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How do immersive experiences influence consumers' purchase intentions?

Mémoire présenté par :

Lilli BOUCHÉ

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Promoteur :

Jean-François METAIS

Boulevard Brand Whitlock 6 - 1150 Bruxelles

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Declaration of Originality

Je soussigné, BOUCHÉ, Lilli, en Master 2, déclare par la présente que le travail ci-joint respecte les règles de référencement des sources reprises dans le règlement des études en signé lors de mon inscription à l'ICHEC (respect de la norme APA concernant le référencement dans le texte, la bibliographie, etc.); que ce travail est l'aboutissement d'une démarche entièrement personnelle; qu'il ne contient pas de contenus produits par une intelligence artificielle sans y faire explicitement référence. Par ma signature, je certifie sur l'honneur avoir pris connaissance des documents précités et que le travail présenté est original et exempt de tout emprunt à un tiers non-cité correctement.

A handwritten signature in black ink, appearing to read 'L. Bouché', with a stylized flourish at the end.

15/05/2025

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Introduction

Our society is evolving at an unprecedented pace. Technological advancements have been part of our evolution for a long time, but the speed at which innovation reshapes industries and consumer expectations today is without historical precedent. In this fast-growing and very competitive environment, brands and companies do not only need to adapt but also anticipate and understand what will shape tomorrow's customer demand. At the same time, consumers are becoming more demanding than ever before: they seek seamless, personalized and extraordinary experiences, expecting brands to engage with them on a deeply individual level.

As a result, companies need to rethink their strategies to integrate technologies capable of meeting these heightened expectations. Among these, Extended Reality (XR) stands out as a rapidly growing technology, capable of transforming how brands engage with consumers. Imagine being able to visit a hotel room before booking it, visualize furniture in your home before purchasing it online, or even visit ancient temples that disappeared centuries ago. These are not scenes from a sci-fi movie but real-world examples of XR reshaping consumer interactions. Extended Reality (XR) is the umbrella term that comprises Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR). As these technologies become more advanced and accessible, they create new opportunities for brands to capture attention, foster engagement and influence decision-making.

In this report, we will explore how these technologies respond to consumers' current needs, how they help companies enhance customer experience, and ultimately, how they influence consumers' purchase intentions, which constitutes the central research question of this master's thesis.

During my internship at Deloitte Digital, from January to April 2025, I had the opportunity to explore the ways these technologies are reshaping marketing. Deloitte Digital, a department of Deloitte, specializes in transforming customer experiences through a combination of strategy, design and innovation. Working with the XR team, I discovered the fascinating world of immersive experiences development and gained firsthand insight into the creative and technical processes involved in enhancing customer journeys through XR technologies.

This professional experience inspired and guided the direction of this master's thesis. To answer the research question, the report is structured around a literature review, the development of hypotheses and a research model and an empirical analysis. We first dive into the literature review by introducing the concepts of spatial computing, Extended Reality (XR), the metaverse and immersive experiences. Then, we look at how XR has been evolving in the past, notably through the Gartner Hype Cycle, and how it is predicted to evolve in the future by examining market growth expectations. Furthermore, we investigate XR marketing, the opportunities XR offers along the customer journey and how it aligns with and enhances current successful marketing trends. After that, we introduce a consumer behavior model and, based on this, we elaborate hypotheses on how immersive

experiences can shape internal psychological processes to, in turn, influence consumers' intentions.

In order to test the hypotheses, the collaboration between Deloitte Digital and the tourism office of Namur allowed me to develop an immersive experience and conduct an experiment at the tourism office with visitors as participants. This experiment also served as a test for measuring participants' satisfaction with the audio-visual aspects of the immersive experience. The results and limitations of this experiment will be discussed, and finally, recommendations will be elaborated on how brands can use immersive technologies to meet consumer expectations and create competitive advantage in an experience-driven economy. By combining academic theories of consumer behavior and research on XR marketing with practical experimentation, this master's thesis aims to offer both scientific insights and actionable recommendations for brands exploring immersive marketing strategies.

Literature review and hypotheses elaboration

1. Spatial Computing, Extended Reality and Immersive Experiences

1.1. Spatial computing

We are currently experiencing the fourth wave of computing innovations, and this revolves around spatial computing and immersive technologies. After the introduction of personal computers, the Internet and mobile devices. Spatial computing is expected to transform the way business is conducted in many sectors (Big Think, 2022; Mystakidis, 2022).

