

## Consumers' perception of Augmented Reality: An application to the "Made in Italy" brand

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### 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 are in touch with AR and how it could affect decision-making process in order to define a new framework of analysis and development in the context of the "Made in Italy" brand.

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 the lack of knowledge about AR and the difficult engagement with new technologies. The paper ends arguing academical and managerial implications along with its limitations and further research.

**Keywords:** Augmented Reality; Consumer journey; Devices.

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## 1. Introduction

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

In a world where digitalization is shaping boundaries between online channels and offline one (Barlow, Siddiqui and Mannion, 2004), where individuals have the possibility to speak with virtual assistants such as Alexa by Amazon, Cortana by Microsoft and Siri by Apple, 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 is not only a smart technology as stated by some scholars, 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). The higher power of this technology is the usability of this tool as a low-cost technology for customers, who receive additional information simply scanning an image (e.g. the QR-Code) both in-store and out-of-the store (Välkynnen et al., 2011).

So the reader could easily understand how AR could play a valuable role in integrating marketing strategies (Scholz and Smith, 2016; Hilken et al., 2017; Remondino, 2018), and why companies such as McDonalds, General Eletrics and Coca-Cola have embraced AR technology in their marketing plans to create a unique and innovative experience for customers. Thus, brands as IKEA and Sephora also decide to introduced mobile AR shopping apps to allow consumers to virtually "try out" products on their own bodies (as Sephora make-up) or in their own houses (Sholz and Duffy, 2018; Olsson et al., 2013), enhancing the customer experience around the purchase of a lipstick or a sofa. So, it is just this ability to combine physical and digital world that let this technology to reach a wider number of consumers, using mobile application on personal smartphone (Perkinscoie Report, 2018).

As a matter of fact, 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).

Despite that, AR has not got a single definition yet. On one hand, some scholars define AR as an ideal technology to create a link between the real and digital world (Sholz and Smith, 2016), focusing their effort in understanding the linkage between the two worlds. On the other, they examined consumers' motivations and 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 how consumer perceive this technology in-store and how AR impacts in their decision-making process.

Therefore, the paper aims to contribute in AR literature by focusing on how customers perceive the purchase of a brand if they use augmented reality into their shopping journey.

To go ahead with this aims, Authors have interviewed 20 consumers using a semi-structural method, 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".

Thus, before to analyse each step of our work, Authors desire to give the reader a better comprehension of the structure of the present paper: firstly, Authors examine the existing literature on augmented reality, defining its meaning, its characteristics and how hedonistic/utilitarian aspect 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. Moreover, a Deloitte report (2018) states an important gap in the Italian market, where despite the potential expressed by the Italian industry in term of innovation, it remains a significant foreign detachment in terms of education and training of the workforce and following adoption of such as technologies in business (Deloitte, 2018). Thus, Authors decide to conduct this study to go ahead these difficulties, understanding better if one or more of the four main Italian industries, the abovementioned "4F", could be consider as mature and more appropriate to introduce AR by practitioners' point of view. Therefore, as aforementioned, to bridge up this gap and contribute to the existing marketing literature, a qualitative analysis with consumers is conducted. This is described and analysed in the methodology and finding section. Then these two sections are followed by a discussion between findings and literature. Finally, the paper ends arguing academic and managerial implications along with its limitation and further research.

## **2. Literature review**

### ***2.1. Augmented reality: definitions and characteristics***

Augmented reality could interest 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). Notwithstanding, AR could also be defined as an emerging form of experience, able to expand and amplify real world virtually (Altipulluk, 2017). As highlighted from the marketing literature, AR combine user satisfaction model along with the technology acceptance one (TAM) (Wixom and Todd, 2005).

Moreover, Augmented Reality (AR) 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 into 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 commonly 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<sup>1</sup>.

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

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 this technology is applied during a shopping journey, 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, Authors 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 Heijden 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).

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

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 (Javornik, 2016).

Recent research show AR might be more a hedonic technology than a 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 referring to augmented reality technology (Hilken et al., 2017; Yim et al., 2017) to drive consumers' attitudes and reactions to augmented reality, even if research on the acceptance of AR app show that the hedonic elements are more investigated than the utilitarian one, as just stated before.

Thus, this paper aims firstly, to investigate how consumers are in touch with augmented reality and secondly how AR could affect decision-making process.

