resources investment into the technology in spite of its profitability (Kostoff et al., 2004).

Notwithstanding these interesting implications AR have on a business, companies are not yet ready to apply a successfully integrated digital experience in-store (Hilken et al., 2018). Here, the lack of knowledge of generated profits with the introduction of AR in companies' business (Bonetti, Warnaby and Quinn, 2018), the scarse promotion of this tool when used (Zagel, 2016) and consumers level of cognitive innovativeness play an important role in companies' adoption of AR.

Thus, from this theoretical framework, the following research questions come up:

RQ1: Which are retailers' motivators and inhibitors to adopt or not AR in retailing?

RQ2: How can retailers balance "positive" and "disruptive" aspects of AR in an omni-channel experience for consumers?

3.2.2. Retailers' preparedness perception in introducing e fresh technologies in-store

Literature on retailers' perception is fragmented (Pantano and Viassone, 2015). In marketing field, to test if a technology could be adopted or rejected for a business, research uses the Technology Acceptance Model-TAM (Davis, 1986). During the years, this model was integrated and expanded by many scholars (Davis, Bagozzi and Warshaw, 1989; Venkatesh and Davis, 1996; Venkatesh and Davis, 2000; Venkatesh, 2000) to find an appropriate and rigorous scale to measure the acceptance of a technology throw two types of perceptions: (a) perceived usefulness (PU) and (b) perceived ease of use (PEOU). PU is defined as "*the degree to which an individual believes that using a particular system would enhance his or her job performance*", whereas PEOU is the "*the degree to which an individual believes that using a particular system would be free of physical and mental effort*" (Chuttur, 2009, p. 5).

Ease of application was particularly stressed in literature by interpreting companies' willingness to adopt or not a technology (Yu and Tao, 2009) and perceived benefits accrue to the new technology. (Bennett and Savani, 2011). Often, companies perceive a technology "easy to use" when they have just adopted "fresh IT applications" (Bennett and Savani, 201, p. 312), which affect their level of preparedness to adopt advanced innovations.

Despite many limitations in generalising results (Lee, Kozar and Larsen, 2003), due to its subjectivity in measures selected (Legris, Ingham and Collerette, 2003; Yousafzai, Foxall and Pallister, 2007a:2007b), theoretical relationship between constructs (Bagozzi, 2007), and the relationships between variables (Yang et al., 2003), TAM is the most used model to evaluate the adoption of an innovative technology in a business.

Although this model is useful in quantitative studies to measure the level of perceived easiness and usefulness of a technology, little has been investigated referring to retailers' readiness perception to adopt or not a technology (Bennett and Savani, 2011).

Hence, readiness refers to individuals' propensity to use new technologies to

accomplish some goals both at work and in their personal life (Parasuraman, 2000). Thus, readiness is a psychological state of mind which determine individuals' predisposition to use technologies (Elliott, Hall and Meng, 2013).

Prior researches have investigated consumers' technological readiness, to understand if they are or not prepare to use advanced technologies in their lives (Wiese, Humbani, 2020; Vaittinen and Martinsuo, 2019; Elliott, Hall and Meng, 2012:2013), so little was investigated referring to retailers (Bennett and Savani, 2011)-

The level of preparedness of a company, as the state of readiness for the introduction of ubiquitous computing (Bennett and Savani, 2011), could affect the perception of the technology, along with its benefits (Zheng et al., 2006). A business that apply a strategic orientation to introduce advanced technologies will be more ready to take the issue of implementation seriously (Hoffman and Klepper, 2000; Santala and Parvinen, 2007). Adopting a strategic orientation means investing long term in advanced technologies regardless of current economic circumstances (expansionary vs recessionary) (Bennett and Savani, 2011). In addition, in some companies, senior managers strongly recognise the significance of introducing advanced technologies for the future well-being of their company (Yu and Tao, 2009), recognising that technological adoption could enhance companies' performance (Davis, 1989).

So, literature describes two determinants of retailers' readiness for the introduction of a new technologies, which are: (i) top management support and (ii) technology adoption factors (Bennett and Savani, 2011).

Top management support refers to the level of management in recognise the importance of technologies for the existing business (Yu and Tao, 2009). It means that those companies where senior managers are aware and sensitive to the influences of technological benefits will be more inclined in adopting advanced technologies (Bennett and Savani, 2011).

Then, technology adoption factors refer to perceived benefits in term of easiness and usefulness embedded into a technology. The greater the benefits perceived to results from the application of the technology, the more likely than top

management will support the adoption into the business (Bennett and Savani, 2011).

Consequently, from this theoretical framework an interest in understanding retailers' readiness perception towards immersive technologies, comes up:

RQ3: Which is retailers' readiness perception on introduce immersive technologies in-store?

3.2.3. SMEs context

In term of economic relevance, the 76% of enterprises active in Italy are Small and Medium Entreprises (SMEs), representing the backbone of this country (Banca IFIS, 2018). In particular SMEs represents the 81% of the workforce and the 68.1% of the value added in Italy (http://doitbetter.info/smes-overview/).

The Italian National Institute of Statistics (ISTAT) defines SMES as firms with fewer than 250 employees (Istat, 2019).

Worldwide, SME are regarded as an important business in innovating activities in the economy, along with its function of provider of employment and a driver of competition (Perry and Towers, 2009; Stanworth and Gray, 1991).

Despite its limitation in investments, finances, and human resources (Mezgár et al., 2000; Jones, 2007), SMEs are considered more innovative and amenable to evolution than bigger companies (Storey, 1994).In this vein, a huge potential is given to SMEs to adopt innovative technologies in their business. In the context of SMEs, CEOs' perception of innovation is essential (Lee and Cheung, 2004) due their role of decision-makers (Roger, 1995; Thong and Yap, 1995).

As a matter of fact, the formation of an attitude towards new technologies will define its adoption or rejection by the company (Roger, 1995).

Thus, the level of consumers readiness, retailers' perceived benefits (such as saving time, facilitating information, accessing to higher number of customers, accessing to better suppliers) from the introduction of the technology into the business and the level of financial resources invested into IT investments influence SMEs to adopt new technologies in retailing (Lee and Cheung, 2004).

3.3. Methodology

With the view to contribute to the extension of the scientific debate on retail and retailers' readiness perception on AR technology, the present study adopts an explanatory approach to provide an answer to the abovementioned three research questions.

Based on the logic of a multiple case-study methodology (Eisenhardt, 1989), this study analysis four enterprises, working on the Furniture and Interiors sector. We opted for this methodology because case-study are made for exploring new processes and behaviors, which are still little understood (Hartley, 1994). Moreover, it makes possible the reaching of some information, which could be difficult to gather using other qualitative methods (Sykes, 1991).

We decided to collect data on four small and medium enterprises (SMEs), following Eisenhardt's study (1989).

A qualitative method was chosen, due its capacity to go deeper on a phenomenon, explaining complex dynamics and avoiding a descriptive approach (McKeown, 2004).

3.3.1. The research context

We have decided to focus this study on the context of Furniture and Interiors sector for different reasons. Firstly, some scholars pointed out the effective emergent possibilities of immersive technologies as augmented reality and virtual reality (VR) applied in Furniture and Interiors sector (Siltanen and Woodward, 2006; Irawati, Green, Billinghurt, Duenser and Ko, 2006). Moreover, Serravalle, Vanheems and Viassone (2019) and Phau and Meng Poon (2000) found consumers' willingness to purchase a low outlay product using digital technologies is higher than a more expensive one in this sector.

Secondly, our attention moved to decide whether focalise the study on AR or VR technology. In this term, the Perkinscoie report (2019) makes an overview on the immersive technologies, evaluating AR more promising than VR in term of

communication in the next five years.

Then, we decided to set the data collection on SMEs in Piedmont, because this region is a destination with a growing reputation in digital technologies since 2016, when Turin was nominated as Smart city (Crivello, 2015). Moreover, a report by Banca IFIS (2018) states that in Italy there are 760,000 small and medium enterprises (SMEs), i.e. the 76% of the total amount of companies (996,000).

So, our sample is representative of the Italian Furniture and Interiors market.

3.3.2. Data collection

This study followed a two steps method. We firstly conducted an investigative analysis on different secondary sources, such as official communication tools (i.e. official websites), documentary information and social network pages (e.g. Facebook and Instagram). In this way, we determined the relevance of these enterprises, having higher information to create an interview protocol. Then, the second phases consisted in developing semi-structural interviews for Managers responsible of the marketing strategies. As a matter of fact, interviews are a great way to "open a window" for achieving the research objectives, collecting deeper data on perception (Abell et al., 2008).

The interview protocol was divided into four sections: The first section aims to understand the use of different technologies in-store, along with retailers' perception in their adoption; secondly, we analyse the effective adoption of augmented reality in retailing, to reach a better comprehension of willingness to use or not this kind of technology. Then, third section analyses retailers' perception on immersive technologies and eventually breaks and problems in adoption. Last section collects data on demographical aspects, delineating general information on the interviewer.

The interviews, collected between January 2019 and July 2019, lasted around one and a half hour and they were recorded and verbatim transcribed. Then, we have translated them in English.

3.3.4. Data analysis

Inductive and iterative process (Miles and Huberman, 1984; Strauss and Corbin, 1990) was the base of our data analysis. Transcript interviews were coded following the readiness perception the approach, to understand both which is retailers' motivators and inhibitors to adopt or not AR and their readiness perception referring to immersive technologies.

Hence, following the example of Pantano et al. (2018), we assigned a measure from "weak" to "strong" to the Enterprises interviewed to understand their level of readiness in adopting new technologies.

Hence, we used the two determinants of retailers' readiness described by Bennett and Savani, (2011).

Referring to the top management support we assigned "weak" when there was a scant interest in investing in new advanced project, "moderate" when there was the willingness to improve the technology, but the company was struggling against external constraints (e.g. cost, consumers' traditionalism) and we rated "strong" when the company have just improved one or more immersive technologies.

According to technology adoption factors (easiness to use the technology and perceived usefulness) we assigned "weak" when retailers interviewed state difficulty to understand or use the technology, "moderate" when they argued some troubles at the beginning and "strong" when retailers found easiness and usefulness in using the technology, recognising its benefits in time saving and enhanced experience for consumers.

Then, data were divided into tables to make a simpler comparison between the different cases, identifying the importance of some keywords representing the framework of our analysis.

At the end, we have made a series of interactions between primary and secondary sources to identify deeper theoretical foundations.

3.3.5. Enterprises' profiles

As just abovementioned, the present study consists in a multiple-case study methodology, where the four SMEs interviewed are anonymised. In Table 1 we have briefly described the sample of enterprises interviewed, with the aim to give the reader a deeper comprehension of the sample of our study. For Alpha, Beta and Delta we interviewed the Owner, whereas due to a sudden meeting, the owner of Gamma delegated his Marketing and Communication Manager.

Alpha

Alpha was born in 1975, with the entrepreneurial instinct of a couple from Piedmont (Italy), who decided to create a shop of furniture. In the 80's their children joined the company, slowly starting to enlarge the company both in terms of number of staff and in the services offered to their customers. Alpha has scant knowledge on technologies, confusing kiosks, mobile application and AR. This lack of knowledge affects decisions, which is to follow traditional consumers.

Beta

Beta was founded in 1968 as a design sales point as a B2B and B2C business. In fact, the territory in which it is immersed required mostly the sale and management of classic furniture and the so-called "Arte Povera" ("Poor Art"). Despite this, the innovation that distinguishes this company has made it possible for it to start selling modern furniture right from the start, facing the challenges of the moment.
Finally, through an accurate after-sales service, the company is able to guarantee a constant service over time.
The company has a moderate knowledge on technologies on the market, recognising the difficulty for retailers to adopt new technologies due to a traditional mindset. Beta adopts the QR-Code to show many products they sell, enhancing consumers' experience in searching information on a product. They

had many difficulties to introduce AR at the beginning, due to traditionalism in the company and for this reason they are supported by an external counselling.

Gamma

Gamma was founded in 1980 with the opening of a shop of about 300 square meters in the centre of Pinerolo (TO).

Today the company has three points of sale in the province of Turin. The excellent value for money combined with courtesy, technical and design expertise, reliability, free and continuous assistance over time, plus the 10-year warranty on the furniture are the pillars of development over the years.

Among the next objectives to be achieved, there is the implementation of a commercial network with the formula of affiliation, as well as the opening of an online sales channel for own brand products.

Gamma was the pioneer to introduce immersive technologies in Piedmont, without any difficulty and understanding its usefulness to sell products and activate imagery in consumers.

Delta

Created with the aim of creating linear lighting, Delta is known in Piedmont for the creation and sale of decorative and lighting systems.

Their mission is to provide customer service in addition to a simple product. In fact, according to the type and morphology of the environment, the company creates and sells a finished product, always maintaining a high level of customization.

Delta knowledge on advanced technologies is moderate. As a matter of fact, they have just introduced QR-Code to let consumers find rapidly all the information they need in a so huge catalogue of more than 7000 products. They recognise the significant function of these technologies in enhancing purchase experience and performance for a business.

Table 1: The sample profile

Enterprises	Foundation	Number of employees	Type of market	Revenue	Nature[5]
Alpha	1975	16	B2C	3,000,000 €	SME
Beta	1968	14	B2B and B2C	2,000,000 €	SME
Gamma	1980	10	B2B and B2C	1,850,000 €	SME
Delta	2009	13	B2B and B2C	2,100,000 €	SME

Source: personal elaboration

3.4. Empirical findings

3.4.1. Findings on technological adoption

Our study brings to light that boundaries are not so defined in measuring retailers' readiness perception of introducing AR in store. This is due to a deep lack of knowledge referring to AR and a scant attention of "fresh" technology adoption in general.

As a matter of fact, Italian companies have many difficulties to effort to survive in a such competitive market, and IT adoption in general is postponed.

In addition, companies are driven by a consumer orientation, which is the bigger inhibitor to postpone the adoption of technologies. As a matter of fact, companies are more interested in offering a traditional service, where the vendor is the main actor, rather than an immersive and more involving experience.

"(…) our public and customers prefer to have a real person from whom they receive information" (**Owner of Beta, 49 years**).

From these statements it is clear retailers are a little resistant to introduce AR in their business for three main reasons: (a) a poor knowledge of the instrument, (b)

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[5] The nature of the enterprise has been selected using the CERVED PMI Report (2018, p.9)

a poor response by the market and by consumers, who (according to the companies interviewed) are not yet ready for this digital revolution and (c) a weak level of technological preparedness.

In according to these findings, some studies suggest resistance in introducing AR technology in business is high (Serravalle, Vanheems and Viassone, 2019).

Only one of the enterprises interviewed have just adopted immersive technology, whereas the others have introduced some preliminary software or mobile application for interior design. For instance, Beta uses constantly mobile applications to "*reduce timing of designing*" and Gamma was the pioneer in introducing immersive technology in furniture sector in Piedmont:

"*We are the only ones in Piedmont at the moment that allow the private individual to wear the visor, walk in their kitchen and imagine it already assembled. It feels like you're already there. (…) Using immersive technologies all the efforts you make in marketing, advertising etc. turns for almost 97% of cases into sales*" (Marketing Manager Gamma, 31 years).

3.4.2. Findings on perception approaches

Literature on retailers' perception on digital technologies is very fragmented. So, results from interviews with enterprises show a very disconnected knowledge on AR technology, so also its application is scant and moreover in a primary stage. The most used tool is the QR-Code, which provide a speed-up of communication towards consumers, moreover if the enterprise' business is not known by them:

"*QR-Code is useful to simplify the visualization of our products, facilitating access to their visualization*" (Owner Delta, 40 years).