Spatial computing seamlessly blends physical and digital, creating an immersive technology ecosystem. It integrates traditional business sensor data with technologies such as the Internet of Things (IoT), light detection and ranging (LIDAR), images, videos and other three-dimensional data to create digital models that accurately reflect real-world business operations. These models can be rendered across a variety of interaction platforms, including traditional two-dimensional screens, lightweight Augmented Reality (AR) glasses and fully immersive Virtual Reality (VR) environments (Deloitte, 2024).

The concept of spatial computing has been popularized recently by Apple with the announcement of the launch of the Vision Pro, a Mixed Reality headset (Kubski, 2025; XR Today, 2023). The device and its operating system are defined as spatial computing (XR Today, 2023). According to Thomas Kubski (2025), Apple introduced this term with an aim to differentiate itself from the current Extended Reality (XR) market. In this way, the product would not be compared to Microsoft and other brands that are positioned in the segment of XR (Kubski, 2025). While Apple is considered pioneer in the area of spatial computing and played a significant role in popularizing the term (Xu et al, 2024), it was already defined in 2003 by Simon Greenwold as “human interaction with a machine in which the machine retains and manipulates referents to real objects and spaces.” (XR Today, 2023; Xu et al., 2024). The first examples of spatial computing were simple, such as Global Positioning System (GPS). However, spatial technology is increasingly growing thanks to Extended Reality (XR) innovations, the metaverse and the rise of new protocols for Web 3.0 (XR Today, 2023).

1.2. Extended Reality (XR)

Extended Reality (XR) is an umbrella term for reality-enhancing technologies: Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR). Since their emergence there has been a great deal of confusion around their meaning, both in the business and in the academic world (Flavián et al., 2019; Rauschnabel et al., 2022).

The Reality-Virtuality Continuum of Milgram and Kishino (1994) has been the starting point for many researchers to categorize reality-enhancing technologies (see Figure 1). At one end of their continuum, there is the Real Environment which refers to the physical world or the reality itself and, at the other end, there is the Virtual Environment which is completely

computer-generated. Mixed Reality is between those two extremes and encompasses Augmented Reality and Augmented Virtuality. Augmented Reality overlays visual elements into the user's actual physical environment and Augmented Virtuality superimposes real-world elements on the virtual environment (Flavián et al., 2019).



FIGURE 1: REALITY-VIRTUALITY CONTINUUM OF MILGRAM AND KISHINO

Source: Author's own conception based on the original continuum. Milgram, P. & Kishino, F. (1994). A Taxonomy of Mixed Reality Visual Displays. *IEICE Trans. Information Systems*, E77-D(12), 1321-1329. ResearchGate. https://www.researchgate.net/publication/231514051_A_Taxonomy_of_Mixed_Reality_Visual_Displays

However, numerous researchers have adapted and enhanced the continuum of Milgram and Kishino through the years as the technology was evolving, and more research was conducted on the subject. For example, Flavián et al. (2019) have identified the disparities in the use and meaning of reality-enhancing technologies. Consequently, they adjusted the continuum of Milgram and Kishino because they believe that Mixed Reality should not be regarded as a broad part of a continuum including Augmented Reality and Augmented Virtuality but rather as an independent dimension falling between the two (Flavián et al., 2019). This evolving perspective has contributed to the later advancements of the concepts used to define reality-enhancing technologies.

In this review, we will not go further into the analysis of the full range of frameworks that have been developed around reality-enhancing technologies concepts. Instead, we will concentrate on the understanding of the concepts that is the most recently reflected in studies, press articles and reports: using Extended Reality (XR) as an umbrella term for reality-enhancing technologies.

Extended Reality (XR) encompasses immersive technologies that combine the real world and the virtual world which include Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) (see Figure 2). These technologies allow users to interact with digital content as if it were real (Atiker, 2023). They are described by Kunkel and Soechtig as “virtual and real worlds colliding to create new environments where digital and physical objects and their data can coexist and interact with each other” (2017).

Virtual Reality (VR) is a computer-generated simulation of an environment. The user feels immersed in a completely virtual environment and interacts with it in a way that feels real (Mystakidis, 2022). The user interacts with the virtual world using a VR headset (Rauschnabel et al., 2022), also called head-mounted display (HMD) (Lee, 2025).