### **2.3. Consumers' perception and technology readiness of AR**

Literature on customers' perception of new technologies such as augmented reality is very poor and fragmented.

To examine this steam of research, Authors have searched articles on the database Web of Science, using the keyword "customer perception". Thus, they found 10,189 results related to this topic. So, introducing the last 5 years-time filter, selecting only article related to the management field and published in marketing journal, results passes to 127. Of them only 13 were in English and in open access format.

Finally, Authors read these articles, selecting 7 of them in base of a pertaining title and abstract. Four of this seven articles are related to customer perception of a brand, using digital technologies.

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).

Literature on customer perception considers price, quality and value as pivotal determinants on shopping behaviour and products choice (Zeithaml, 1988).

In this vein, perceived quality was defined by Lewin (1936) as a consumers' judgment about a product's overall excellence or superiority. It depends from the evaluation of quality attributes by consumers' point of view. In many fields, this evaluation is very difficult, because consumers have not all the information yet, such as in experience goods (restaurants meals, haircuts, ...) and services (insurance policies, auto repairs, ...) (Darby and Karni, 1973).



In literature price is the cost where a consumer sacrifices its money to obtain a product. Jacoby and Olson (1977) distinguish the actual price of a product, named objective price, by the one encoded in consumers' mind, referring from what is meaningful to them (Dickson and Sawyer, 1985).

This latter is called perceived price and it could be defined as the level of cost encoded by consumers referring to a product (Zeithaml, 1988).

Then the last element is perceived value, which could be defined as the moment where people have satisfied their based needs, delivering value, putting goods in stronger position in the long term (Hartnett, 1998).

Referring to perceived service quality (SQi), in their SERVQUAL model, Parasuraman, Zeithaml and Berry (1988) suggest that SQi increases as the differences between performance perception (Pij), whereas service quality expectation (Eij) increases across attributes.

This model shows 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 their 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 in 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 belief towards technology, and negative (discomfort and insecurity), making customers reluctant towards technology (Lin and Hsieh, 2006).

Thus, experiences could promote customer memory (Paivio, 1971), contributing to their creation of preferences referring to products and services (Ebrahim et al., 2016).

In this term, also customers' perception on brands could be particularly interesting, moreover if the selling is associated with the utilisation of digital technologies. As a matter of fact, sensorial, emotional and creative aspects are becoming important components of a brand, which are often used to differentiate products, enhancing customer preferences (Zarantonello and Schmitt, 2010; Berry, Carbone and Haeckel, 2002; Schmitt, 2009).

Thus, scholars analyse consumers' salient beliefs on a brand, including functional and experiential benefits as attribute perception (Grimm, 2005; Czellar, 2003; Park and Srinivasan, 1994). As a matter of fact, research on customer perception state it exists a positive affection on customers' preferences (Myer, 2003; Cobb-Walgren et al., 1995; Park and Srinivasan, 1994), contributing to enhance brand experience (Gentile et al., 2007; Tynan and McKechnie, 2009; Rondeau, 2005).

So, in this term it is interesting analysis customers' perception referring to the introduction of digital innovation in the "Made in Italy" brand, with a particular attention to augmented reality, extending the literature on customers' brand perception using this technology.

#### **2.4. Consumers engaging in AR during the purchase journey**

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

In defining customer engaging, Authors aims to point attention of the active coproduction of value for the firm. As a matter of fact, on one hand, Brodie et al. (2011) define CE as a psychological state, where customers co-create experience, focusing 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*".

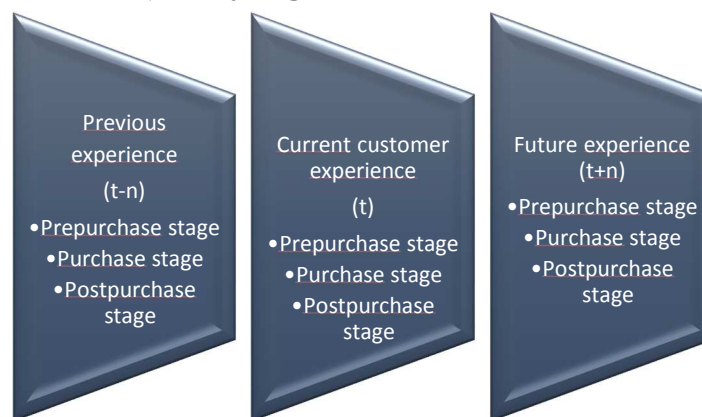
These definitions can be better understood if considered into the customer journey, where each phase of the purchasing is analysed. Thus, as shown in figure 1 below, there are three stages in the customer journey: the *pre-purchase*, the *purchase* and the *post-purchase* step. Each of these stages represents 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 customers' interactions with brand and the



environment during the purchase is analysed, where behaviours such as choice, ordering and payment are dominant.