As stated in the literature section, we have decided to investigate the feature of technological readiness perception by retailers. To reach this aim, we have created a scale of measure as mentioned in the methodological section to rate the two main drivers of readiness' perception (Bennett and Savani, 2011) following the example designed by Pantano et al. (2018).

Table 2 sums up these results gathered by the interviews with the four enterprises.

Table 2: Level of technological readiness perception by retailers

Features of technological readiness perception	Alpha	Beta	Gamma	Delta
Top management support	Weak	Moderate	Strong	Moderate
Technology adoption:				
Perceived usefulness	Weak	Moderate	Strong	Moderate
Perceived ease of use	Weak	Moderate	Strong	Moderate

Source: personal elaboration

Thus, from the analysis of data collected by section two of the questionnaire two main categories affecting retailers' readiness perception on AR are emerged: (a) the resistance to change of enterprises and (b) the utilitarian aspect of this technology when introduced. Unfortunately, without the break of the first category, it is hard for enterprises to understand all the benefits of this kind of technology.

As stated by Markus (1983) enterprises are inclined to use a new technology if they believe and support its use in a business. Without this element, enterprises prefer to reject an innovation, avoiding to taking the risk of failure:

"*The difficulty is always because the mental legacy is always to keep it where you are able to do. So, sometimes it seems new changes makes something more difficult instead of facilitating it*" **(Owner Beta, 49 years).**

Other enterprises are worried about losing their market position in term of quality and professionality, being surpassed by these kinds of technologies. Thus, the commodification of the profession could lead to a disqualification of vendors' professionality, automating a service currently offered to personalize customers' needs:

"I hope AR will not increase purchases on internet at the expense of those in-store" (**Owner Alpha, 39 years).**

The second category describes retailers' perception on AR technology as a useful tool to improve comprehension in the final aspect of a personalize product, testing virtually the product, also thanks to the superimposition function:

"I see particularly useful AR in Furniture sector. Here objects are real, you can change colour, having an immediately try-on of products" **(Owner of Beta, 49 years).**

Moreover, due to its usability AR could enhance customer service in the Furniture sector, enhancing enterprises' visibility in the market. In this way, the introduction of AR in-store should help customers to familiarize with new businesses and new incoming products:

"QR-Code can facilitate access to the display of our products (...). In the near future these technologies will be almost indispensable, because they are very useful to facilitate the sale and to make sure that our business is always displayed and taken into account when it comes to buying a product belonging to our product category" **(Marketing Manager of Gamma, 31 years).**

3.5. Discussion of results

Retailing omnichannel environment is re-shaping the boundaries of businesses (Rigby, 2011; Renko and Druzijanic, 2014). Although many companies are starting to introduce advanced technologies in-store, some of them have still a high degree of reticence in applying technologies. The principal reason, which is coming out from results, it is the lack of deep knowledge around AR technology and a weak level of retailers' preparedness (RQ3). Retailers perceive technology as a possible danger for the position and professionality of the enterprise "*I hope AR will not increase purchases on internet at the expense of those in-store*" (Owner Alpha, 39 years). As a matter of fact, according to retailers interviewed, immersive technologies destroy vendors' professionality, giving the consumers the virtual elements to choose alone. AR and VR are actually just two instruments to enhance consumers' experience (Pantano, Rese and Baier, 2017), not to replace it. The vendors' function is particularly useful to give instructions to consumers to enhance their shopping purchase. So, we believe this professional figure will change in the future, creating a more digital portfolio of experiences.

Thus, there is still a lot of work to do, before arriving to a full comprehension of immersive technologies and the following adoption in-store (Hilken et al., 2018).

Thus, for this reason, we believe retailers' perception is still fragmented about the incoming adoption of technology in businesses, even if we agree many enterprises just perceive technology usefulness (Inman and Nikolova, 2017), where benefits such as cutting costs, new marketing experience and a more extended customer engagement ought to be present (Bonetti, Warnaby and Quinn, 2018; Spreer and Kallweit, 2014; Pantano, 2015).

In addition, as showed by literature companies who have just experience "fresh technologies", having a higher level of exposure to knowledge, are more willing to improve enterprises' innovation performance (Rodan and Galunic, 2004). As a matter of fact, when the enterprise has a low exposure to the knowledge of a technology, it has a greater resistance in introducing it in the business.

Thus, retailers still perceive a higher level of risks in introducing "fresh technologies" than their benefits for the business. For this reason, at the moment, they prefer to implement primordial example of immersive technologies, such as the QR-Code which could simplify consumers' search in their catalogue or adding precious information, but which have still many limitation to really enhance a shopping experience (RQ1).

In addition, many of these enterprises don't exploit all the potentialities of the QR-Code, because they have still not given value to its functions, preferring to serve the consumer in a traditional way.

To overpass this inhibitor, enterprises need information such as profits generated with the introduction of AR in business (Bonetty, Warnaby and Quinn, 2018), implementing their promotion around the introduction of advanced technologies, as a new service for consumers. So, in this vein the enterprise image increases its value as a high-tech enterprise, place itself as an innovator in the market (Rogers, 2010).

Moreover, also a higher self-embodied into the technology by consumers in a more enhancing experience could be an interesting alternative to enhance retailers' perception on this technological instrument (Scholz and Duffy, 2018).

To date, retailers have not found a solution to balance the "positive" and "disruptive" functions of immersive technologies and of AR. This is due to their

primordial usage of advanced and fresh technologies for the reasons abovementioned. As a matter of fact, using moreover QR-Code to enhancing information and speed of search, they posit their usage of these technologies following the positive approach, characterized by enhance the interactivity consumer-retailer (RQ2).

3.6. Conclusion and final remarks

This paper has outlined an analysis on retailers' readiness perception to introduce advanced technologies, with a focus of AR,in an omni-channel environment.

We focused on AR, because it is the more promising immersive experience according to the annual report by Perkinscoie (2019). The reason why AR is so promising is due to the easiness to use these technologies everywhere just using a smartphone, in contrast to other immersive technologies such as VR, which need a costly instrumentation.

So, using AR consumers can enhance their experience, which assumes an adding value in term of more personal and embodied purchase.

From a retailer-side, we believe the introduction of AR in-store could create three main changes in retailing: (1) an enhancing consumers' experience, with an increasing of consumers' willingness to use immersive technology for an hedonic experience; (2) an higher consciousness of retailers' knowledge on immersive technologies, understanding all the benefits for their business and (3) a more skilled professionality for vendors, which will be able to use immersive technologies. From a theoretical standpoint, we have enhanced retailing literature investigating retailers' preparedness perception in creating omni-channels experiences in-store, which was a topic still fragmented in the theoretical scenario. As a matter of fact, the present study has delineated the existing boundaries between digital and traditional channels, with a specific focus on retailers' inhibitors to adopt technologies in business. Here the utilitarian aspect of technologies predominates, even if the degree of uncertainty avoidance in retailers' decision is still high. Then we have traced theoretical evolutions and

approaches, creating an advancement in omnichannel retailing literature.

On a managerial point of view, our research shows the substantial majority of enterprises recognise usefulness in adopting immersive technologies to enhance consumers' shopping experience in store.

Retailers have a higher readiness to apply technologies when they have just introduced and experienced primordial example of AR as the QR-Code. This is in line with findings by Yu and Tao (2009), which suggest a higher pre-existing level of sophisticated technologies adoption could positively affect the organisation's preparedness to adopt fresh technologies. Despite that, retailers should understand if they are ready to maintain an updating service for consumers. As a matter of fact, technologies require frequent updating to be performant. So, company could reflect to create a specific work position inside their business such a web marketer to offer a constantly updating and performing AR experience to consumers. In fact, without a constant update, the AR app could have some problems in make consumers to experience the try-on, reducing their expectations and then their willingness to buy the product.

Notwithstanding these interesting results, our research does not exile from limitations. First of all, our study nature is exploratory. Further studies could investigate a larger sample of enterprises on different sector of the 4F of the "Made in Italy" brand, investigating if there are any similarities with results found in this study. Secondly, the analysis could be extended abroad, making a comparison between Italian mindfulness and maybe the French one, which is very similar from some of the six dimensions of the Country compass by Hofstede (2011; 2019).

Thirdly, we believe a quantitative study could be conducted, measuring retailers' readiness in comparison on their readiness' perception, to enhance knowledge on technological preparedness in retailing.

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CHAPTER 4- Understanding consumers' behavioural intentions: an extended flow experience with augmented reality and product involvement

Abstract

To date, digitalisation is shaping boundaries between online and offline channels especially in retailing world. The use of technologies creates a state of flow in those consumers who experience purchases. To the authors' knowledge, the relationship between consumers' product involvement, flow augmented reality (AR) experience and behavioural intention is not been investigated before. Thus, the aim of this study is to explore and measure the interactions between the three variables abovementioned to understand consumers' behavioural responses. Drawing on Csikszentmihalyi's (1975) studies on flow and Laurent and Kapferer's (1985) research on product involvement, the present analysis is based on a quantitative methodology to measure a model designed according to the literature. Data, gathered online in the month of May 2020, provide an overview of the moderator effect of flow AR experience between product involvement and consumers' behavioural responses. Finally, the paper ends summarising main theoretical and managerial contributions, along with main limitations and further research.

Keywords: Consumer behaviour; product involvement; Flow theory; Augmented Reality.

4.1. Introduction

With the advent of digitalisation, retailers are increasing their adoption of immersive technologies (i.e. Augmented reality) in-store (Javornik, 2016a). These technologies are defined in literature as those devices which enable consumers to experience directly whilst in physical or online store (Vanheems, 2019; Bonetti,

Warnaby and Quinn, 2018). To date Augmented reality (AR) enhances customer experience while shopping, being a wearable and portable technology (Javornik, 2016a, 2016b). Thanks to its interactivity, during a virtual try-on AR can share contents such as images, videos, and sounds virtually in the physical world, facilitating the exchanging and transmission of information (Stewart and Pavlou, 2009; Littlejohn and Foss, 2008). Thus, consumers involvement in the experience is higher, such as their involvement in products, due to all the additional information provided by this technology (Huang and Liao, 2015). This promotion of consumers' involvement in products creates a state of flow, defined as a completely immersion on the virtual try-on experience (Huang and Liao, 2017; Javornik, 2016a; Kim and Forsythe, 2008).

Prior works showed a huge interest by academics in analysing acceptance of this technology by largely focusing on consumers perception of this technology (Perannagari and Chakrabarti, 2019; Serravalle, Vanheems and Viassone, 2019; Dalim et al., 2017; Rese et al., 2017; Huang and Liao, 2015; Pantano and Di Pietro, 2012; Ha and Stoel, 2009; Zhou, Dai and Zhang, 2007; Oppewal and Timmermans, 1999; Dholakia and Uusitalo, 2002).

Although some scholar started being aware of the importance of AR, understood interactivity of this technology in creating a state of flow in consumers during the purchase experience (Javornik et al., 2019; Huang and Liao, 2017; Javornik, 2016a), there is still a literature gap concerning consumers' behavioural intentions towards personal product involvement in a context of an immersive shopping experience. Therefore, a new question arises in retailing: *Which is the impact of consumers' purchase involvement in behavioural intentions?*

Thus, this study aims to measure this relationship, exploring the interactions between product involvement and behavioural intentions to examine consumers' willingness to purchase using AR, to share information of this experience, to recommend the AR purchase to family and friends and to create online and offline traffic for the retailer.

Our model proposes that the product involvement influences the AR flow experience in term of attitude towards the AR experience, which influence

behavioural intentions in term of willingness to buy, share with friends and relatives (word of mouse and word of mouth), recommend the AR shopping experience and intention to return (willingness to visit the retailers' store, the retailer's website and willingness to repeat the AR purchase experience).

The main questions that guided this research are the following:

RQ1: Does consumers' product involvement enhance the AR immersive experience while shopping?

RQ2: If yes, which is the impact on consumers' attitude towards the AR experience?

RQ3: What is consumers' product involvement impact on different behavioural intentions?

So, this paper is organized as it follows: next section will review literature on consumers' product involvement, flow state of immersion in AR experience and consumers' behavioural intentions. The subsequent section will focalise on the methodology of research, going deeper on the sample selection and data procedures. Then, findings are presented and discussed. Last section presents conclusions, along with main limitations of the studies and further research.

4.2. Literature

4.2.1. Consumers' product involvement

Motivation is the higher driver to process information around a product by consumers (Balabanis and Reynolds, 2001). As a matter of fact, the level of involvement a consumer has with a product is referred to personal needs, interests, and values (Zaichkowsky, 1985).

As a hypothetical construct, involvement is not a unitary measure (Laurent and Kapferer, 1985). Many studies were conducted to understand the level of consumer involvement (Houston and Rothschild, 1977; Laurent and Kapferer,

1985; Arora, 1982; Calvo-Forrar et al., 2019). Likewise, to provide a more dynamic picture of consumers' subjective situation, there is a great consensus that involvement could be classified into three types: (i) situational, (ii) enduring and (iii) emotional (Calvo-Porral et al., 2019; Houston and Rothshild, 1977). Specifically, situational involvement reflects concern with a specific situation such as a purchase occasion; enduring involvement relates to the general personal relevance of a product class. As suggested by Rothschild (1979) individuals could purchase low-price products due to low enduring involvement, but on specially occasion as a boss gift they will choose high involvement product of a specific brand. Thus, in the enduring involvement, one's ego is involved with the action (e.g. the purchase) (Ostrom and Brock, 1968).

Another differentiation could be categorized as "emotional" involvement (Vaughn, 1980). It refers to emotional interactions between the consumers and the product category, such as pleasure (Laurent and Kapferer, 1985).

In addition, personal involvement represents individual and emotional nature of involvement, where the product choice is perceived as a sign of consumers selves (Laurent and Kapferer, 1985).

Finally, Laurent and Kapferer (1985) depicted two other types of involvements, which could be categorized as the risk associated with the product and its sign and the probability of error.

The former is a type of situational involvement which depends from risk in all circumstances and situations, whereas the latter is an enduring involvement, depending from the characteristics of the product.

Thus, highly involved consumers will put greater effort on searching information before the purchase, on process this information in greater detail and on use different criteria during their decision-making than other consumers (Maheswaren and Meyers-Levy, 1990). These criteria could refer for instance to the channel used by retailers, the quality of the website, the price or the quality of material (Hoffman and Novak, 1996). Hence, referring to retailers' website, consumers normally react differently in term of the technology involvement and their attitude to use or not online channels to purchase (Balabanis and Reynolds, 2001).

Thus, the drive to understand a specific consumers behavioural intention has created significant interest in literature in term of the involvement construct (O'Cass, 2000; Laurent and Kapferer, 1985; Mittal and Lee, 1989; Ohanian, 1990; Slama and Tashchian, 1985; Zaichkowsky, 1986).

More in details, involvement was identified as the relationship between the individual and the object, which could be a product, a purchase decision, an advertising campaign, or a consumption (Bloch, 1981; Muehling et al., 1993). As a matter of fact, consumers could be involved not just with products, but also with the process of purchasing and the product communication (Mittal, 1989). In this way, researcher can reach an overall profile from consumers, understanding all the complexities of their purchases and consuming behaviours.

In addition, consumers perception of the important of a product could fluctuate along with its level of product involvement (Mittal, 1989; Mittal and Lee, 1989). Thus, the view proposed here is to argue product involvement referring to the extent to which consumers put emphasis and meaningfulness on the focal object as central in this moment of their life (O'Cass, 2000).