Augmented Reality (AR) overlays virtual elements onto the real world via smartphones, tablets or AR glasses. The user sees and interacts with these virtual elements while remaining connected to the real world (Lee, 2025; Rauschnabel et al., 2022).

Finally, Mixed Reality (MR) combines elements of VR and AR to allow for more advanced interaction between virtual objects and the real world. Virtual objects can interact realistically with the physical environment and users can manipulate these objects as if they were part of the real world. For example, in MR users would not be able to see a virtual box under a table unless they bent down. This is a major difference with AR where the virtual box would simply be overlaid and then visible for the user without bending to look under the table (Flavián et al., 2019). In a discussion with a developer from Deloitte Digital, another important differentiator between Augmented Reality and Mixed Reality was identified and it referred to how the user interacts with the digital elements that are embedded in the physical world. In AR, the user can only interact with digital elements through a device like a smartphone. While in MR, the user can directly manipulate and interact with digital elements by touching them. This is why Mixed Reality can only be used with headsets or glasses that support hand tracking while Augmented Reality can be used through a wide variety of devices such as smartphones, tablets and smart glasses.

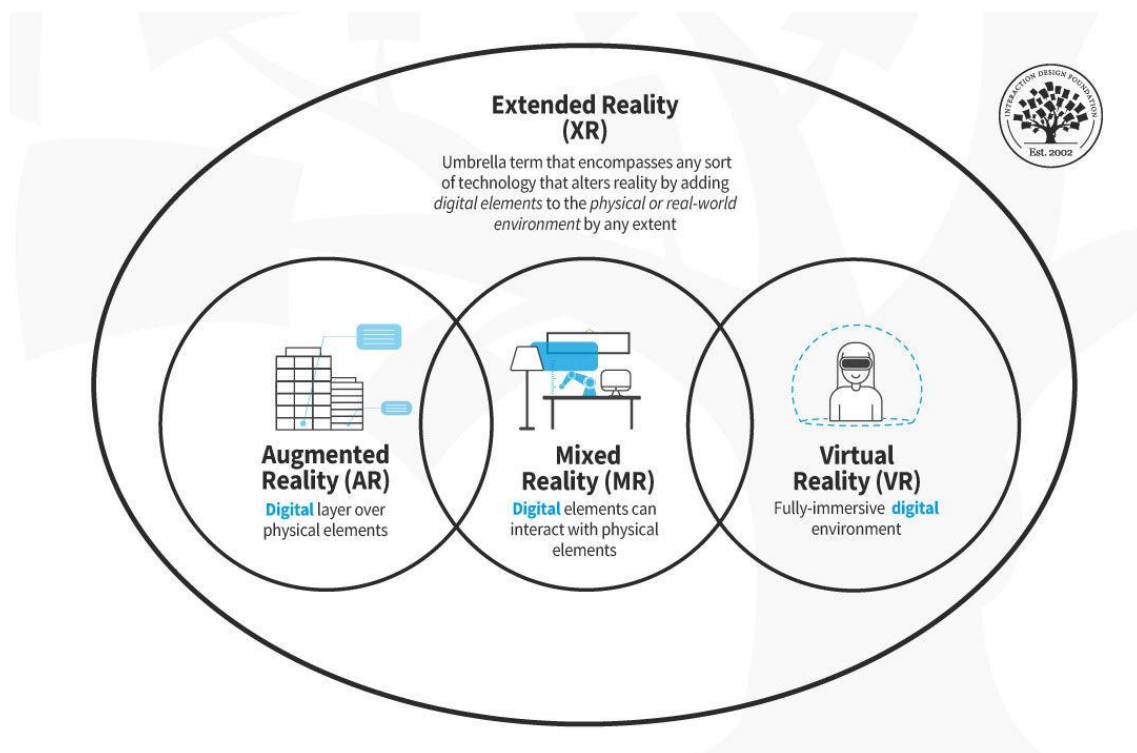


FIGURE 2: EXTENDED REALITY

Source: Interaction Design Foundation. (2022, January 24). *What is Extended Reality (XR)?*
<https://www.interaction-design.org/literature/topics/extended-reality-xr>

Extended Reality (XR) and spatial computing are closely related (XR Today, 2023). Extended Reality (XR) can be considered as the experience and spatial computing as the engine powering the experience. Spatial computing allows the interaction of digital technology with the physical environment making it the “backbone” that makes XR feel real and responsive. To work effectively, XR needs spatial awareness such as head and hand tracking or the mapping of the environment (OpenAI, 2025a; XR Today, 2023).

