

**THAT'S AUGMENTED! A STUDY ON CUSTOMERS' PERCEPTION ON
AUGMENTED REALITY**

**THAT'S AUGMENTED! UNE ÉTUDE SUR LA PERCEPTION QU'ONT LES
CLIENTS DE LA RÉALITÉ AUGMENTÉE**

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Abstract (English)

In marketing field many studies were conducted to investigate the use of augmented reality in customers' motivation. Notwithstanding, there is a lack of research on customers' perception of this technology. Thus, referring to Lemon and Verhoef's (2016) work on customer journey, Authors aim to make an exploratory study on this topic in the context of the "Made in Italy" brand, referring to the so called "4F": Fashion, Food and Beverage, Furniture and Ferrari sectors. To reach this aims five preliminary semi-structured interviews were collected in Piedmont to pursue this analysis later with a bigger sample. The paper ends with the discussion of preliminary data along with its main limitations.

Keywords: Augmented reality; Consumer Perception; Digital Retail; Customer journey.

Résumé (French)

Dans le domaine du marketing, de nombreuses études ont été menées pour étudier l'utilisation de la réalité augmentée dans la motivation des clients. Néanmoins, il y a un manque de recherche sur la perception qu'ont les clients de cette technologie. Ainsi, se référant aux travaux de Lemon et Verhoef (2016) sur le voyage du client, les auteurs ont l'intention de réaliser une étude exploratoire sur ce sujet dans le contexte de la marque "Made in Italy", en se référant à la marque dite "4F" : Secteurs de la mode, de l'alimentation et des boissons, de l'ameublement et des Ferrari. Pour atteindre cet objectif, cinq entretiens préliminaires semi-structurés ont été collectés dans le Piémont afin de poursuivre cette analyse plus tard avec un échantillon plus large. Le document se termine par une analyse des données préliminaires et de leurs principales limites.

Keywords: *Réalité augmentée ; Perception du consommateur ; Digital Retail ; Parcours des clients.*

Managerial summary (Résumé managerial)

Digitalization is shaping boundaries between digital and physical world. Thus, for this reason companies are changing their strategies around customer shopping experiences, to create a more involving and immersive purchase. Moreover, also customers want to live more immersive and richer experiences while shopping. For this reason, the introduction of innovative technologies, such as augmented reality (AR) in companies' business could become a valid solution to create more interesting and involving shopping experience, both during the pre-purchase and the post-purchase steps. Thus, this study aims to focus more on customers' perception around this topic, along with their main motivations and brakes to use or not this technology while they are shopping. To reach this aim, Authors have created a preliminary sample of analysis, represented by five consumers in the "Made in Italy" brand: Fashion, Furniture, Food and Beverage and Ferrari/Automotive.

The objective is firstly to understand if consumers are interested or not in using this kind of technology in store. If the answer to this question will be positive, Authors want to expand this analysis to at least twenty consumers (as academic literature suggests). The second aim of this study refers to understand in which sectors of the "Made in Italy" brand, the analysis could be more interesting to focus more in one or two sectors of this brand in further research. To do so, a quantitative analysis was conducted, using the semi-structured interview method. From data gathered, three important aspects were reached by this preliminary research. Firstly, consumers are not ready to use a so innovative technology during a purchase in store. This is due to a lack of knowledge in this technology and its potential. As a matter of fact, respondents are more interested in the hedonic and gaming aspect of this technology, created by a "WOW" effect, than in the potential and utilitarianism intrinsic in this innovation. Secondly, this technology is perceived as a tool, which could reduce time using during the purchase steps. For instance, in the rapidity to receive the product if the purchase was made online or in the possibility to easily personalize the item. Lastly, the preliminary interviews show a particular interest in the usage of AR tools in the Furniture sector, where imaging the final version of an item could decrease dissatisfaction in the post-purchase phase.

Thus, using this research companies could better understand the potential of this technological innovation, along with consumers' perceptions about this tool. As a final step, companies should make their consumers understand the potential of technology, for example during their advertising campaigns.

Introduction

In a phygital world, retailers are trying to enrich customers' experience in physical stores by proposing them new technologies. One of these technologies is augmented reality (AR), which can be defined as a new way to expand and augment the real world virtually (Altipulluk, 2017).

Actually, by helping them to foster customers' engagement (Pantano, 2009) and to forge deeper relationships with their customers (Sholz and Smith, 2016), augmented reality is supposed to provide value to retailers. This new type of technology is also supposed to promote purchase (Pantano, 2014).