Although, since 1960s lot of researchers have worked on physical products by consumers (O'Cass, 2000), a little is done referring to products visualized virtually. Thus, there is still interesting gaps to overcome to better delineate consumers behavioural intentions in an omnichannel retailing.

So, in this paper we are interesting to examine the product involvement to reach different behavioural intentions and affective responses trough a completely immersive purchase experience.

To do that, our model aims to investigate how product involvement influences consumers behavioural intention thanks to the flow and the affective responses given by an AR purchase experience.

Thus, we hypothesis:

H1a: Higher product involvement leads to more intense flow AR experience

H1b: Higher product involvement affects willingness to buy the item

4.2.2. Flow state using an Augmented Reality app

This study is interested in understanding how the above-discussed product involvement could affect behavioural intention during an AR experience.

Flow experience concept was theorized by Csikszentmihalyi (1975) to describe a deep immersion of consumers into an activity. Its application in marketing has shown many findings related to consumers immersion in new technologies (Javornik, 2016b) as a mediator between interactivity on brand attitude, exploratory behaviour and purchase intentions (Agarwal and Karahanna, 2000; Hoffman and Novak, 1996; van Noort et al., 2012; Nah, Eschenbrenner and Dewester, 2011).

Its role of mediator affects consumers' affective responses, such as attitude towards an immersive experience (van Noort et al., 2012).

Flow can promote a feeling of involvement and fun (Huang and Liao, 2017), creating positive subjective experiences, increasing exploratory and participatory behaviour and a distortion of time perception (Javornik, 2016a; Huang and Liao, 2017).

Moreover, studies have found flow experience could be invoke by consumers' engagement and interest, reflecting a complete state of immersion and absorption in an activity (Hamari et al., 2016). In particular, technologies have the potential to affect this state of consumers' mind (Hung, Sun, & Yu, 2015; Brom et al., 2014; Barzilai & Blau, 2014; Chang, Wu, Weng, & Sung, 2012; Liu, Cheng, & Huang, 2011), moreover if consumers have a positive attitude in receiving a technological support by the retailer (Taylor and Levin, 2014). As a matter of fact, without a favourable attitude towards the retailer's technology, such as a shopping mobile application, consumers will be reluctant to download and use it (Taylor and Levin, 2014).

So, the two principal components of the flow experience are the total concentration on an activity and the enjoyment deriving from this activity (Ghani and Deshpande, 1994). These two characteristics along with curiosity and sense of control (Javornik, 2016b) make flow as a multidimensional concept.

In the context of AR, flow acts as a mediator towards three different features, which are affective responses, cognitive responses, and behavioural intentions (Coyle and Thorson, 2001; Hoffman and Novak, 2009; Nah et al., 2011; Javornik, 2016b).

Hence, Noort et al. (2012) found interactivity of websites influences consumers' cognitive, affective and behavioural responses thanks to the online flow, which acts as a mediator between these variables.

Javornik (2016b) replicated this study, founding AR does not increase perception of interactivity (cognitive responses).

Thus, in this study we want to expand literature on flow theory, hypothesise that when consumers' use AR while shopping, the perceived product involvement has an effect on consumer's attitude towards the AR experience.

H2a: Higher interest in the AR application leads a greater flow AR experience

Prior research further demonstrated that there is a relationship between online flow and affective responses (van Noort et al., 2012) and interest

As a matter of fact, flow has a beneficial effect on attitude purchase online (Korzaan, 2003).

Attitude refers to the willingness to reply a given stimulus which is perceived as a positive, neutral or negative affective state (Pantano and Viassone, 2015; Fishbein and Ajzen, 1975).

Thus, consumers who experience an online flow while shopping have more positive feelings than those who have not done this experience (Hoffman and Novak, 1996). So, attitude could lead positive behavioural reactions such as willingness to purchase (Pantano and Viassone, 2015; Groeppel-Klein, 2015; Wu et al., 2014; Vanheems and Kelly, 2009).

In addition, online interactivity creates a flow on that websites, which enhances positive vibes towards the website visited and that brand (van Noort et al., 2012).Extending this definition to a more immersive shopping experience, such as those with AR, consumers' flow state could enhance their attitude towards the AR experience.

Thus, we hypothesize:

H2b: Higher flow AR experience leads to a more intense attitude towards the AR experience.

4.2.3. Behavioural response from an immersive experience

Behavioural intentions are defined as "*the individual's intuitive and subjective awareness in performing a certain behaviour which in turn, is the significant determinant of actual behaviour*" (Moorty et al., 2019, p. 3).

Behavioural intentions could be translated into different actions by consumers. As a matter of fact, consumer, whose purchase grateful experience, will be more favourable to have positive reactions such as willingness to remake the purchase (Pantano and Viassone, 2014; Poncin and Mimoun, 2014; Davis, 1989), willingness to share this experience with family and friends (Constant et al., 1994), willingness to recommend (positive Word-of-Mouth) the purchase experience (Poushneh and Vasquez-Parraga, 2017) and willingness to generate traffic in term of visit the retailers' online website (Balabanis and Reynolds, 2001) and the physical store (Gao and Su, 2017; Kalyanam et al., 2018; Heitz-Spahn, 2013).

In this term, the main investigated consumers' willingness by scholars is user willingness to buy (WB), which is defined as consumers' tendency to purchase a specific product in the near future (Poushneh and Vasquez-Parraga, 2017). In particular, WB is strongly impacted by immersive technologies such as AR and virtual reality (VR) (Verton, 2001). As a matter of fact, these technologies enhance consumers' experience in term of enjoyment and mental imagery (Schlosser, 2003), encouraging them to buy the product visualized virtually (Huang and Hsu-Liu, 2014). Thus, the immersive flow created by this enhancing technology could affect positively consumers' behaviour towards a product.

In this vein, due to this positive feeling of enjoyment, consumers are more enticed to recommend and share this experience with people. In fact, previous research in retail shows that positive experience influence recommendation and positive

word-of-mouth in store and off-store (online) (Poushneh and Vasquez-Parraga, 2017).

When the service and the shopping experience can add value to consumers' shopping journey, people are more motivated to recommend the purchase with the AR app to encourage friends and relatives to live the same feelings (Fisk et al., 2011).

The same happens with willingness to sharing information around an experience. In general, people are naturally willing to share information (Constant et al., 1994, 1996). As a matter of fact, sharing information create a feeling of belonging to a community, enhancing their awareness (Wasco and Fraj, 2000; Fulk et al., 1996). Trying an immersive and innovative experience create a WOW effect (Cohen, 1997), which enhance their willingness to share the moment lived with others. This is due to a higher present of oxytocin in consumers body, enhanced by the positive experience. As a matter of fact, when consumers live involving experience, their level of oxytocin increase, along with their willingness to share event-related emotions (Lane et al., 2013).

In addition, if consumers have a positive attitude on a product, it could affect positively consumers' behaviour intention in term of higher willingness to visit the retailers' website (Balabanis and Reynolds, 2001) and the physical store (Gao and Su, 2017; Kalyanam et al., 2018; Heitz-Spahn, 2013).

Thus, the following hypotheses were developed:

HP3a: A greater attitude towards the AR experience leads to enhance consumers' willingness to buy.

HP3b: A greater attitude towards the AR experience leads to enhance consumers' willingness to visit the retailer website.

HP3c: A greater attitude towards the AR experience leads to enhance consumers' willingness to visit the retailer physical shop.

HP3d: A greater attitude towards the AR experience leads a higher consumers' willingness to recommend and share the experience.

Figure 1: The model
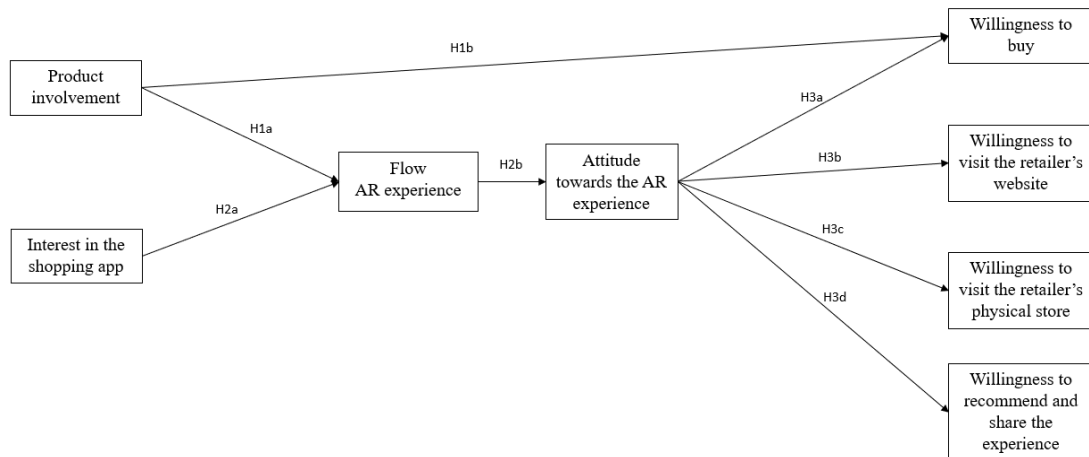
Source: own personal elaboration

4.3. Methodology

4.3.1. Data collection

Empirical data were collected online using the Toluna platform service in the month of May 2020 in Italy. Respondents were self-selected and an initial screening was created to interview just those respondents whose smartphone software could make them experienced an AR mobile purchase. This depends by the embedded software, which should be higher than 7.0 version for Android smartphone and higher than the 11.0 version for IoS.

So, the online survey yielded 254 usable respondents on 343 selected.

43,31% of the sample were represented by male, while 56,69% by female. 31,50% of participants aged between 25-34 years, whereas the 28,74% and the 21,26% where respectively between 35-44 and 45-54-year-old.

The most of them had a diploma (41,34%), were employed (59,06%) and married (52,76%).

All respondents were asked to use their smartphone to download the AR mobile application "*Wanna Kicks*" and experience the try-on of a pair of sneakers. We

selected this fashion application, due to the predominant role of involvement of fashion (clothes and shoes) in our society ((Khan, 2020; Workman et al., 2019; O'Cass, 2004; Beaudoin et al., 2003; Browne and Kaldenberg, 1997; Fairhurst, Goog and Gentry, 1989; Flynn and Goldsmith, 1996; Tigert et al., 1976; O'Cass, 2000) and the extremely ego-involving functions of clothes due to their symbolic meaning in expressing one's lifestyle or personality (Levy, 1959). As a matter of fact, product involvement represents an important symbolic consumption area in fashion sector. The way we dress up could say a lot around an individual in term of awareness, status, and identity (Loussaïef, Ulrich, Damay, 2019).

After the try-on, we asked them to reply to a questionnaire. Some of them were stopped at the beginning because their smartphone cannot download the AR application. So, a control question was created to understand and selected just those respondents which were able to experience the virtual try-on.

Table 1 makes a short sum up of respondents' profile.

Table 1: Respondents' profile

Measure	Items	Frequency	Percentage
Gender	Male	110	43,31%
	Female	144	56,69%
Age (Years)	18-24	21	8,27%
	25-34	80	31,50%
	35-44	73	28,74%
	45-54	54	21,26%
	55-64	23	9,06%
	Oltre 65	3	1,18%
Education	Secondary school	17	6,69%
	Professional qualification	11	4,33%
	Diploma	105	41,34%
	Bachelor	42	16,54%
	Degree	62	24,41%
	PhD	3	1,18%
	Master I° level	8	3,15%
	Master II° level	6	2,36%

Profession	Student	27	10,63%
	Entrepreneur/self-employer	39	15,35%
	Employee	150	59,06%
	Retired	7	2,76%
	Housewife	31	12,20%
Living situation	Single/unmarried	111	43,70%
	Married	134	52,76%
	Separated/divorced/widow	9	3,54%

Source: own personal elaboration

4.3.2. Measurement

Questionnaire were developed according to a deep study and analysis of the literature on consumers' product involvement, flow state and behavioural responses.

We used the product involvement scale by Kapferer and Laurent (1993; 1985), slightly adapted to the virtual try-on of sneakers.

Interest in application scale was adapted by Taylor and Levin's scale (2014). We used the flow experience scale developed in Huang and Liao (2016) to measure consumers' state of flow after the try-on experience.

Then we used and adapted the attitude scale validated in Kevin et al. (2003) to measure attitude towards the AR experience, whereas for willingness to recommend and share we used the scale developed and tested in Ali and Omar (2013).

Then, adapting the willingness scale tested by Poushneh and Vasquez-Parraga (2017) we measured willingness to create online and offline traffic and willingness to buy the product visualised (the sneakers).

Each item was measured using a seven-point Liker scale, ranging from "Strongly disagree" (1) to "Strongly agree" (7).

Before to start with the data collection an online pre-test with 30 respondents were run using Qualtrics, to validate the instrument of analysis.

Respondents were asked to give comments and feedbacks on the length of the questionnaire, the comprehension of questions, the easiness to download the AR application, the using of words and additional comments (if any).

4.4. Findings

4.4.1. Measurement model

Path analysis (Wright, 1960), a multiple regression statistical analysis useful to examine relationship between a dependent variable and more independent variables, was employed to examine the measurement model's relationships (Bryman and Cramer, 1992).

This quantitative analysis was developed by Wright (1960) to validate hypothesized relationships and showing causal mechanisms through variables.

Using SPSS 26.0 and AMOS 26.0, we could explore the underlying theoretical structure of the proposed model (Jöreskog and Wold, 1982).

We verified the reliability and validity of the model, testing the Cronbach's α value ranged 0.911 (> 0.70). Also, the Bartlett sphericity test (χ^2= 1706.69, p=0.000) and the Kaiser Meyer Olkin (KMO) measure (0,881) indicates the goodness of the model.

Then, we run the analysis on AMOS, finding goodness in fitness measures, which are in details: χ^2/degree of freedom= 2.543 (p= 0.038), GFI (goodness-of-fit-index)= 0.990, AGFI (adjusted goodness-of-fit-index)= 0.912, NFI (normed fit index)= 0,994, CFI (comparative fit index) = 0.996 and RMSEA (root mean square error of approximation)= 0.078. All these fitness measures overcome the acceptable value suggested by literature, as shown in table 2 below. Thus, the model proposed yields a suitable fit.

Table 2: Fit index for model goodness

Measure	Recommended criteria	Literature	Measurement model
χ^2/d.f.	<3.0	Hayduck, 1987	2.543

GFI	>0.9	Scott, 1994	0.990
AGFI	>0.8	Scott, 1994	0.912
NFI	>0.9	Pantano and Viassone, 2015	0.994
CFI	>0.9	Bagozzi and Yi, 1988	0.996
RMSEA	<0.10	Browne and Cudek, 1993; Jöreskog & Sörbom, 1993	0.078

Source: Personal elaboration

4.4.2. The hierarchical construct in a structural model

The path model was tested using AMOS 26.0. Figure 2 shows the results of the model with significant path as linear line and non-significant paths as dotted lines. Standardized path coefficients are presented between constructs.

Contrary to our hypothesis (H1b), product involvement has not a significant effect on willingness to buy (β= -0.062, p=0.757). As a matter of fact, this effect is mediated by flow AR experience and attitude towards the AR experience (H1a confirmed; β= 0,55, p<0.001).

The effect of interest in the shopping app is significant, but quite small (β= 0.17, p< 0.001). The two independent variables are not correlated (ρ= 0.20) (H2a).

Consumers enter in a deep state of flow experienced the AR mobile app, which enhance their attitude towards the AR experience (β=0.90, p=0.000). These strong relationships support our hypothesis 2b.