1.3. Immersive experiences

Our research question includes the term immersive experiences, here is an explanation of what we mean by this term. When we are talking about immersive experiences, the word “immersive” refers to the user’s involvement in the digital experience. The goal of an immersive experience is to give the user a sense of truly being there, in the virtual or augmented world (Atiker, 2023). In the context of this thesis, we will be tackling immersive experiences experienced through XR technologies. It was important to specify this because they could have been mistaken for immersive experiences that refer to what can be frequently found in art exhibitions with projections on walls. The Van Gogh Immersive Experience is a good example. In this exhibition, his paintings come alive in animated projections on walls, floor and ceiling transforming Van Gogh’s world into a fully immersive experience without the use of XR.

In this thesis, when we start tackling the research question and consequently focusing on immersive experiences, we will refer specifically to experiences delivered through a headset that combines Mixed Reality and Virtual Reality, as defined in the previous section. This definition has been chosen because the experience developed to test the hypotheses will involve this specific combination of Virtual and Mixed Realities. However, in the following sections, we will discuss XR technologies more broadly, not just immersive experiences as defined here, in order to establish the general context in which they are situated.

1.4. Metaverse

The word “metaverse” originates from the science fiction novel, *Snow Crash* by Neal Stephenson (Arya et al., 2024; Mystakidis, 2022). In the novel, the metaverse is depicted as a virtual reality successor to the Internet in which users can interact with each other through avatars in a shared digital space (Mystakidis, 2022). Since then, the concept of metaverse has evolved from speculative fiction into a reality driven by tremendous technological advances.

Arya et al. (2024) cite the definition of metaverse from Gartner (2022) which describes it as a place where physical and virtual worlds merge, allowing users to interact via avatars. These avatars are configurable digital representations that embody the user within the metaverse. With their digital embodiment users can interact, socialize and meet other users in a virtual space even though they are on another place on earth. Decentraland, Sandbox, Zepeto, Fortnite and Roblox are all examples of metaverse platforms that allow these kinds of interactions (Arya et al., 2024).

Today, the word metaverse is widely used to describe virtual worlds (Jeon, 2022) or a collective virtual shared space, blending physical and digital worlds through technologies such as Virtual Reality (VR) and Augmented Reality (AR) that enable multisensory interactions with virtual environments, digital objects and people (Mystakidis, 2022). In other words, XR technologies provide a platform and tools to create, access and interact with virtual worlds, serving as a gateway to the metaverse (Atiker, 2023).

1.5. XR technologies on the Gartner Hype Cycle

The Gartner Hype Cycle is a graphical representation of a recurring pattern that arises with each new technology or innovation. The progression depicted goes from overenthusiasm, through a stage of disillusionment and eventually to a potential understanding of the innovation's relevance in the market (Gartner, 2018).

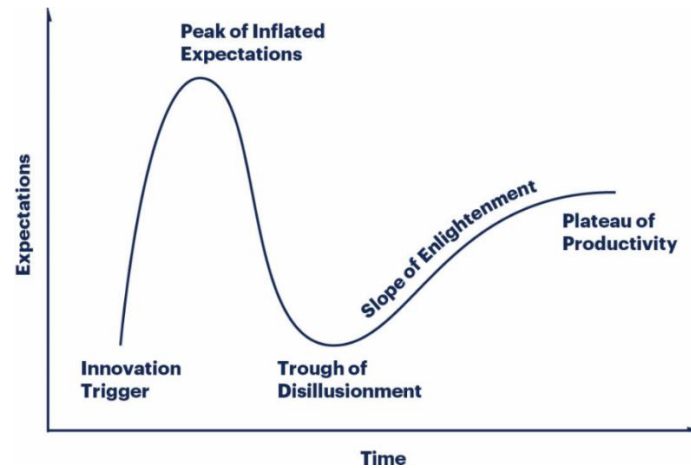


FIGURE 3: GARTNER HYPE CYCLE

Source: BMC. (2020, May 5). *Introduction to the Gartner Hype Cycle*. <https://www.bmc.com/blogs/gartner-hype-cycle/>

According to the cycle, technologies and innovations pass through five stages to eventually attain productivity. First, there is the Innovation Trigger which is the launch of the product. Then, the Peak of Inflated Expectations is a “buzz” around the innovation that builds expectations for the innovation which rise above its current capabilities. Afterwards, slower-than-expected adoption, problems with performance or failure to deliver financial returns trigger the Trough of Disillusionment. Once some early adopters overcome the first challenges, they start to experience the benefits of the innovation. Then, organizations leverage the knowledge gained from the early adopters. The understanding of where and how the innovation can be used to have a positive impact marks the beginning of the Slope of Enlightenment. Finally, the Plateau of Productivity is reached when the real-world benefits of the innovation are demonstrated and accepted. This initiates a drastic increase in adoption and penetration accelerates sharply as a result of productive and useful value (Gartner, 2018).