The last step is (c) post-purchase, where research focuses 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 engaging (Van Doorn et al., 2010).

**Figure 1: Customer journey stages**



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 out 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)

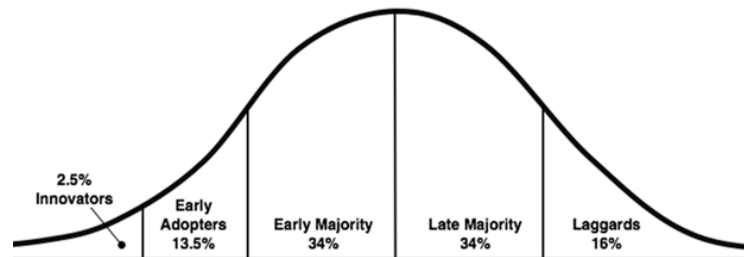
*Late Majority* (34%) adopt an innovation after the average member of the society. Their approach to an innovation is sceptic and late.

*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<sup>2</sup>.

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

**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.

Thus, this research seeks to provide a deeper understanding of brand perception using digital technologies by providing answers to the following three research questions:

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

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

*RQ3: In which sectors of the "Made in Italy" brand AR is perceived as more useful and attractive by consumers?*

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.

### 3. Methodology

The aim of this research is to evaluate customers' brand perception using an AR mobile application in-store through qualitative research, using an inductive approach. Data has been collected in Italy. For the collection of data, Authors chose four different sectors that represent the 4F of "Made in Italy" brand, that means "Food", "Fashion", "Furniture" and "Ferrari/Automotive"<sup>3</sup>.

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<sup>3</sup> 4F definition comes from an English translation from the "4A" sectors, which are "Alimentare" (Food), "Abbigliamento" (Fashion), "Arredamento" (Furniture) and "Automotive" (Ferrari/Automotive). Explanation 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 29<sup>th</sup> October 2018).

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). Authors decide to use this mobile application because it was particularly conforming in explaining purchases with AR technology in the context of analysis (the "4F" of the "Made in Italy" brand). Consumers used this mobile app during the interview 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" sectors are or were settled there, as "Fiat" (now "FCA") 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, Authors have interviewed them from the 19<sup>th</sup> of November 2018 to the 30<sup>th</sup> January 2019. 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 19<sup>th</sup> of November 2018 to the 30<sup>th</sup> January 2019. As a part of the research, respondents' experience an AR market based mobile application, before reply to 42 questions.

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 research.

Consumers were selected randomly in the central commercial area of the cities abovementioned. Then, Authors decided to analyse all the four sectors of the "Made in Italy" brand, not to focalize to only one, because they want to go ahead with this research in understanding motivations and breaks to use or not AR in each of the 4 "F". The major number of the interviewed are women, with an age between the cluster of "18-25", employed with a secondary school, as shown in Table 1 below

**Table 1: Preliminary sample of analysis**

<b>Gender</b>	14 female, 6 men
<b>Age</b>	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
<b>Status</b>	7 Not married, 7 Married, 4 Cohabitant, 2 Widow/er
<b>Education</b>	6 Secondary school, 1 Professional qualification, 4 Diploma, 7Undergraduated degree, 2 Postgraduated degree
<b>Residence</b>	North-West Italy
<b>Professional condition</b>	8 Employed, 3Entrepreneur/self-employed, 5 Students, 4 No professional condition
<b>Average number of smartphones</b>	1.1
<b>Average number of tablets</b>	1.45

*Authors' 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<sup>4</sup>. 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 due to three aspects: (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), thanks to a mobile app by one of the Author personal smartphone.

Thus, 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 in each section. 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 they were (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.

Data were coding using main keywords on transcriptions. As a matter of fact, Authors read all the interviews transcript, creating three main rough codes: (1) Degree of consumers engagement with AR, (2) benefits of AR purchase and (3) customer perception about the more appropriate sector for AR. These codes are categorized as top-down codes, because they were constructed according to the literature (Charmaz, 2006). So, next section wants to analysis the preliminary findings of the present research.