Then, data offers interesting information on the typologies of behavioural intentions users want to do. Thanks to this total immersion in the virtual try-on, consumers enhance their willingness to recommend and share information on this virtual experience (β=0.95, p<0.001). In particular, their willingness to buy the item increase (β=0.99, p=0.000), along with their willingness to create offline (β=1.05, p=0.000) and online traffic (β=0.93, p=0.000), visiting respectively the offline and online retailers' store. Therefore, hypotheses 3a, 3c and 3d were supported by the analysis. According to Chin (1998), endogenous variables could be described as weak, moderate or substantial based on R^2 values of 0.19, 0.33 or

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0.67. This model shows flow AR experience (R^2=0.36), willingness to visit the retailer's website (R^2=0.53) and willingness to buy (R^2=0.51) as moderate, willingness to visit retailers' physical shop (R^2=0.12) as weak, whereas attitude towards the AR experience (R^2=0.71), willingness to recommend and share the experience (R^2=0.72) as substantial variables. Thus, data shows smaller differences between the observed data and the fitted values in term of R^2 values.

So, we can conclude our analysis highlighting that due to the mediators effect of flow AR experience and attitude towards the AR experience, consumers' product involvement affects significantly their behavioural intentions in term of buy the product, recommend both the product and the experience and lastly creating a deeper traffic on retailers' point of sales (physically and virtually).

Figure 2: Results of the path analysis
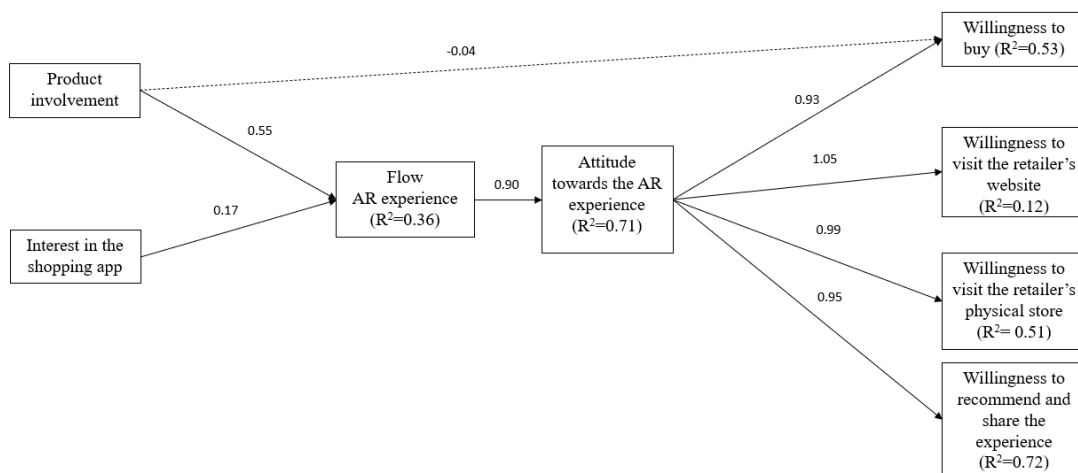
Source: Personal elaboration

Notwithstanding, path coefficient indicates a great variability in data between attitude (ATT) and willingness to visit the retailer's physical shop (WP).

Even if path coefficients may exceed +1 and -1 in absolute value (Wright, 1960), we investigated this indicator to find a reason of this values. We hypothesis multicollinearity between these variables, thus we decided to evaluate a direct relationship between the flow AR experience and each behavioural response.

Running the analysis, we found that evaluating a direct relationship between flow and each willingness multicollinearity is resolved.

As a matter of fact, Cronbach's α value still ranges good 0.888 (> 0.70). Also, the Bartlett sphericity test (χ^2= 1274.77, p=0.000) and the Kaiser Meyer Olkin (KMO) measure (0,852) indicates still the goodness of the model.

Then, we run the analysis on AMOS, finding goodness in fitness measures, which are in details: χ^2/degree of freedom= 3.358 (p= 0.018), GFI (goodness-of-fit-index)= 0.989, AGFI (adjusted goodness-of-fit-index)= 0.897, NFI (normed fit index)= 0,992, CFI (comparative fit index) = 0.994 and RMSEA (root mean square error of approximation)= 0.097, which is still acceptable (RMSEA <0.10) (Browne and Cudek, 1993; Jöreskog & Sörbom, 1993).

All these fitness measures are not significantly different from the previous model. What is really more performing are beta coefficients between variables. Hence, multicollinearity between variables is eliminated. Figure 3 shows path coefficient with respectively R^2.

Figure 3: The final model
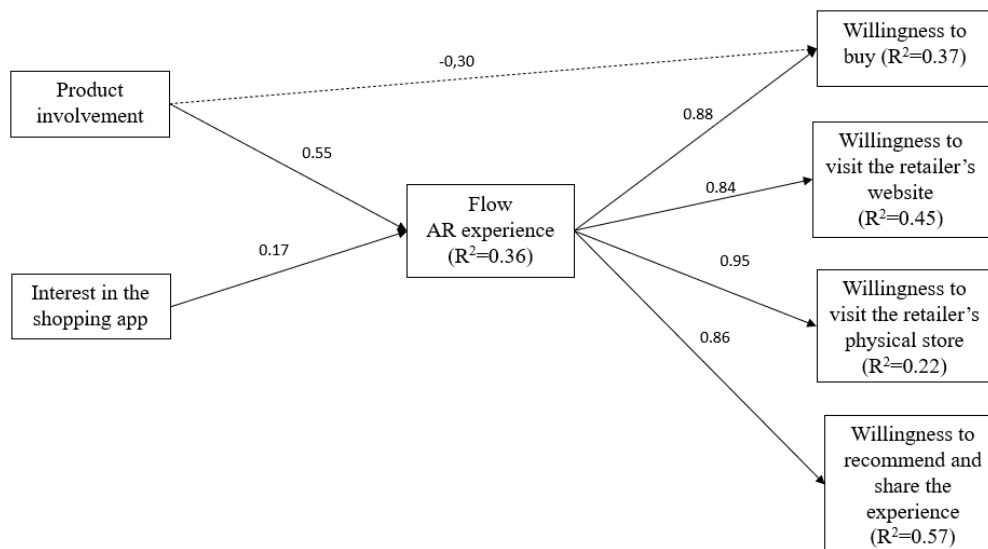
Source: Personal elaboration

For this reason, all the hypotheses were edited. In this final model, flow AR experience exercises a mediator function between consumers' product involvement and interest in the shopping app and each behavioural intentions

(willingness to buy, to visit the retailers' website, to visit the retailer's physical store and to share and recommend the experience).

Thus, the abovementioned hypotheses become as follow:

H1a: Higher product involvement leads to more intense flow AR experience.

H1b: Higher product involvement affects willingness to buy the item.

H2: Higher interest in the shopping app leads to more intense flow AR experience.

HP3a: A greater Flow AR experience leads to enhance consumers' willingness to buy.

HP3b: A greater Flow AR experience leads to enhance consumers' willingness to visit the retailer's website.

HP3c: A greater Flow AR experience leads to enhance consumers' willingness to visit the retailer's physical shop.

HP3d: A greater Flow AR experience leads a higher consumers' willingness to recommend and share the experience.

The interesting relationship between product involvement and flow AR experience pushes us to explore more on this meaning. Thus, we found this relationship is significant for only two dimensions of product involvement, described by Laurent and Kapferer (1985; 1993): pleasure (0.33, p=0.000) and sign (0.19, p=0.002). The other three dimensions showed are not statistically significant: risk importance= 0.04, p= 0,477; probability of error=0.00, p=0.988; interest= 0,14, p= 0,056.

4.5. Discussion

This study provides actionable and interesting insights for both academics and practitioners into the omnichannel retailing.

From a theoretical standpoint, this research points out attention on a strong relationship mediated by the flow AR experience between consumers' product involvement and behavioural intentions, extending knowledge on consumers' behaviour literature. More specific, consumers are more involved in products when they experience "emotional involvement" (Vaughn, 1980; Laurent and Kapferer, 1985). This is manifested in term of (a) the hedonic value of product in term of perceived pleasure and (b) the degree to which product could express and enhance personal self (the sign) (Laurent and Kapferer, 1985; 1993).

These findings expand knowledge of prior works on product involvement, understanding the sources of its relationship with flow AR experience and depicting a dynamic picture of consumers' subjective involvement (Laurent and Kapferer, 1985).

This is particularly interesting also analysis these findings with an omnichannel side, where technologies can enhance consumers' purchase experience especially for those products in fashion sector, where involvement plays a huge role between consumer and product (Khan, 2020; O'Cass, 2000). In addition, the model presented in this study provides insights into flow state using immersive technologies. Due to a multicollinearity problem attitude was eliminated from the initial model, thus each relationship between flow AR experience and consumers' intentions were not mediated by this variable. As a matter of fact, data gathered showed a huge correlation even if items were completely different and fitness values were good. We are in the case described by Cambpbell (1960) and Nunnally (1978) of a lack of discriminant validity, thus we decided to eliminate attitude to investigate the interaction between "product involvement-flow AR experience- behavioural intentions". Data highlights interesting insights, between these variables, making us understand a direct relationship between flow AR experience and each behavioural intention.

Thus, consumers' involvement in product (H1a) and interest in the application (H2) used in the virtual purchase is higher if supported by immersive technologies such as AR, which aids the consumers in visualising virtually the product, enhancing their purchase experience (H1a and H2). Correspondingly, higher will

be consumers' immersion in the virtual try-on the greater will be positive behavioural intentions in term of recommend the experience (H3d), buy the item (H3a) visualized or visit the physical (H3c) and online store (H3b).

More specifically, the strength of this moderation is particularly strong in the relationship between flow AR experience and willingness to visit the retailers' physical shop ($\beta =0.95$, p=0.000).

This provides actionable insight for retailers, who want to introduce these technologies to generate traffic in-store.

On the contrary, product involvement has not any direct impact on willingness to buy we hypothesised ($\beta= -0.30$, p> 0.05) (H1b). Thus, to be involved a consumer should experience a virtual try-on to generate different behavioural responses. Thus, AR becomes an essential instrument to involve consumers in the virtual try-on, without with consumers do not feel manifest nor attitude towards the experience or behavioural responses.

To sum up, table 3 shows hypotheses confirmed and not of our findings.

Table 3: Hypotheses confirmation

Hypotheses	Results
H1a: Higher product involvement leads to more intense flow AR experience.	Confirmed
H1b: Higher product involvement affects willingness to buy the item.	Not confirmed
H2: Higher interest in the shopping app leads to more intense flow AR experience.	Confirmed
HP3a: A greater Flow AR experience leads to enhance consumers' willingness to buy.	Confirmed
HP3b: A greater Flow AR experience leads to enhance consumers' willingness to visit the retailer website.	Confirmed
HP3c: A greater Flow AR experience leads to enhance consumers' willingness to visit the retailer physical shop.	Confirmed
HP3d: A greater Flow AR experience leads a higher consumers' willingness to recommend and share the experience.	Confirmed

Source: personal elaboration

Thus, these results expand current knowledge also on AR technology as a flow tool, which become a useful omnichannel technology for companies to enhance consumers' behavioural intentions when they feel sign and pleasure in the product and in the AR application (even if less than the previous ones). In particular, findings have enhanced prior product involvement studies, where consumers' involvement between the product and the immersion in the AR experience (flow) depends to the extent they put an emphasis, adding to the sign value (O'Cass, 2000; Laurent and Kapferer, 1985) the hedonic and meaningfulness ones. Finally, a direct relationship between flow AR experience and different behavioural intentions (willingness to buy the product, willingness to visit the website, willingness to visit the physical store and willingness to recommend and share the experience) highlights that consumers could be involved both in products and in the AR application, showing both an emotional (products) and situational (AR app) involvement, which can express themselves in different intentions thanks to the role of mediator of the flow AR immersion. As a matter of fact, this immersion is essential to affect consumers' behavioural intentions (van Noort et al., 2012), promoting feeling of involvement and fun (Huang and Liao, 2017) and creating a favourable predisposition towards the retailer's AR app, without with they will be reluctant to download and use it (Taylor and Levin, 2014).

4.5.1. Managerial implications

From a managerial standpoint, this study provides insights into what retailers can do to enhance their sales in store, positive word-of-mouse (recommendation) and web traffic generation.

Introducing AR to make the try-on, consumers could experience the product, personalizing colours and shapes as they fit better. This enhancing experience positively influence their behavioural intentions as argued, amplify their willingness to act. More specific, some of them could be interesting in try physically the product before to buy it. Thus, retailers could amplify its sales in-store, maybe using some marketing campaigns.

Thus, AR could extend retailers' profitability and performance in sales, enhancing consumers to visit their physical store, search online information on the retailers and visit the online website.

More specifically, enhancing hedonic and sign value of the product, especially for shoes and clothes (O'Cass, 2000; Laurent and Kapferer, 1985) retailers enhance consumers to experience the virtual try-on. Thus, they could think to introduce

this AR immersive experience only for those "ego involving" products (such as clothes and shoes) (Levy, 1959), which can arise in consumers these feelings. As a matter of fact, literature suggest not to introduce innovative technologies when consumers have not favourable feelings on it, because they will be reluctant to download the application to make the try-on (Taylor and Levin, 2014).

Finally, this immersion could be a valid solution to sell products when consumers are not able to enhance a physical shopping journey as it happens nowadays during the COVID-19 pandemic. Here, it is not essential distinction between "emotional" or not products, because AR becomes an additional instrument to replace momentarily traditional shopping.

4.6. Conclusion

The literature on product involvement and consumers' behavioural intentions recognise that involvement exists only when there is sign (Baudrillard, 1968; Laurent and Kapferer, 1985). This study has expanded knowledge also on the importance of pleasure in consumers to be involved in a product and in a technology.

As with any research, this study has some caveats and limitations. Firstly, data were collected during the COVID-19 pandemic using an online platform, where consumers were selected in term of their smartphone's software. As a matter of fact, those who were not able to experience the virtual try-on were not considered in the sample. Thus, the ability to access of a larger sample of respondents, using authors' personal smartphone and conducting the try-on does offset some of this weakness. In this way, also heterogeneity between devices could be reduce, along with differences in screen dimension, which could enhance differently the AR experience.

Secondly, the analysis is limited to Italian consumers, thus generalizability may be limited to this country with a demographically homogeneous customer base. Thus, even if data provides vital and actionable insights, this study might be expanded upon different countries and mindsets in further research. In addition, it

could be taken into account a comparison between similar countries in term on one or more of the six Hofstede's cultural compass dimensions (2011) to investigate consumers' reactions towards the adoption of immersive technologies, confirming or not for instance a similar uncertainty avoidance.

In addition, this study suggests many opportunities for further examination. For instance, this model should be expanded to include and evaluate consumers' adoption of immersive technologies in an omnichannel retailing, using the TAM model (Davis, 1985) or better (due to the high number of critics to the TAM during the years) the Task-technology fit (TTF) model (Goodhue and Thompson, 1995).

Thus, we believe that immersive technologies and retail omnichannel are providing many new rich contexts where academics could investigate both consumers' and retailers' behaviour, extending knowledge in perspective views.

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CHAPTER 5- Discussions and conclusion

Let's imagine the future channels in retailing. How will be shop and where? Which kinds of technologies consumers will agree to introduce in their personal shopping routine? What will be retailers' readiness to satisfy new incoming consumers' needs to enhance their shopping experience?

The aim of this doctoral thesis was to depict a better comprehension of omnichannel retailing, understanding consumers' and retailers' perception and readiness respectively to use digital technologies while shopping and to introduce them in their business (offline and online).