For customers, the use of AR is an emerging form of experience in which the real world is augmented by computer-generated content (Altipulluk, 2017). Several studies show that AR can provide experiential customer value (Huang and Liu, 2014; Mathwick et al., 2001; Salo et al., 2013).

The aim of this paper is to study customer perception of augmented reality and their motivations and brakes to use such technology during a purchase in a physical store. This paper is structured as follows. Firstly, it analyses the main literature review about the topic. Secondly, it presents the methodology of the research and its results. Finally, it focuses on the discussion of data along with preliminary results and its limitations.

1. Literature Review

Digitalisation has shaped boundaries into the online and the virtual world (Barlow, Siddiqui and Mannion, 2004), changing the interactions between retailers and consumers (Poushneh, 2018).

As a matter of fact, during a shopping purchase, consumers experience both utilitarian and hedonic value (Babin, Darden and Griffin, 1994) thanks to the introduction of such technologies in store. According to Zygon (2002) consumers use at least three channels to research or to purchase a product, that means the connection between the search online and the effective purchase in-store is very common. Thus, while utilitarian value supports customers in their performance such as the fulfilment of a task or a goal, the hedonic one provides them pleasure and fun while shopping in a traditional physical store.

These utilitarian and hedonic values can also be experienced thanks to the augmented reality technology provided by retailers (Hilken et al., 2017; Yim et al., 2017). This aspect may increase customers' engagement and enrich their shopping journey (Lemon and Verhoef, 2016).

Actually, augmented reality is described as a smart technology (Pantano, 2009), which allows to connect the physical world with the digital one in giving additional information to consumers while shopping (Altipulluk, 2017). As a matter of fact, AR offers virtual contents that can be added to the reality. For example, *Ikea* mobile application superimposes objects such as a sofa or a table onto the physical space, understanding if these objects could fit with the consumers' home décors. As a matter of fact, AR gives contents such as images and videos, which can be added to the reality of consumers during their shopping experience. This technological tool is very different from virtual reality (VR), that is a computer-generated 3D environment, where the user navigates and interacts with different situations in real-time simulation of one or more of its five senses (Yung and Khoo-Lattimore, 2017). So, as reader can easily understand, this last technology is more immersive than the first one, which is more useful to enhance real-world environment (Guttentag, 2010).

In particular, a very important characteristic which allows AR to be particularly significant in retailing is that this technology is able to supplement reality without replacing it,

offering a “touch-and-feel” experience and using “vivid, customized and connected digital content” (Hilken et al., 2018).

A recent research by Javornik (2016) shows that AR might be more hedonic than utilitarian for consumers, especially during the preliminary phases of the decision process (pre-purchase step of the customers’ journey as described by Lemon and Verhoef in 2016). Thus, AR is supposed to be more hedonic in the phases of the decision process, when the role of affective choices (e.g the ones referred to customers’ feeling and experiences around the product) is particularly strong (Javornik, 2016). This exploratory study aims at investigating consumer perception of AR during the three phases of purchase (pre-purchase, purchase and post-purchase).

Thus, the present research aims at answering to the following research questions:

RQ1: How consumers perceived AR in the four categories of product abovementioned?

RQ2: May AR have an impact on their willingness to buy? Did this impact differ according to the categories of products?

2. Methodology

Data was gathered in Piedmont (North-West Italy) in the month of November 2018 by using an Italian mobile application of AR, created by Experenti, a company in Padova (Italy).

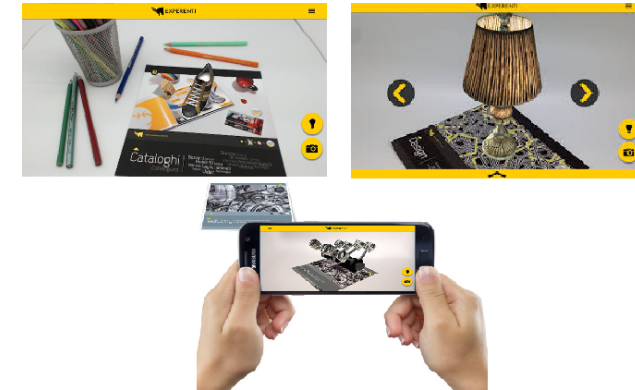
The experiment consisted into scanning some pictures, receiving different typologies of contents, able to describe some characteristics of the products. One the author’s personal device (id est a Samsung Galaxy S3 Duos) was used in order to facilitate the downloading of the app and reduce any personal bias (Venkatesh, Thong and Xu, 2012). The location was a quiet and cosy room to put consumers in their comfort zone and neutralize any noise. In this way, the interviewer was able to control distracted events and pose questions clearly.

