ISCTE Business School
Instituto Universitário de Lisboa

VIRTUAL REALITY AND ARTIFICIAL INTELLIGENCE APPLIED TO CONSUMER EXPERIENCE: A SCENARIO-BASED APPROACH

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- Spine example -

Abstract

Emerging technologies like Virtual Reality (VR) and Artificial Intelligence (AI) have been receiving much attention in the Marketing context as a new way to attract customers and enrich their experiences with brands. This study aimed to research the current state of these technologies in Business and discuss the extent to which experiences using Virtual Reality and Artificial Intelligence may impact a customer experience in three different points of the customer journey: pre-purchase, purchase, and post- purchase stage. An online survey was constructed to measure the effectiveness of VR and AI on a scenario-based approach, along three consumer behaviours in the customer journey – brand associations (pre-purchase stage), purchase intention (purchase stage) and brand loyalty (post-purchase stage). From a sample of 302 respondents, the results suggest that these technologies represent valuable opportunities in Marketing. Overall, the results revealed that the type of experiences addressed in this paper are more prone to instil action (purchase stage) than to build brand associations (pre-purchase stage) or brand loyalty (post-purchase stage). An in-depth analysis of these results manifested interesting outcomes, suggesting several managerial on how to apply these technologies in an integrated marketing communication (IMC) plan.

Keywords: Virtual reality, artificial intelligence, customer experience, integrated marketing communications.

JEL Classification System:

M30: General Marketing

M31: Marketing

Resumo

Realidade Virtual (RV) e Inteligência Artificial (IA) têm recebido bastante atenção nos últimos anos pelo facto de serem uma nova forma de atrair os consumidores e enriquecer as suas experiências com as marcas. O principal objetivo desta dissertação é oferecer uma visão do *state of the art* da aplicação destas tecnologias no marketing e investigar até que ponto as experiências com RV e IA podem contribuir para uma melhor experiência do consumidor, nomeadamente em três fases distintas da jornada do consumidor: antes da compra, no momento da compra, e após a compra. Um questionário *online* foi construído para medir a eficácia de 7 cenários usando RV e AI, em três dos mais representativos comportamentos de uma jornada do consumidor: associações à marca (antes da compra), intenção de comprar (momento da compra) e lealdade à marca (após a compra). Com base numa amostra de 302 participantes, os resultados sugerem que RV e IA contribuem para a criação de significantes oportunidades no marketing. Numa forma geral, os resultados indicam que as experiências que foram selecionadas para este estudo são mais eficientes a persuadir os potenciais consumidores a comprar (momento da compra) do que a contribuir para a criação de associações à marca (antes da compra) ou para construir lealdade à marca (depois da compra). Sendo que, numa análise mais profunda dos resultados, diversas recomendações em como aplicar estas tecnologias numa comunicação integrada de marketing foram retratadas neste estudo.

Palavras-chave: Realidade virtual, inteligência artificial, experiência do consumidor, comunicação integrada de marketing.

Classificação JEL:

M30: Marketing Geral

M31: Marketing

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List of Abbreviations

AGI - Artificial General Intelligence

AI – Artificial Intelligence

AR – Augmented Reality

CAVE – Cave Automatic Virtual Environment

CI – Confidence Interval

DF – Degrees of Freedom

ELLIS - European Lab for Learning and Intelligent Systems

GVA- Gross Value Added

H – Hypothesis

HMD - Head-Mounted-Display

IMC – Integrated Marketing Communications

KMO - Kaiser-Meyer-Olkin

NLG - Natural Language Generation

NLP - Natural Language Processing

NLU - Natural Language Understanding

PCA – Principal Component Analysis

SEMS – Strategic Experiential Modules

SEO – Search Engine Optimization

VCASS – Visually Coupled Airbone Systems Simulator

VIVED – Virtual Vided Environment

VR – Virtual Reality

WOM – Worth of Mouth

1. INTRODUCTION

Virtual Reality (VR) and Artificial Intelligence (AI) have benefited from a constant presence in the front stage of the top technological breakthroughs due to their potential contribution in a vast range of areas, going from healthcare to business and industry innovation. Even though healthcare and manufacturing industries have been the early adopters of both technologies, there is a growing interest to understand the potential of VR and AI in the field of Marketing, as a new way to attract customers and enrich their experiences.

With the emergence of a digital world, a greater number of new marketing tools (e.g. mobile and social media) has appeared. Recent reports document that it is more and more challenging for brands to be different and to gain competitive advantage (Batra and Keller, 2016; Kotler and Keller, 2012). Therefore, it is shown that experiences are being incorporated as the new marketing branch to attract customers, in which technological experiences are getting a lot of attention (McCarty and Wright, 2004; Schmitt, 1999; Pine II and Gilmore, 1998). In fact, experiences with the support of VR and AI have provided some of the most successful experiential marketing campaigns, leading to growing adoption of these technologies in brands' marketing strategies.

However, the opinions found about the potential of VR and AI in this field differ. A problem which many business leaders are interested in is to figure out if both technologies are just a trend or can be considered as a sustainable marketing tool like social media already is. Also, most of those who agree that we are on the verge of immerse change, are struggling how VR and AI contents fit into their future campaigns (Dell Technologies, 2018).

One way to understand the influence of these technologies in marketing outcomes is to get, as much possible, a complete perspective of the consumer behaviour when confronted with all touch-points with a brand (Kotler and Keller, 2012). In fact, there is an extensive literature on how to better select the most appropriate combination of media choices along the consumer decision journey, thus building the most efficient Integrated Marketing Communication (IMC) plan (Batra and Keller, 2016; Lemon and Verhoef, 2016). Nonetheless, Virtual Reality and Artificial Intelligence are still reasonably new concepts for most the marketing professionals, and, little has been reported under their effectiveness in marketing strategies. The researchers, usually from consultant or technology firms as *Accenture, Sage, Business Insider, Core Sight*

Research, Dell Technologies, Ericsson Consumer Lab, Google, Microsoft, PWC, among others, are more focused on the technological, political, economic and social impact that these technologies will most likely proliferate in the next few years.

The present work describes a model that focuses on perceiving the impact these two emerging and disruptive technologies in a consumer experience along the customer journey. To do so, the paper is organised as follows: First, the existing definitions and constructs associated with Integrating Marketing Communications (IMC), customer experience, and customer journey were examined. Second, extensive research about VR and AI was developed, based on historical facts, technical factors, social implications and future outlooks. Third, the technologies were linked to aspects within marketing. Finally, based on the findings, a model to study the impact of VR and AI in three different stages of the customer decision-making process was suggested – *pre-purchase stage* measured by the organisational associations, *purchase stage* measured by the purchase intention, and *post-purchase phase* measured by the brand loyalty.

On the basis of these dimensions, seven descriptive scenarios, based on real-life examples of applications of VR and AI (three VR applications, four AI applications) were developed and evaluated in an online survey. Moreover, several questions addressing the perceptions of individuals about the technologies were also assessed. The results analysis suggested that Virtual Reality and Artificial Intelligence technologies represent great opportunities with diverse applications in marketing, which in turn, ultimately should materialise in the development of a diverse set of customer experiences integrated into different points of the consumer path to purchase.

2. INTEGRATED MARKETING COMMUNICATIONS

The primary role of Marketing Communications is to dialogue and create a relationship with firms' stakeholders, persuading and influencing them to buy company's products and services. The major concern is not to decide whether to communicate, but rather to know *"what to say, how and when to say it, to whom, and how often"* (Kotler and Keller, 2012: 475). With the disruptive advances in technology, the consumer today is more connected to devices than ever, and the communication between brands and consumers has changed thoroughly. With the greater number of media possibilities, and the consumer "path to purchase" more complex and less hierarchical, designing an IMC program is more challenging for marketers (Batra and Keller, 2016).

2.1. Defining Integrated Marketing Communications (IMC)

The proliferation of new communication tools has forced firms to choose the most appropriate combination of communication platforms to deliver a stronger message consistency and also to allocate the marketing budget over these efficiently. For this to happen, it is necessary to adopt a "360-degree view" of consumers to get a complete and potentially full understanding of their behaviour in all touch-points with a brand (Belch and Belch, 2009; Du Plessis *et al*., 2005 in Kotler and Keller, 2012). In the literature review, this is named as an **Integrated Marketing Communication (IMC) Plan.**

"IMC is an audience-driven business process of strategically managing stakeholders, content, channels, and results of brand communication programs" (Kliatchko, 2008: 140). *Annexe 1* summarises the development of IMC definitions over time.

To develop a well-integrated marketing communication, Kliatchko (2005) suggested three features that Nowak and Phelps (1994) introduced and are still widely stated today by other authors: **consistency, complementarity and cross-effects. Consistency** – the aim is to induce action where the same persuasive message and brand image is reinforced along the brand's touch points. It contributes to a synergy effect, meaning that all messages connected contribute much more to brand equity and to drive sales than separate messages delivered on their own. **Complementarity** – determines if the communication option addresses the effects and objectives that others do not, allowing marketers to check which would be discarded if they

stopped using a specific communicant option. **Cross-effects** – the communication effects can be enhanced when communication options are specifically designed to work together, and consumers have contact with different brand touchpoints.

From the three criterion mentioned to a more **strategic, consumer-oriented and measurable approach** (Moriarty and Schultz, 2012), the field of IMC has matured, and five additional criterion was added to achieve a top-down evaluation of how efficient a particular program is. Batra and Keller (2016) named it 7C's.

- **Coverage** – It measures how useful our communication tools in reaching our target audience are, and also how much overlap exists with other communication tools.
- **Cost** – Financial efficiency of the communication programs. Coverage and Cost are usually used in unison to determine how cost wise effective a media plan is.
- **Contribution** – Aims to explain if the communication option created the desired outcome and if it achieved the communication objectives that were determined.
- **Conformability** – Included to understand if the communication options deployed work across a wide array of consumers, even with their communication history and characteristics. It is essential to check it when dealing with consumers from different cultures.
- **Commonality** – It can be considered similar to the "Consistency" criterion from Nowak and Phelps (1994), but Batra and Keller (2016) added a different approach to the concept. In their perspective, it is important to determine how common the communication effects are and to check if there is an overlap in the communication options, determining a better course of action, if necessary.

Moreover, since we live in an age of constant technological and social transformations, new theories and supporting concepts have contributed to a more accurate and efficient IMC program. Table 1 displays critical managerial guidelines that emerged from this review.

Table 1. List of managerial guidelines for an IMC program

Concept	Author(s)
Compelling content designed and tailored to reach all selected target audience groups.	Batra (2016); Kliatchko (2008)
Consumer-Oriented Approach. A brand/firm needs to strategically manage the total customer experience by understanding customer needs and behaviour to meet their requirements.	Moriarty and Schultz (2012)
Look at a marketing plan as a **circular process.** It implies a shift from a start-and-stop campaign to continuous planning. Schultz and Schultz (2004) suggested an IMC process with five stages: (1) customer identification, (2) customer valuation, (3) creating and delivering messages and incentives, (4) estimating ROI, and (5) budget, evaluating and recycling.	Moriarty and Schultz (2012); Schultz and Schultz (2004) in Kliatchko (2008)
Cultivate a **long-term relationship with stakeholders** (not only with consumers) and develop individual messages for each one of them. The emergence of digital media forced firms to deliver a set of messages not only to reach the consumer but also, all of the key stakeholders (suppliers, distributors, government, employees) who are easily embedded in a brand community through WOM or social networks.	Duncan and Moriarty (1997) in Moriarty and Schultz (2012)
Behavioural measurement. IMC programmes must be measured through behavioural outcomes (e.g. ROI) instead of traditional models such as brand recall, brand awareness and what media options were bought. In this way, this measurement method ensures that a firm is focused on the most profitable customers and it is applying its scarce resources most effectively.	Kliatchko (2008)

Source: Author's elaboration

2.2. Marketing Communication Mix

2.2.1. Marketing Tools

According to Kotler and Keller (2012), there are eight significant platforms of communication: **Advertising, Sales Promotion, Events and Experiences, Public relations and Publicity, Direct Marketing, Interactive Marketing, Word-of-Mouth Marketing and Personal Selling** (See *Annexe 2*). Traditional media, such as TV and print, was often the most used marketing tool in an IMC plan. Nonetheless, considering the emergence of new media (e.g. wireless internet connections, smartphones) people are shifting from a **passive** to an **active consumer.** Now it is common to find an **online consumer**, **responsive and demanding** that **actively seeks** for product information through **different media sources.** Taking into account this consumer behavioural change, Keller along with Batra in 2016, improved the major communication models, subdividing interactive marketing into six new online communication options that have been widely addressed to integrate communication programs (Batra and Keller, 2016):

1) **Search Ads:** Focusing on Search Engine Optimization (SEO) is an effort that will be paid off. It consists in defining the right keywords that are associated with the brand or product so that when the customers search for those strings, their brand is more likely to match and appear in the search results' first positions.
2) **Display Ads:** There are Ads that appear on websites, social networks, among others, which are multiple times related to our interests due to the usage of cookies. Also: "*Display advertising can positively affect visitation to a firm's website for users in most stages of the purchase funnel but may not do so for those who previously visited the site without creating an account."* (Batra and Keller, 2016: 6).
3) **Websites:** When using Websites as a communication strategy, it is essential to understand that these can be more effective if they match the consumer's expectations and needs, but also if they fit the consumer's cognitive styles and address their age, gender and geographical location. Taking into account these considerations, the positive impact that websites have on the consumer's decision to purchase can be leveraged.
4) **Mobile:** With mobile usage competing with desktop and laptop, it is crucial that all the contents that are available online be customised to different devices.
5) **E-mail:** E-mail marketing has been a strategy that has been gaining much interest on the brands' side. If well used, i.e. highly customised to the consumer's profile, it can be compelling. In fact: "*E-mail effectiveness has been shown to improve with personalised emails—though, even then, repeated e-mails can backfire—as well as with customised landing pages when someone clicks.*" (Batra and Keller, 2016: 6).
6) **Social Media:** It may be the most widely known way of promoting a brand, product or service. With different channels to be used for separate occasions, profiles and outcomes, social networks as Facebook, Instagram, LinkedIn, YouTube, Pinterest, Snapchat, Tumblr, among others, address different targets and goals.

2.2.2. IMC Conceptual Framework

Each communication tool has its contribution, meaning that, traditional media has still power addressing consumers. The primary challenge for marketers is to figure out how older and newer media interact with each other most effectively and efficiently. Batra and Keller (2016) developed an IMC framework that analyses the best media combinations by stages of the consumer decision journey. It is based on two conceptual models.

Bottom-Up Communications Matching Model: It matches different communication objectives at various stages of the decision journey (Figure 1) with the best media options (Figure 2). For instance, the major communication platform to create awareness, according to this model, it is advertising, which in turn, it corresponds to the first stage of a consumer decision journey – "Needs/Wants". The eight communication needs and objectives are explained in detail in Table 2.

Figure 1. Possible combination needs and objectives across 12 stages of the consumer decision journey

Decision Journey Stage	Communication Needs and Objectives							
	Awareness	Information	Imagery	Trust	Emotion	Action	Loyalty	Connect
Needs	+++	+++	+	++	++	+	+	+
Is aware	+++	+++	+	+	+	+	+	+
Considers	+++	+++	+++	++	+	+	+	+
Learns	+++	+++	+++	+++	+	+	+	+
Likes	++	+++	+++	+++	+++	+	+	+
Will pay	++	+++	+++	+++	+++	+	+	+
Commits	++	+++	+++	+++	+++	+++	+	+
Consumes	+	++	+++	+++	++	+++	+	+
Is satisfied	+	++	+++	+++	++	++	+++	+
Is loyal	+	+	+	++	++	+++	+++	++
Engages	+	+	+	++	++	+++	+++	+++
Advocates	+	+	+	++	++	+++	+++	+++

Notes: +++ = greatest influence; ++ = medium influence; + = least influence.

Source: "Integrating Marketing Communications: New Findings, New Lessons and New Ideas" by Batra and Keller (2016)

Figure 2. Relative strengths of different communication options across 12 stages of the consumer decision journey

Decision Journey Stage	Communication Options										
	TV	Promos	Events	PR	Social Media	Website	Search	Display	Mobile	Direct	Selling
Needs	+++	+	+	++	++	+	+++	+++	++	+++	+++
Is aware	+++	++	+++	++	++	+++	+++	+++	+	+++	+++
Examines	++	++	+	+	++	+++	+++	+++	++	+++	+++
Learns	++	++	+	+	++	+++	+++	++	+++	+++	+++
Likes	+++	++	+++	++	+++	+++	+	+	+++	++	++
Will pay	+	++	+	++	+	++	+	+	++	+++	+++
Commits	+	+++	+	+	+	++	+	+	+++	+++	+++
Consumes	+	+++	+	+	++	+	+	+	++	+	+
Is satisfied	++	++	+	++	++	++	+	+	++	+	+
Is loyal	++	+++	+++	+	+++	++	+	+	+++	+++	+++
Engages	+	+++	+++	+++	+++	+++	+	+	+++	+++	+
Advocates	+	+	+++	++	+++	+++	+	+	+++	+	+

Notes = +++ = greatest influence; ++ = medium influence; + = least influence.

Source: "Integrating Marketing Communications: New Findings, New Lessons and New Ideas" by Batra and Keller (2016)

Top-Down Communications Optimization Model: This model evaluates eleven communication options proposed above by Batra and Keller (2016) based on the 7C's, already explained in Section 2.1. The 7C's allow us to capture key insights about different media options, contributing to improve the efficiency and effectiveness of the whole communication strategy. For instance, once the Search and Display communication options are considered useful in creating awareness (See in Figure 2) it would not be efficient to use both in a marketing

plan. It will most likely be more efficient to focus on just one of the two to create awareness and allocate the remaining budget to other stages.

Annexe 3 presents an illustrative framework of this model.

Table 2. Communication Outcomes

Communication outcomes	Purpose	Author(s)
Create awareness and salience	It refers to *"the ability of a potential buyer to recognise or recall that a brand is a member of a certain product category"* (Aaker, 1991: 61).	Aaker (1991) in Buile, Leslie and Martinez, (2008)
Convey detailed information	It aims to deliver a message to a potential buyer inducing that the actual product/service is the best one fulfilling their needs/desires.	Batra and Keller (2016)
Create imagery and personality	It is related to the intangible benefits with a brand. It happens when the consumer identifies itself with a brand and attributes human-like traits to it (e.g. cool, excitement).	Aeker (1997) in Batra and Keller (2016)
Build trust	Convey trustworthy, credible, expertise, "authentic" information to facilitate message acceptance.	Brown, Kozinets, and Sherry (2003); Lynch, Marmosrtein, and Weigold (1998) in Batra and Keller (2016)
Elicit emotions	Add significance to a message through symbolic, emotional or social benefits that are going to influence the final decision.	Richinhs (1997); Westbrrok and Oliver (1991); Olney, Holbrook and Batra (1991); Batra and Athola (1990); Belk (1988); Edell and Burke (1987); Holbrook and Batra (1987); Holbrook and Hirschman (1982); Levy (1959) in Batra and Keller (2016)
Inspire action	An accepted message does not lead directly to a purchase intention. It requires a connection between 3 experience dimensions: cognition, affection, and behaviour. Therefore, this point aims to create a particular kind of message to induce action.	Johnson, Chang, and Lord (2006); Bagozzi and Dholaka (1999) in Batra and Keller (2016)
Instil loyalty	"*The attachment that a customer has to a brand*" (Aaker, 1991: 39). It happens when consumers become committed to a particular brand and purchase a product/service repeatedly over time.	Batra and Keller (2016); Buil, Chernatony and Martínez (2008)
Connect people	The sense of "brand love" in which customers become delighted and share with others their positive experiences with a brand.	Batra and Keller (2016)

Source: Author's elaboration

Actually, in 1993, Keller already focused on some of these communication objectives in their definition of **customer-based brand equity**. According to him, the strength of brand knowledge induces different effects on consumer behaviour. **Brand knowledge** is based on brand awareness and brand image, which in turn, is linked with a set of brand associations. This means that it is the unique and robust **brand associations** induced by marketing campaigns that affect dimensions like purchase intention and brand loyalty. Moreover, brand associations can be divided into three different groups: the associations made through **attributes** that characterize a product or service; the values that a brand can transmit to consumers, i.e. **brand personality**; and the overall opinion about a brand, in other words, **the organisational**

associations (Pappu *et al*., 2005; Chen, 2001; Aaker, 1996 in Buil, Chernatony and Martinez, 2008). Thus, in a multiplex communication environment where it is difficult for companies to differentiate themselves from their competitors and create a strong brand equity (Keller, 1993), experiences have been emerging as an opportunity to include in an IMC plan.