As a matter of fact, we know that after the dot.com bubble, internet and digital technologies have shaped all the boundaries between online and offline world (Christensen and Raynor, 2003). Retailing switched from multichannel, where online and offline coexists separately, to an omnichannel world, where they are mixed and integrated during a purchase.

In recent years, many scientific interest was born to investigate the interaction between the two world, and also a growing number of practitioners start to be interested in main advantages and disadvantages of these technologies, even if little was done to integrate them in business.

Within this framework, the first research objective (Chapter 2) of this thesis is to examine to what extent AR could enhance consumers' shopping journey. Thus, after defined AR as an emerging technology able to supplement the real world virtually (Azuma, 1997) and described the main characteristics and features, the analysis focused on consumers' perception of the technology from a hedonistic and utilitarian stand point (Babin, Darden and Griffin, 1994). Specifically, literature suggests this technology enhance consumers' shopping experience if their technology readiness, which is the individual propensity to embrace the new technology, is high (Parasuraman, 2000; Roy et al., 2018). As a matter of fact, AR is described as an impacting tool in consumers' journey. Moreover, in the pre-purchase step, consumers can experience virtual try-on before their purchase

decision (Scholz and Duffy, 2018). Thus, using an exploratory qualitative approach, 20 semi-structured interviews were conducted with Italian consumers. Results shows consumers' TR is still low. This is due to a low adoption of AR in company, which creates a low individual propensity to embrace and use the new technology (Parasuraman, 2000). In addition, Italian consumers are very traditional by culture (Hofstede, 2011), so they need to touch and see physical material and quality of items.

As this thesis has shown just from the first article, considering the Italian context of the analysis, retailers' readiness to adopt disruptive and immersive technologies is quite low.

Thus, the second article of this thesis (Chapter 3) analyses retailers' standpoint in term of TR to adopt immersive technology (with a focus on AR). Throw a multiple case study methodology, results show retailers preparedness on immersive technologies, along with their lack of readiness to adopt them. As a matter of fact, even if in the past the advent of internet have changed dramatically the retailing scenario, Italian SMEs, which represents the 81% of the workforce in this country, are still reticent to introduce immersive technologies in their business (Hilken et al., 2018), due to lack of knowledge and exposure on these "fresh" instruments. According to Rodan and Galunic (2004), higher are companies exposed to an innovation, the greater will be their willingness to improve the technologies in their business. In addition, SME have memory of this destructive wave with which they had to deal heavily: the online. For this reason, their propensity and perception of technology remains anchored to the main difficulties given by the small and medium size of their business, such as the high risk of failure, the high cost of skill implementation and the high competitiveness in the online market.

From a consumer standpoint, retailers' reticence to use immersive technologies makes consumers' usage of immersive technologies still limited. Except from some primordial cases of introduction of QR-Code, AR is an instrument not so common in Italy during a shopping routine.

With the advent of the COVID-19 pandemic, retailers had to reinvent their business due to the lockdown, be more interesting in the adoption of these innovative technologies. In addition, Chapter showed an interesting insight from consumers side: when the technology is used stand alone, consumers' perception focuses on the "WOW" effect, without any implications in term of behavioural intentions. In addition, here some sectors are more performing than other, where tactile experience is essential to value the product as genuine, for instance in Fashion and Food and Beverage, where physical taste and try-on is a priority for consumers and it could not be replaced by the virtual experience.

On the contrary, when consumers are involved in the product, the virtual try-on projects them into a flow state, which enhance positively the experience, strongly mediating towards different behavioural intentions. As a matter of fact, the greater is the immersion into the digital experience, the higher will be consumers' willingness to buy the product, willingness to recommend the experience and to create online and offline traffic. This outline was investigated in the last article (Chapter 4), which aim was analyse the mediation effect of flow AR experience between involvement on both a product (Sneakers) and the AR mobile application and different consumers' behavioural intentions (willingness to buy, to recommend and share the experience and to create online and offline traffic).

Using a path analysis, a quantitative approach particularly useful to investigate mediation, direct and indirect effects (Wright, 1960; Bryman and Cramer, 1992), this study analysed 254 responses of an online survey with consumers. Results highlights the potential of AR technology to enhance flow state in consumers, positively mediating the interactions between product and mobile app involvement and consumers' behavioural intentions. Without this interaction involvement is not sufficient to push consumers' behavioural intentions.

In addition, nor consumers' product involvement or the immersive technology itself are significant predictors to stimulate consumers' behavioural intentions.

It is necessary to combine an emotional state such as product involvement in an "ego involving" product (e.g. Sneakers, shoes, clothes) or interest into the mobile AR application (even if this latter has slower effect into the flow state than the

previous one) to enhance positively the AR immersion and consumers'
behavioural intentions (Levy, 1959; Vaughn, 1980; Laurent and Kapferer, 1985;
Kapferer and Laurent, 1985).

5.1. Theoretical implications

These findings are particularly interesting if we contextualise technology
perception in an omnichannel context, where digitalisation and physicality are
combined into the same shopping experience (Beck and Rygl, 2015).

In particular, this doctoral thesis advances knowledge on the gap between offline
and online channels (Verhoef et al., 2015), which until now was hard to cover.
Using consumers' involvement in products, retailers could shape individuals'
reticence in using innovative technologies to shop, offering a similar experience
both online and offline. Thus, a new perception paradigm comes up, where
technology become ad addition tool to satisfy new consumers' attendance while
shopping and increasing retailers' preparedness in using immersive technologies.

More specifically, the first exploratory study (Chapter 2) contribute to expand
consumers' perceptions scientific discussion, extending knowledge on their
readiness to use the technology itself. Results confirm how the initial "WOW"
effect of surprising is not significantly sufficient to create a new habit, adopting a
new tool to shop. In addition, this paper contributes in omnichannel retailing
literature, enhancing knowledge on consumers' perception on immersive
technologies in a virtual purchase (Teas, 1993; Brown and Swartz, 1989;
Parasuraman, Zeithaml and Berry, 1988). Results confirm how consumers are
sophisticated in their beliefs (Rosenbaum and Wong, 2015). More specifically,
this study found consumers are not ready to adopt AR technology (Parasuraman,
2000), even if they understand the main benefits. Thus, also consumers'
engagement during the three steps of the purchase journey (Lemon and Verhoef,
2016) is still low.

Then, Chapter 3 has delineated the existing boundaries between digital and
traditional channels, with a specific focus on retailers' inhibitors to adopt

technologies in business (Hilken et al., 2018). Here the predominance of utilitarian aspect of technologies was evaluated (Babin, Darden and Griffin, 1994), along with the high degree of uncertainty avoidance in Italian context of analysis (Hofstede, 2011). As consumers, retailers are prepared on AR advantages, but their high uncertainty avoidance makes not them to introduce the technology in their business.

Finally, Chapter 4 expands knowledge on product involvement, flow theory and behavioural intentions theory. Results found that for consumers it is necessary something more to be enrolled in a new behaviour than just a "WOW" effect (Cohen, 1996) as described in Chapter 2, such as involvement (Cohen, 1997; Laurent and Kapferer, 1985). Thus, results enhance current knowledge also on AR technology as a flow tool, which become a useful omnichannel technology for companies to enhance consumers' behavioural intentions when they feel sign and pleasure in the product and in the AR application (Laurent and Kapferer, 1985; Kapferer and Laurent, 1985). So, two dimensions of involvement could enhance this mediation role of flow AR experience, which are pleasure and sign, contributing to enhance Laurent and Kapferer's studies on this topic (1985; 1993). Additionally, the role of flow was deepened on AR experience. As a matter of fact, its function of mediator between involvement and behavioural intentions advances knowledge on three different steam of literature, which are consumers' involvement (Laurent and Kapferer, 1985; Kapferer and Laurent, 1985; O'Cass, 2000; Khan, 2020), flow theory (Csikszentmihalyi, 1975; Huang and Liao. 2017) and consumer' behaviour (Moorty et al., 2019; Poushneh and Vasquez-Parraga, 2017; Davis, 1989) as discussed in Chapter 4.

This finding confirms the high interactivity function of AR, such an interactive instrument, able to enhance exploratory and participatory behaviour (Javornik, 2016) and invoking consumers' behaviours (Hamari et al., 2016).

5.2. Methodological implications

This doctoral thesis is explorative in nature, which means the aim is to investigate a phenomenon which is not clearly defined as consumers' and retailers' perception of immersive technology in an omnichannel environment. Thus, each study was created to enhance knowledge. Data were selected using both secondary (literature review and online research) and primary data (interviews and survey) and then through triangulation findings could be discussed (Flick, 2018). More specifically, the first study (Chapter 2) adopts 20 semi-structured interviews to investigate consumers' perception on AR adoption. The exploratory nature and the psychological topic need to dig deeper to reveal hidden layers of consumers' personality. Thus, interviews were selected for their ability to investigate the real and genuine respondents' standpoint, along with their experiences and ideas on the topic analysed (Barbour, 2003). Using semi-structural interviews, it is also possible to see cultural scripts and stereotypes, observing respondents' first level of reflections and reactions (Diefenbach, 2009).

Then Chapter 3 uses a multiple case study methodology to look for new insights typical of exploratory studies as suggested by Saunders et al., (2015). Case studies are appropriate to answer why and how questions of phenomena (Yin, 2004), capturing knowledge from practitioners as in this study (Bonoma, 1985) and discover hidden data (Gerring, 2009). Thus, this method enables researchers to investigate emerging and new phenomena in their natural setting (Benbasat et al., 1987), extend knowledge on a topic where boundaries between phenomenon and context are not still evident (Yin, 2014).

Finally, the last article concludes the analysis using a quantitative approach, trying to measure different constructs which were not investigated before. More specific, using of path analysis, a quantitative approach particularly useful to investigate mediation, direct and indirect effects (Wright, 1960; Bryman and Cramer, 1992), this study analysed 254 responses of an online survey with consumers. This study

clearly defines the role of mediator of AR flow experience and the indirect effect of involvement on behavioural intentions.

5.3. Managerial implications

This doctoral thesis provided useful insights for practitioners and retailers, who work in technology and marketing fields. This thesis is addressed to those SMEs who want to understand more on immersive technologies and in particular on AR, such as cheaper and powerful technology to enhance shopping experience. More specific, the second and third chapters give an overview of an exploratory analysis on consumers' and retailers' perception, extend knowledge on this topic from a consumer- and competitor-side. A clear definition and explication of the AR tool is given avoiding common misunderstanding between the two common immersive technologies: AR and VR. In particular, the evidence emerging from the consumers' side (Chapter 2) are all the benefits which attracts consumers to use the technologies in-store, which could be an advantage in term of performance for the retailer: evocative capacity in the decision making process, additional information on the product (especially referring to the QR-Code), easiness and rapidity of purchase, high personalisation of the product and the possibility to receive a quickly feedback on the product, using other consumers' reviews.

Thus, this immersive technology could be exploited to interact more with those consumers which are looking for an enhancing experience while shopping. As a matter of fact, AR could create a more-accurate expectations in consumers, along with more confidence about their purchase decisions. So, collecting constantly feedbacks and information from them to understand their trends and needs, retailers could start to implement AR in "Fashion" and "Furniture", which are the two sectors more attractive for consumers under investigation, creating sensorial experience, maybe using sounds and smells across the visualisation of virtual try-on to create a more evocative shopping experience.

In addition, Chapter 3 confirms results on previous research, where retailers should implement firstly pivotal applications of immersive technologies, such as

QR-Code, to get used to AR and then enhance the shopping experience offered to consumers with virtual try-on, virtual mirrors and so on (Yu and Tao, 2009). This is useful to get confidence with AR and to be prepared and ready to the effective adoption. More specifically, technologies require investment in frequent updating and a specific web marketer position could be interesting to be created to solve this task in the company. Thus, it could be costless for companies to start with pivotal experiences to understand their willingness and readiness to continuously guarantee and updated instrument for consumers.

In addition, using AR, retailers could reduce showrooming, because experiencing the product before to buy it could reduce their uncertaincy on the product.

In addition, if consumers are involved with the product, the potential of AR experience will be higher.

The evidence of the fourth chapter provides that consumers' willingness to buy, share, recommend the experience, along with the creation of online and offline traffic respond positively to the immersion (flow) into an AR experience when consumers are involved in the product visualised with the AR mobile application. Without this involvement, it is difficult to create a new behaviour in their shopping journey. So, these findings is particularly interesting for retailers, which could decide to adopt AR try-on moreover for those products in "Fashion" and "Furniture" sectors, who are more "ego involving" with consumers, such as clothes, shoes or sofas.

Accordingly, retailers might create experienced AR applications which consumers would be able to freely download to live a rich "omnichannel experience", which leads to a higher web and physical shop traffic, enhancing purchases.

5.3. Limitation and further research

Retailing is an ever-ending evolution of new strategies and new technological adoption. Thus, this doctoral thesis is not without any limitations. Specifically, I conducted two exploratory analysis (Chapter 2 and 3) to firstly go deeper on consumers' and retailers' perception. One of the methodological instruments more

useful to do that is face-to-face interview (Ellonen et al., 2009). More precisely, I focused the analysis in the Italian context. In Chapter 2 I have investigated Italian consumers' standpoint, while in Chapter 3 Italian retailers' one. Thus, using this qualitative approach, generalisation of results could be difficult if we considered Hofstede's cultural compass (2019), where each country has six different dimensions, which characterise its peculiarity. So, further studies could enhance this limitation, replicating the analysis on a larger sample of consumers' and retailers' in both similar countries (such as France) to create a comparison with my results and with different ones, to investigate to what extent results could be distant. In this way, cultural mindset could be reduced, and results can achieve a higher degree of generability.

In addition, in all these studies, I have focused my analysis on AR, due its potentiality in the next future. Because retailing is a continuously evolving topic in research, further research could go over the limitation of taking in analysis only one immersive technology (in my case augmented reality), going deeper with more advanced tools, such as artificial intelligence (AI) could be. As a matter of fact, even if AR could shape boundaries between online and offline world in an omnichannel retail, AI could be more disruptive and impacting as a technology, revolutionising all consumers' traditional ways to do shopping (e.g. present of chatbot online, robots, virtual assistant or automatize process in the creation of personal product as Intelligent X's beers).

Finally, the discussed "involvement-flow-behavioural intentions" model discussed in Chapter 4 represents an additional and interesting tool to understand when it is profitable for retailer to introduce an immersive technology in their business. It represents a valid contribution to consumers' behavioural literature and an extending of knowledge on flow with immersive technologies and product involvement. This is just a first step to analyse deeper the relationship between personal involvement, flow and behaviours. Forthcoming studies could explore additional variables related with consumers selves to investigate for example if flow state could depict an embeddedness or an embody (Belk, 1988) into the

technological try-on and if this phenomenon could enhance more consumers'
behavioural intentions.

References chapter 5

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Annex_ Substantial summary in French and Italian

Résumé en Français

Après la bulle Internet des années 1990, Internet a modifié les frontières entre le monde en ligne et le monde hors ligne. Les technologies sont devenues de plus en plus omniprésentes dans la vie quotidienne des consommateurs, leur offrant de nouvelles expériences.

Cette évolution a suscité un intérêt scientifique au sein de la communauté académique. Les chercheurs se sont progressivement intéressés à l'usage des technologies immersives dans le commerce de détail, même si les travaux sur ce sujet restent encore peu nombreux.

Face à ce constat, l'objectif de ce travail doctoral est d'étudier la perception que les consommateurs et les distributeurs ont de l'usage des technologies immersives (la réalité augmentée, RA) dans le monde du commerce. La question est également d'analyser leur impact sur les intentions comportementales des consommateurs (achat, bouche à oreille positive, création de trafic en ligne et hors ligne).