Now, where do Extended Reality (XR) technologies position themselves on the cycle? To answer this question, the Gartner Hype Cycles for emerging technologies from the past 9 years have been taken into consideration (see Appendix 2) and insights from an expert in the domain of XR have been gathered through an interview (see Appendix 5).

The Gartner Hype Cycles for Emerging Technologies were taken into consideration from 2015 until 2024 because the earlier versions could not be found from a reliable source. The Hype Cycles from the past 9 years can be found in the appendices (see Appendix 2). In order to analyze them, the first step was to identify the scope of the research. Indeed, XR technologies, as stated previously, encompass AR, VR and MR, so we will take a closer look

at where they are each situated. We will additionally see where spatial computing is situated as we evoked it at the beginning of this chapter.

The first observation is that the last appearance of XR technologies per se was in 2018 with Augmented Reality and Mixed Reality positioned in the Trough of Disillusionment with expectations of reaching the Plateau of Productivity within 5 to 10 years (see Figure 4). Based on this 2018 forecast, it would be reasonable to assume that by 2025, they should be approaching the Plateau of Productivity. Virtual Reality, on the other hand, made its last appearance in 2016 (see Appendix 2). It was positioned on the Slope of Enlightenment in 2016 with an estimation of reaching the Plateau of Productivity within 5 to 10 years, it is likewise reasonable to assume that Virtual Reality is also nearing the Plateau of Productivity by 2025.