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<sup>4</sup> 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

#### 4. Discussion of results

In the present study, Authors conducted an inductive data analysis where the unknown of AR technologies has been observed by data gathered. Data gathered show three main aspects referring to customers' perception of AR technologies, which are in line with the literature described in the paragraph 2.3:

- 1) Individual presents both favourable and unfavourable belief on AR (Rosenbaum and Wong, 2015). As a matter of fact, all of them are curios 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 (Parasuraman, 2000), 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 (Roy et al., 2018). As a matter of fact, those who present discomfort and insecurity are less participative during the try 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. As a matter of fact, this technology is perceived as an instrument to reduce price of goods, referring to this latter not only as a cost of products, but also as the sacrifice of time to search and found goods (Becker, 1965; Zeithaml, 1988):

*"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, enhancing both the perceived quality by consumers (Lewin, 1936) and the utilitarian use of this kind of technology in projects (Babin, Darden and Griffin, 1994):

*"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 respondents. This situation has destroyed their beginning "WOW" effect, highlighting 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 interviewees, the try of this new technology and their curiosity about AR were more important than the purchase possibility by this technology. In this case, hedonic aspect (Babin, Darden and Griffin, 1994) is enforcing, describing augmented reality as an additional tool to advertise famous brand, where customer memory plays a big role in creating preferences (Paivio, 1971), maximising consumer engagement (Scholz and Schmitt, 2016):

*"A brand can tempt consumer in purchasing with AR. In fact, people come to you only to try out 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. This kind of discomfort makes consumers lose the control of the mobile app (Roy et al., 2018):

*"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, despite its potential as affirmed in the advertising literature by Scholz and Schmitt (2016) and stated by some of the consumers interviewed. Moreover, due to a lack of knowledge of this instrument and its infancy stage, the majority of respondents are not ready to use this kind of technology in their purchase yet (Roy et al., 2018; Parasuraman, 2000). As a matter of fact, many implementations could be done to create a more involving experience for consumers, starting from the fulfilment of the design and usage of mobile app 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, reinforcing Roy et al's (2018) study on individual readiness of new technologies.

## **2. Benefits of AR purchase**

Stated the absence of engagement in this preliminary phase of the research, data were 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, making a comparison in their mind with online purchase and not focus on 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. This is probably due to the interesting of respondents in trying this new kind of technology, reducing risks. So, the hedonic aspect pushes consumers to finalize an impulsive purchase (Pescher et al., 2014; Park et al., 2012):

*"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, as stated before, 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 (Pescher et al.,

2014), (b) giving additional information (Carmigniani and Furht, 2011), (c) more comfort purchase (Altipulluk, 2017), (d) personalization process and (e) freedom of choice (Javornik, 2016; Song and Zinkhan, 2008), (f) reviews of other consumers (Park, Lee and Han, 2007; Zhu and Zhang, 2010).

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 (Carmigniani and Furht, 2011): *"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 in term of interactivity for those consumers who wants more from the standardized product (Javornik, 2016; Song and Zinkhan, 2008):

*"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?", responses are balanced between the significance of this technology to be "an additional service" and the "incomprehension of this tool" (RQ3), 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 during the try with the AR mobile application, rejecting the smartphone in a first moment. Here the lack of technology readiness by consumers is reinforcing, affecting their attitude and behaviour (Lin and Chang, 2011; Ferreira, Da Rocha and Da Silva, 2014).

These data point 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. Secondly, it could be a barrier to retain them in a long view as stated by the quotes above, where technical problems lose this attracting element, creating frustration and dissatisfaction.

Notwithstanding, data gathered illustrate as the most attractive sector to make a purchase the "Furniture" sector, 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"*.

Then, 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)

Similarly, in the "Food and Beverage" industry, respondents state an evocative ability of videos recipes with augmented reality to advertise a product, despite they are not willing to buy this product online if ever tried before:

*"With AR I wouldn't buy food products even if they were typical products from other Regions. Maybe with e-commerce I could change my opinion, but it should be something that I've just tried before"* (Ludovica, 24 years)

*"On the Web there is no certainty of what we could buy, so I would not buy with AR at all"* (Marita, 61 years)

*"Hardly. I need try a food product on first. I need to know it. A nice video or an app that shows me how a food product is done it is not enough for me. I need taste it before"* (Paolo, 59 years)



Nevertheless, this disinclination in the usage of augmented reality in these two sectors seem 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, Authors 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 Authors 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 interviewees as just argued.