3. CUSTOMER EXPERIENCE

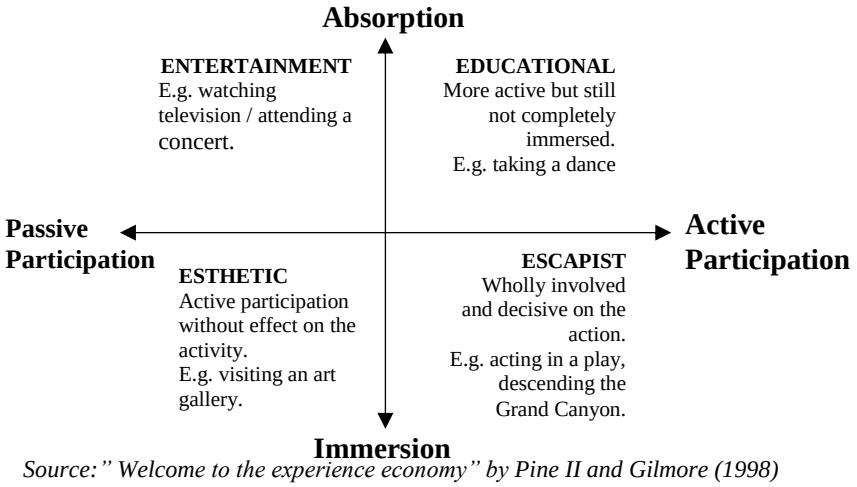
3.1. The Emergence of Customer Experience

Align with Batra and Keller (2016) theory, with the proliferation of multiple communication tools and the rise of multiple touch points, more and more firms are feeling the urgency to move away from traditional marketing toward creating memorable experiences for their customers. **Traditional marketing** is a set of assumptions referred and accepted for decades by academics, consultants and practitioners. Nonetheless, in 1999, Bernd Schmitt has already suggested that this methodology was out-of-date and untested. According to him, traditional marketing view customers only as rational decision makers. It means that customers (business customers or end consumers) make their buying decisions based exclusively on product features and benefits, selecting a product which satisfies better their need satisfaction. Furthermore, for a traditional marketer, the only ones with whom to worry are competitors inside the same category. For instance, from a conventional perspective, McDonald's only competes against Burger King, and brands like Pizza Hut or Starbucks are not relevant for their strategy (Schmitt, 1999).

Nowadays, with the establishment of the broadband internet and the development of new marketing tools like social media, brand information is spread away instantly and globally. This means that features and product benefits are not the sole point of difference anymore. Instead, consumer experiences are what drives consumption, and these are getting firms' attention as a strategy to attract customers and to gain competitive advantage.

B. Joseph Pine II and James H. Gilmore (1998) conceptualised experience as the progression of economic value. *"An experience occurs when a company intentionally uses services as the stage, and goods as props, to engage individual customers in a way that creates a memorable event."* (Pine and Gilmore, 1998: 2). That is, an experience is a differentiated offer with a **premium** but **worth pricing** which is personal and memorable. According to them, companies only achieve the stage experience when they are charging customers for it, instead of charging them for goods or services. For instance, Hard Rock Café does not yet explicitly charge for the events that they stage, but for the service itself. In Figure 3 this concept is defined in two dimensions: (1) **participation** which can be active or passive if customers are merely observers and (2) **connection** with the event/performance which lies in absorption or immersion (Pine and Guilmore, 1998).

Figure 3. The Four Realms of an Experience



Source:" Welcome to the experience economy" by Pine II and Gilmore (1998)

On the other hand, other researchers have defended a broader view of customer experience. Schmitt (1999) termed it as **experiential marketing.** The first and most important assumption of experiential marketing is that a customer is a rational and mainly an **emotional human being** who values functional attributes but also pleasurable experiences. According the Strategic Experiential Modules (SMEs) from Schmitt (1999) a consumption experience can exploit five different reactions: a sensory experience through sound, touch, taste, sight and smell **(SENSE)**; an affective experience that appeals to customers' emotions **(FEEL)**; a cognitive experience that enhances intrigue and provocation with the creation of a problem solving (e.g. "Does it make sense?") **(THINK)**; a rational approach to changes in lifestyle and behaviours (e.g. Nike with "Just Do It") **(ACT)**; and finally a social-identity experience that relates the person to a reference group or culture (e.g. the brand Harley-Davidson) **(RELATE)** (Schmitt, 1999).

3.2. Customer Journey and Experience

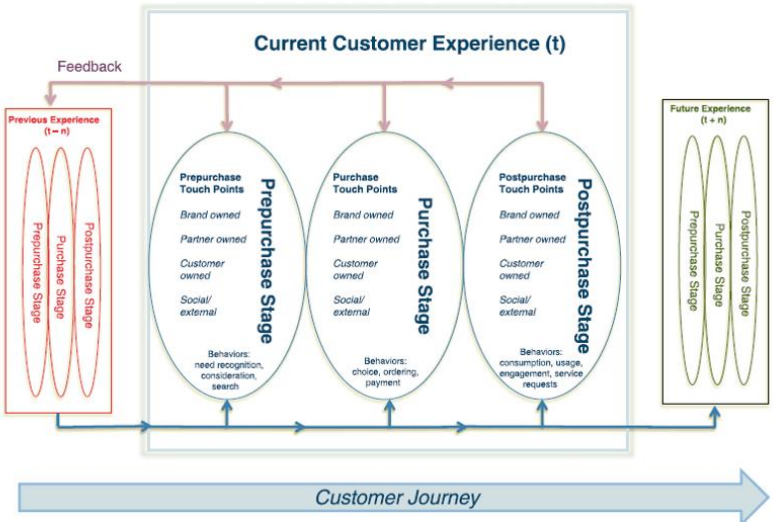
Lately, Lemon and Verhoef (2016) developed a theory where a multidimensional and dynamic process defines a customer experience. In a far-reaching perspective, customer experience combines *"the customer's cognitive, emotional, social, and spiritual responses to all interactions with a firm"* (Lemon and Verhoef, 2016: 70).

Marketers name that dynamic process as the "Customer Decision-Making Process". Nowadays, the classic "purchase funnel" or the AIDA model by Elias St. Elmo Lewis (1898) (**A**wareness, **I**nterest, **D**esire, and **A**ction) are outdated. The consumer "path to purchase" is any more a hierarchical process, but a non-linear and circular one in which consumers before to select a

brand, modify their first choices as often as they want until to find the product/service which satisfies them more. Researchers from *Mckinsey and Company* so-called it as a "Consumer Decision Journey Circle" (Court *et al.*, 2009 in Lemon and Verhoef, 2016). Actually, Batra and Keller (2016) in IMC Framework (*Figure 1*) developed a **Dynamic, Expanded Consumer Decision Journey** with 12 potential steps: **(1)** Needs/Wants; **(2)** Is Aware; **(3)** Considers; **(4)** Searches; **(5)** Likes/Trusts; **(6)** See Value/Is Willing to Pay; **(7)** Commits/Plans; **(8)** Consumes; **(9)** Is Satisfied; **(10)** Is loyal/Repeat Buyer; **(11)** Is Engaged/Interacts; **(12)** Actively Advocates. Note that this is a probabilistic path that consumers follow, there is always a chance to move backwards because of negative product experiences, for example. *Annexe 4* explains each step in detail.

Along with these findings, the framework suggested by Lemon and Verhoef (2016) - *Process Model for Customer Journey and Experience* (Figure 4) - tries to explain the consumer experience using three broader stages where the 12 steps suggested by Batra and Keller (2016) can be mapped by approximation. The first stage is **pre-purchase** which consists of the full experience before purchase. It contains the **(1)** feel of a need, **(2, 3, 4)** the willingness to know more about it/search for more information and finally **(5, 6)** to consider fulfilling that need with a purchase. Then, the second stage is the **purchase** itself where **(7, 8)** customer gets in contact with the brand through behaviours like choice, ordering and payment. In this stage, the marketing mix elements have been considered relevant to influence purchase intention. Last but not least, the **post-purchase** stage that encompasses the possible behaviours that follow the usage or consumption **(9, 10, 11, and 12):** (dis)satisfaction, repurchase, worth-of-mouth, (dis)engagement or loyalty (Lemon and Verhoef, 2016).

Figure 4. Process Model for Customer Journey and Experience



Source: "Understanding Customer Experience throughout the Customer Journey" by Verhoef and Lemon (2016)

3.3. Technology as Experience

Technology has contributed to some of the most irreverent and successful marketing campaigns. McCarty and Wright (2004) argue that interactions with technology must be seen as an **Aesthetic Experience,** i.e. the most complete and richest experience which stimulate curiosity and pleasure (Jennings, 2000; Dewey, 1958 in McCarty and Wright, 2004). Aligned with the Schmitt's theory, they suggest that the quality of human-computer interactions depends on four threads.

Sensual Thread

The sensual thread refers to the interactions with the external world using our five sensory organs: vision, hear, touch, smell and taste. Therefore, for a rich and pleasurable experience, **all senses need to provoke an affirmative answer from the user** (Norman, 2004; Steuer, 1992 in McCarty and Wright, 2004). In a technology experience, the quality of the user's sensual experience is determined by the mental representation that is build up with the five senses and also by the sense of presence that is influenced by the design of the software (Kant, 2006 in Kim, 2015). Spend hours in front of a tablet, smartphone or pc clearly demonstrates how people can be highly sensory engaged.

Emotional/Judgmental Thread

The judgmental thread is based on the experience evaluation, during or after it. Usually, this self-examination is linked with the "sense-making" where the user determines **if the experience was "good" or "bad"** based on values, goals and desires they have. This judgement depends on the type of value (Sweeney and Soutar, 2011; Woodruff, 1997 in Kim, 2015). A utilitarian value is related to the fulfilment of a goal/need, where a hedonistic value is associated with emotions (pleasure, frustration) provided by an experience.

Compositional Thread of Experience

Compositional Thread is related to the relationship between all elements (people, objects, surroundings) that made part of an experience. In a technology experience, several questions may appear: "Does it make sense? What will happen next? Where am I?" This questions will help users to understand if **that experience is valuable and meaningful** for them or not. When the relationship between the user and the object gets so closely related, the experience is characterised by an immersive and aesthetic one (McCarty and Wright, 2004). For instance, for some people is very pleasurable and enjoyable to play games on the computer, for others the same activity is worthless.

The Spatiotemporal Thread

It is related with the sense of time and space of the interaction. **The quality of time and space** is a component that is present in all experiences, and it affects the willingness to engage with a service or good. Depending on the level of interaction, experiences can make the time speed up or slow down; it can turn spaces more open up or close down; more realistic or unrealistic (McCarty and Wright, 2004).

4. EXPERIENCES USING TECHNOLOGY

Virtual Reality (VR) and Artificial Intelligence (AI) are the new high-tech activations that brands are starting to invest in experiential marketing (The Future Today Institute, 2018).

4.1. VIRTUAL REALITY

4.1.1. Definition of Virtual Reality

Virtual Reality is a suite of technologies capable of placing the user inside to a simulated environment. The interaction with 3D graphics, instead of viewing a screen in front of them, is the most immediately-recognisable component of VR. With the huge advancements in this technology, VR has recently become more associated to an immersive VR experience which includes the use of a Head-Mounted-Display (HMD) to immerse the user into a complete 3D artificial world. Although, there are two additional forms of VR (Stone, 1995):

Desktop-based VR – Considered the beginning of VR, where a conventional desktop monitor builds the image of an imaginary world in 3D format.

Projection-based VR - A virtual reality experience is created via 3D projections from a pair of conventional video projectors, in a "CAVE" (See figure in *Annexe 5*).

The following table presents a list of definitions that have been discussed over time about VR, proving that what differentiates a VR experience from 60 years ago is its device functionality. Nowadays the virtual environment created by 3D graphics is much more realistic and precise than before (Mazuryk and Gervautz, 1996; Pulli, Salmela and Similä, 1996).

Table 3. List of VR definitions

Definition	Author(s)
"*Real-time interactive graphics with three-dimensional models, combined with a display technology that gives the user the* ***immersion*** *in the model world and direct manipulation."*	Fuchs (1992)
"Virtual Reality technology is a real-time expression of using a computer to generate and stimulate the sense world of human beings. It is compressively developed by combining computer graphics technology, multimedia technology, human-computer interaction technology, network technology, and stereo display technology as well as emulation technique."	Yao, H. Liu, Y. and Han, C. (2012: 4288)

*Virtual reality is an immersive computing technology that incorporates a "set of technologies that enable people to **immersively** experience a world beyond reality."*	Berg and Vance (2016: 1)
*"VR elicits a **sense of presence** or "the feeling of actually being in another place" above and beyond what was made available in 2D and simpler 3D platforms."*	Gronstedt (2016)

Source: Author's elaboration

4.1.2. Virtual Reality, Augmented Reality and Virtual Worlds

Virtual Worlds and Augmented Reality (AR) are most of the times mistakenly referred to as VR synonyms. First, most scholars discriminate a virtual world as a networking reality where a virtual avatar represents the user (e.g. Second Life, World of Warcraft). Whereas in VR and AR users do not see a virtual representation of themselves (Bainbridge, 2007 in Kerrebroeck, 2017). Then, besides Augmented Reality being referred to as a form of Virtual Reality, there are slight differences between them. Virtual Reality users are immersed in an imaginary and 360-degree digital environment. In contrast, Augmented Reality, introduced in the form of Google Glass in 2013, instead to replace the real world, it simulates artificial objects in a visible world (Cognizant, 2016). The video game *Pokémon Go* is a very well-known example of it.

To conclude, **Mixed Reality**, still an enterprise-focused application, is another promising form of VR in the near future. Similar to AR, virtual objects are integrated and projected into visible surroundings via an immersive technology (headset and controllers). At the moment, *Magic Leap* and Microsoft with *HoloLe*ns are the pioneers and the biggest players in the market (Cognizant, 2016).

4.1.3. The Emergence of Virtual Reality

Virtual Reality (VR) is not a new concept. Since 1965 this terminology has been developed mostly for engineer and scientific projects. Ivan Sutherland presented the first definition of VR, where he says "*make that (virtual) world in the window look real, sound real, feel real, and respond realistically to the viewer's actions.*" (Sutherland, 1965 in Mazuryk and Gervautz, 1996: 2).

In 1965 Ivan Sutherland created an artificial world construction concept with interactive graphics, sound, smell, taste and force-feedback. Nonetheless, only in 1968, the first VR head-mounted display (HMD) was created – "The Sword of Damocles" – by Sutherland. It was the

first virtual reality system realised in hardware. After that, for over 60 years, VR experiences like VCASS (Visually Coupled Airbone Systems Simulator), VIVED (Virtual Vived Environment Display), GROPE, VIDEOPLACE, BOOM, CAVE (Cave Automatic Virtual Environment) and AR (Augmented Reality) were developed. *Annexe 5* contains a glossary of VR devices developed across the time (Mazuryk and Gervautz, 1996).

In the beginning, these VR experiences were built with the purpose to help militaries, astronauts or medicine students performing dangerous tasks. Only in the 90's, with the advancements in computing technology, numerous firms began to apply it to films, theme parks or video games. Cyber-Maxx, I-Glasses and VFX-1 were the first VR devices for video games which appeared onto this market. It was the beginning of VR in the entertainment industry (Stone, 1995).

Currently, there are two basic types of devices in the market: mobile VR and tethered VR.

Mobile VR: In 2014, Google understood the necessity to develop the same technology to smartphones, and it launched a low-cost alternative that allows consumers to experience a virtual environment through a cardboard VR headset, *Google Cardboard*, which uses smartphone displays to a 360º VR experience. It did not take long for Samsung to join Oculus in the development of its first version of *Gear VR*, a headset with motion detectors affordable with Samsung Galaxy smartphones. Then, it was the turn of Facebook with *Facebook 360* and Youtube which developed a new category inside their website to feature unique VR videos.

Tethered VR: In 2016, Oculus revolutionised the VR world when it launched its first fully immersive VR device – *Oculus Rift*. From this day onwards, big players like Sony with PlayStation VR, HTC, Dell, Lenovo and Asus have followed Oculus with similar desktop-powered VR platforms and HMD's, sending to the market a signal that VR comes to stay. However, this devices still belongs to a more niche market – the gaming industry - due to the enormous investment required to acquire these devices.

4.1.4. Virtual Reality in Business

"*VR is one of the most promising emerging technologies regarding business innovation."* (Kerrebroeck, 2017; Gartner, 2016: 177). Virtual Reality is not considered at all a new technology, but with the emergence of VR systems like *Oculus Rift* and *Gear VR*, it becomes

powerful and affordable enough to be adopted by consumers and also by professionals in training and simulation at the workplace.

Army and healthcare industry were the early adopters of VR, but, more and more companies are starting to realise the power of VR. According to Marketo, a digital marketing company from US, in 2016 Life Events (75%), Travel and Tourism (74%), Movies (67%), Home Design (66%), Education (64%) and Gaming (61%) were the industries that showed more interest with VR.

4.1.4.1. Virtual Reality at Workplace

Virtually Reality and also Augmented Reality have played a vital role in how professionals work, train, and cooperate. As a result of advancements over the years in the field of VR, some companies already understood the potential of it in employee's safety, company performance and business results (Higgins, 2017).

Safety

Through the conception of a detailed visual world, it is possible to make a simulation of complex tasks. This makes employees or students to learn faster, be more effective and to feel more capable and confident in risky situations (Kugler, 2017; Higgins, 2017). For instance, in the health-care industry, VR has been effectively applied to teach students performing highly technical procedures. In healthcare, for example, doctors have used VR to treat patients with phobias or stress disorder (Higgins, 2017).

Company Performance

Also, in the oil and gas, aerospace, construction and manufacturing industries, some companies have already perceived the potential of VR-based training. One of the major oil company during one year saved $2 million in travel and training costs by replacing traditional training for VR training (Higgins, 2017).

Virtual Reality is also reshaping designing and engineering practises. Through a 360ºvideo or a VR headset, projects like developing a new vehicle become more time and cost efficient. The VR environment lets designers and also stakeholders to have a more transparent and detailed vision of the project, finding defects or errors more easily (Sgambelluri, 2017).

4.1.4.2. Marketing and Virtual Reality

If there are no doubts about the potential of VR at the workplace, the same cannot be said in marketing practices. VR is one of the current technologies that has been caught the attention of marketers. However, this technology in Marketing is in its early stage, and marketers are still trying to figure out how to best employ the tool to reach customers in a new, innovative and creative way (Greenwald, 2016).

With the increasing presence of Virtual Reality headsets in the mass market, several companies have risked, and they have already started to adopt virtual reality to advertise products and brands. Some of them prefer to provide a fully immersive experience at events or even in-store using Tethered VR (e.g. *Oculus Rift*), while others have decided to reach a vast number of consumers through a VR experience at home, on smartphones, with *Google Cardboard* or *Samsung Gear VR*.

Some researchers have shown that this technology can be a powerful tool to engage customers and also to create compelling content. However, the marketing literature is still somewhat limited concerning how impactful is VR for brands. Michelle Greenwald (2016) described a few adoptions of this technology along customers' journeys:

1. Demonstrate in a clear and creative way product/service attributes and the range of capabilities (E.g. Cirque du Soleil);
2. Support consumers choice with more detailed information before they buy (E.g. Thomas Cook);
3. Provide to consumers an excited and brand entertainment immersive experience (E.g. HBO with Game of Thrones);
4. Develop more immersive and engaging storytelling with a brand (E.g. Madame Tussauds New York);
5. Communicate in a personalised and compelling manner the brand mission and the brand values (E.g. BMW Virtual App).

Table 4 presents several examples of how brands are adopting VR in their marketing strategies.

Table 4. Applications of VR in different industries

Industry	Brand	VR Tactic
Travel Industry	Thomas Cook [2015]	A travel agency that through an in-store virtual reality experience targeted five-holiday destinations: Egypt, Cyprus, Greece, New York and Singapore. The company achieved a 180 per cent uplift in New York destination.
Food Industry	McDonalds Sweden [2016]	"Happy Googles", made from a Happy Meal Box, allowed kids to a play a VR skiing game.
	Coca-Cola [2015]	Using an Oculus Rift, people who visited the Polish Market had the opportunity to be immersed in a sleigh ride over Vienna as Santa Claus himself.
	Baptiste and Bottle - Luxury Hotel Bar at Chicago [2017]	This bar added VR to the menu. Clients are invited to get to know the history of one top quality Whisky through a VR experience. When customers return from the VR trip the cocktail is already created for him/her.
Entertainment	Cirque du Soleil [2017]	"Dreams of O", a 3D experience comprised of aerial acrobatics, dives, fire and amphibious characters. This VR experience was available for Samsung Gear VR, Oculus Rift and HTC Vive.
	Madame Tussauds New York [2017]	The museum promoted the Ghostbusters movie through a ghost hunt game which required visitors to use a VR headset and weapon to play. Sounds and smell effects have joined to the experience, creating a 4D experience.
Fashion Industry	Dior [2015]	With a Dior Eyes Virtual Reality Headset, users were able to experience the elegance of premiere Dior' fashion show in 360 degrees wherever they are.
Sports	Next VR	Next VR is the leader in broadcasting events in virtual reality. Available in the leading platforms of VR, this company cover the main sports events in the USA, such as NBA, NFL and so on.
E-commerce	eBay and Myer [2016]	Myer is an Australian retailer who joined to eBay to launch the first VR department store app. Customers can navigate through the product range available with their gaze with the option to hover over information icons.
Cinema	HBO [2014]	"Ascend the Wall" was the VR exciting experience that HBO used to launch a new season of Game of Thrones. With the Oculus Rift headset, viewers entered an elevator that featured blasting cool air and physical rumbling, creating the feeling they were hoisted up 700 feet to the top of the Wall at Castle Black, a landmark very well known by the fans of this TV series.
Automobile	BMW [2018]	BMW has been used VR to launch new models of cars, such as its latest crossover SUV in January. In a fair in Las Vegas, BMW lets potential customers try in first-hand the vehicle through a virtual reality demo experience.