Dans cette perspective, l'objectif est également d'évaluer les avantages et les inconvénients que les consommateurs et les vendeurs associent à ces technologies.

Les objectifs de cette thèse de doctorat peuvent donc être résumés comme suit :

1. Étudier la perception par les consommateurs italiens de l'usage de la RA ;

2. Étudier comme la RA peut être utilisée dans l'activité des petites et moyennes entreprises afin de décrire dans quelle mesure elles peuvent améliorer l'expérience du consommateur lors de ses achats ;

3. Étudier la perception qu'ont les distributeurs des technologies immersives afin d'améliorer les environnements en magasin et rendre l'expérience plus engageante ;

4. Étudier l'impact de l'utilisation d'applications mobiles de réalité augmenté sur l'état immersif du consommateur ;

En fait, ces dernières années, l'un des défis majeurs a été d'introduction des technologies digitales, (smartphones, tablettes) et des médias sociaux dans la vie quotidienne des consommateurs. Le client évolue ainsi entre monde réel et monde virtuel. Ainsi il déambule une sorte de "*salle d'exposition sans murs*" (Verhoef, Kannan et Inman, 2015, p. 2), où les barrières telles que les frontières géographiques et l'ignorance des consommateurs sont abattues, créant un monde plus digitalisé.

Au sein de ce monde, le défi serait pour les distributeurs de proposer une expérience similaire sur tous ces canaux (Verhoef et al., 2015), notamment en ce qui concerne les points de contact utilisés quotidiennement par les consommateurs, à l'instar des smartphones.

Toutes ces technologies permettent donc aux distributeurs d'offrir plus de contenu digital en magasin, tout en améliorant les services offerts aux acheteurs et aux consommateurs. Ainsi le point de vente traditionnel a été progressivement transformé par l'introduction de technologies digitale en libre-service ont été introduites par plusieurs magasins au cours du processus de numérisation (Pantano et Timmermans, 2014).

Le commerce de détail s'inscrit ainsi de plus en plus souvent dans un environnement omnicanal, où les vendeurs interagissent avec les clients en utilisant différentes « touchpoints » technologiques et physiques, telles que les magasins, les kiosques, les sites web, les réseaux sociaux, les appareils mobiles, etc.

Cette évolution influence les habitudes d'achat des consommateurs, dont les niveaux d'attentes vis-à-vis de l'expérience en magasin sont de plus en plus

élevées. Les détaillants ont donc un grand défi à relever : créer une expérience attrayante et unique en offrant aux clients la possibilité d'utiliser des technologies digitales en magasin.

Dans ce contexte, la RA est considérée comme l'une des technologies les plus prometteuses pour les cinq prochaines années. Grâce à la génération d'images virtuelles, elle permet à l'utilisateur d'interagir avec du contenu virtuel en temps réel (Dey et al., 2018 ; Azuma, 1997). Cette technologie peut intégrer la réalité sans la remplacer, grâce à l'utilisation d'appareils portables, tels que les smartphones ou les tablettes, ce qui brouille les frontières entre les canaux en ligne et hors ligne.

Par conséquent, l'application mobile qui utilise la RA peut améliorer l'expérience vécue, par l'ajout d'informations à l'instar d'Ikea Place, qui permet de simplifier l'ameublement et la décoration avec la possibilité d'essayer virtuellement les objets avant de les acheter, ou des simulateurs de maquillage proposés par Sephora, simulateurs capables de mettre du contenu virtuel au sein du monde réel.

L'expérience du client pendant la phase pre-achat est considérablement améliorée, offrant une expérience "touch-and-feel" grâce à un contenu vivant et personnalisé avec lequel l'utilisateur peut interagir contrairement au commerce en ligne, caractérisé par une image 2D avec peu d'informations et de capacité narrative (Hilken et al., 2018 ; Dacko, 2017).

La participation du consommateur lors de l'utilisation de la réalité augmentée permet de le plonger dans un état d'immersion. À cet égard, Csikszentmihalyi (1975) décrit l'immersion dans laquelle des consommateurs se trouvent plongés lorsque leur activité est hautement absorbante, comme un état de flux. Une telle immersion améliore l'expérience du consommateur, son apprentissage et créer des distorsions en termes de perception du temps et contrôle de son comportement. Ainsi, le flux devient un médiateur l'utilisation de la réalité augmentée et les réponses des consommateurs, (l'attitude envers le site web, réponses cognitives, intention comportementale, intention de réac).

Une étude menée par Hoffman et Novak (1996) révèle qu'une fois que les consommateurs sont entrés dans un état de flux, ils seront plus susceptibles d'avoir une expérience positive, favorisant les désirs d'exploration envers la technologie. Par conséquent, plus les consommateurs sont en état d'immersion lors de leur expérience, plus ils sont disposés à utiliser à nouveau la technologie dans un avenir proche.

Afin d'atteindre les objectifs poursuivis, cette thèse de doctorat a été organisée en trois articles scientifiques, chacun d'entre eux contribuant à l'un des objectifs de recherche décrit ci-dessus.

Le chapitre 2 analyse l'influence de la RA sur le parcours d'achat des consommateurs. Une étude qualitative exploratoire (20 entretiens semi-structurés) met en lumière, dans un contexte italien, les freins à l'utilisation de technologies immersives dans les commerces. Cela révèle encore une certaine réticence à changer ou à combiner canaux traditionnels et digitaux. Ce qui est conforme à la boussole culturelle de Hofstede (2011), qui montre que l'aversion au risque est un indicateur très pertinent en Italie. Trois éléments sont à souligner :

1) Conformément à l'étude de Rosenbaum et Wong (2015), l'individu présente une croyance à la fois favorable et défavorable sur la RA. En fait, tous sont curieux d'essayer pour la première fois cette technologie, même s'ils ne lui font pas du tout confiance, par exemple :

"C'est curieux, voyons ce qu'ils ont inventé cette fois, je suis un peu réticent à utiliser toute cette technologie, car elle nous détache de la réalité, nous perdons l'horizon. Cela pourrait être utile pour le travail ou pendant une pause, mais le problème reste que nous sommes sujets à utiliser trop de technologie" (Simona, 24 ans).

2) Les consommateurs sont influencés par leurs attentes en référence à leur croyance dans la technologie de la RA (Roy et al., 2018), par exemple :

"Je pense que la technologie est allée beaucoup plus loin qu'il y a quelques années. C'est peut-être intéressant pour les ventes en ligne, mais vous devez déjà

avoir quelques connaissances sur le produit, dans le sens où vous êtes déjà client de cette marque, et vous voulez juste comprendre quel effet il peut vous donner, peut-être avec une couleur différente" (Diego, 50 ans).

3) Si les consommateurs sont optimistes et font preuve d'innovation en ce qui concerne la technologie AR, ils sont plus réceptifs et plus intéressés à l'essayer (Parasuraman, 2000). En fait, ceux qui présentent un malaise et une insécurité sont moins participatifs pendant l'expérience avec l'application mobile de la RA, par exemple :

"Cette technologie ne m'intéresse pas et je ne sais pas si les consommateurs pourraient être intéressés" (Marita, 61 ans)

"Je n'ai aucune résistance à l'innovation. Si une technologie m'intéresse et m'intrigue, je l'essaie immédiatement dès que possible" (Sarah, 24 ans).

La deuxième étude (chapitre 3) se situe au niveau des distributeurs et examine la perception qu'ils ont des technologies immersives et de leur volonté de les adopter au sein du point de vente. En utilisant un multiple-case study, l'étude révèle que les PME Italienne sont conscientes des avantages que l'expérience omni-canal peut offrir à leurs clients, et ce en dépit de leur aversion au risque, ce qui les pousse à adopter les innovations technologiques avec prudence, ce qui se traduit par une adoption des technologies les plus simples et les moins coûteuses (par exemple le QR-Code). L'innovation est adoptée progressivement, l'objectif étant de minimiser la prise de risque dans les PME qui disposent de faibles ressources financières par rapport aux grandes entreprises. La tabelle 1 montrent le niveau de perception de l'état de préparation technologique par les distributeurs.

Tabelle 1 : Niveau de perception de l'état de préparation technologique par les détaillants

Caractéristiques de la perception de l'état de préparation technologique	Alpha	Beta	Gamma	Delta
Soutien de la haute direction	Faible	Modéré	Fort	Modéré
Adoption de la Technologie :				
a) Utilité perçue	Faible	Modéré	Fort	Modéré
b) Facilité d'utilisation perçue	Faible	Modéré	Fort	Modéré

Elaboration personnel

Ainsi, l'analyse des données collectées par la section deux du questionnaire fait apparaître deux grandes catégories affectant la perception de l'état de préparation des détaillants en matière de RA : (a) la résistance au changement des entreprises et (b) l'aspect utilitaire de cette technologie lorsqu'elle est introduite. Malheureusement, sans la rupture de la première catégorie, il est difficile pour les entreprises de comprendre tous les avantages de ce type de technologie.

Comme l'a déclaré Markus (1983), les entreprises sont enclines à utiliser une nouvelle technologie si elles croient et soutiennent son utilisation dans une entreprise. Sans cet élément, les entreprises préfèrent rejeter une innovation, évitant ainsi de prendre le risque d'un échec :

"*La difficulté est toujours due au fait que l'héritage mental est de toujours la garder là où vous êtes capable de la faire. Ainsi, il semble parfois que les nouveaux changements rendent quelque chose plus difficile au lieu de le faciliter*" (Propriétaire Bêta, 49 ans).

D'autres entreprises craignent de perdre leur position sur le marché en termes de qualité et de professionnalisme, en étant dépassées par ce type de technologies. Ainsi, la marchandisation de la profession pourrait conduire à une disqualification de la professionnalité des vendeurs, en automatisant un service actuellement offert pour personnaliser les besoins des clients :

"*J'espère que l'AR n'augmentera pas les achats sur internet au détriment de ceux en magasin*" (Propriétaire Alpha, 39 ans).

La deuxième catégorie décrit la perception des détaillants sur la technologie de la RA comme un outil utile pour améliorer la compréhension de l'aspect final d'un produit personnalisé, en testant virtuellement le produit, également grâce à la fonction de superposition :

"*Je considère que la RA est particulièrement utile dans le secteur du meuble. Ici, les objets sont réels, vous pouvez changer de couleur, en essayant immédiatement les produits*" (propriétaire de Beta, 49 ans).

La dernière étude enfin (chapitre 4) met en lumière un résultat intéressant quant à l'effet médiateur de l'immersion expérientielle de la réalité augmentée entre l'implication du produit et les réponses comportementales du consommateur (volonté d'acheter l'article, de visiter le magasin physique, de visiter le site web et de recommander l'expérience). L'étude révèle la capacité de l'expérience de Réalité Augmentée à stimuler différents types de comportements chez le consommateur.

Le modèle présenté dans cette étude donne un aperçu de l'état des flux en utilisant des technologies immersives (Image 1).

Image 1 : Le modèle
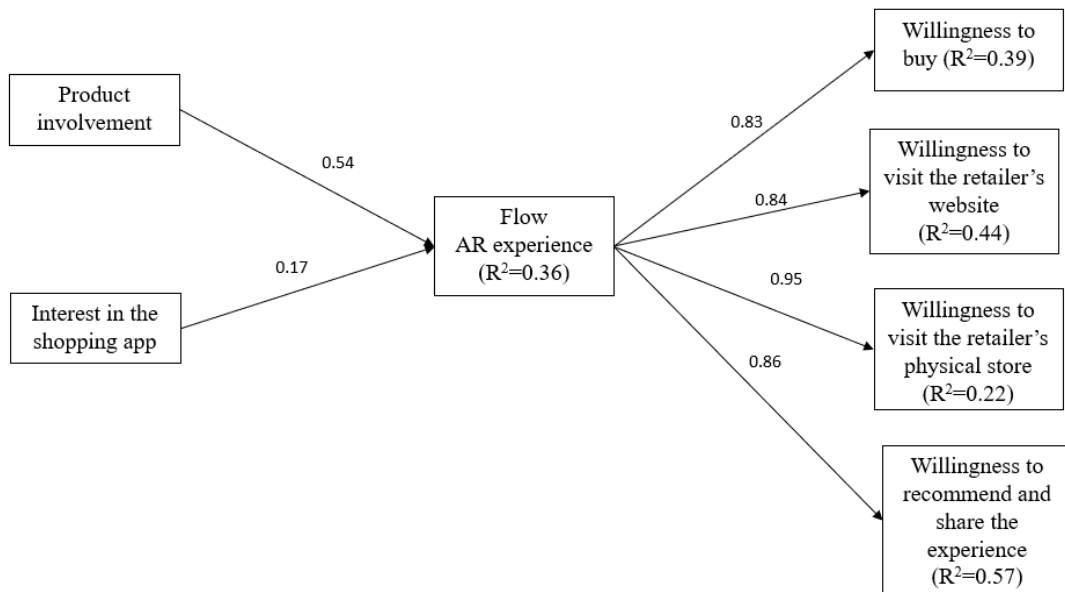
Élaboration personnel

L'immersion des consommateurs dans l'achat virtuel est plus importante si elle est soutenue par des technologies immersives telles que la RA, qui aide les consommateurs à visualiser virtuellement le produit. En conséquence, plus le consommateur est immergé dans l'essai virtuel, plus son attitude à l'égard de l'expérience est importante. Cette attitude se manifestera par une intention comportementale positive en termes de recommandation de l'expérience, d'achat de l'article visualisé ou de visite du magasin physique et en ligne.

Plus précisément, la force de cette modération est particulièrement forte dans la relation entre l'expérience de flux et la volonté de visiter le magasin physique des détaillants (β =0,95, p=0,000).

Cela fournit des informations utiles aux détaillants qui souhaitent introduire ces technologies pour générer du trafic en magasin.

Comme le révèle ce travail doctoral mené dans un contexte italien, la volonté des distributeurs d'adopter des technologies immersives et engageantes est plutôt faible. Bien qu'Internet ait radicalement changé le scénario de la vente au détail,

les PME italiennes, qui représentent 81 % de la main-d'œuvre italienne, sont toujours réticentes à introduire des technologies immersives dans leur activité, en raison de leur manque de connaissances et d'utilisation de ces "nouveaux" outils. Selon Rodan et Galunic (2004), plus les entreprises sont exposées à l'innovation, plus elles sont disposées à améliorer les technologies dans leur activité. De plus, les PME se souviennent de cette vague destructrice qu'elles ont dû affronter avec acharnement, la vente sur Internet. Leur perception de la technologie et leur propension à l'adopter restent liées aux principales difficultés qu'elles rencontrent en tant que petite et moyenne entreprises (risque élevé d'échec, le coût élevé de la mise en œuvre des compétences, forte concurrence sur le marché en ligne).

Du point de vue du consommateur, la réticence des détaillants à utiliser les technologies immersives rend encore l'utilisation de ces technologies limitée pour les consommateurs. À l'exception de quelques cas d'introduction du QR-Code, le RA n'est pas si courant en Italie.

Cependant, ce travail montre un résultat intéressant côté des consommateurs : lorsque la technologie est utilisée seule, et qu'il n'y a aucune implication émotionnelle envers la catégorie de produit, la perception des consommateurs se concentre sur l'effet "WOW", sans que cela ne génère aucune implication en termes d'intentions comportementales. De plus, dans les secteurs où les preuves physiques créent une valeur ajoutée (habillement et agroalimentaire), si les consommateurs n'ont pas une implication émotionnelle envers cette catégorie, l'expérience de la RA ne remplace pas l'expérience physique.