To answer to these questions, a qualitative exploratory research has been conducted in Italy for four different categories of products of the so called “4F” of the “Made in Italy” (Biondi, 2015): “Food and Beverage”, “Fashion-Clothing”, “Home Furnishings” and “Ferrari-Automotive-Automation-mechanical-plaster-rubber” (Cappelli et al., 2017; Fortis, 2005; Fortis and Reallacci, 2009).

In this paper Authors presented a preliminary phase of the research, i.e. five of the twenty interviews planning. They decide to start with five interviews, that represents one fourth of the minimum sample suggested by Glaser, Barney, Strauss and Anselm (1967), to understand the interest of the topic to pursue then the analysis with a bigger sample. Thus, the study presented is a pilot study with the aim to be implemented later. The mobile application used is market based, and respondents follow a semi-structural interview. 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 about the different categories of products of the “4F” of the “Made in Italy” brand: “Fashion-Clothing”, “Food and Beverage”, “Home Furnishings” and “Ferrari-Automotive-Automation-mechanical-plaster-rubber” ones, showing augmented contents in each of the four industries in the order abovementioned. For the “Fashion-Clothing” respondents see a 3D shoe, whereas in the “Food and Beverage” a video receipt explains how to make some traditional biscuits. A lamp was the 3D content in the “Home Furnishings” industry, where consumers could choose to different typologies of this category and an engine for the “Ferrari-Automotive-Automation-mechanical-plaster-rubber”, to better understand how this one works in a car, as show in figure 1. The stimuli of this application were various to make the interviewee better understand all the potentiality of this technology in each sector of analysis, as just applied by this company in business. For instance, in “Food and Beverage” it was more interesting showing video receipts than the 3D

images of a product, whereas in “Fashion” sector it was very useful shown both videos than images of clothes.

Figure 1: Screenshot of the AR experiment



Source: Revised by Experenti website

The interview analysed the perceived use of AR technology by respondents (Javornik, 2016; Poushneh, 2018), using the mobile application before to answer the questions about their perception of using AR for each category of product. Then 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. A focus was also made on consumers resistance to innovation (Ram and Sheth, 2015) and on the purchase decision. Finally, the profile of respondents (age, gender, status, education, residence, income, profession) were registered.

Interviews lasted around forty minutes and they were tape-recorded, making a verbatim transcription. Then preliminary data gathered are examined by an inductive approach (Gioia, Corley and Hamilton, 2013).

3. Discussion of results

The preliminary sample of this study is described in Figure 1.

Table 1: Preliminary sample of analysis

Interviewee	Gender	Age	Status	Education	Professional condition
Interviewer1	Male	59	Married	Diploma	Self-employed
Interviewer2	Female	24	Not married	Postgraduated degree	Student
Interviewer3	Female	39	Married	Diploma	Employed
Interviewer4	Female	26	Not married	Undergraduated degree	Employed
Interviewer5	Female	24	Not married	Undergraduated degree	Student

Source: Authors personal elaboration

This research firstly shows there was not engagement between customer and augmented reality, before this study. 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.

Thus, using an inductive approach, Authors have found four conceptual categories referred to data gathered on augmented reality technology:

1. Willingness to use AR
2. Attractiveness of AR
3. Destroyed effect
4. Perception of AR

1. The nature of AR adoption

In term of motivations, the use of technological tools may be explained by the willingness to **save time and money** in daily routine as mentioned by three of the five respondents as shown in the following example:

- *“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”.*

Furthermore, motivations to use AR are the rapidity to try and to receive the product, the freedom it can give, the possibility to personalize, and finally the curiosity as mentioned in the following verbatims by interviewees answers on stimuli of the mobile application used during the interview:

- *“the **rapidity** to **receive** the product at home and moreover in **try on before**”.*
- *“the **free of choice** during the decision-making process, where there is not a vendor, who tries to sell you anything she/he can”.*
- *“the possibility to **personalize** how you prefer the product, try on at home”.*
- *“the **curiosity** to use a mobile application to see what there is not on the sheet of paper”.*

These motivations, except curiosity seems to be essentially utilitarian ones.

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

2. The most attractive categories of products in AR

The interviews show that the most attractive category of products to use AR technology is the “Home Furnishings” as respondents stated that “it is *easy to test*”. It helps customers to project the products in their home and then to reduce their risk perception during the purchase of a such involving product.