Source: Author's elaboration

4.1.5. The potential of VR in Business

The opinions of experts about the future of VR in business diverge. Ericsson in their report about Mixed Reality (2017) reunited several reasons why VR is not yet mainstream (See *Annexe 6*).

Statements like *"Headsets today are uncomfortable"*, *"The technology is just for games"* or *"The technology is too expensive"* are fairly common. Besides costs have been decreased, a headset that provides a fully immersive experience still costs significantly (~500€). However, Mobile VR is already an alternative to Tethered VR. With an investment of less 100€, users can buy headsets affordable for smartphones like a *Gear VR* and still to have an enjoyable VR experience anywhere with no cords attached (Sabre Labs, 2017). Moreover, according to Kate L. Harrison, a green tech branding and marketing expert, in the very near future, VR is not going to be used only by gamers and tech lovers. She says *"VR is the next frontier for building authentic experiences with young consumers."* 41% of young people from Gen Z has already tried VR headsets (Google Cardboard, Oculus Rift, Samsung Gear) and 12% use them on a daily basis (Q4 2016 study of 300 Gen Z'ers by Sabre Labs: "Emerging Tech in Travel 2017").

Lack of mobility, bulky headsets and network lag are the main reasons that maintain this technology at the tip of the iceberg regarding adoption in the mass market, but the forecasts are positive.

- According to Entrepreneur, **Mobile VR users** will more than duplicate, passing from 18 million worldwide in 2016 to 135 million users by 2020. Moreover, VR/AR hardware market is estimated to sell 24 million units in 2018, representing $4 billion in value. ABI, a market-foresight advisory firm in the US, goes forward and increase the amount for $61 billion by 2021 (Congress MWC17).
- **Standalone VR Headsets** are the next generation of HMDs. Oculus with *Oculus Go* and Google with *Mirage Solo* were the pioneers this spring. This new devices understand the movement without the need for external sensors and the users do not need cables, a PC or a phone for the consumption of VR (Oculus, 2018; Google, 2018).
- China is one step forward, and they are already developing the first 5G smartphones. **5G networks** will provide a fast and a bandwidth network (GSMA, 2018). Services

such as 4K / 8K Ultra-HD video will enable mobility in VR/AR experiences (Ericsson, 2017).

4.1.6. Virtual Reality Factors

Virtual Reality experience is based on two main factors: **the sense of presence and the level of immersion** (See *Table 3*).

Slater and Wilbur (1997) define presence as a state of mind encouraged by a set of senses in a virtual environment. When the user gets involved to a level that he loses the sense of time and ignores the physical world, he achieves a state of mind termed by **flow** (Novak *et al*., 2000; Csikszentmihalyi, 1997 in Tikkanen *et al*., 2009). High levels of **interactivity** (e.g. sensation of there is something in his/her hand; to fell the weight of objects) and **high media richness** (e.g. image quality and the sense of being there) have a positive influence on presence, and consequently a state of flow can be achieved (Novak *et al*., 2000; Steuer, 1993 in Tikkanen *et al*., 2009).

Recently, Helena Van Kerrebroeck *et al*., (2017) examined the role of **vividness/ high media richness** in purchase intentions. In the context of VR versus 2D regular representation, they concluded that more top vividness experiences lead to more favourable brand attitudes and thus higher purchase intentions.

Nonetheless, these authors only took into account that the sense of presence (i.e. the level of interactivity and vividness) is influenced by the **technology-mediated environment** delivered by the VR device. Donghee Shin (2017) somewhat contradicts previous findings when he suggests the immersion level achieved in a VR experience is a two-tiered process characterised by the **user experience** (technical features), and also by the **quality of experience** which is measured by personality traits "empathy" and embodied cognition. In other words, users are more likely to engage with virtual environments when the content delivered is relevant for themselves and they have willing-to-be-immersed personalities.

In this way, in a VR context:

- Immersion is not only influenced by the quality of technology. The user's attitudes and personality traits are represented in VR viewing processes (Weibel *et al*., 2010 in Shin, 2017)
- The immersive experience is not a static and consequential factor in VR, but an interactive and ongoing process which is shaped by users. The users' mood and disposition will affect the level of immersion perceived (Shin, 2017).

4.2. ARTIFICIAL INTELLIGENCE

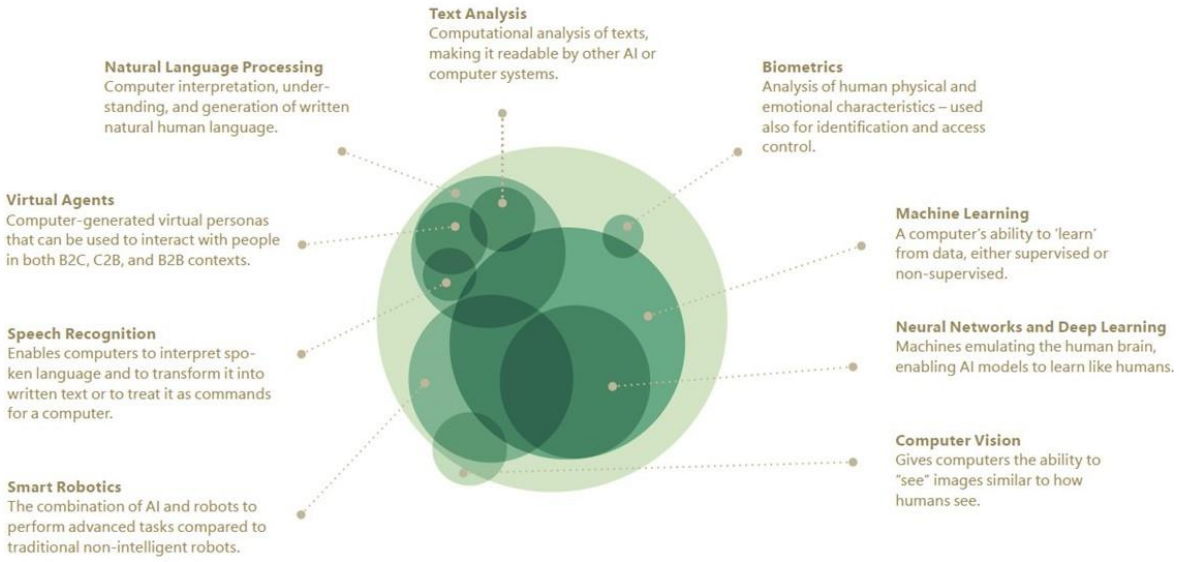
4.2.1. Definition

Artificial Intelligence is a division of computer science where machines are programmed through a complex algorithm to mimic human brains and consequently to behave intellectually like humans. It can be sorted into two main categories (Tech Trends Report, 2018; Future Today Institute, 2018).

(1) Artificial Narrow intelligence or Weak AI which is already extensively used in the technology industry or routine jobs. Playing chess, weather forecasts, recommendations in Amazon, or the spam filter in the email are examples of this kind of AI.

(2) Artificial General Intelligence (AGI) in which devices can perform human intellectual tasks. **Machine Learning** can be considered the "father" of AGI. Instead of teaching computers how to do everything, systems are trained to learn for themselves, meaning that they are capable of observing, learn over time, perceive a situation and make decisions without human intervention (The Future Today Institute, 2018; Marr, 2016). However, what is revolutionising the business world is the discovery of **Deep Learning**. The main difference between machine and deep learning is that deep learning is a more complext technique since it allows systems to process terabytes of data in different forms (images, audio, and video) (Marr, 2016). Both are responsible for the emergence of other advanced AI technologies illustrated in Figure 5.

Figure 5. Technologies included in the definition of AI



Source: "Artificial Intelligence in Europe" by Microsoft and EY (2018)

As suggested by Figure 5, AI applications are no more than a combination of different AI technologies. For instance, Virtual Agent is a smart robot powered by Natural Language Processing, which includes text analysis and speech recognition, and Deep Learning.

4.2.2. The Emergence of Artificial Intelligence

4.2.2.1. AI in Business

In 1956, the term **"artificial intelligence"** was introduced by John McCarthy in a historic meeting at Dartmouth. Over the past 70 years, computers scientists such as Alan Turing, Claude Shannon and John McCarthy have been contributing to the development of this field. In 1950, even before the concept has emerged, Alan Turing introduced the question *"Can machines think?"* Later on, in 1986, Geoffrey Hinton, discover the technique behind the current excitement of AI – the deep learning – being considered "the father of deep learning" (Somers; 2017).

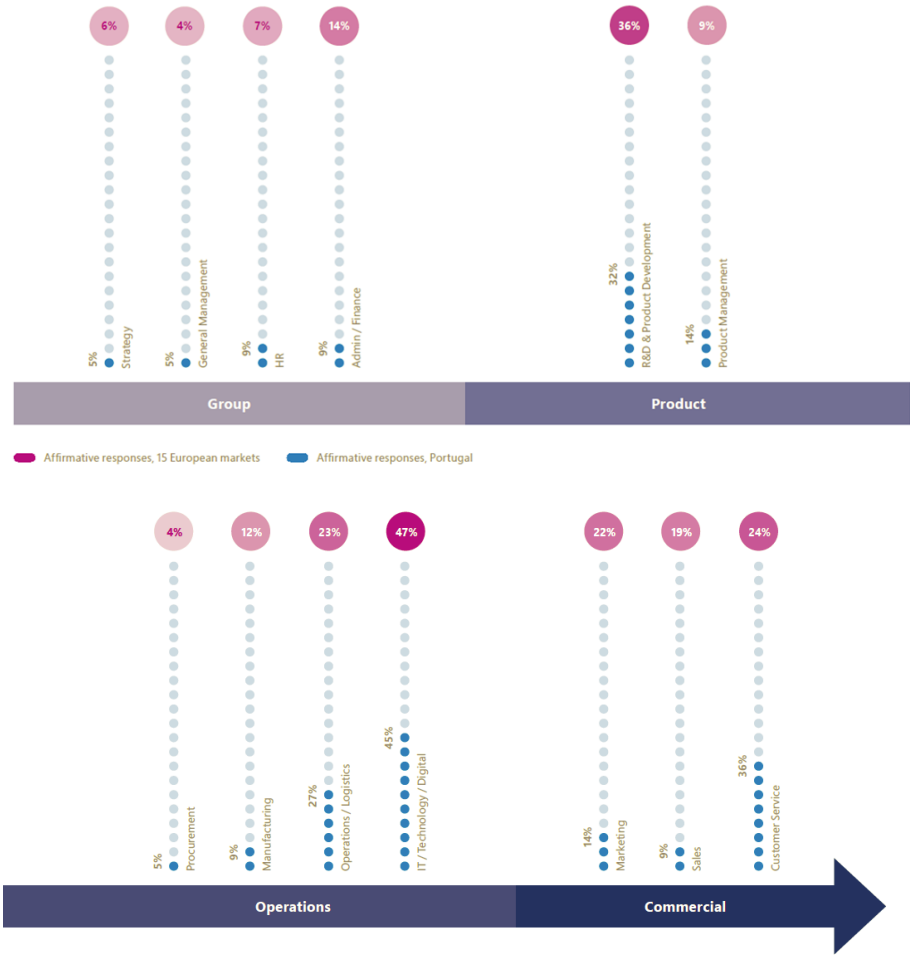
However, due to the inefficient computer power at that time, the enthusiasm with AI was asleep temporarily and only in the last decade with the advances of technology, companies like Alphabet, Amazon, Microsoft, IBM, Facebook, Apple and three giants companies from China – Tencent, Baidu and Alibaba – have reborn the field (The Future Today Institute, 2018). Some authors say the current generation is assisting to the 4th industrial revolution (Pires, 2017),

others, named it *the era of computing* (The Future Today Institute, 2018). In fact, AI comes to rethink and to revolutionise the businesses processes in four domains (Microsoft and EY, 2018):

- **Engage customers**: Provide pleasurable experiences, knowing better consumers' needs (Topic explored in the next section).
- **Labour Productivity**: Rising employee efficiency through predictions and automation of repetitive tasks.
- **Optimise operations**: Forecast demand and predict gaps or excess stock. *Blue Yonder, Vekia, Celect, Diwo* and many others are examples of supply chain management solutions to making retail more efficient (E.g. Alibaba, one of the leaders of technology innovation in retail, developed an intelligent logistics and warehouse management network – *Cainiao* – that have enabled them to reduce costs in more than 10% in packaging materials and to cut vehicle use by 10% (CoreSightResearch, 2017).
- **Enables innovation**: Automation of repetitive tasks allows the workforce to **focus on creative tasks**; Data analysis enable to get insights from consumer's behaviours and add value to services and products; AI technology is driving us to the creation of new products (E.g. Voice Assistants).

Although AI has been a "hot topic" among businesses, in Europe the majority of companies are still planning how to implement AI in their supply chain (Microsoft and EY, 2018). If we compare the level of AI maturity in Portugal against Europe, companies in Portugal are bellow regarding adoption. Actually, in a report developed by Microsoft and EY (2018), none of the Portuguese companies surveyed **has adopted actively AI in their processes.** Figure 6 represents the main business functions where the European companies of the survey have applied AI. IT and R&D functions revealed to be the ones that benefit more with AI.

Figure 6. AI and Business Functions



Source: "Artificial Intelligence in Europe by Microsoft" and EY (2018)

4.2.2.2. AI in Marketing

It has been proven that more and more firms are using AI to reshape journeys, anticipating consumer's moves and delighting them as they cross in the customer journey stages (Edelman and Singer, 2015). The applications of AI in marketing can be rooted in three core tenets:

- **Data synthesis and automation** which enables firms mapping consumer journey and consequently anticipate consumer's behaviours and increase customer satisfaction (Microsoft and EY, 2018).
- Build **better brand stories** with the support of dynamic and creative advertising experiences using AI (Google, 2018).

- The creation of **personalised** customer relationships with the automation of content production (Google, 2018).

In the following section, the most notable uses of AI in Marketing, at the moment, are outlined.

COMMUNICATION

Recommendation Systems / Personalized Experiences

AI enables brands to offer a more personal and personalised online experience. When we visit the Amazon's website, they seem to already know what we want, and according to our preferences, they can suggest not only what we need but also new products that we did not even know we needed. Moreover, AI technology facilitates the control of customers' steps across many channels (physically or virtually), allowing firms to react instantly to persuade a purchase or even to avoid negative brand experiences. For instance, if an airline company sent us the boarding pass as soon as we entered the airport, it would create not only a pleasurable experience for their consumers, but it would also allow them to map the consumers' journey (CoreSightResearch, 2017; Edelman and Singer, 2015).

Chatbots

Having a conversation with robots with skin, voice and body like *Sophia* is still not a reality. However, today it is trendy for companies to use chatbots on their websites and social media accounts to provide 24/7 personalised responses in human-like language. For instance, *Sephora* developed a chatbot in their website to give suggestions and recommend products to help customers to find the product which suits them better; *Laredoute* created the *Alphonde*, an online personal assistant that offers advice for a perfect look. (CoreSightResearch, 2017).

Voice Assistants

Voice Assistants are one of the most popular AI applications. Supported by AI functionalities, they are devices that use the voice to interact with humans and to perform a huge variety of customer services – play music, turn on/off the lights, search news, buy online products, among others (Accenture, 2018). Apple with *Siri*, Samsung with *Viv*, Microsoft with *Cortana*, Tencent with *Xiaowei* or Amazon with *Alexa* are some examples of virtual home assistants that started

to be part of people's daily lives. Actually, in a study from Accenture Portugal (2018), 66% of the respondents admitted they are replacing mobiles usage as they buy these devices.

Tractica, a market research firm from the USA, forecasts that this specific market will reach nearly $16 billion by 2021, with the most of that growth coming from consumers (Tractica, 2018). Also, according to a study from Accenture Portugal, voice assistant's demand in 2018 is expected to duplicate against last year, reaching 26% in German, 24% in the United Kingdom, 37% in the USA, 39% in India and 33% in China.

Considerable changes are predictable in future marketing strategies due to Voice Assistants (Agrawal, Kapur, Nibber and Yun, 2016):

- **Traditional channels (e.g. stores) and even e-commerce** will be disrupted. According to OC&C Strategy Consultants, voice shopping will increase from $2 billion today, to 40$ billion in 2022 (Williams, 2018).
- **Omnichannel customer experience** will not be a concern for marketers anymore. It means customer acquisition will focus on a single channel – home virtual assistants.
- Virtual Assistants **will have a deeper relationship with consumers than brands**. Therefore, it is relevant for brands to position on AI platforms than reinforce direct relationships with consumers. In other words, sellers will probably have to pay to be mentioned by Alexa, for instance.
- AI platforms will know more than consumers themselves, leading to a **higher rate of satisfaction**. They can anticipate their needs and even predict trade-offs consumers are willing to make, such as, suggest a desert to a person on a diet in a celebration.
- It will be **harder to keep consumers** once the platform evaluates the past behaviour versus better alternatives now in the market, suggesting if necessary new products/services, meaning that competition will intensify.

EXPERIENCE RETAIL

AI has given companies the opportunity to develop enjoyable and memorable experiences both online and in-store.

With the support of **facial and voice recognition**, magic mirrors or voice interactive mirrors have become a point of differentiation for several brands. For instance, H&M at its New York

City flagship in Times Square has an interactive voice mirror that allows consumers to take selfies or receive fashion inspirations and discounts via QR codes (Howland, 2018). *L'Oréal Makeup genius app* or *Sephora* with *Visual Artists* are other brands that are using magic mirrors. Visitors can see how they look with their favourite makeup products, such as shades and lipsticks. Then, they can immediately order the chosen products online and pick them up in the nearest store (Edelman and Singer, 2015).

Checkout-free stores are another AI application which avoids checkouts and waiting queues in stores, contributing to a faster and pleasant shopping experience. By using **computer vision** functionalities, shoppers only need to use an app to enter the store, take the products and go. Amazon Go was the pioneer with its first store in Seattle. However, Microsoft is also exploring checkout-less technologies (Ryan, 2018).

Delivery drones purpose is to send recent purchases in minutes. Amazon and Domino's are the few key companies that are investing in this technology (CoresightResearch, 2017). However, because of the logistics and also regulatory hurdles, it may take time to build acceptance and trust with customers.

Shopping 4.0. is a new concept of shopping. Brands can anticipate what customers want, need or prefer. Touchpoint Restaurant Innovations created an app that registers customer's coffee habits, and it automatically notifies employees to start preparing a coffee when a usual customer is approaching the shop at a particular time of the day. Send personalised coupons or products suggestions based on consumer's behaviour is another AI approach that brands are investing. (Pictures of the Future, 2017). For example, *Continente,* a Portuguese hypermarket, periodically sends coupons to consumers based on their previous purchases.

CREATIVE PROCESS

For now, being creative in AI language represents to compose instrumental music or create art, like designing dresses. In 2017, it was established for the first time a system whose purpose was to make art. With the support of researchers from Rutgers University, College of Charleston, and Facebook's AI Research Lab, this system can create original paintings difficult to distinguish from human's paintings. In music, Sony's Flow Machine and *Magenta*, a project from Google Brain, offer platforms to generate new music and art (The Future Today Institute,

2018). For instance, **Youtuber Taryn Southern** used *Amper Ai*, an artificial music composer, to create her song called by "Break Free".

DATA ANALYSIS

The primary potential of AI is based on data management that is widely used to improve business performance and competitiveness.

- AI software applications enable workers to focus on high-value tasks, replacing routine ones, accelerating **innovation** and the development of new products (Plastino and Purdy, 2018).
- AI-powered data analytics can **define prices** for all products depending on local weather or market conditions and to determine an optimal price for new products without previous historical.
- Through customer analytics, it is easier and faster to **predict consumer behaviour** and react at the moment. For instance, *Einstein* is a salesforce's artificial intelligence tool that analysis conversations in real time, alerting managers for possible opportunities or problems with consumers. Netflix uses their data to engage with their public on Twitter: "To the 53 people who've watched A Christmas Prince every day for the past 18 days: Who hurt you?? – Netflix US, December 11, 2017" (Walgrove, 2018).