Au contraire, lorsque les consommateurs sont impliqués dans la catégorie de produit, les tests virtuels les projettent dans un état de flux, ce qui améliore leur expérience vécue, et agit fortement sur les leurs intentions comportementales. En fait, plus l'immersion dans l'expérience digitale est grande, plus les consommateurs sont disposés à acheter le produit, à recommander l'expérience et à plus ils sont enclins à visiter le site en ligne et le magasin physique de l'entreprise.

La RA a un effet sur l'état de flux et sur les intentions comportementales des consommateurs seulement lorsque leur implication dans la catégorie de produit est forte.

Ces résultats sont particulièrement intéressants si l'on replace la perception de la technologie dans un contexte omnicanal, où numérisation et physicalité se combinent dans la même expérience d'achat (Beck et Rygl, 2015).

En particulier, cette thèse de doctorat permet de combler les connaissances entre les canaux hors ligne et en ligne (Verhoef et al., 2015), qui était jusqu'à présent difficile à combler. Cette thèse met en lumière l'intérêt d'utiliser la réalité augmentée pour les situations de forte implication chez le consommateur, celle ayant un impact positif sur l'état de flow et sur leur intention comportementale.

En particulier, la première étude exploratoire qui porte sur la perception des consommateurs (chapitre 2) contribue au débat scientifique. Elle permet de comprendre leur motivations et freins à utiliser la technologie de réalité augmentée. Les résultats confirment que l'effet initial "WOW" n'est pas significativement suffisant pour créer de nouvelles habitudes d'achat. Il en faut plus (chapitre 4) pour adopter un nouveau comportement, comme l'engagement (Cohen, 1997 ; Laurent et Kapferer, 1985).

Ensuite, le chapitre 3 a tracé les frontières entre le canal digital et le canal traditionnel, en mettant lumière les freins des détaillants à adopter les technologies dans leur activité.

En outre, le rôle de l'immersion dans les nouvelles technologies a été approfondi, en analysant sa fonction de médiateur entre l'implication et les intentions comportementales. Ce résultat fait progresser les connaissances sur trois sujets différents dans la littérature, qui sont l'implication des consommateurs (Laurent et Kapferer, 1985 ; O'Cass, 2000 ; Khan, 2020), la théorie des flux immersifs (Csikszentmihalyi, 1975 ; Huang et Liao. 2017) et le comportement des consommateurs (Moorty et al., 2019 ; Poushneh et Vasquez-Parraga, 2017 ; Davis, 1989), comme indiqué au chapitre 4.

Ce résultat confirme la fonction hautement interactive de la RA, un outil capable d'améliorer le comportement exploratoire et participatif des consommateurs (Javornik, 2016).

Les apports de ce travail doctoral sont d'ordre théorique, méthodologique et managérial.

D'un point de vue théorique, cette thèse a permis de construire une revue de littérature sur les différentes technologies utilisées dans le retailing et en particulier sur la RA. Les notions de réalité augmentée et virtuelle ont été définies et une distinction a pu être opérée entre ces deux technologies. Une revue de littérature a permis de présenter les principales recherches sur la RA, de mettre en lumière les principaux résultats obtenus lors de ces recherches et d'identifier les problématiques actuelles non encore traitées par des recherches antérieures.

Ensuite, une définition et une explication claires de l'outil sont données, ce qui permet d'éviter les malentendus courants entre les deux technologies de plongée les plus répandues : la réalité augmentée et la réalité virtuelle.

D'un point de vue méthodologique, j'ai utilisé des méthodologies variées que sont l'entretiens semi-structurés (Chapitre 2), la multiple case-study methodology (Chapitre 3) et la path analysis methodology (Chapitre 4). Dans le premier et troisième étude, j'ai collecté des données auprès des consommateurs après une séance de réalité augmentée, pendant dans les deuxième étude les données ont été collecté auprès des distributeurs.

D'un point de vue managérial, cette recherche offre des pistes de réflexions pour les distributeurs. Elle révèle les motivations et les freins des consommateurs à utiliser la réalité augmentée, ce qui constitue autant de pistes d'action. Cela peut amener les distributeurs à ne pas investir dans cette technologie, ce qui constitue une décision stratégique. Ils pourront également investir dans la technologie, charge à eux de lever les freins ou d'exploiter leurs motivations.

La recherche révèle que la réalité augmentée peut être pertinente pour des catégories de produits à forte implication. Dans ce cas en effet, la RA met le

consommateur en état d'immersion, ce qui impacte alors positivement les intentions comportementales. Ce résultat révèle que l'utilisation de la RA est surtout pertinente pour les produits à forte implication et/ou pour les individus fortement impliqués dans une catégorie de produit. Un vendeur en magasin pourrait ainsi inviter son client à utiliser une application de RA sur son smartphone s'il le sent particulièrement impliqué dans la catégorie de produit.

Cette thèse de doctorat a fourni des informations utiles aux professionnels et aux détaillants travaillant dans le domaine de la technologie et du marketing. Tout d'abord, cette thèse s'adresse aux PME qui veulent se positionner sur les technologies immersives et surtout la RA, comme la technologie la moins chère et la plus puissante pour améliorer l'expérience d'achat.

Les deuxième et troisièmes chapitres analyse la perception qu'ont les consommateurs et les distributeurs de la réalité augmentée, ce qui offre de nouvelles connaissances pour les professionnels.

En particulier, les éléments qui ressortent du côté des consommateurs sont tous les avantages qui incitent les consommateurs à utiliser les technologies en magasin, ce qui pourrait être un avantage en termes de performance pour les détaillants : capacité d'évocation dans le processus de décision, informations supplémentaires sur le produit (notamment en ce qui concerne le QR-Code), facilité et rapidité d'achat, personnalisation élevée du produit et possibilité de recevoir rapidement un retour d'information sur le produit, en utilisant les avis d'autres consommateurs. En fait, le détaillant doit être préparé en premier lieu à la technologie et à toutes ses fonctions, afin de créer des stratégies d'adoption dans son entreprise. De cette façon, la RA pourrait être utilisée comme un outil supplémentaire pour améliorer l'expérience d'achat, en particulier lorsque les consommateurs sont impliqués dans le produit. Les données du quatrième chapitre montrent que la volonté des consommateurs d'acheter, de partager, de recommander l'expérience, ainsi que la création de trafic en ligne et hors ligne, réagissent positivement à l'immersion (au flux) dans une expérience de RA, même si les consommateurs sont impliqués dans le produit présenté avec l'application

mobile de RA. Sans cette implication, il est difficile de créer un nouveau comportement dans leur parcours d'achat.

Riassunto in italiano

Dopo la bolla delle dot.com degli anni Novanta, Internet ha cambiato i confini tra il mondo online e quello offline. Le tecnologie sono diventate sempre più pervasive nella vita quotidiana dei consumatori, offrendo loro nuove esperienze.

Questo sviluppo ha suscitato l'interesse scientifico nella comunità accademica. I ricercatori sono sempre più interessati all'uso di tecnologie immersive nella vendita al dettaglio, anche se la ricerca su questo tema è ancora scarsa.

Alla luce di ciò, l'obiettivo di questo lavoro di dottorato è quello di studiare la percezione che i consumatori e i rivenditori hanno dell'uso delle tecnologie immersive (con particolare focus alla realtà aumentata, RA) nel mondo del retail. In particolar modo, viene analizzato l'impatto di queste tecnologie sulle intenzioni comportamentali dei consumatori (acquisto, passaparola positivo, creazione di traffico online e offline).

Da questo punto di vista, l'obiettivo è quello di valutare i vantaggi e gli svantaggi che consumatori e rivenditori associano a queste tecnologie.

Gli obiettivi di questa tesi di dottorato possono quindi essere riassunti come segue:

1.   Studiare la percezione dei consumatori italiani dell'uso della RA;

2.   Studiare come la RA possa essere utilizzata nell'attività delle piccole e medie imprese per descrivere in che misura esse possano migliorare l'esperienza d'acquisto del consumatore;

3.	Studiate come i rivenditori percepiscono le tecnologie immersive per migliorare gli ambienti all'interno del punto vendita, rendendo l'esperienza più coinvolgente;

4.	Studiare l'impatto dell'uso di mobile app di RA sul coinvolgimento esperienziale del consumatore;

Infatti, negli ultimi anni, una delle maggiori sfide è stata l'introduzione delle tecnologie digitali, (smartphone, tablet) e dei social media nella vita quotidiana dei consumatori. Attraverso questo processo di digitalizzazione, il consumatore sposta continuamente i propri bisogni esperienziali tra il mondo reale e quello virtuale, attraversando una sorta di "showroom senza pareti" (Verhoef, Kannan e Inman, 2015, p. 2), dove barriere come i confini geografici e l'ignoranza dei consumatori vengono abbattute attraverso un mondo maggiormente digitalizzato.

All'interno di questo mondo, la sfida sarebbe quella di offrire ai consumatori un'esperienza simile su tutti questi canali offerti (sia online che offline) (Verhoef et al., 2015), soprattutto per quanto riguarda quei "punti di contatto" da loro utilizzati quotidianamente: gli smartphone.

Infatti, l'utilizzo di queste tecnologie da parte dei consumatori consente ai rivenditori di offrire più contenuti digitali nei negozi, migliorando al contempo i servizi offerti agli acquirenti e ai consumatori. Così, il punto vendita tradizionale è stato gradualmente trasformato dall'introduzione delle tecnologie digitali self-service che sono state introdotte da diversi negozi durante il processo di digitalizzazione (Pantano e Timmermans, 2014).

La vendita al dettaglio si svolge quindi sempre più spesso in un ambiente omnicanale, dove i rivenditori interagiscono con i consumatori utilizzando diversi "punti di contatto" tecnologici e fisici, come negozi, chioschi, siti web, social network, dispositivi mobili, etc. (Pantano e Timmermans, 2014).

Questo cambiamento sta influenzando le abitudini d'acquisto dei consumatori, che hanno aspettative sempre più elevate riguardo l'esperienza in-store a loro offerta. I rivenditori devono quindi affrontare una grande sfida: creare un'esperienza

attraente e unica, offrendo ai consumatori la possibilità di utilizzare le tecnologie digitali in-store.

In questo contesto, la RA è vista come una delle tecnologie più promettenti per i prossimi cinque anni. Infatti, attraverso la generazione di immagini virtuali, la RA permette all'utente di interagire con contenuti virtuali in tempo reale (Dey et al., 2018; Azuma, 1997). Questa tecnologia è in grado di integrare la realtà senza sostituirla, attraverso l'utilizzo di dispositivi portatili come smartphone o tablet, sfumando i confini tra i canali online e offline. Basta infatti scannerizzare un'immagine o un QR-Code per ottenere un cruscotto di informazioni aggiuntive riguardo ad un prodotto, come ad esempio delle proposte di abbinamento di capi di abbigliamento.

Esempi concreti di applicazioni mobile di RA, capaci di migliorare l'esperienza aggiungendo informazioni, possono essere rappresentati da Ikea Place, che semplifica l'arredamento e la decorazione con la possibilità di provare virtualmente gli oggetti prima di acquistarli, o dai simulatori di trucco offerti da Sephora, in grado di portare contenuti virtuali nel mondo reale attraverso la creazione di una prova make-up totalmente digitale.

Come precedentemente detto, l'esperienza del consumatore nella fase di preacquisto viene notevolmente potenziata, offrendo un'esperienza "touch-and-feel" grazie a contenuti live e personalizzati con cui l'utente può interagire, a differenza del commercio online, caratterizzato da un'immagine 2D con poca capacità informativa e narrativa (Hilken et al., 2018; Dacko, 2017).

La partecipazione del consumatore all'uso della realtà aumentata porta quest'ultimo in uno stato di immersione. A questo proposito, Csikszentmihalyi (1975) descrive questa immersione percepita dal consumatore durante un'attività ad alto impatto di coinvolgimento come stato di flusso (flow). Tale immersione migliora sia l'esperienza del consumatore sia l'apprendimento, creando distorsioni in termini di percezione temporale e di controllo del proprio comportamento. I risultati riportati nel lavoro di questa tesi mostrano come questo flusso immersivo

abbia una funzione mediatrice tra l'uso della RA e le differenti risposte dei consumatori dopo l'esperienza virtuale con RA (atteggiamento verso il sito web, risposte cognitive, intenzione comportamentale, intenzione di reagire).

In aggiunta a ciò, uno studio condotto da Hoffman e Novak (1996) rivela che una volta che i consumatori entrano in uno stato di flusso hanno maggiori probabilità di vivere un'esperienza positiva, favorendo desideri esplorativi verso la tecnologia. Pertanto, quanto più i consumatori saranno immersi in uno stato di immersione durante la loro esperienza, tanto più saranno disposti ad utilizzare nuovamente la tecnologia nel prossimo futuro.

Per raggiungere questi obiettivi, la presente tesi di dottorato è stata organizzata in tre articoli scientifici, ciascuno dei quali ha contribuito a uno degli obiettivi di ricerca sopra descritti.

Il capitolo 2 analizza l'influenza della RA sul percorso di acquisto dei consumatori. Uno studio esplorativo di tipo qualitativo (20 interviste semi-strutturate) mette in evidenza, in un contesto italiano, le barriere all'utilizzo di tecnologie immersive nei negozi. Tale studio rivela ancora una certa riluttanza a cambiare o a combinare canali tradizionali e digitali da parte dei consumatori. Ciò è in linea con il compasso culturale di Hofstede (2011), che mostra come l'avversione al rischio sia un indicatore molto rilevante in Italia.

Tre elementi sono da sottolineare:

1) In linea con lo studio di Rosenbaum e Wong (2015), l'individuo presenta sia una credenza favorevole che una credenza sfavorevole sulla RA. Tutti gli intervistati sono infatti curiosi di provare per la prima volta questa tecnologia, anche se non si fidano affatto, per esempio:

"È curioso, vediamo cosa hanno inventato questa volta, sono un po' riluttante a usare tutta questa tecnologia, perché ci distacca dalla realtà, perdiamo l'orizzonte. Potrebbe essere utile per il lavoro o durante una pausa, ma il

problema rimane che siamo soggetti all'uso di troppa tecnologia" (Simona, 24 anni).

2) I consumatori sono influenzati dalle loro aspettative che si riferiscono alle loro convinzioni sulla tecnologia RA (Roy et al., 2018), per esempio:

"Credo che la tecnologia sia andata molto oltre rispetto a qualche anno fa. Può essere interessante per quanto riguarda le vendite online, ma devi avere già un po' di conoscenza del prodotto, nel senso che sei già cliente di quel marchio, e vuoi solo capire che effetto può dare, magari con un colore diverso" (Diego, 50 anni).

3) Se i consumatori sono ottimisti e presentano una certa innovatività rispetto alla tecnologia RA, sono più ricettivi e interessanti nel provarla (Parasuraman, 2000). Infatti, coloro che presentano disagio e insicurezza sono meno partecipativi durante l'esperimento con l'applicazione mobile RA, ad esempio:

"Non mi interessa questa tecnologia e non so se i consumatori potrebbero essere interessati" (Marita, 61 anni)

"Non ho alcuna resistenza all'innovazione. Se una tecnologia mi interessa e mi intriga, la provo subito" (Sarah, 24 anni).