## **5. Conclusion, implications and further research**

The aim of our research was to evaluate customers' brand perception using an AR application in-store.

It shows how the use of augmented reality is still scarce by consumers during their purchases, because they often don't understand well the function of this technology. For this reason, also the companies of this territory don't make big efforts on this front. As a matter of fact, they could probably start with some explications to their consumers on the use and functions of this technology in-store, applied in the purchase context, showing all the benefits and results achievable.

Thus, this research also underlines the different types of sectors where consumers could be willing to use AR, notwithstanding a lack of knowledge of what AR means in their mind.

As a matter of fact, customers interviewed were attracted and particularly curious of what AR could show during the try with the mobile application, stating it could be an added strategy for companies to advertise products. Otherwise, this suggest implementing more and more this application graphically to give a more realistic experience. In this term, they prefer the "Furniture" sector, where customers could personalize at home products and then decide to go to the shop to conclude the purchase process or to do it online.

In this case, Authors can state the integration of purchase in-store and offline world, which are combined during the purchase step.

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, Authors believe companies could implement the use of AR alongside this sector with physically try on, as sample of materials and some tastes.

So, if a technology eliminates the two sensorial aspects, id est touch and taste, this brand loose its power and its evocatory aspect important to the customer, standardizing with the other brands.

In terms of limitation, this study focuses on only 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 interview was destroyed, creating incomprehension of this technology and unwillingness to use it during their purchase.

Then another technical limit was the dimension of the smartphone screen. As a matter of fact, it wasn't big enough to involve totally the respondents in the experience. For this reason, Authors 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). In this way, it could give a major understanding of adopters and their interaction with the AR technology during a purchase journey. Additionally, Babin, Darden and Griffin (1994) found the two-dimensional scale to perceive shopping value, referring to hedonic and utilitarian aspect. A major study could be conducted referring to this framework in term of impulse to buy if there is the introduction of an innovative technology such as AR during the shopping journey.

In terms of theoretical and managerial implications, this study has bridged to many important contributions. First of all, this is the first study to analyse "Made in Italy" brand perception of AR, implementing both AR, brand perception and customer journey literature existing and also Rogers' study about innovation adopters (1983). As a matter of fact, the existent literature depicts many definitions and application of augmented reality in many fields (Reitmayr and Drummond, 2006; Carmigniani and Furht, 2011; Javornik, 2016; Altipulluk, 2017), never using as a research context the "Made in Italy" sector and its potential influence to detect the willingness to purchase, described separately in the literature (Cappelli et al., 2011).

Then, in the dynamic business environment data gathered bring significant managerial implications for companies both in utilitarian and hedonistic point of view. Firstly, the introduction of augmented reality in-store could increase customer consciousness about the products, enhancing their willingness to buy a "Made in Italy" goods due to its genuinely for instance. Then, the payment could be faster using QR-Code, reducing cues. From a hedonistic point of view, customer experience is enhancing, offering a more vivid and funny experience in-store, for instance in try-ons clothes using AR mobile applications. Instead, depending of which sectors they are, companies could decide to implement AR using moreover monitor screen or tablets in-store, giving an added service to customers in hurry or to whom who finalise by themselves the purchases. On the other hand, if they need an advice or a suggestion by the vendor, they can decide to have the possibility to be helped by a professional figure.

Despite that, the difficulty for practitioners to implement AR in-store is very high. So, Authors believe they could start implementing QR-Code technology to give customers the possibility to visit their websites, showing all the colours, materials and shapes they have referred to a single product.

Moreover, further research could expand this study, focalising more on what Authors have done on experiential marketing in using augmented reality referring to national brands. In addition, Authors will conduct a further study on "Made in Italy" perception referring only to the furniture sector, which is the "F" of the "Made in Italy" brand that consumers perceived as more adapt in introducing such kind of digital technology.

Finally, we believe consumers must assume a better comprehension of what AR means in the purchase stages, letting companies to implement many different touch points in store with this technology. After this introduction of AR in-store, consumers could better understand its potentials, implementing it at home or anywhere, reducing time-cost of purchase (Gandolfi, 2008).

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