4.2.2.2.1. AI applications and Privacy

For AI applications be successful in the market they need to ensure accuracy, alignment and privacy (Niraj Dawar, 2018). Marketers and Retailers should **correspond to the consumer expectations** but at the same time be **committed** to transparency about their relationships with consumers. Brands should balance the information gathered and how much customers feel exposed. Moreover, for consumers not to lose trust in brands, it is relevant to have practices where users can control what is done with the information shared (Walgrove, 2018).

4.2.3. The Potential of Artificial Intelligence

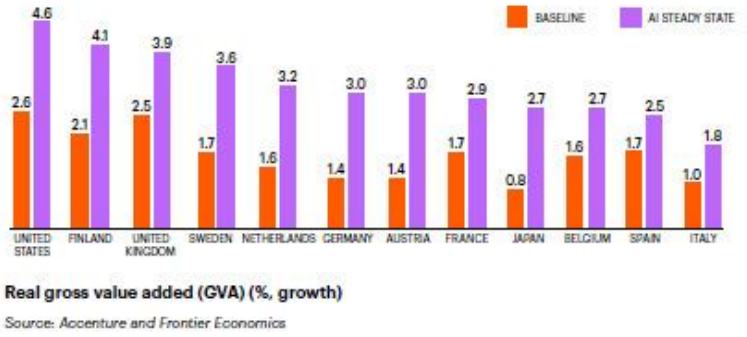
AI is not yet considered the most essential digital priority when compared to others. As a matter of fact, today a few tech companies have computer power and knowledge to create and deliver

products/services powered by AI (e.g. Amazon with *Alexa*). Satya Nadella, Microsoft's CEO, names it as **"bespoke" stage.** The next level is to **democratise** the concept, meaning it everyone could have access to it, including build AI systems to fulfil their needs. For this happens it is mandatory to "cultivate" future generations, developing empathy and educate them for the new reality (Nadella, 2017).

The expectations about the impact that AI may have in businesses are enormous. A lot of consultants and tech companies are exploring how AI will transform the world.

- **[industries adoption]** According to Tractica (2018), telecommunications, consumer (internet services), **advertising**, healthcare, automotive, and **retail** are some of the industries that will lead in AI adoption by 2025. They predict that AI software annual revenue worldwide will grow from $5.4 billion in 2017 to $105.8 billion by 2025.
- **[country economy]** Accenture and Frontier Economics predict that the United States will be the country that will benefit more with AI (US$ 8.3 trillion GVA (gross value added) by 2035). Japan's GVA could increase more than three times, from 0.8% to 2.7%, resulting in US$ 2.1 trillion of additional GVA (Purdy and Daugherty, 2018) (Figure 7).

Figure 7. GVA with AI



Source: "Why Artificial Intelligence is the Future of Growth" by Purdy and Daughterty (2016)

- **[workplace]** Dell Technologies (2018) says that 82% of business leaders believe humans and machines will work as integrated teams within their organisation in the next five years. Furthermore, 50% believe automated systems will free-up their time, and 42% think undesirable offloading tasks to machines will increase job satisfaction.

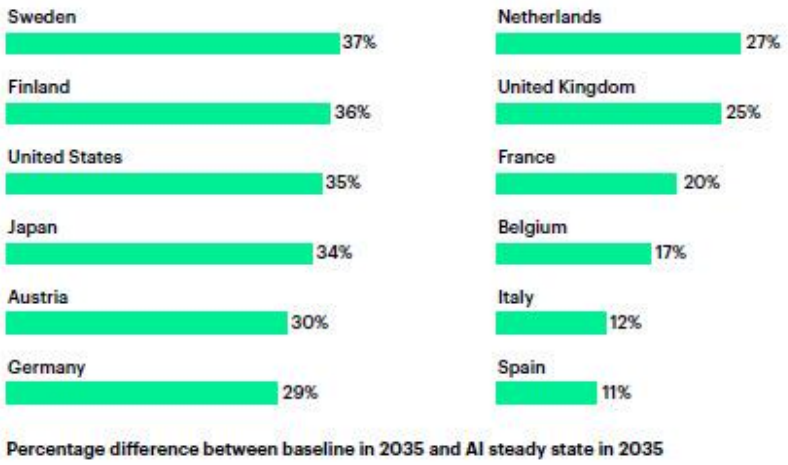
4.2.4. Ethical and Social Implications

AI has been the subject of much debate.

- For Elon Musk, Tesla's CEO, AI could *"become humanity's biggest existential* ***threat****"* (NBC News, 2017).
- Sundar Pichai, Google's CEO, says "*AI is one of the most* ***important*** *things that humanity is working on. It's more profound than electricity or fire."* (The Future Today Institute, 2018: 47).
- Mark Zuckerberg, *"In the next five to 10 years, AI is going to deliver so many improvements in the quality of our lives."*(NBC News, 2017).
- Satya Nadella (2016), Microsoft's CEO, suggested that AI should not be judged as good vs evil, but rather by the values of those organisations are building this technology. Humans are the ones who have control about the future they want to develop.

The most critical step is to manage this transition and be prepared for "*intellectually, technologically, politically, ethically, and socially*" dramatic changes (Purdy and Daugherty, 2018: 21). Thanks to AI, labour productivity is estimated to increase 40 per cent in developed countries. Sweden (37%), Finland (36%) and United States (35%) are in the TOP 3 of the most promising countries (Figure 8) (Purdy and Daugherty, 2018).

Figure 8. AI steady state in 2035



Source: "Why Artificial Intelligence is the Future of Growth" by Purdy and Daughterty (2016)

Therefore, one of the biggest fears of society is the change of future employment opportunities, where some job functions will be irreparably replaced (Sage, 2018). The forecasts affirm that:

- According to PWC, a significant percentage of job functions in the United Kingdom (30%), USA (38%), German (35%) and Japan (21%) will be replaced by robots or automated software until 2025. Industries like transport and storage (56%), manufacturing (46%), retail (44%), and financial sector (32%) are the ones where the changes will be more dramatic (Pires, 2017).
- The Mckinsey Global Institute projects that until 2030, between 75-375 million of the global workforce (3-14%) must change their type of work to attain full employment. Also, 60% of present-day professions have at least 30% of their activity susceptible to being replaced (Pereira, 2018).

Programme machine ethics is another issue that has emerged with the adoption of AI in businesses. Besides the efforts of well-known researchers to create ELLIS (European Lab for Learning and Intelligent Systems) and the contribution of Sage and Microsoft with the development of ethics codes, we are merely at the very start of programming ethics for machines (Pereira, 2018). According to Luis Moniz Pereira (2018), AI is handy with perception, image and voice recognition applications, but when it comes to teaching machines about morality, there is not an instruction manual for that. Every person/society has its sense of morality and its vision, this means that there is not a model about what is right, or wrong so that machines could be programmed. Furthermore, robots need to make mistakes to learn, meaning that while they are learning to behave like humans, people's lives can be at risk. For instance, an autopilot car is programmed to drive safely, but if other cars do not follow the rules, he will not know how to react, and there is a considerable probability of occurring an accident. Another issue that arises in these situations is to understand who was responsible for the crash since robots cannot justify their decisions (Pereira, 2018). Similarly, **software bugs (coding errors)** have caused concerns about the limits of technology. The most recent example was the Tesla fatal crash when the vehicle's autopilot sped up and steered into a concrete barrier (Dawar, 2018; The Future Today Institute, 2018).

5. CONCEPTUAL MODEL AND HYPOTHESES

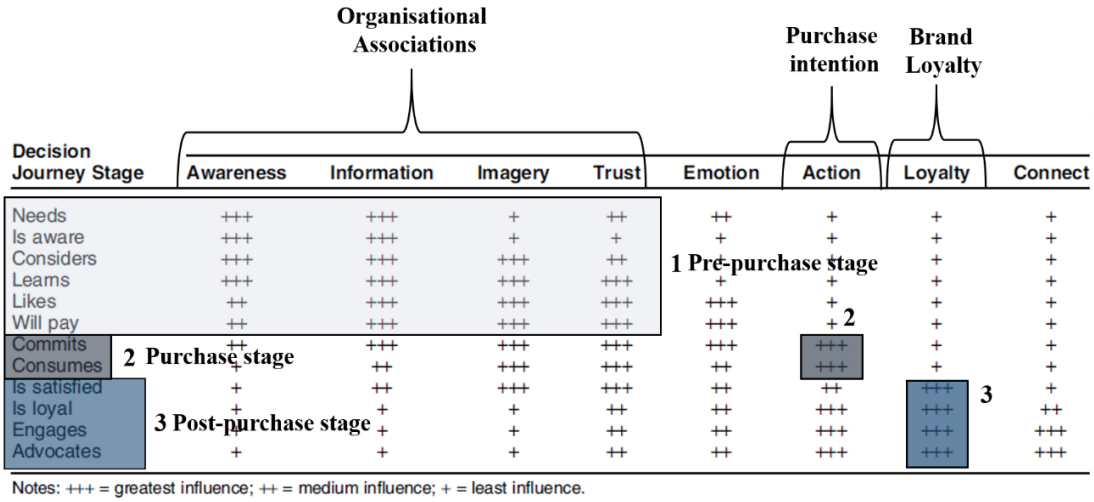
5.1. The Conceptual Framework

Along with this dissertation, it has been argued that **customer experiences** are receiving more attention from firms than before. This enthusiasm arose with the increasing number of communication tools and thereupon the necessity to instil positive experiences within the customer journey (Lemon and Verhoef, 2016).

Technology development is the primary driver to a more complex customer journey. Social Media and Mobile were the first ones that revolutionised the marketing field**,** already being considered fundamental for any IMC programme (Batra and Keller, 2016). Nowadays, **Virtual Reality and Artificial Intelligence** are the new high-tech activations that brands are starting to invest for their marketing strategies (The Future Today Institute, 2018). Although forecasts are hugely positive and promising, VR and AI are still in their early adoption level by firms or consumers and, to our knowledge extent, **there are no formal empirical investigations** by academic researchers on how consumers react (e.g. customer attitudes and perceptions) to brands' experiences using these technologies. Moreover, it appears that there is a **lack of specific studies** about the potential of VR and AI as a sustainable marketing tool, being referred for some experts as a mere trend.

Considering that, a model that aims to provide a practical understanding of the impact of experiences using VR and AI along the consumer experience was developed. The framework was based on the concept of ***Customer-based Brand Equity*** **(Keller, 1993),** ***IMC Conceptual Framework*** **(Batra and Keller, 2016), and also on the** ***Process Model for Customer Journey and Experience*** **from Lemon and Verhoef (2016).** Firstly, to make the model slightly more feasible, **the three phases (pre-purchase, purchase and post-purchase)** argued in Lemon and Verhoef's model were contemplated to describe the customer experience in this model. Ideally, it would be necessary to have proven scale approaches to evaluate the customer experience at each stage in the customer journey, but this topic is quite recent, and the current research and practise is still very fragmented (Lemon and Verhoef, 2016). As a result, only **three meaningful communication objectives** (Batra and Keller, 2016) were selected for the research purpose, as detailed in Figure 9.

Figure 9. Selection of three more representative communication objectives in the consumer decision journey



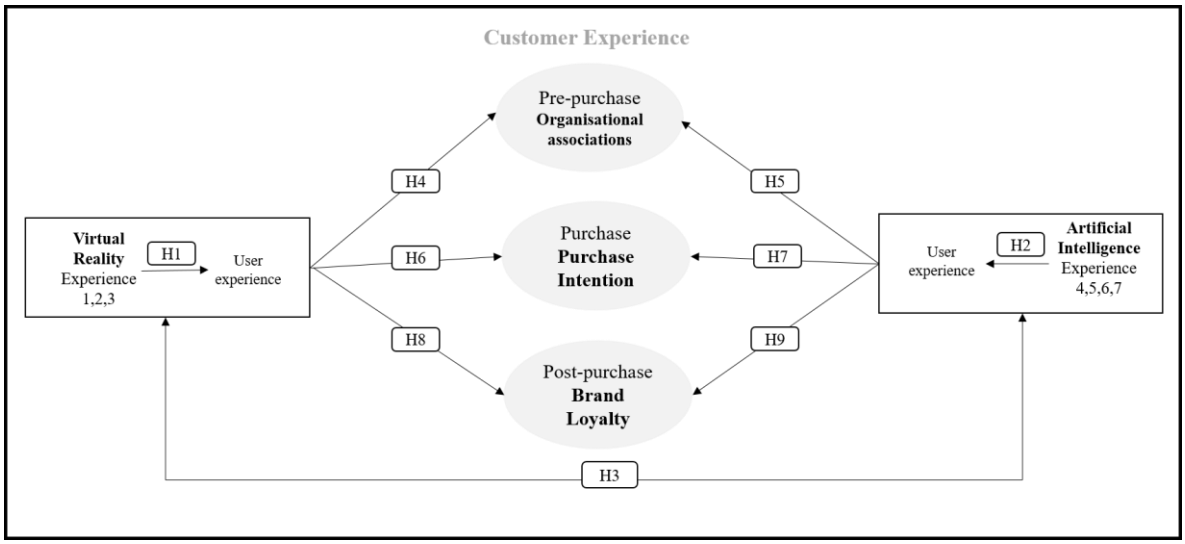
Source: Author's elaboration

In figure 9 contains a table developed by Batra and Keller (2016) (*Figure 1*) where the 12 stages of the decision journey were divided into three groups (1. Pre-purchase, 2. Purchase and 3. Post-purchase), as suggested by Verhoef and Lemon (2016). Then, for each stage, the communication objective that has the greatest influence was selected (+++). For example, the Post-purchase group of stages ('Is satisfied', 'Is loyal', 'Engages' and 'Advocates') is mostly influenced by the communication objective 'Loyalty'. In the end, we concluded that the most relevant dimensions to address in this study are:

- **Organisational associations** because it is an antecedent of **awareness, information, imagery and trust** (Keller, 1993), which in turn represents quite well the pre-purchase stage.
- **Purchase intention** (action) which has the most significant influence in the purchase stage (Batra and Keller, 2016).
- **Loyalty** which has the most considerable influence in the post-purchase stage (Batra and Keller, 2016).

Figure 10 presents the model.

Figure 10. Research Framework



Source: Author's elaboration

5.2. Hypotheses Formulation

Firstly, it is important to measure to what extent the **user experience** is affected by the technical features of VR and AI technologies (H1 and H2).

Technology experiences are seen as **Aesthetic ones** (McCarty and Wright, 2004), and they can exploit different reactions. In a human-computer perspective, McCarty and Peter Wright (2004) characterised the quality of experience according to four influential drivers: sensual, emotional, compositional and spatiotemporal (McCarty and Peter Wright, 2004).

Nonetheless, the literature review does not go much further. Regarding Virtual Reality, it is only defined by the majority of authors with a high level of immersion and sense of presence (*Table 3. List of VR definitions*) where users may lose the sense of time and ignore the physical world when they get involved (Csikszentmihalyi, 1997; Novak *et al*., 2000; Tikkanen *et al*., 2009). Considering this, hypothesis 1 (H1) intends to evaluate the impact that VR functionalities have in an experience.

H1: Virtual Reality influences the user experience positively.

When it comes to Artificial Intelligence, the topic is still unhinged, and experts' opinions diverge. According to several researchers, the current generation is witnessing the fourth industrial revolution, where computing is starting to dominate the world. Moreover, this field

is in its early stages of development in marketing, which makes it even more challenging to evaluate experiences using AI applications. For this reason, hypothesis 2 (H2) was formulated with the objective of recognising the quality of this type of experience based on McCarty and Wright theory.

H2: Artificial Intelligence influences the user experience positively.

Then, to understand which of the two delivers a better user experience from the consumer point-of-view, hypothesis 3 (H3) was developed.

H3: Virtual Reality influences more positively the user experience than Artificial Intelligence.

The following hypotheses are directly related to the influence of experiences using VR and AI in three different communication outcomes: organisational associations, purchase intention, and brand loyalty. Seven experiences (three VR experiences, four AI experiences) were designed to get a broader view of the significance of VR and AI in consumer experience. A thorough description of each scenario is provided in Section 6.1.4.

Experiences with the support of VR headsets or AI applications can efficiently transmit not only the tangible product benefits but also the intangible ones. This new approach to convey messages to consumers may influence the way they perceive a brand. Hypotheses 4 (H4) and 5 (H5) were defined to understand if VR and AI are reliable tools to exploit contents in a credible, trustworthy and attractive way (i.e. organisational associations).

H4: Experience 1, 2, 3 have the propensity to create positive organisational associations.

H5: Experience 4, 5, 6, 7 have the propensity to create positive organisational associations.

The **purchase intention** is the most common and meaningful construct throughout the literature (Beerli and Santana, 1999; Andrews *et al*., 1992 in Li, Daugherty and Biocca, 2002). The main objective of any business is to persuade consumers to choose their products/services. According to Keller (2003) promos, mobile, direct selling and search are the communication tools that easily reduce barriers to action and explicitly impel action. Then, it is equally crucial to understand if experiences powered by VR/AI technology have a direct impact in **purchase stage**. The hypotheses 6 (H6) and 7 (H7) reflect these doubts.

H6: Experience 1, 2, 3 have the propensity to inspire action.

H7: Experience 4, 5, 6, 7 have the propensity to inspire action.

Because customers become **loyal to a brand** when their expectations about a product or service are exceeded, the meaningful engagements delivered along the consumer experience (e.g. brand interactions on social media, coupon offers) may contribute to evoke positive feelings towards a brand and to create emotional ties. Consequently, a desire to purchase the same product or service repeatedly over time emerges. Thus, hypotheses 8 (H8) and 9 (H9) were defined to assess the **expected impact** of VR and AI experiences can have on consumer's fidelity levels.

H8: Experience 1, 2, 3 have the propensity to instil loyalty.

H9: Experience 4, 5, 6, 7 have the propensity to instil loyalty.

6. METHODOLOGY

6.1. Research Design

Since this study aims to measure the importance of consumer experiences with Virtual Reality and Artificial Intelligence in three points of the consumer journey, a **descriptive research** was conducted. According to Mooi and Sarstedt (2011), this type of research is the most appropriate when it comes to describing and measuring performances quite specific to marketing, like consumer behaviour. Moreover, the data was collected only once from a single sample, meaning that a descriptive research in a longitudinal format was performed (Mooi and Sarstedt, 2011). Lastly, this research is based on an **empirical approach**. All the conclusions come from the data collected through experimentation/observation, not from theories or abstractions.

6.1.1 Participants

The group of individuals in which it is intended to make judgements is called by population (Mooi and Sarstedt, 2011). Thus, the group selected for this research are the Portuguese individuals. Besides the topic of this dissertation is about Virtual Reality and Artificial Intelligence, the population may not have yet used both. Due to the lack of development/investment in these technologies in Portugal, some of the Portuguese residents may not be aware of its existence, or, had not the opportunity to experiment. Then, the minimum requirement to be part of the sample is to have a social media account (e.g. Facebook, Email, WhatsApp), which means that the data collected correspond to people that lead with technology in their daily lives.

The sampling method chosen was the **non-probability type with a convenience approach.** In this cases, it is the researcher who controls the respondents, meaning that the sample is more subjective, limited and it may be influenced by situational factors (Mooi and Sarstedt, 2011). Furthermore, according to Mooi and Sarstedt (2011), the gains in precision are very marginal if the sample size increases far above 100-250. As a result, a total of 537 participants were reached, being that final sample corresponds to 302 completed answers.

6.1.2. Data Collection

The type of data gather was **primary data**, which means the researcher collected it for this specific purpose (Mooi and Sarstedt, 2011). Then, in the form of an online questionnaire, a **quantitative research** was carried out. That is, the results are presented in values, and consequently, the conclusions are factual and precise (Mooi and Sarstedt, 2011). The questionnaire was made in *Qualtrics,* an online survey software. Since the mother language of the population considered is Portuguese, all the questionnaire was written in their language for convenience and to ensure that the questions were interpreted correctly. Moreover, the final questionnaire was only shared on social media platforms: Facebook, WhatsApp, Instagram, LinkedIn and Email, to fulfil the requirement explained above.

6.1.3. Instrument Construction

All the approaches used throughout the survey were based on the extensive literature carry out and made clear to the participants in each question. Before the questionnaire has been concluded, a pre-test was conducted with a sample of 6 people with different qualifications and ages. As a result, some adjustments to the questionnaire's sentences were considered in the final inquiry (Mooi and Sarstedt, 2011). The questionnaire[1] is divided into three parts with a total of twenty one questions. Out of twenty one questions, sixteen questions were constructed to evaluate VR and AI in consumer experiences, and five questions for weighting demographic characteristics of the sample. The experiment began with a short introduction explaining the primary purpose of it, and, assuring to participants the confidentiality of data.