On the contrary, AR technology seems also very attractive for little objects as it can be used for products with a low risk perception as mentioned by the following verbatim “*costless*

thanks the possibility to buy little objects to test this new type of purchasing”. As a matter of fact, it could be a way to test the technology for customers.

Moreover, during the try with the mobile application, one of the customers declares distrust in technological methods of purchase, stating the possibility to buy a product with AR only if it has a little dimension. As a matter of fact, in this respondent’s mind a little object could avoid risk to occur in a fraudulent sale.

The less attractive sector is the “Fashion-Clothing” one (three of the five respondents), because in respondents’ point of view here “*there is not the possibility to touch the material of clothes*” and “*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!*”.

As a matter of fact, during the try three of the interviewees recognize the role of AR in augmenting the attractivity of products moreover in “Fashion” industry, despite the real possibility to touch materials or taste products in the case of “Food and Beverage” sector.

Notwithstanding, the video receipt in the “Food and Beverage” sector is perceived as particularly interesting to show products provenience and explaining how to cook the different products.

Referring to “Furniture” industry AR let consumers perceive better what they are purchasing, for instance understanding better the shaping or the colour of a lamp.

3. The destroyed effect of a non-performant technology

Even that, three of the five respondents had technical problems using the mobile application during the interview. This situation has destroyed their “WOW” effect at the beginning. These technical problems have probably psychological effect and may affect the willingness to use augmented reality while shopping.

4. A new stimulating technology: a linkage between curiosity and usefulness

About the perception of AR for the four categories of products, all the customers interviewed state this technology could be “*useful, but not necessary*”. As a matter of fact, “*it 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*”.

So, the diffusion of this technology starts from people, who are interesting in the try, influenced by the so called “WOW” effect. Thus, Authors can categorize these individuals as “Innovator” by Bass’s model in 1969. So, consumers decide to adopt a new technology by two types of sources: (a) *external ones*, i.e. mass media channels, and (b) *internal ones*, i.e. psychological and interpersonal elements. The technology could then be diffused by some individuals called “Imitators” by this model, that means who is influenced by the previous adoption of the new technology by other individuals in time.

So, 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, and secondly it could be a barrier to retain them in a long view.

Finally, by data gathered and observation during interviews Authors can state a bigger interesting by respondents in using AR in try on different products, pointing on **the utilitarian element**, which shows how this technology could help consumers in some actions such as saving time and money, or personalisation of products they are interesting to buy.

4. Conclusions

This pilot study has shown how consumers are not ready to introduce digital technologies such as augmented reality during their purchase yet.

Then, just the preliminary data gathered could bring potential managerial implications for companies. As a matter of fact, depending of which sectors they are, companies could decide to implement AR using moreover monitor screens or tablets in-store, giving an added service to the customer, who is in hurry or who wants to have the freedom to finalise by himself the purchase.

For instance, retailers on “Furniture” sector of the “Made in Italy” could start to implement such as technologies instore to let consumers living a more interactive experience while shopping. Moreover, this tool could be perceived by them as an additional service, which could add value to the company brand.

In term of theoretical contributions, this study implement literature in digital transformation, where consumers are not ready to apply this technology yet. The same happens with companies, which are still worried to implement this kind of technology in store, due to the lack of knowledge. So, to let consumers start to come in touch with this technology, companies could start to adopt AR applications during the pre-purchase step. In this way, they could see and try products before to go to the store or decide to finalize the purchase by the mobile app or the website. This additional service could be very attractive and costless for consumers, able to save time and so avoid frustration to go to the store and not finalize the purchase, maybe due to the lack of sizes or different colours.

The results of this exploratory research concern the first five interviews of this pilot study that have been conducted so far. The result will naturally have to be supplemented by the analysis of the content of additional interviews until theoretical saturation. Such an exploratory research is a first step to construct a conceptual model of value generated by AR that will be tested through a quantitative research. Furthermore, consumers are not so still in touch with this new technology, moreover due to the lack of use by companies in selling their products. For this reason, Authors are not still able to analyse how they perceive AR during the purchase and post-purchase steps, notwithstanding we can affirm consumers are not willing to use this technology while shopping.

So, this limitation could be one of further research Authors want to pursue, to better analyse AR technology in term of customers perception during the purchase step. This aim could be reach by a lab experiments, where an AR purchase could be simulated.

Moreover, further research could be done also in comparing AR users with VR ones, understanding their potential differences in customer engaging during a shopping experience.

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