Il secondo studio (capitolo 3) è a livello dei rivenditori ed esamina la loro percezione delle tecnologie immersive e la loro disponibilità ad adottarle nel punto vendita. Lo studio rivela, attraverso un multiple-case study, che le PMI italiane sono consapevoli dei vantaggi che l'esperienza multicanale può offrire ai loro consumatori, nonostante la loro avversione al rischio, che le porta ad accogliere con cautela le innovazioni tecnologiche, con il risultato di adottare le tecnologie più semplici ed economiche (ad esempio il QR-Code). L'innovazione viene quindi implementata gradualmente, con l'obiettivo di ridurre al minimo l'assunzione di rischi nelle PMI con scarse risorse finanziarie rispetto alle grandi imprese.

La tabella 1 mostra il livello di percezione della prontezza tecnologica da parte dei distributori.

Tabella 1 : Livello di percezione della prontezza tecnologica da parte dei distributori

Caratteristiche della percezione della prontezza tecnologica	Alpha	Beta	Gamma	Delta
Supporto per il Senior Management	Debole	Moderato	Forte	Moderato
Adozione della tecnologia				
a) Utilità percepita	Debole	Moderato	Forte	Moderato
b) Facilità d'utilizzo percepita	Debole	Moderato	Forte	Moderato

Elaborazione personale

Così, dall'analisi dei dati raccolti dalla sezione due del questionario sono emerse due categorie principali che influenzano la percezione della disponibilità dei distributori sulla RA: (a) la resistenza al cambiamento delle imprese e (b) l'aspetto utilitaristico di questa tecnologia quando viene introdotta. Purtroppo, senza la rottura della prima categoria, è difficile per le imprese comprendere tutti i benefici di questo tipo di tecnologia.

Come afferma Markus (1983), le imprese sono inclini a utilizzare una nuova tecnologia se credono e ne sostengono l'uso in un'impresa. Senza questo elemento, le imprese preferiscono rifiutare un'innovazione, evitando di correre il rischio di fallire:

"*La difficoltà sta sempre nel fatto che l'eredità mentale è sempre quella di mantenerla dove si è in grado di fare. Così, a volte sembra che i nuovi cambiamenti rendano più difficile qualcosa invece di facilitarla*" (Owner Beta, 49 anni).

Altre imprese sono preoccupate di perdere la loro posizione di mercato in termini di qualità e professionalità, essendo superate da questo tipo di tecnologie. Così, la mercificazione della professione potrebbe portare ad una squalifica della

professionalità dei rivenditori, automatizzando un servizio attualmente offerto per personalizzare le esigenze dei clienti:

"*Spero che la RA non aumenti gli acquisti su internet a scapito di quelli in negozio*" (Proprietario Alpha, 39 anni).
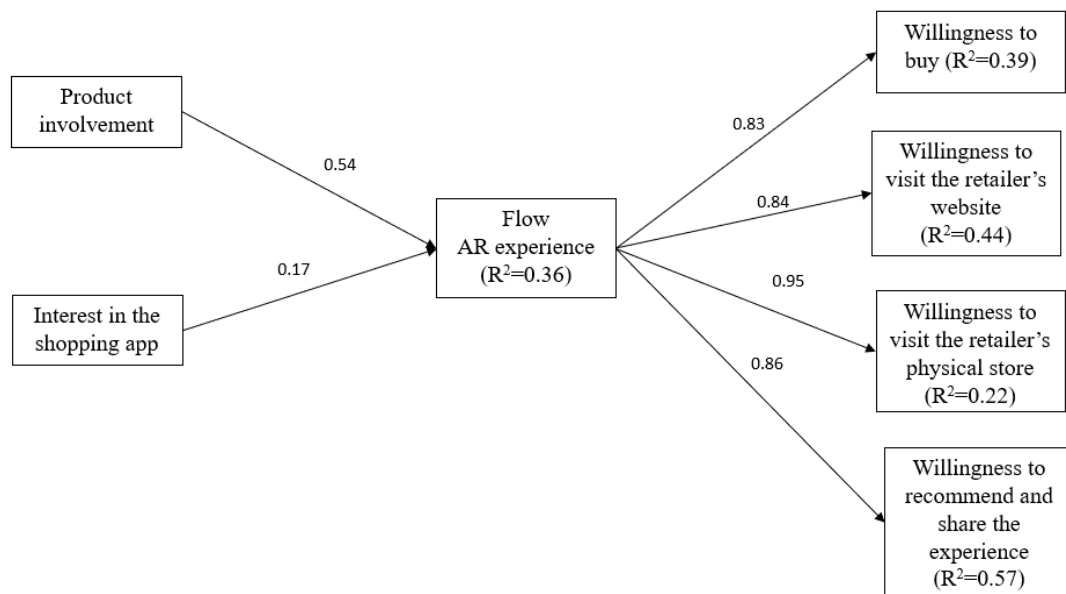
La seconda categoria descrive la percezione dei rivenditori sulla tecnologia RA come uno strumento utile per migliorare la comprensione nell'aspetto finale di un prodotto personalizzato, testando virtualmente il prodotto, anche grazie alla funzione di sovrapposizione:

"*Vedo la RA particolarmente utile nel settore del mobile. Qui gli oggetti sono reali, si può cambiare colore, avendo una prova immediata dei prodotti*" (Proprietario di Beta, 49 anni).

Infine, l'ultimo studio (Capitolo 4) evidenzia un interessante risultato relativo all'effetto mediatore dell'immersione esperienziale della RA tra il coinvolgimento del prodotto e le risposte comportamentali del consumatore (disponibilità ad acquistare l'articolo, a visitare il negozio fisico, a visitare il sito web e a raccomandare l'esperienza). Lo studio rivela la capacità dell'esperienza della RA di stimolare diversi tipi di comportamento dei consumatori.

Il modello presentato in questo studio fornisce informazioni sullo stato del flusso utilizzando tecnologie ad immersione (Immagine 1).

Immagine 1: Il modello

Product involvement

Interest in the shopping app

0.54

0.17

Flow AR experience ($R^2=0.36$)

0.83

0.84

0.95

0.86

Willingness to buy ($R^2=0.39$)

Willingness to visit the retailer's website ($R^2=0.44$)

Willingness to visit the retailer's physical store ($R^2=0.22$)

Willingness to recommend and share the experience ($R^2=0.57$)

Elaborazione personale

Cioè, l'immersione dei consumatori nell'acquisto virtuale è maggiore se supportata da tecnologie immersive come la RA, che aiuta i consumatori a visualizzare virtualmente il prodotto. Di conseguenza, maggiore sarà l'immersione dei consumatori nella prova virtuale, maggiore sarà il loro atteggiamento nei confronti dell'esperienza. Questo atteggiamento si manifesterà con un'intenzione comportamentale positiva in termini di consigliare l'esperienza, acquistare l'articolo visualizzato o visitare il negozio fisico e online.

In particolare, la forza di questa moderazione è particolarmente forte nel rapporto tra l'esperienza di flusso e la disponibilità a visitare il negozio fisico del rivenditore (β =0,95, p=0,000).

Ciò fornisce una visione d'insieme interessante per i rivenditori, che vogliono introdurre queste tecnologie per generare traffico all'interno del proprio punto vendita.

Come rivela questo lavoro di dottorato condotto in un contesto italiano, la disponibilità dei rivenditori ad adottare tecnologie coinvolgenti è piuttosto bassa. Nonostante Internet abbia cambiato radicalmente lo scenario della vendita al dettaglio, le PMI italiane, che rappresentano l'81% della forza lavoro italiana,

sono ancora restie a introdurre tecnologie immersive nel loro business, a causa della loro scarsa conoscenza e dell'utilizzo di questi "nuovi" strumenti. Secondo Rodan e Galunic (2004), più le aziende sono esposte all'innovazione, più sono disposte a migliorare le tecnologie nel loro business. Inoltre, le PMI ricordano ancora l'ondata distruttiva che ha creato l'e-commerce nei loro confronti. Pertanto, la loro percezione della tecnologia e la loro propensione ad adottarla rimangono legate alle principali difficoltà che incontrano dovute alla loro piccola o media dimensione, difficoltà che possono essere riassunte nell'alto rischio di fallimento, negli alti costi di implementazione delle competenze e nella forte concorrenza nel mercato online.

Dal punto di vista del consumatore, la riluttanza dei rivenditori a utilizzare tecnologie immersive rende per loro ancora più limitato l'uso di queste tecnologie. Infatti, ad eccezione di alcuni sporadici casi di introduzione del QR-Code, la RA non è così comune in Italia.

Tuttavia, questa tesi di dottorato mostra un risultato interessante dal punto di vista del consumatore: quando la tecnologia viene utilizzata da sola, e non vi è alcuna implicazione emotiva nei confronti della categoria di prodotti, la percezione del consumatore si concentra sull'effetto "WOW", senza generare alcuna implicazione in termini di intenzioni comportamentali. Inoltre, in quei settori in cui l'esperienza di prova offline crea valore aggiunto (ad esempio, abbigliamento e cibo), senza un coinvolgimento emotivo dei consumatori in questa specifica categoria prodotto, l'esperienza di RA non sostituisce l'esperienza fisica, non creando alcuna intenzione comportamentale nel consumatore.

Al contrario, quando i consumatori sono coinvolti nella categoria dei prodotti, l'esperienza virtuale con la categoria di un prodotto li proietta in uno stato di flusso, che migliora la loro esperienza, influenzando fortemente le loro intenzioni comportamentali. Infatti, dato il coinvolgimento emotivo in un prodotto, maggiore è l'immersione nell'esperienza digitale, più i consumatori sono disposti ad acquistare il prodotto, a consigliare l'esperienza e a visitare il sito online e il negozio fisico dell'azienda.

La RA ha quindi un effetto sullo stato di flusso immersivo nell'attività dei consumatori e sulle successive intenzioni comportamentali solo quando il loro coinvolgimento nella categoria di prodotti è forte.

Questi risultati sono particolarmente interessanti se collochiamo la percezione della tecnologia in un contesto omnicanale, dove digitalizzazione e fisicità si combinano nella stessa esperienza d'acquisto (Beck e Rygl, 2015).

In particolare, questa tesi di dottorato colma il divario di conoscenza tra i canali offline e online (Verhoef et al., 2015), che finora è stato difficile da colmare. In questo lavoro viene infatti evidenziato l'interesse nell'utilizzare la realtà aumentata per situazioni di forte coinvolgimento dei consumatori, creando un impatto positivo sullo stato di flusso e sulla loro intenzione comportamentale.

In particolare, il primo studio esplorativo sulla percezione dei consumatori (capitolo 2) contribuisce al dibattito scientifico permettendoci di capire le motivazioni e gli ostacoli dei consumatori all'utilizzo della RA. I risultati confermano che un iniziale effetto "WOW" non è significativamente sufficiente a creare nuove abitudini di acquisto. Occorre di più (capitolo 4) per adottare un nuovo comportamento, come il coinvolgimento emotivo in un prodotto (Cohen, 1997; Laurent e Kapferer, 1985).

Successivamente, il capitolo 3 ha delineato i confini tra il canale digitale e quello tradizionale, evidenziando le principali barriere che i rivenditori incontrano nell'adottare le tecnologie nel loro business.

Inoltre, è stato approfondito il ruolo dell'immersione nelle nuove tecnologie, analizzandone la funzione di mediatore tra coinvolgimento e intenzioni comportamentali. Questo risultato fa progredire la conoscenza su tre diversi argomenti della letteratura, che sono il coinvolgimento dei consumatori (Laurent e Kapferer, 1985; O'Cass, 2000; Khan, 2020), la teoria del flusso immersivo (Csikszentmihalyi, 1975; Huang e Liao. 2017) e il comportamento dei consumatori (Moorty et al., 2019; Poushneh e Vasquez-Parraga, 2017; Davis, 1989) come discusso nel capitolo 4.

Questo risultato conferma la funzione altamente interattiva della RA come strumento per migliorare il comportamento esplorativo e partecipativo dei consumatori (Javornik, 2016).

I contributi di questo lavoro di dottorato possono essere suddivisi in tre categorie: teorici, metodologici e manageriali.

Da un punto di vista teorico, questa tesi ha permesso di costruire una rassegna della letteratura sulle tecnologie utilizzate nel retailing, con particolare focus sulla RA. Sono state infatti definite le nozioni di realtà aumentata e virtuale e si è fatta una distinzione tra queste due tecnologie. Una rassegna della letteratura ha permesso di presentare le principali ricerche sulla RA e di evidenziarne i principali risultati ottenuti nel corso di questa ricerca, individuando alcuni gap non ancora affrontati dalle ricerche precedenti.

Da un punto di vista metodologico, ho utilizzato varie metodologie come le interviste semi-strutturate (Capitolo 2), la metodologia della multiple-case study (Capitolo 3) e la path analysis (Capitolo 4). Nel primo e nel terzo studio la raccolta dati analizza il punto di vista dei consumatori sull'utilizzo della RA dopo aver mostrato loro una prova virtuale di RA, mentre nel secondo studio i dati sono stati raccolti presso i rivenditori.

Da un punto di vista manageriale, questa ricerca offre numerosi spunti di riflessione manageriali. Attraverso l'illustrazione delle principali motivazioni ed ostacoli dei consumatori ad adottare la RA, i rivenditori possono riflettere a livello strategico sulla possibilità di investire in questa tecnologia cercando di andare oltre l'attuale situazione di stallo verso l'introduzione di tecnologie immersive.

In particolare, la ricerca mostra come la realtà aumentata possa essere rilevante per invogliare i consumatori in specifiche azioni di fronte a quelle categorie di prodotti per loro ad alto coinvolgimento emotivo. In questo caso, la RA avvolge il consumatore in uno stato di immersione, che influenzerà positivamente le sue intenzioni comportamentali post esperienza virtuale. Questo risultato rivela che l'uso della RA è più rilevante per i prodotti ad alto coinvolgimento e/o per le

persone che sono molto coinvolte in una categoria di prodotti. Un venditore all'interno del negozio potrebbe quindi invitare il suo consumatore ad utilizzare un'applicazione di RA sul suo smartphone se sente in lui un particolare coinvolgimento nella categoria di prodotti.

In breve, questa tesi di dottorato ha fornito informazioni utili ai professionisti e ai rivenditori che lavorano nel campo della tecnologia e del marketing, rivolgendosi innanzitutto alle PMI che vogliono posizionarsi sulle tecnologie immersive, in particolar modo sulla RA, intesa come la tecnologia al momento più economica e potente per migliorare l'esperienza d'acquisto del consumatore.

In particolare, gli elementi che emergono dal lato consumatore sono tutti i benefici che motivano i consumatori ad utilizzare le tecnologie in-store, che potrebbero rappresentare un vantaggio prestazionale per i rivenditori: capacità evocativa nel processo decisionale, informazioni aggiuntive sul prodotto (soprattutto per quanto riguarda il QR-Code), facilità e velocità di acquisto, alto livello di personalizzazione del prodotto e la possibilità di ricevere un rapido feedback sul prodotto, utilizzando le opinioni degli altri consumatori. Infatti, il venditore deve essere preparato prima di tutto alla tecnologia e a tutte le sue caratteristiche, al fine di creare strategie di adozione nella sua attività. In questo modo, la RA potrebbe essere utilizzata come strumento aggiuntivo per migliorare l'esperienza d'acquisto, soprattutto quando i consumatori sono coinvolti con il prodotto. I dati del quarto capitolo mostrano che la disponibilità dei consumatori ad acquistare, condividere, consigliare l'esperienza, così come la creazione di traffico online e offline, rispondono positivamente all'immersione (al flusso) in un'esperienza di RA, anche quando i consumatori sono coinvolti nel prodotto presentato con l'applicazione mobile di RA. Senza questo coinvolgimento, è difficile creare nuovi comportamenti nel loro percorso di shopping.