Once the final goal of this research is to study the consumer's behaviours and perceptions in experiences using Virtual Reality and Artificial Intelligence, the type of construction of the first two groups are identical. The first one refers to Virtual Reality, and the second part addresses Artificial Intelligence. Firstly, each respondent was invited to answer multiple choice and rank questions about their behaviour and attitude towards the technology in question. Then, participants evaluated a set of seven scenarios with VR and AI (three experiences in VR group and four experiences in AI group) according to a Likert scale from one (strongly disagree = 1)

[1] https://iscteiul.co1.qualtrics.com/jfe/form/SV_5v7tluMkirEb2mh?fbclid=IwAR1U8_y_fQQNv5rIlL1ocTR5frbsKGlyEXu2aV63ugwgWlAJpYroPSkbAtQ

to five (strongly agree = 5). The five-point Likert scale was elected because it provides us with more profound descriptive and explanatory opinions. Moreover, compared with seven and ten points Likert scale, a five-point Likert scale diminish the survey's length, and it is easier to answer. Also, in each situation described, were attached representative images so that respondents who are not aware of these technologies, perceived in the most explicitly the referred scenario. In the end, the last part is about the respondents' socio-demographic information (gender, age, academic background, and place of residence).

6.1.4. Stimulus

To investigate the impact of Virtual Reality and Augmented Reality in consumer experience the questionnaire needed to (1) ensure the type of experiences described effectively represented both technologies, and (2) stand for an application and industry of moderate interest. As a consequence, seven scenarios were self-constructed. Majority of brands (e.g. brand X) are fictitious not to influence the final answers.

For the virtual experience condition, it was appropriate to select three of the main VR applications with more interest for consumers (Greenwald, 2016). For the artificial intelligence experimental conditions, four of the most notable uses of AI in Marketing at the moment were chosen (CoreSightResearch, 2017). Accounting for more than seven experiences would be exhaustive for the respondents to answer. Moreover, for each of them, based on the intensive research literature on this topic an industry had to be chosen, so that examples would not be too subjective (e.g. Table 4 and section 4.2.2.2.). This allowed participants to feel some identification when answering to the survey, but at the same time the industries covered may have some influence in results and limit the conclusions' scope.

Virtual Reality: sorted by type of content delivered

Experience 1: Support consumers' choice with more detailed information before they choose their travel destination in a travel agency

Travel agency X offers you the opportunity to (virtually) travel across five possible destinations: Egypt, Greece, New York, Singapore and Philippines. During this experience, you will observe and get to know the most iconic and beautiful places of each destination.

Experience 2: Provide consumers an enthusiastic and entertaining immersive experience in a TV series premiere

A TV channel launched a new season of Game of Thrones through a brand activation in a shopping centre. With the Oculus Rift headset, you have the opportunity to enter an elevator that featured blasting cool air and physical rumbling, creating the feeling you were hoisted up 700 feet to the top of the Wall at Castle Black, a landmark well-known by the fans of this TV series.

Experience 3: Communicate in a personalised and compelling manner an automobile's brand mission and values

The automobiles brand XYZ used VR to launch a new model in a fair. You have the opportunity to try in first-hand the vehicle in an emotional driving through a virtual reality demo experience.

Artificial Intelligence: sorted by type of application

Experience 4: **AI with personalised/recommendation systems in a real state agency**

The real state agency X offers its customers an online personalised experience. Whenever you visit their website or Facebook page, a virtual assistant will be available to clarify all doubts about their products and services (e.g. prices, property suggestions). Moreover, when browsing in their website, some recommendations of properties, based on your preferences, will appear.

Experience 5 – AI with Voice Assistant for a supermarket brand

Supermarket X allows customers to order their purchases through a voice assistant. It means you do not need to go to the physical store or even order in their website. You only need to talk with a voice assistant and explain to it what you desire.

Experience 6 – AI with Voice Interactive Mirror for an apparel brand

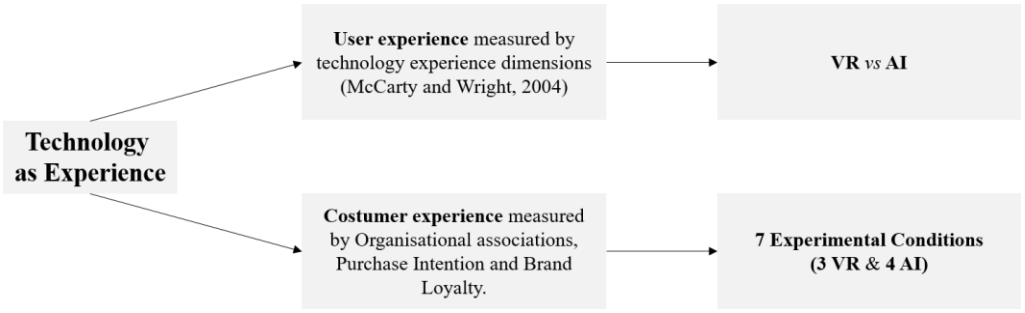
Apparel brand X has in their physical stores an interactive mirror where their customers can take selfies, keep up with recent fashion trends and receive coupons. Moreover, customers can see how they look with their favourite makeup products.

Experience 7 – AI with Checkout-Free Store for a supermarket brand

Supermarket brand X has a new concept store which avoids checkouts and waiting queues. You only need to download an app and activate it when entering in the store. After that, you take the products you need and just leave.

6.1.5. Measures

Figure 11. Model Construct



Source: Author' elaboration

To assess the quality of user experience using VR and AI, the participants who have already been exposed to these technologies were invited to rank five items from one (strongly disagree = 1) to five (strongly agree = 5). Each of those items describes one of the dimensions of a technology experience: sensual, emotional, compositional, spatial and temporal (McCarty and Wright, 2004) (Figure 11).

Thus, as described in Figure 11, the second dimension of the model is about to measure the consumer experience, and the seven situations described above were analysed based on three different variables (organisational associations; purchase intention; brand loyalty). To measure them, **a multi-item scale** was designed, with 3 Likert-type items from 1 to 5, for each variable. The items were developed by using measurement scales adopted from prior studies. To adapt the current construct in the research context, slight adjustments were made to the items. All the scales were equally tested in the seven scenarios, and the same participants were asked to analyse all the experiences. Table 5 summarises the model constructs.

Table 5. Construct and Item Summary

Construct	Items	Adapted from
Pre-purchase **Organisational Associations**	A1. Brand X offers very good quality and reliable products. A2. I like brand X. A3: I trust the company which makes brand X.	Pappu *et al.*, (2005, 2006); Aaker (1996)
Purchase **Purchase Intention**	B1. I Would consider trying this product/brand. B2. Next time I am in a store I will look for this product/brand. B3. I will purchase the brand next time I need this type of product. (**Note:** B.4 *I started using the product after this experience* – This item was ignored of this construct because this statement does not make sense in a fictitious scenario/brand situation).	Morton & Friedman's (2002); Karrh's (1998); Putrevu and Lord (1994); Taylor and Baker (1994); MacKenzie *et al*., (1986)
Post-purchase **Brand Loyalty**	C1. Brand X would be my first choice when considering Y. C2. I consider continuing to buy products/services of this brand. C3. I will not buy other brands of Y if I have access to brand X.	Yoo *et al*. (2000)
Technology Experience Dimensions	D1. **Sensual:** It provokes senses reactions (e.g. vision, hear, touch, smell and taste).	McCarty and Peter Wright (2004); Norman (2004); Steuer (1992); Author's elaboration.
	D2. **Compositional:** The experience convinced me and it was interesting. D3. **Spatiotemporal:** I lost the sense of time. D4. **Spatiotemporal:** I lost the sense of space. D5. **Emotional:** Induce my feelings and reactions.	McCarty and Peter Wright (2004); Author's elaboration.

Y	**Industry**
X	**Fictitious Brand**

Source: Author's elaboration

7. RESULTS

7.1. Procedure

Firstly, a total of 537 survey answers was submitted from the *Qualtrics* platform into the statistics software SPSS 25 ®. Nonetheless, due to incomplete questions, only 302 responses were considered valid for the final sample.

7.1.1. Reliability and Validity tests

Before the hypotheses testing process, one needs to demonstrate the quality of each measure. To begin with, the Cronbach's alpha was computed to measure the internal consistency among *organisational associations*, *purchase intention* and *brand loyalty* dimensions in each type of experience. This coefficient varies from 0 to 1, being that the generally accepted lower limit is 0.7 (Mooi and Sarstedt, 2011). Table 6 demonstrates that all exceed the lower limit pre-established, thus showing a stiff consistency.

Table 6. Reliability Statistics

Cronbach's Alpha

		Organisational Associations	Purchase Intention	Brand Loyalty	User Experience
VR	Exp. 1	0.810	0.723	0.821	0.892
	Exp. 2	0.848	0.776	0.802	
	Exp. 3	0.870	0.761	0.846	
AI	Exp. 4	0.847	0.748	0.824	0.947
	Exp. 5	0.873	0.792	0.871	
	Exp. 6	0.870	0.815	0.852	
	Exp. 7	0.881	0.863	0.844	

Source: Author's elaboration

Then, an explanatory factor analysis was performed using principal component analysis (PCA) to test the scale's validity. Before, two tests confirmed that the sample under examination is appropriate to perform the PCA: (1) the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, whose values above 0.6 are considered as acceptable to perform PCA; and (2) the Bartlett's test of Sphericity that measures the existence of a strong correlation among variables ($p<0.05$). As a result, a PCA was executed, and the results suggested that the variables are unidimensional across all experiences. It means that all the items of each scale are sufficient to

create a single factor with highly representative factor loadings (all the individual factors extracted explain more than 70% of the variance) (See *Annexe 7*). Then, for the hypotheses testing procedure, 23 new unidimensional variables were computed by averaging the scores from the correspondent items.

7.1.2. Model Validation

The analysis of the results starts with a sample characterisation, in which main demographic characteristics of the sample are briefly described (age, gender, academic background) and own attitude and interest in AI and VR.

7.1.2.1. One-Sample Student's Upper-Tailed T-test and Paired Sample Upper T-test

All the premises of the model, with the exception of H3, were validated with a **One-Sample Student's Upper-Tailed T-test.** This test determines whether the mean of a variable is statistically and significantly higher from the test value settled by the researcher (Laerd Statistics, 2015). The hypothesised population mean established was 3.5 because all the dimensions were valued with a 5-point Likert Scale and as 3 is the natural neutral choice, a value of 3.5 would be conservative enough to derive conclusions. Considering this, the statistical tests were conducted with H0: $\mu \leq 3.5$ and Ha: $\mu > 3.5$. Taking the standard 5% significance value, if the p-value is less than 0.05 ($p<0.05$), the null hypothesis is rejected with at least 95% confidence level.

Before running the tests, four assumptions on the variables and data were tested and validated. (1) The dependent variables (i.e. organisational associations, purchase intention, brand loyalty and user experience) are a continuous variable, (2) the data is not correlated/related, it means the observations in each test are independent, (3) there are no significant outliers, and (4) as assessed by the outputs of a normal Q-Q Plot, dependent variables are normally distributed (Laerd Statistics, 2015) (See *Annexe 8).*

Finally, to study the mean differences between the quality of experience with VR and AI (H3), we opted for a **Paired Sample Upper T-test**. This case only required the assumptions (3) and (4) to be met (See *Annexe 8).*

7.2. Data Analysis and Discussion

Before going further into data analysis, it is important to note that in this section whenever the terms AI and VR are mentioned, it refers not to technology in general, but to the seven experiences to I set out to study. Thus, in the following sub-sections, the most exciting findings are reported and briefly explained.

7.2.1. Sample Characterization

Table 7. Sample Characterization

Individual Characteristics	Sample classification	Absolute frequency	Relative frequency
Gender	Male	127	42.1
	Female	175	57.9
Age	Less than 18	5	1.70
	18-24	116	38.4
	25-34	58	19.2
	35-44	63	20.9
	45-54	48	15.9
	55-64	9	3.00
	More than 65	3	1.00
Educational Level	Elementary Education	6	2.00
	Secondary Education	108	35.8
	Bachelor's degree	120	39.7
	Master degree	63	20.9
	PhD degree	5	1.70

Source: Author's Elaboration

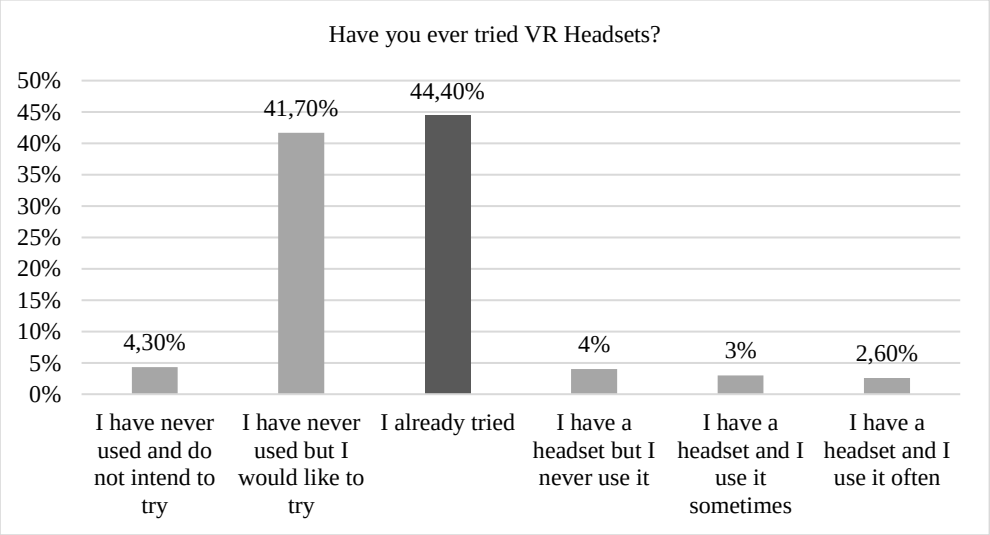
Gender, age, and academic background were considered the most relevant demographic characteristics for this analysis. According to Table 7, more than half of the respondents are women (57.9%), though the **gender** variable is balanced and seems to represent the population fairly. Regarding the **age**, participants between 18 and 24 years old are the largest age group of the sample with 116 answers (38.4%), followed by the respondents aged between 35 and 44 with 63 responses (20.9%). Participants with more than 65 years old (1%) and less 18 years old (1.7%) are the less representative group counting for less than 3%. Concerning the **educational level**, 39.7% of the respondents had a bachelor's degree, and 35.8% have just completed the secondary education. Master degree, Elementary Education and PhD are the less represented groups, 20.9%, 2% and 1.7%, respectively.

7.2.2. A Descriptive Analysis: Consumers are receptive to VR and AI

A first look to the answers shown that about half of the respondents already have been in contact with VR or AI, or even both. Furthermore, it was possible to conclude that people show a positive attitude regarding the use of these technologies for marketing purposes.

Virtual Reality is a technology that most of the respondents showed receptiveness, with just 4.3% saying they have never tried the technology and they are not interested in doing so. 54% of the participants reported that they already tried a VR headset and 41.7% that never tried but are interested in doing it. It allows us to understand that most participants are receptive to Virtual Reality experiences, yet there is still a long way to go to achieve the technology's massification (Figure 12). Additionally, no substantial differences between genders and groups of age were found regarding this question.

Figure 12. Majority of participants already tried VR

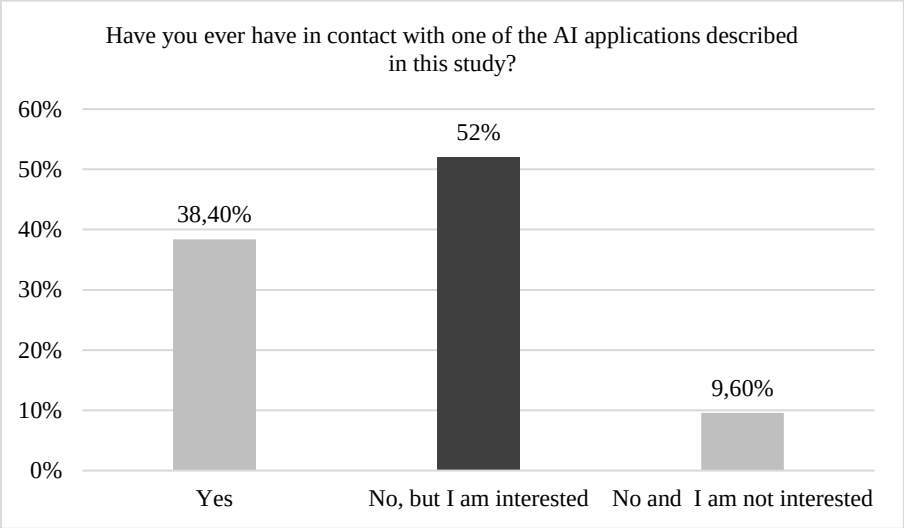


Source: Author's elaboration

Artificial Intelligence is also a technology which participants showed interest or that were in contact with. From the 302 respondents, 38.4% said they already tried at least one of the exposed AI experiences and from those who never tried **84.4% are receptive to experiment**. In our sample, we can see that a more significant number of participants had already been in contact with VR headsets in comparison with the AI's referred experiences (54.0% *vs* 38.4%). Plus, from the 46.0% who never experimented VR, 9.3% said that they do not want to do it either, whereas the number grows to 15.6% in AI (Figure 13). However, this does not

necessarily mean that the mentioned AI applications are unsuitable for the public, though VR seems to be in a later adoption stage of the technology life cycle.

Figure 13. Participants are interested in AI



Source: Author's elaboration

Annexe 9 contains the results obtained when respondents were asked to rank from the most to the least decisive, six factors that, in their perception, have challenged the adoption of VR headsets until today. On average, the three most important challenges pointed were the following: (1st) headsets are still expensive, (2nd) the content is still limited to gaming, and (3rd) the headsets are uncomfortable to wear for a long time. The challenges related with (4th) headsets block the view, (5th) headsets cause sickness and nausea or (6th) the equipment is too complicated to set up, were considered the least important. As expected, **perceived high price**, a commonly referred issue found in the literature, **was ranked by participants as the most significant** from the list of possible challenges of VR. The fact that participants have identified VR as a technology with a narrow scope, i.e. restricted to the gaming industry, can influence them to see the VR headset as a high price product in a relative basis. This happens because people's perception of price is also linked to the value that the product delivers them. If consumers do not see that many useful features in VR beside gaming, even if the price is not that high for the technology itself, it might be perceived as if it was.

Similarly, participants who were not interested in AI were asked to manifest their agreement level with five sentences, through a 5-point Likert Scale, to assess the reasons that led to a lack of interest. As detailed in Table 8, on average, participants do not identify with the provided

statements (Mean < 3.5), meaning that the sentences could not capture why people were not interested. Instead, a possible explanation for this might be that people just have a natural aversion to change and a new concept as AI exacerbates these frictions. Still, the sentence "I do not trust in intelligent robots/machines" is the one with the highest score (M=2.93, SD=1.07) suggesting that some of the disbelief may come from a lack of trust. Contrary to what experts pointed, participants of this survey **do not perceive this technology and the robots as threatening**.

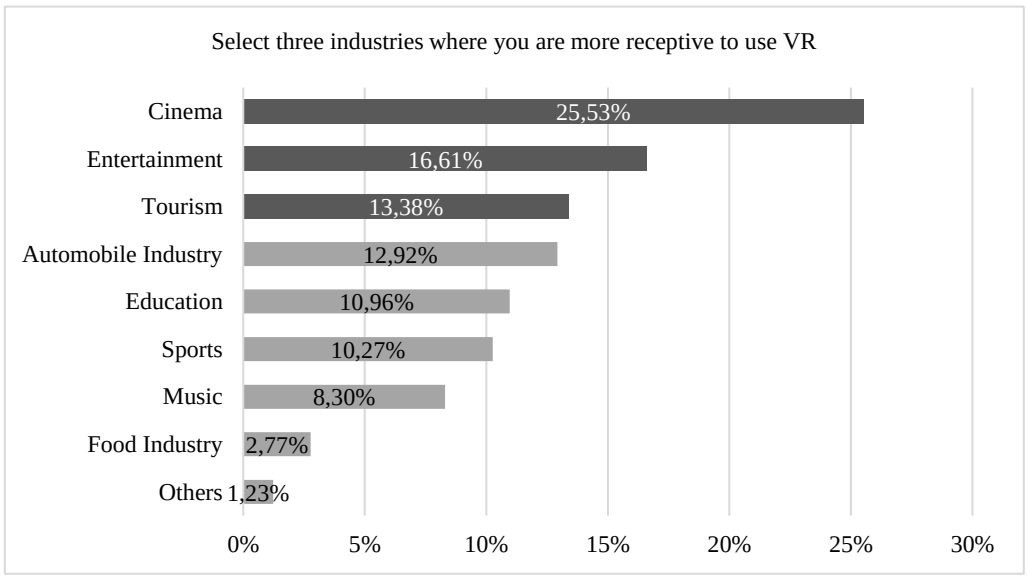
Table 8. Challenges with AI today Statistics

Challenges with AI	N	Minimum	Maximum	Mean	Median	Std. Deviation
I feel that artificial intelligence is a threat to the human race	29	1	4	2.31	2.00	1.22
I feel that these technologies are replacing human job positions	29	1	4	2.17	2.00	0.85
I do not trust intelligent robots/machines	29	1	4	2.93	3.00	1.07
It makes me confused that a robot can react and think like a human	29	1	4	2.59	3.00	1.21

Source: Author's elaboration

Participants were also asked to select three industries, from a proposed list, where they would be more receptive to use VR headsets: "Food"; "Automobile"; "Cinema"; "Sports", "Entertainment (e.g. museums)"; "Education", "Music", "Tourism" and "Others". Results showed that the "Cinema" (23.53%), "Entertainment" (16.61%) and "Tourism" (13.38%) industries, respectively, are the industries with the most potential in VR Marketing (Figure 14).

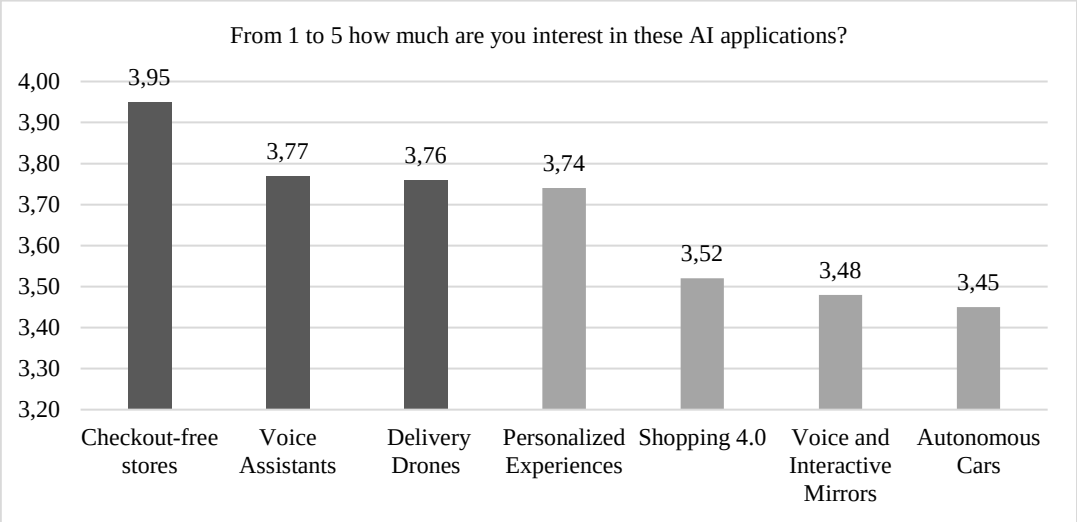
Figure 14. VR Potential Industries



Source: Author's elaboration

As observed in the VR section, participants were inquired in respect of their interest level in 7 different applications with AI, with a 5-point Likert Scale: "Personalized Experiences", "Voice Assistants", "Voice and Interactive Mirrors"; "Checkout-free stores"; "Delivery Drones"; "Autonomous Cars" and "Shopping 4.0". In general terms, the seven applications were rated as enjoyable for the participants (mean range between 3.45 and 3.95).

Figure 15. Mean Scores AI Applications



Source: Author's elaboration

"Checkout-free stores" was considered the most exciting application of AI, where 30.8% of respondents agreed that they are extremely interested on it, a fact the novelty effect probably augments that. Surprisingly, "**Autonomous Cars" were considered the less attractive** application, from the ones mentioned in the survey. Autonomous cars are one of the "hot topics" in technological advancement arriving at the public right now, with Tesla in the frontend. Thus, a possible interpretation for this result is that from all the applications described in this question, this is the only one that refers to a specific product/industry that the participants may perceive as dangerous and threatening to their life. Conversely, the remaining are innovations that any business may invest to enrich the customer experience and create efficiency gains, but virtually do not require the customer to take any safety risk. Still, it may be affirmed that AI related experiences are welcome in an IMC plan.

7.2.3. Hypotheses Testing: Customers prefer Virtual Reality experiences

The dimensions "sensations", "spatial" and "temporal" revealed to be the core dimensions to contribute to a richer and more enjoyable experience with Virtual Reality, though the case is not the same with Artificial Intelligence.

The first hypotheses (H1 and H2) address the importance the experience quality with technology.

H1: Virtual Reality influences the user experience positively.

H2: Artificial Intelligence influences the user experience positively.

In a Likert-type scale from 1 to 5, the respondents who have already been exposed to these technologies (VR = 164 respondents | AI = 117 respondents) classified their respective experiences across five dimensions, as explained previously in 6.1.5 section. Thus, the results obtained derived from a One-Sample Student's Upper-Tailed T-test (H0 $\mu \leq 3.5$ and Ha $\mu > 3.5$) and a Paired Sample Upper T-Test.

As evident from Table 9, **VR has a mean score significantly higher**, in statistical terms, than 3.5 (M=3.65; t(163)=0.0235; p=0.0235), indicating that we have evidence to reject the null hypothesis.

Table 9. User Experience - VR vs AI

One-Sample Student's Upper-Tailed T-test | Test Value=3.5

		Items mean	Mean	t	df*	Sig. (1-tailed)	90% Conf. Level		Null Hyp.
							Lower	Upper	
V R	Senses reactions	3.80	3.645	2.000	163	0.023	0.025	0.266	**Reject**
	Compositional	3.48							
	Spatial	3.42							
	Temporal	3.72							
	Emotional	3.81							
A I	Senses Reactions	3.55	3.089	-4.923	116	≈ 0	-0.549	-0.272	Not Reject
	Compositional	3.53							
	Spatial	2.60							
	Temporal	2.48							
	Emotional	3.28							

**df - Degrees of freedom*

Source: Author's elaboration.

The individual properties of VR led users to rank the overall experience above the neutral score of 3.5, allowing us to conclude that the user experience is positively influenced by Virtual Reality (H1). The sense of presence induced by VR headsets (Senses Reactions, M=3.80), the temporal sensation (losing the notion of time) provoked by the level of interaction (Temporal, M=3.72), and the feelings aroused in experience's aftermath (Emotional/Judgmental M=3.65) have a crucial weight in that result. Regarding **AI, the mean is statistically and significantly lower than 3.5** (M=3.08; t(116)=-4.923; p<0.005), implying that we do not have evidence to reject the null hypothesis that the mean is lower than or equal to 3.5. This result was considerably influenced by the low scores obtained in the spatial (M=2.60) and temporal (M=2.48) dimensions. (Note that besides the p<0.05, their confidence interval is negative, which means in an upper-tailed t-test, the null hypothesis is not rejected).

Then, a paired sample upper t-test was performed to compare if the two experiences were statistically and significantly different.

H3: Virtual Reality influences more positively the user experience than Artificial Intelligence.

The results illustrated in Table 10 confirm the previous conclusions – experiences with VR are more likely to induce positive feelings than experiences based on AI systems (MD = 0.67, t(88)=6.560, p<0.005). This test is more robust than the former as the groups here are directly comparable, as the participants that contributed to the VR group mean were the same entering in the AI's. This way we are controlling for the personal effect of the experiences, i.e. instead of having different answers provided by different people, we have different answers provided by the same people.

Table 10. Paired Sample Upper T-Test – User Experience

		Paired Differences					t	df*	Sig (1-tailed)
		Mean	Std. Deviation	Std. Error Mean	90% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	mean_VR - mean_AI	0.665	0.956	0.101	0.497	0.834	6.560	88	≈ 0

**df - Degrees of freedom* *Source: Author's elaboration*

As shown in Table 11, a reasonable explanation for this discrepancy resides in the temporal (MD=0.978) and spatial (MD=1.315) dimensions encouraged by a virtual environment. In

opposition, the "Compositional" aspect that captures if consumers value the experience as meaningful, was the only that exhibited no differences between experiences (MD=0.18; t(88)=0.97; p=0.1675).

Table 11. Paired Sample Upper T-Test - User Experience Dimensions

VR-AI		Paired Differences					t	df*	Sig. (1-tailed)	Null Hypotheses
		Mean	Std. Deviation	Std. Error Mean	90% Confidence Interval of the Difference					
					Lower	Upper				
Pair 1	Sensational	0.461	1.399	0.148	0.214	0.707	3.108	88	0.001	Reject H0
Pair 2	Compositional	0.180	1.749	0.185	-0.128	0.488	0.970	88	0.168	Not reject
Pair 3	Temporal	0.978	1.406	0.149	0.730	1.225	6.559	88	≈ 0	Reject H0
Pair 4	Spatio	1.315	1.520	0.161	1.047	1.582	8.162	88	≈ 0	Reject H0
Pair 5	Emo/Jud	0.528	1.349	0.143	0.290	0.766	3.693	88	≈ 0	Reject H0

**df - Degrees of freedom* *Source: Author's elaboration*

Thus, **H1 and H3 are accepted, and H2 is rejected.**

7.2.4. Hypotheses Testing: The influence of VR and AI in Consumer Experience

The hypotheses below test the effectiveness of VR and AI in three different points of a consumer experience: Pre-purchase (Organisational associations); Purchase (Purchase intention) and Post-purchase (Brand Loyalty). With a 1 to 5 Likert-type scale, participants were asked to classify seven different scenarios (Section 6.1.4.) through the three variables listed above in parenthesis. The results reported below were obtained from a One-Sample Student's Upper Tailed T-test (H0 $\mu \leq 3.5$ and Ha $\mu > 3.5$).

7.2.4.1. VR, AI and the issues in creating positive brand attitudes

Results are unclear regarding the influence of the mentioned experiences in the kind of associations perceived by the respondents.

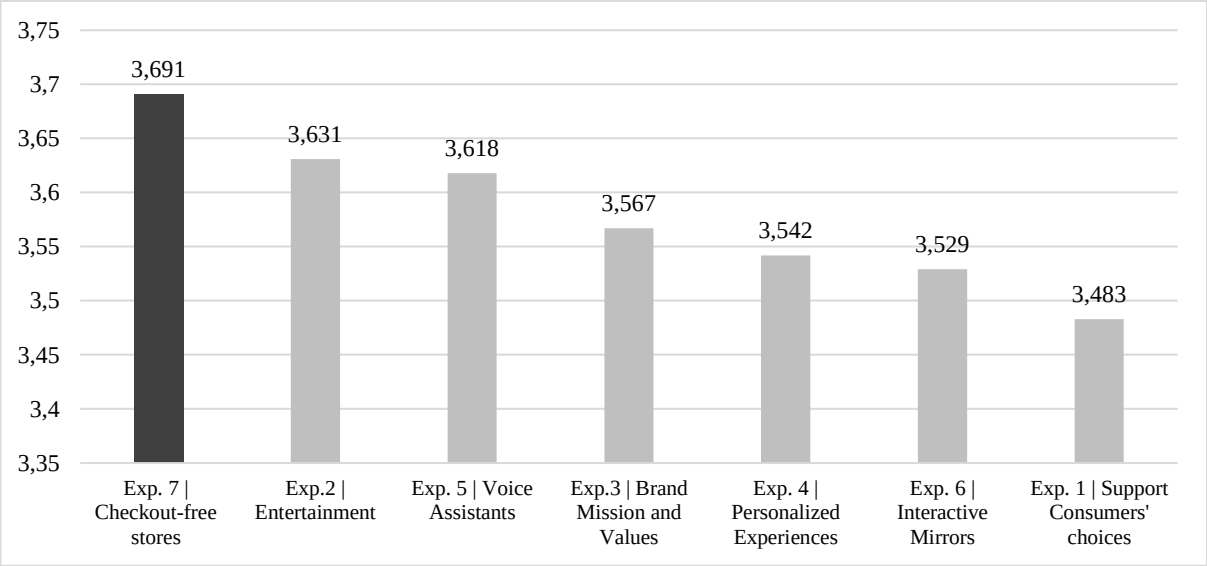
Hypothesis 4 (H4) and Hypothesis 5 (H5) address the impact of seven representative experiences in the conception of organisational associations.

H4: Experience 1, 2, and 3 have the propensity to create positive organisational associations.

H5: Experience 4, 5, 6 and 7 have the propensity to create positive organisational associations.

On average, the organisational associations perceived by the participants of the sample is similar through the seven experiences (M1=3.483; M2=3.631; M3=3.567; M4=3.542; M5=3.618; M6=3.529; M7=3.691) (Figure 16).

Figure 16. Mean Scores on Organisational Associations



Source: Author's elaboration

However, as illustrated in Table 12, the mean score is only **statistically and significantly higher than 3.5 in Exp.2** (M=3.631, t(301)=3.455, p=0.005), **3** (M=3.567, t(301)=1.754, p=0.04), **5** (M=3.618, t(301)=2.941, p=0.002) and **7** (M=3.691; t(301)=4.507, p<0.005), indicating that consumers' perceptions like credibility, trust and attractiveness are felt in these type of experiences.

Table 12. Organisational associations across the seven experimental conditions

One-Sample Student's Upper-Tailed T-test | Test Value=3.5

		Mean	t	df*	Sig. (1-tailed)	Null Hypothesis
VR	Exp.1 Support consumers' choices	3.483	-0.467	301	0.320	Not reject
	Exp.2 Entertainment	3.631	3.455	301	≈ 0	**Reject**
	Exp.3 Brand Mission and Values	3.567	1.754	301	0.040	**Reject**
AI	Exp.4 Personalized Experiences	3.542	1.138	301	0.128	Not reject
	Exp.5 Voice Assistants	3.618	2.941	301	0.002	**Reject**
	Exp.6 Interactive Mirrors	3.528	0.721	301	0.236	Not reject
	Exp.7 Checkout-free stores	3.691	4.507	301	≈ 0	**Reject**

**df - Degrees of freedom* *Source: Author's elaboration*

In Exp.1, the mean score was not significantly higher than 3.5, posting the lowest mean score (M=3.483). In the context of this survey, the travel industry experience is somewhat different from the remaining VR experiences, since the travel agency is just the facilitator of the travel, it does not own the end product, whereas the cinema and automobile industries were treated as product owners. So, Exp.1 may have revealed less relevant regarding positive effects to the VR provider organisational associations, because these associations possibly flow into the product's brand rather than to the facilitator's. This means that, in **Exp.1, these effects will be directed more to travel destination than to the travel agency**; although this is yet to be proved and further research would be needed to provide a more reliable explanation.

Similarly, in Exp.4 and 6, that in somehow their objective was to assist consumer choices as in Exp.2, the hypotheses were rejected as well. This may have occurred because participants trust more in a brand when **they talk directly with the companies' employees rather than with robots**. In fact, as shown in *Figure 2*, Keller and Batra (2016) suggest indirectly this, when they classify direct selling has a marketing tool with great influence in the pre-purchase stage. Moreover, these experiences are based on users' personal data, and the loss of privacy can influence as well the brand associations created by consumers (Walgrove, 2018).

Consequently, **H4 and H5 are only partially accepted** because Exp.1 (VR supporting consumer's choices in a travel agency), 4 (personalised experiences) and 6 (voice and interactive mirrors) were not considered a source of organisational associations.

7.2.4.2. VR and AI are greater drivers of purchase intention

Purchase intention is by far the one with the most consistent results. Overall, the respondents exhibited a significantly positive attitude in all experiences. Voice assistants (Exp.5) and Checkout-free stores (Exp.7) revealed to have the most considerable influence persuading consumers.

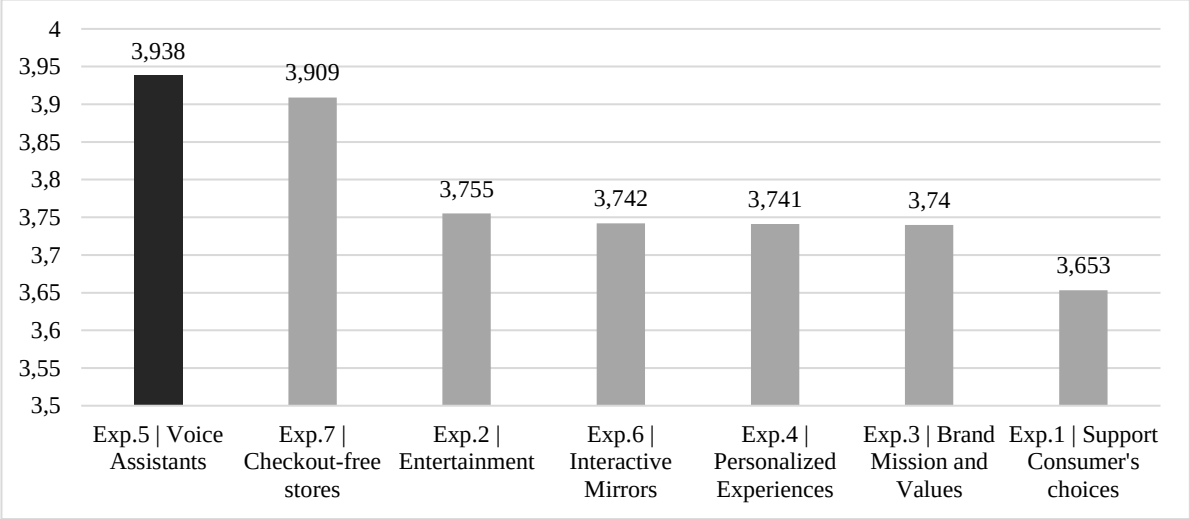
Hypotheses 6 (H6) and 7 (H7) address the impact of seven representative experiences in the purchase decision.

H6: Experience 1, 2, 3 have the propensity to inspire action.

H7: Experience 4, 5, 6, 7 have the propensity to inspire action.

The Purchase Intention's mean score has a strong overall concordance across the seven experiences (M1=3.653; M2=3.755; M3=3.740; M4=3.741; M5=3.938, M6=3.742; M7=3.909) (Figure 17).

Figure 17. Mean Scores on Purchase Intention



Source: Author's elaboration

Table 13's results suggest that the **purchase intention's mean score is statistically and significantly higher than 3.5** in all experimental conditions ($p<0.005$). Specifically, purchase intention was **consistently higher for Exp.5 (voice assistants)** ($M=3.938$, $t(301)=12.889$, $p<0.005$) **and 7 (checkout-free stores)** ($M=3.909$, $t(301)=10.142$, $p<0.005$).

Table 13. Purchase Intention across the seven experimental conditions

One-Sample Student's Upper-Tailed T-test | Test Value=3.5

		Mean	T	df*	Sig. (1-tailed)	Null Hypothesis
VR	Exp.1 Support consumer's choices	3.653	3.560	301	≈ 0	**Reject**
	Exp.2 Entertainment	3.755	7.486	301	≈ 0	**Reject**
	Exp.3 Brand Mission and Values	3.740	7.909	301	≈ 0	**Reject**
AI	Exp.4 Personalized Experiences	3.741	7.805	301	≈ 0	**Reject**
	Exp.5 Voice Assistants	3.938	12.889	301	≈ 0	**Reject**
	Exp.6 Interactive Mirrors	3.742	7.333	301	≈ 0	**Reject**
	Exp.7 Checkout-free stores	3.909	10.142	301	≈ 0	**Reject**

**df - Degrees of freedom* *Source: Author's elaboration*

These results are consistent with the answers to the potential of several applications of AI (*Figure 15*) which ranked voice assistants and checkout-free stores the two most interesting ones. The novelty effect and the more comfortable and smoother purchasing process may heavily contribute to persuading easier consumers to buy.

To conclude, **H6** and **H7 are accepted**.

7.2.4.3. VR and AI experiences are not strong enough to create brand loyalty

Participants reported that, on average, technology experiences do not contribute positively sufficient to make them loyal to a brand. Personalised experiences (Exp.4) and the kind of VR application used in the automobile industry (Exp. 3) revealed the lowest results.

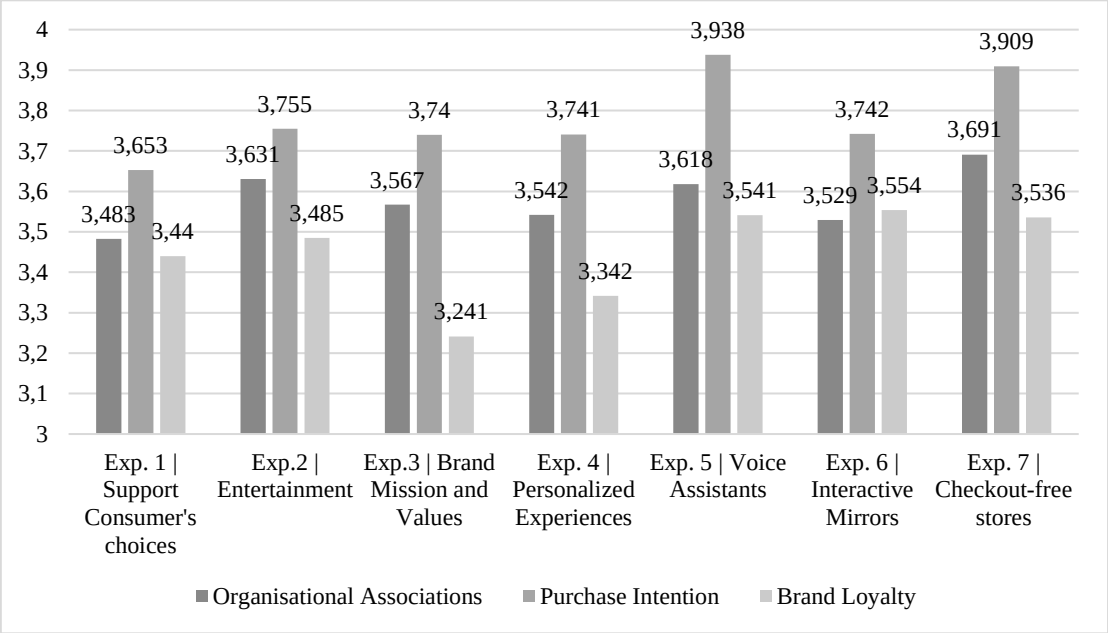
Hypotheses 8 (H8) and 9 (H9) aim to conclude if the seven experimental circumstances have the propensity to build brand loyalty

H8: Experience 1, 2, 3 have the propensity to instil loyalty.

H9: Experience 4, 5, 6, 7 have the propensity to instil loyalty.

From the three variables (organisational associations, purchase intention, brand loyalty), this **revealed lower mean scores** across the seven experiences with technology (M1=3.440, M2=3.845; M3=3.240; M4=3.342; M5=3.541; M6=3.554; M7=3.536). See Figure 18.

Figure 18. Mean Scores across the three variables



Source: Author's elaboration

As represented in Table 14, the average **brand loyalty score is statistically and significantly lower than 3.5 in all experiences.** The p-value is smaller than 0.05 in Exp. 3 and 4, though, both confidence intervals are bounded by negative values, which in an upper-tailed t-test implies that the null hypothesis is not rejected.

Table 14. Brand Loyalty across the seven experimental conditions

One-Sample Student's Upper-Tailed T-test | Test Value=3.5

		Mean	t	df*	Sig. (1-tailed)	90% Confidence Level		Null Hypothesis
						Lower	Upper	
VR	Exp.1 Support consumer's choices	3.440	-1.443	301	0.077	-0.128	0.009	Not Reject
	Exp.2 Entertainment	3.485	-0.357	301	0.361	-0.087	0.056	Not Reject
	Exp.3 Brand Mission and Values	3.240	-5.813	301	≈ 0	**-0.333**	-0.186	Not Reject
AI	Exp.4 Personalized Experiences	3.342	-3.757	301	≈ 0	**-0.227**	-0.089	Not Reject
	Exp.5 Voice Assistants	3.541	0.886	301	0.188	-0.035	0.117	Not Reject
	Exp.6 Interactive Mirrors	3.554	1.191	301	0.117	-0.021	-0.129	Not Reject
	Exp.7 Checkout-free stores	3.536	0.795	301	0.214	-0.039	0.112	Not Reject

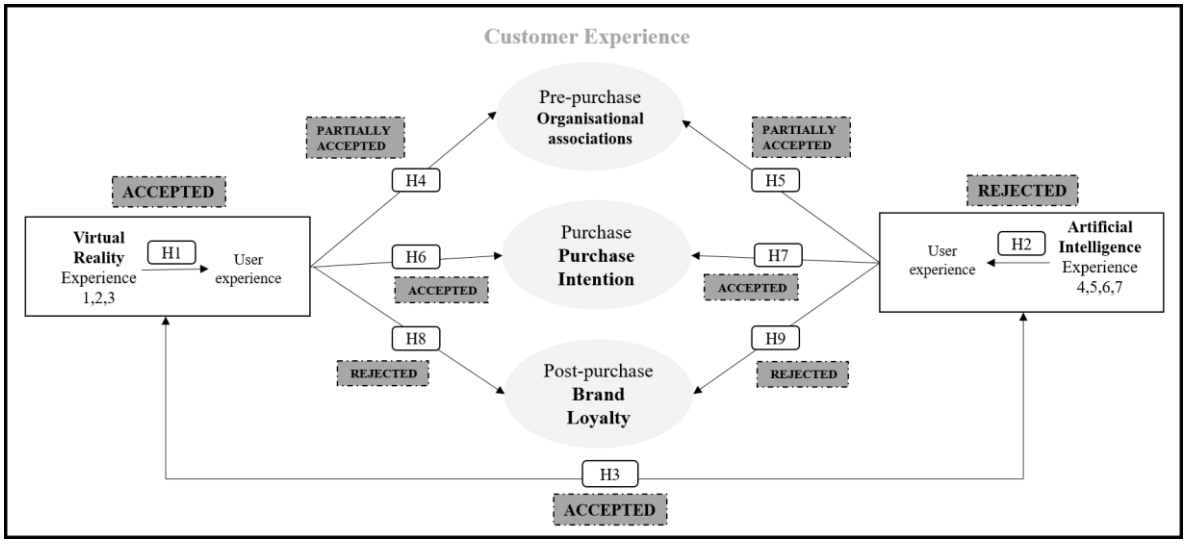
**df - Degrees of freedom* *Source: Author's elaboration*

One should bear in mind that despite the growing importance of customer experience, the product itself continues to be the main driver instilling loyalty[2]. This may explain the possibly insignificant impact that the seven experiences had on brand loyalty. Furthermore, in this exercise, we were measuring expected and theoretical brand loyalty based on perceptions, thus to be more exact, further research should be conducted with customers that purchased the product indeed.

Lastly, **H8 and H9 are rejected**, technology experiences addressed in the study do not significantly affect brand loyalty.

Summing up:

Figure 19. Hypotheses Validation



Source: Author's elaboration

[2] A survey on American shopper's attitudes towards customer loyalty, it is found that 55.3% of consumers are brand loyal because they love the product (Bitran, 2018).

8. CONCLUSION

8.1. Managerial Implications

There are several important managerial guidelines from this study that can help companies deciding if it is worth investing in Virtual Reality and Artificial Intelligence technologies, and consequently, how to better integrate them in marketing plans.

1. **Develop a fully IMC Plan**

Given the recent advances in technology, a higher number of media possibilities has appeared, and the combination of all these communication options most effectively and efficiently is one of the greatest challenges for marketers nowadays. It is critical for marketers to develop fully integrated marketing communication (IMC) plan based on two pillars: 1. To understand quite well the consumer behaviour in all touch points with a brand and 2. To demystify the role of all possible communication options in the final results of a campaign.

2. **Create Memorable Experiences**

Marketers must integrate and map the customer purchase journey as possible in the development of marketing plans. In a growing competitive environment, to stand out requires companies to focus on creating memorable experiences along with all possible touch points with a brand. To do this, marketing, supply chain, and commercial departments need to stop working separately and to build a consistent customer experience. Customers do not make their buying decisions based exclusively on product features and benefits. They value brands who care about their emotions and feelings since the first contact with them.

3. **Start thinking about including VR and AI in short to medium term horizon**

There are encouraging signs for Virtual Reality and Artificial Intelligence, on how they are going to transform, not only the marketing field but also companies' workforce. Besides VR has revealed better results regarding experience quality than AI, both technologies help to deliver hyper-connect customer experiences. The main challenge for a successful VR adoption is to know how to create the right content to engage people because the sense of being in another place is already considered as given in any VR experience. On the other hand, AI has numerous

applications that aim to improve customer experience on several levels, and many of them are not yet widespread.

If businesses do not prepare now for the near future, they may not be able to compete over the next decades. Executives should explicitly attempt to conduct short to medium-term plans to start thinking in this transition, and given the broad scope of AI, it is fundamental to start by prioritising problems to solve (e.g. engage customers, the creation of innovative products and services, or optimising operations). A key challenge aligned with this transition is to create collaborative alliances with VR or AI specialists to mitigate the risk of being a follower and lose competitive advantage.

4. VR and AI as the future of growth

Besides, in the empirical study of this research, participants have revealed interested in both technologies. If we look to the forecasts presented in the literature review, it is possible to state that AI is a technology that has much more to room grow than VR. VR purpose will probably continue to be essentially the same, the sense of being transported to another reality. On the other hand, AI is a science with unknown limits, so far. Firms need to keep attentive to the development of this field and be prepared to expected radical challenges in their businesses.

5. Choose the most appropriate technology application for your Marketing Plan

Adapted from *Figure 2. Relative strengths of different communication options across 12 stages of the consumer decision journey*, a table with the central empirical insights from this research is presented (Figure 20).

Figure 20. Research Propositions: VR and AI in Consumer Decision Journey

Decision Journey Stage	Virtual Reality			Artificial Intelligence			
	Exp. 1	Exp. 2	Exp. 3	Exp. 4	Exp. 5	Exp. 6	Exp. 7
Pre-purchase Organisational Associations	+	++	++	+	++	+	+++
Purchase Purchase Intention	++	++	++	++	+++	++	+++
Post-Purchase Brand Loyalty	+	+	+	+	+	+	+

Notes: +++ = greatest influence; ++ = medium influence; + = least influence.

Label:
Exp.1 Support consumers' choice (travel agency)
Exp.2 Excited and brand intertainment (cinema)
Exp.3 Communication in a compelling manner the brand mission and values (brand car)
Exp.4 Chatbots and personalized experiences (real state agency)
Exp.5 Voice assistant (supermarket)
Exp.6 Voice Interactive Mirrors (apparel brand)
Exp.7 Checkout-free stores (supermarket)

Source: Author's elaboration

Pre-purchase *with* **Organisational Associations:** At this stage, consumers recognise a need but do not have cognitive ability to choose a particular product instead of others. The role of marketers is to understand the best communication tool to transmit brand information and consequently build trust and credibility. According to our results, **VR and AI do not have a clear and strong ability to "transfer in" these organisational associations.** According to Keller and Batra (2016), media options like YouTubers' endorsements or TV ads are effective on it and, given our results, these probably better positioned for this purpose than VR and AI. However, it is important to take into account that this stage can be subdivided, and there are many others communication objectives, besides to create brand associations. Then, for each communication objective, a marketer should ask himself the impact of that tool in the marketing plan, based on the 7 C's explained in the literature review of this research.

Purchase *with* **Purchase Intention:** Brands in this stage must induce quick action. **Both VR and AI have a high propensity to persuade consumers to buy. From the three variables in the study, VR and AI are more effective in this stage.** Companies ought to seize the capacities of both technologies and invest in IT workforce to create new concepts completely disruptive, as the checkout-free stores. Today, it is innovations like this that are sustaining the company's success over more extended periods. Moreover, voice assistants is also a gadget that firms should be aware, as it is expected that they will be part of consumers' daily lives sooner than later. It is reasonable to think of a scenario where brands will have to enlarge their communication channels and pay to be mention by Alexa, for instance.

Post-purchase *with* **Brand Loyalty:** A purchase does not automatically lead to repeat purchases, it is crucial to have a purchase reinforcement. If a company is doubtful on how to introduce VR/AI in their marketing plan and do not have an enormous budget, **post-purchase is the last stage that should invest.** There are better communication tools to persuade the consumer to repurchase, like Social Media, Mobile and Events (Batra and Keller, 2016).

8.2. Academic Implications

Besides the managerial implications, this study raises some new academic lessons, both in terms of theory development and concept validation.

1. **There is a need to recognise VR and AI as marketing tools**

The literature review developed for this dissertation and consequently, the empirical results, elicit that both technologies are significant platforms to respond actively to the new challenges presented by new media and the demanding consumers. Then, Kotler and Keller (2012), Batra and Keller (2016) and other authors focused in this field, ought to integrate them in their theories and models about the marketing communication mix.

2. **Develop a definition of VR and AI in a marketer perspective**

When it comes to understand the role of these technologies in marketing, there is no a clear definition. The definitions found were poor and extremely segmented. Moreover, the majority of authors describe them only concerning technical features. Researchers should develop richer explanations with valid insights into how VR and AI affect the marketing field. Thus, I suggest:

Virtual Reality (VR): A technology in the format of Head Mounted Displays (HMD) that gives companies the opportunity to transform even potentially boring contents into an immersive and compelling manner. Its primary purpose is to offer a new and easy way to engage consumers (Fábia Fino, 2018).

Artificial Intelligence (AI): A variety of applications, such as chatbots or voice assistants, directed to assist consumer experiences along the consumer journey. Its main characteristic is to allow companies to recognise the consumer's value, offering different approaches to create personalised, up-to-date and interactive relationships between brands and consumers (Fábia Fino, 2018).

3. **Incorporate VR and AI in the future IMC research modelling and analysis**

By virtue of the first academic implication purposed - VR and AI as marketing tools – it is crucially important that Batra and Keller (2016), who offered, in our knowledge extent, the most accurate IMC framework, refine the Bottom-Up Communications Matching Model. VR and AI should be linked with other communication options, and their efficiency and effectiveness should be investigated in the 12 stages of a consumer decision journey suggested by the authors.

4. **Interpret technology experiences as a two-tiered process**

When interpreting the efficacy of experiences supported by technologies like VR and AI in consumers' behaviour, marketers need to take into account that an experience is shaped not only by the technician's features, like the sense of presence provided by VR headsets, but also by the context and the user's empathy. Donghee Shin (2017) has already recommended it, but only in a VR experience perspective. Thus, the McCarty and Wright (2004) theory about "Technology as experience" shall concretize better their concept of experience besides the four threads: sensual, emotional/judgmental, compositional and spatiotemporal.

8.3. Limitations and Further Research

There are a few limitations that should be considered in this research. First, the sample includes only Portuguese people who can limit the scope of this research. Replicating the questionnaire in other countries would increase the results viability and generalisation. Second, besides having a rational ponderation of which industries and applications were more suitable to include in the questionnaire, the selection of others scenarios using VR and AI could potentially affect the results. Third, the scale of the technologies' user experience was self-constructed, based only in McCarty and Wright's theory. The use of a proven scale may lead to more relevant results. However, as stated before, no strong customer experience scales have been developed on our knowledge extent. Lastly, the length of the questionnaire and the fact that it was spread through the internet without the possibility to witness the scenarios described, may affect the integrity of the participants' answers and perceptions. This may especially impact the VR results, as it is an experience heavily characterised by the sense of presence exploited by headsets.

In further research, there is a seriousness need to develop strong scales that measure the consumer experience along the expanded consumer decision journey suggested by Batra and Keller (2016), since the purchase funnel model used in this research is already outdated. Additionally, the purpose of this dissertation was to pre-validate and create awareness in literature to the importance to address these technologies as essential tools in marketing shortly. Nonetheless, to obtain rigorous and specific results regarding the impact of AI technologies in marketing, there is space in the literature to make cross-industry analysis, controlling for different applications, something that stood beyond the scope of this paper. To conclude,

additional academic research could be conducted to determine the influence of these technologies on important marketing outcomes, such as profitability. Overall, researchers and managers are only interested in the impact of VR and AI in the economy and the potential to transform businesses.

8.4. Conclusion

Prior research has documented the effectiveness of a fully integrated marketing communication (IMC) plan in improving customer relationships along the decision journey. Batra and Keller (2016), for example, suggest a comparative model of the strength of each media communication across a dynamic and expanded consumer decision journey. However, these studies have not focused on experiences using emerging technologies, namely Virtual Reality and Artificial Intelligence that have got growing attention and adoption by marketers as a new experience to boost customer engagement.

In this study, we present an updated literature review of *the state of the art* of these technologies and how they can be applied to an IMC plan. Furthermore, we tested the extent to which experiences using Virtual Reality and Artificial Intelligence improve customer experience in three different points in time of a customer journey: pre-purchase, purchase, and post-purchase stage. Moreover, since these are disruptive technologies and the opinions regarding their potential in marketing communication plans differ, the consumer's receptiveness was also objected of study.

We found that Virtual Reality and Artificial Intelligence technologies are changing the game: new marketing opportunities are being created, and the popularity and excitement in consumers are rising. Both boost the consumer experience along the decision journey and, overall, we confirmed that these type of experiences are more suited to instil action (purchase stage) than to build trust and credibility (pre-purchase stage) or brand loyalty (post-purchase stage). Nonetheless, it is noteworthy that the consumer attitude in each stage is not only influenced by the technological quality (technological features) delivered by the devices/software, but also by the experimental conditions which are measured by the user's attitudes and their empathy with the mediated environment. For this reason, each experience proposed to study had different outcomes, not being possible to generalise conclusions (e.g. Virtual Reality is efficient building

brand loyalty). This also shows the necessity for researchers to specialise in one industry at the time to better concretise the insights exposed in this project.

These findings extend those of Batra and Keller (2016) and Lemon and Verhoef (2016), confirming that each communication option, in this case, VR and AI, has its strength across the consumer decision journey, and, by selecting the most or least appropriate marketing tools tends to produce more effective and efficient marketing plans. Moreover, this research provides a *state of the art* about the potential of these technologies in Marketing and Business, offering general insights across different technological applications. Most notably, this is one of the first studies, to our knowledge, investigating the effectiveness of VR and AI in an IMC plan.

Lastly, some limitations are worth noting. Although our findings were supported statistically, the sample reports only Portuguese people and the empirical tests were made through a non-face-to-face questionnaire. Future work should, therefore, evaluate the effectiveness of experiences with Virtual Reality and Artificial Intelligence in an expanded consumer decision journey.

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10. ANNEXES

Annexe 1. IMC definitions over time

Author/year	Definition
American Association of Advertising Agencies (4As) (1989)	*"A concept of marketing communications planning that recognises the added value in a programme that integrates a variety of strategic disciplines and combines these disciplines to provide clarity, consistency and maximum communication impact."*
Schultz (1991)	*"The process of managing all sources of the administration about a product/service to which a customer or prospect is exposed, which behaviourally moves the customer towards a sale and maintains customer loyalty."*
Keegan *et al*. (1992)	*"The strategic coordination of all messages and media uses by an organisation to collectively influence its perceived brand value."*
Kotler *et al*. (1999)	*"IMC is the concept under which a company carefully integrates and coordinates its many communications channels to deliver a clear, consistent and compelling message about the organisation and its products."*
Duncan (2002)	*"A cross-functional process for creating and nourishing profitable relationships with customers and other stakeholders by strategically controlling or influencing all messages sent to these groups and encouraging data-driven purposeful dialogue with them."*
Schultz and Schultz (2004)	*"IMC is a strategic business process used to plan, develop, execute and evaluate coordinated, measurable, customers, prospects, and other targeted, relevant, external and internal audiences."*
American Academy of Advertising Agencies (Belch and Belch, 2004)	*"Integrated Marketing Communications recognises the value of a comprehensive plan that evaluates the strategic roles of a variety of communication disciplines advertising, public relations, personal selling, and sales promotion and combines them to provide clarity, consistency, and maximum communication impact."*
Kliatchko (2005)	*"IMC is the concept and process of strategically managing audience-focused, channel-centred and results-driven brand communication programmes over time."*
Kliatchko (2008)	*"IMC is an audience-driven business process of strategically managing stakeholders, content, channels, and results of brand communication programs."*

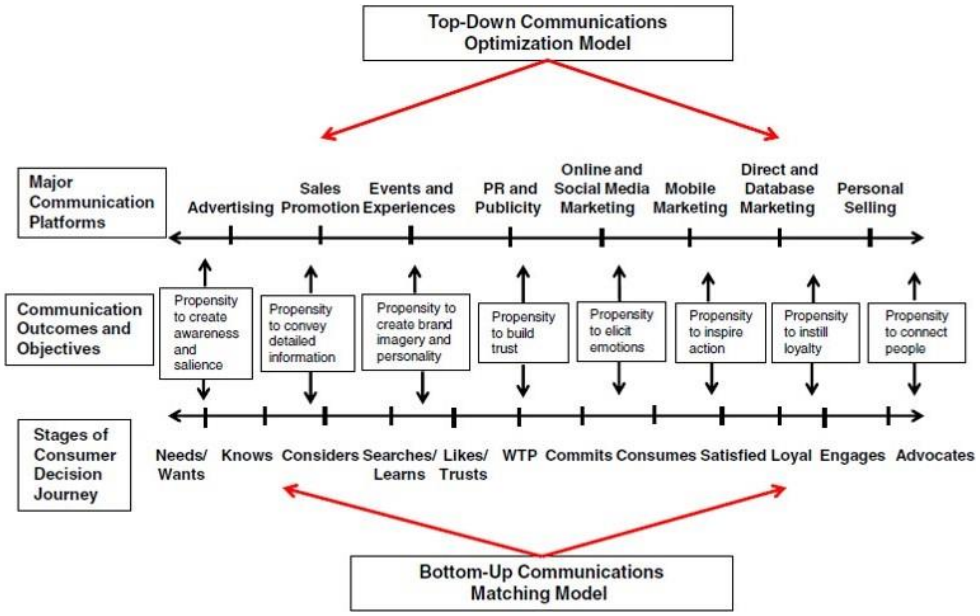
Source: Compiled by Gayle Kerr, Don Schultz, Charles Patti, Ilchul Kim for the article "An inside-out approach to integrated marketing communication" (2008).

Annexe 2. Marketing Communication Mix characteristics

Platforms	Definition	Examples	Characteristics
Advertising	A controlled paid form of communication. Consists of communication messages dispersed in the mass media to a defined target audience.	Print and broadcast ads; packaging-outer and inserts; billboards; cinema, display signs.	(1) **Amplified expressiveness** through the artful use of print, sound and colour**;** (2) the message is repeated many times which allows the buyer to compare with competitors; (3) the advertiser has absolute **control** about what want to communicate.
Sales Promotion	Short-term incentives in the form of promotions to instil a stronger and quicker buyer response.	Contests; premiums and gifts; sampling; exhibits; demonstrations; coupons; rebates.	(1) Distinct **invitation** that attracts the consumer to the product; (2) **Incentive** that delivers value to the consumer.
Events and Experiences	Usually in the format of company-sponsored activities and programs with the purpose to establish a special connection or interaction with consumers.	Sports; entertainment; festivals; arts; causes; company museums; street activities.	(1) Easy-way to **engage** consumers; (2) An indirect **"soft sell".**
Public Relations and Publicity	A variety of programs that intend to promote or defend a company's image. It can be directed internally to employees or externally to media, consumers or other company stakeholders.	Press kits; speeches; seminars; annual reports; charitable donations; publications; community relations; lobbying, company magazine.	(1) **High credibility** if compared with ads; (2) Ability to reach buyers who avoid mass media and targeted promotions; (3) Capacity to amplify and dramatise the story behind a company, brand, or product.
Direct Marketing	Use of platforms such as mobile or email to communicate directly with a specific company target.	Catalogues; mailings; telemarketing; electronic shopping; TV shopping; fax; e-mail; voice mail; company blogs; websites.	(1) **Personalised** and (2) **interactive** messages; (3) **Up-to-date,** once a message is easily created and sent.
Interactive Marketing	All kinds of online activities to increase the brand image or to persuade sales across customers or potential purchasers.		
Word-of-mouth marketing	Sharing opinions about experiences of purchasing or using product or services through written and electronic communications or face-to-face interactions.	Person-to-person; chat rooms; blogs.	(1) **Influential** when WOM occurs between people know each other, or even (2) **personal** when intimate opinions are discussed. (3) **Timely.**
Personal selling	Interpersonal communication with potential buyers to make presentations, answering questions and acquiring orders.	Sales presentations; sales meetings; incentive programs; samples; fairs and trade shows.	(1) **Personal interaction** which may also permit to evolve from a "selling" relationship to a deep personal friendship **(Cultivation)**; (2) Buyers are incentivized to respond directly.

Source: "Marketing Management" by Kotler and Keller (2012)

Annexe 3. IMC Framework



Source:" Integrating Marketing Communications: New Findings, New Lessons and New Ideas" by Batra and Keller (2016)

Annexe 4. A Dynamic, Expanded Consumer Decision Journey

Transcribed from "Integrating Marketing Communication: New Findings, New Lessons and New Ideas" by Rajeev Batra and Kevin Lane Keller (2016), Appendix B, page 140.

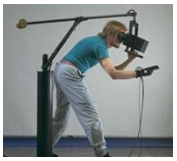
1. Feels a need, or want for it (at category level)
2. Knows about it (sufficient brand awareness regarding recall and recognition)
3. Actively considers it (examines, attributes and benefits)
4. Searchers for more information learn more about it, and begin to evaluate it critically (builds brand knowledge)
5. Likes it and has trust/confidence in it (has functional and nonfunctional brand associations that are strong, favourable, and unique)
6. Is willing to pay (more) for it (high perceived brand value based on functional, emotional, social and symbolic benefits)
7. Choose to try it soon and knows where, when and how to get it (high desire to act)
8. Consumes it (timing, frequency, and amount of consumption)
9. Is satisfied with it (has positive thoughts, feelings, and experiences)
10. Is loyal repeat buyer of it (both attitudinal and behavioural loyalty)

11. Is engaged and interacts with it (participates in both online and offline brand-related activities)
12. Is an active advocate for it (both offline and online with social media)

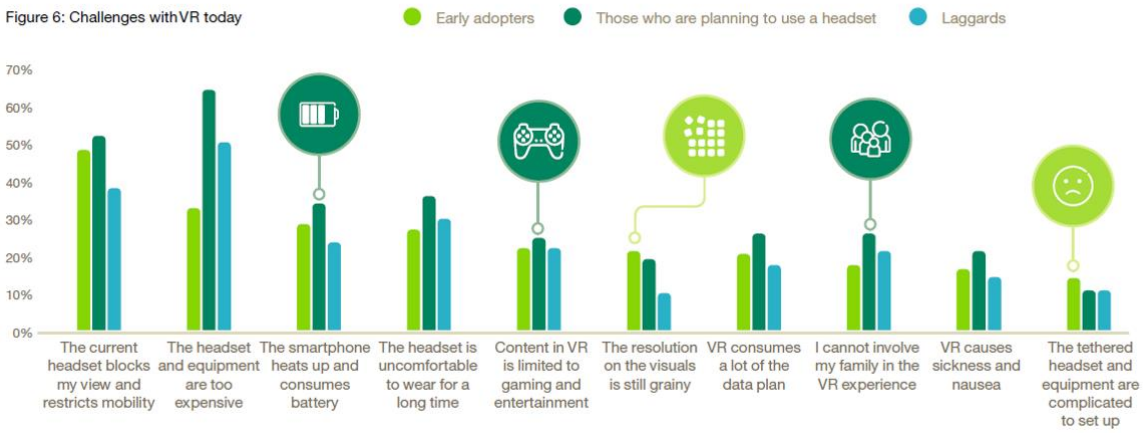
Annexe 5. Glossary of Virtual Reality Experiences

Source: Author's elaboration

	Definition	**Photo / Examples**
Stereoscopic Vision	"*The term stereoscopic vision refers to the human ability to view with both eyes in similar, but slightly different ways. This allows humans to judge distance, which develops their ability to have true depth perception*." (Tech Fac, 2017).	
Shutter Glasses	"*It is a pair of glasses where each leans is substituted with an electronic shutter (monochrome LCD). Looking at a CRT (monitor) showing left and right images synchronised with them, the shutters are alternatively opaque or transparent."* (Jinzhao Wang, 2012).	
HMD	"*HMD's use separate displays mounted in a helmet/ pair of goggles for each eye. In front of each eye is a tiny monitor, and once there are two monitors, images appear as three dimensional."* (Webopedia).	VFX-1, Oculus Rift, Samsung Gear VR
Head-Tracker	It identifies the user's head movements. (Techopedia, 2017).	
VCASS	"*The visually coupled airbone system simulator – an advanced flight simulator. The fighter pilot wore an HMD that augmented the out-the-window view by the graphics describing targeting or optimal flight path information."(*Mazuryk and Gervautz, 1996: 2).	
(1975) Videoplace	"*Artificial Reality created in 1975 by Myron Krueger - the silhouettes of the users by the cameras were projected on a large screen. The participants were able to interact one with the other thanks to the image processing techniques that determined their positions in 2D screen's space*" (Mazuryk and Gervautz, 1996: 2).	
(1984) VIVED	"*Virtual Visual Environment Display – constructed at Nasa Ames with off-the-shelf technology a stereoscopic monochrome HMD.*" (Mazuryk and Gervautz, 1996: 2).	
(1985) Data Glove	Data Glove recognises user's hand's movements. (Mazuryk and Gervautz, 1996).	
(1987) Eyephone HMD	EyePhone was the first VR device available for consumers, produced by VPL (Mazuryk and Gervautz, 1996).	

(1989) BOOM	"*It is a small box containing two CRT monitors that can be viewed through the eye holes. The user can grab the box, keep it by the eyes and move through the virtual world, as the mechanical arm measures the position and orientation of the box."* (Mazuryk and Gervautz, 1996: 3)	
CAVE	"*It is a virtual reality and scientific visualisation system. Instead of using an HMD it projects stereoscopic images on the walls of the room (user must wear LCD shutter glasses*" (Mazuryk and Gervautz, 1996: 3).	
(the 1990s) VFX-1	"*The Forte VFX1 was a consumer-level head-mounted display marketed during the mid-1990s. It comprised a helmet, a handheld controller, and an ISA interface board, and offered head-tracking, stereoscopic 3D, and stereo audio*" (Wikipedia, 2017).	
(2015) Google Cardboard VR	A headset, constructed of cardboard, for an Android smartphone (Google, 2018).	
(2015) Samsung Gear VR	Gear VR is ground-breaking VR technology that combines a lightweight, wireless headset with the convenience of the full line of Samsung GALAXY flagship smartphones (Oculus, 2017). It is possible to convert the galaxy Samsung smartphone into a portable VR device.	
(2016) Oculus Rift	The Oculus Rift is a virtual reality system that completely immerses users inside virtual worlds (Oculus, 2017).	
(2016) HTC	It is another player in the market which offers the same system of Oculus Rift.	
(2016) Sony with Playstation VR	Sony is one of the players in HMD's market with a VR system prepared for the console PS4 (Playstation, 2018).	
(2016) Lenovo	Asus, Dell has similar HMD. Both of them use the software from Windows – Windows Mixed Reality (Microsoft, 2018).	
(2018) Standalone VR – Oculus GO	HMD that does not need cables, a PC or a phone (Oculus, 2018).	

Annexe 6. Challenges with VR today



Source: "Merged Reality" by Ericsson (2017)

SPSS Outputs

Annexe 7. Reliability and Validity Tests

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy

		Product Information	Purchase Intention	Brand Loyalty	User Experience
VR	Experience 1	0.698	0.577	0.666	0.812
	Experience 2	0.713	0.652	0.681	
	Experience 3	0.729	0.665	0.672	
AI	Experience 4	0.711	0.620	0.685	0.838
	Experience 5	0.708	0.624	0.731	
	Experience 6	0.711	0.654	0.723	
	Experience 7	0.730	0.687	0.700	

Bartlett's Test of Shericity

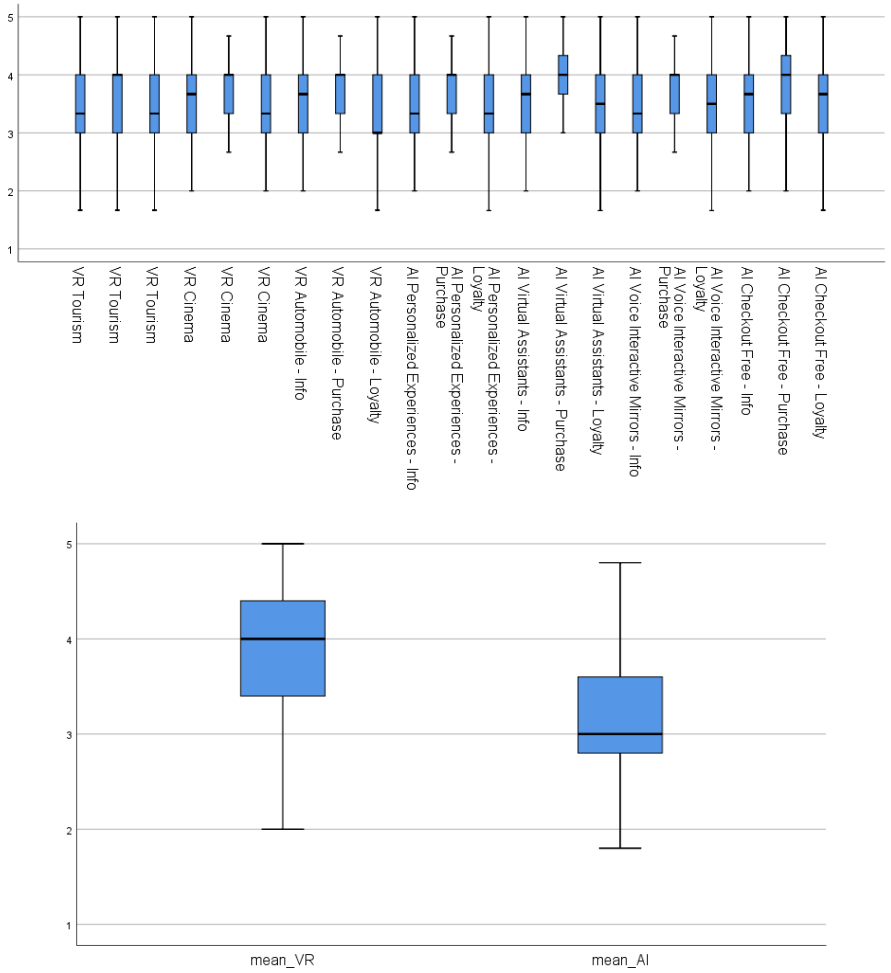
		Product Information	Purchase Intention	Brand Loyalty	User Experience
VR	Experience 1	0.0000	0.0000	0.0000	0.0000
	Experience 2	0.0000	0.0000	0.0000	
	Experience 3	0.0000	0.0000	0.0000	
AI	Experience 4	0.0000	0.0000	0.0000	0.0000
	Experience 5	0.0000	0.0000	0.0000	
	Experience 6	0.0000	0.0000	0.0000	
	Experience 7	0.0000	0.0000	0.0000	

% of Variance Explained Criteria

		Product Information	Purchase Intention	Brand Loyalty	User Experience
VR	Experience 1	72,43	67,112	73,794	70,021
	Experience 2	76,796	69,88	72,36	
	Experience 3	79,427	68,007	77,295	
AI	Experience 4	76,632	67,857	74,625	82,602
	Experience 5	79,91	71,222	80,251	
	Experience 6	79,472	73,786	77,582	
	Experience 7	80,735	78,565	76,811	

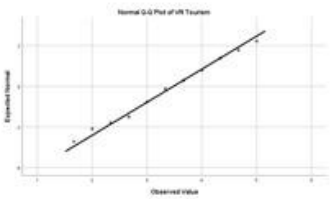
Annexe 8. Test Assumptions

Box Outliers

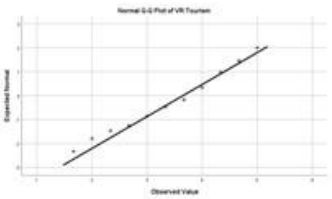


Normality Tests

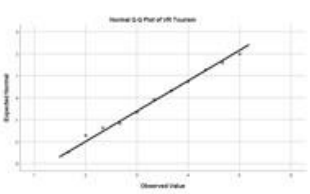
Experience 1



Organisational Associations

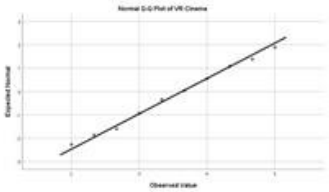


Purchase Intention

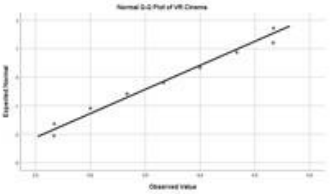


Brand Loyalty

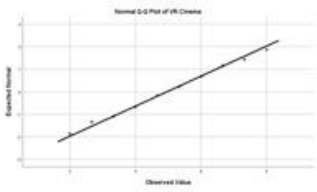
Experience 2



Organisational Asssociations

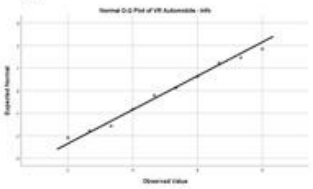


Purchase Intention

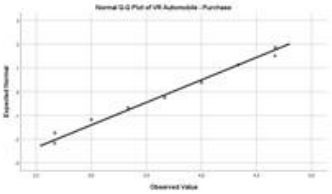


Brand Loyalty

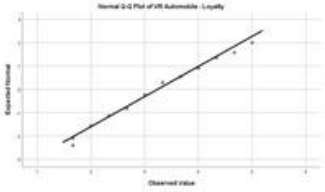
Experience 3



Organisational Asssociations



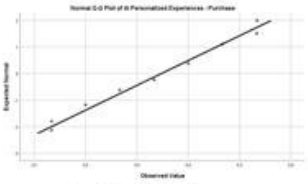
Purchase Intention



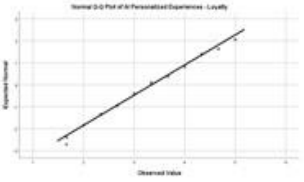
Brand Loyalty

Experience 4

Organisational Asssociations

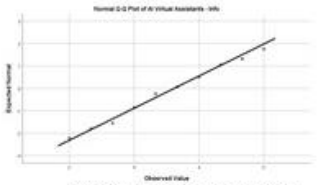


Purchase Intention



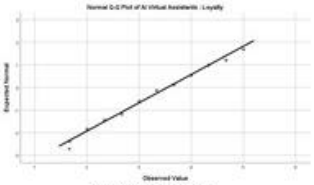
Brand Loyalty

Experience 5



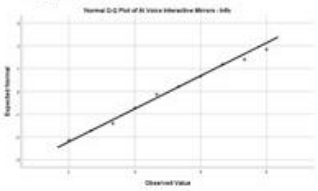
Organisational Asssociations

Purchase Intention

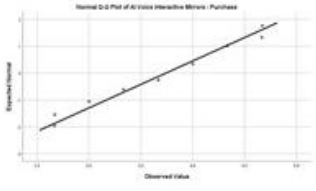


Brand Loyalty

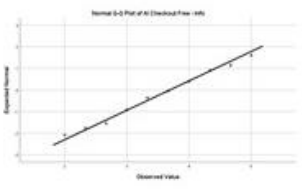
Experience 6



Organisational Associations

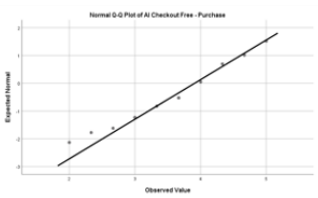


Purchase Intention



Brand Loyalty

Experience 7

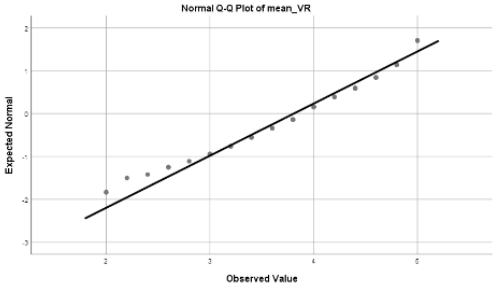


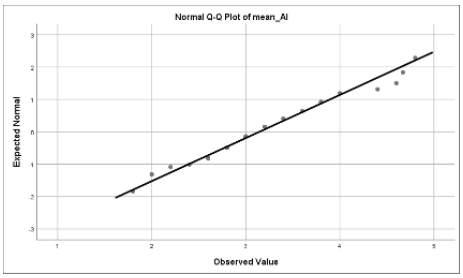
Organisational Associations

Purchase Intention

Brand Loyalty

User Experience (Technology Dimensions)





Annexe 9. Challenges with VR Today Statistics

	Most Important		2nd Choice		3rd Choice		4th Choice		5th Choice		Least Important	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
The current headset blocks my view and restricts mobility	23	7.6%	40	13.2%	69	22.8%	83	27.5%	61	20.2%	26	8.6%
The headset and equipment are too expensive	172	57%	53	17.5%	34	11.3%	22	7.3%	12	4%	9	3%
The headset is uncomfortable to wear for a long time	29	9.6%	85	28.1%	105	34.8%	48	15.9%	25	8.3%	10	3.3%
Content in VR is limited to gaming and entertainment	54	17.9%	77	25.5%	42	13.9%	46	15.2%	56	18.5%	27	8.9%
VR causes sickness and nausea	20	6.6%	20	6.6%	26	8.6%	42	13.9%	94	31.1%	100	33.1%
The tethered headset and equipment are complicated to set up	4	1.3%	27	8.9%	26	8.6%	61	20.2%	53	17.5%	131	43.4%