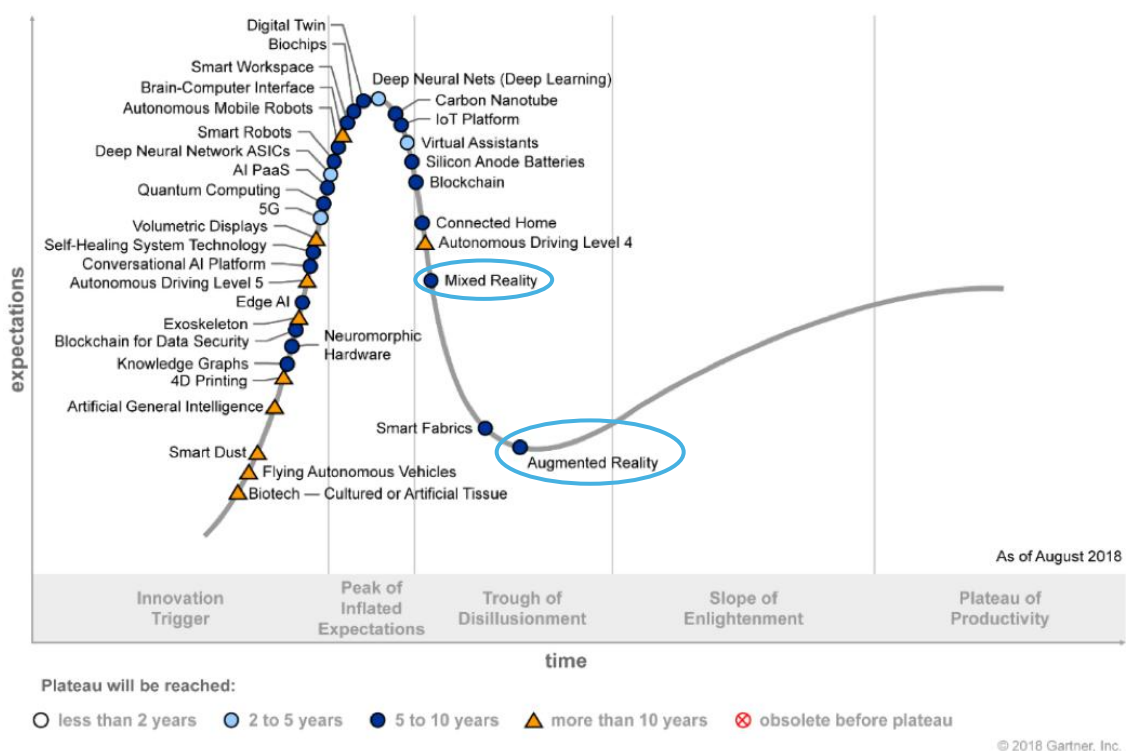


FIGURE 4: HYPE CYCLE FOR EMERGING TECHNOLOGIES, 2018

Source: Gartner. (2018, August 20). *Gartner Identifies Five Emerging Technology Trends That Will Blur the Lines Between Human and Machine*. <https://www.gartner.com/en/newsroom/press-releases/2018-08-20-gartner-identifies-five-emerging-technology-trends-that-will-blur-the-lines-between-human-and-machine>

As we do not have a recent representation of XR technologies on the Hype Cycle, let us examine the insights of an expert on the subject. In our interview, Thomas Kubski, the Director of digital strategy and immersive experiences at Deloitte Digital, highlights that not all XR technologies share the same level of maturity, an observation that aligns with what we have seen in Hype Cycles. According to him, Augmented Reality is currently on the Slope of Enlightenment while Mixed Reality is at the beginning of the same slope. Then, concerning what is most relevant to our research question, immersive experiences, defined as the combination of Virtual Reality and Mixed Reality, he places them at the beginning of the Slope of Enlightenment (Kubski, 2025).

Furthermore, Thomas Kubski suggests that a technology's position on the Hype Cycle depends not only on the technology itself but also on its specific use cases. For example, he considers XR applications in training to be situated between the Slope of Enlightenment and the Plateau of Productivity. In contrast, when applied in a marketing context, XR technologies would be situated at the very beginning of the Slope of Enlightenment, indicating a more experimental and emerging phase of use (Kubski, 2025).

Moreover, Thomas Kubski introduced two primary reasons why immersive experiences are advancing along the Slope of Enlightenment. First, he argued that the emergence of the Quest 3 and the Vision Pro has helped overcome technological barriers that previously hindered companies from generating returns on investment. They are both Mixed Reality headsets, developed by Meta and Apple respectively, and are playing a role in revolutionizing the industry. The Quest 3 dominates the consumer market with a 90% share, making it widely accessible, while the Vision Pro signifies the future direction of the industry. These two examples have contributed to a shift in immersive experiences, from Virtual Reality oriented experiences to Mixed Reality oriented experience. Whereas Virtual Reality tends to be isolating due to its complete disconnection with the physical world, Mixed Reality enables the integration of virtual elements into the real world, addressing the issue of user isolation. Moving on to the second reason, improvements in processing power and miniaturization have made a major difference in the quality of immersive experience. Just five years ago, virtual elements appeared unrealistic, while today, these experiences closely resemble reality, offering a much more convincing and engaging experience (Kubski, 2025).

In conclusion, the combination of these two factors, the introduction of Mixed Reality headsets and technological advancements, has driven a shift in the field of immersive experiences helping them move out of the Trough of Disillusionment and making their way on the Slope of Enlightenment to soon enough reach the Plateau of Productivity.

On an ending note, it is still relevant to mention that spatial computing, which we introduced in the first section, was positioned in the latest version of the Gartner Hype Cycle in 2024 at the Innovation Trigger stage, with an expectation of reaching the Plateau of Productivity within 5 to 10 years (see Appendix 2). This confirms that Augmented, Virtual and Mixed Realities play a role in the spatial computing trend but are not the sole drivers of its advancement.

1.6. Market size and expected growth

In order to define the global Extended Reality (XR) market size and the projections for the following years, the results of several market research agencies were considered. The reports of Precedence Research (2025), Mordor Intelligence (2024), Fortune Business Insights (2025), Data Bridge Market Research (2025), Markets and Markets (2024) and Statista (2025) have been investigated for this analysis. The scope of the Extended Reality (XR) market covers the three types of technology: Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR).

The global Extended Reality (XR) market value was estimated in 2024 between 119.86 and 189.31 billion USD by Data Bridge Market Research (2025), Fortune Business Insights

(2025) and Precedence Research (2025). The predictions for 2025 range between 157.44 and 253.5 billion USD according to Fortune Business Insights (2025), Mordor Intelligence (2024) and Precedence Research (2025). These agencies expect the global market size to exceed the trillion USD by 2032 with a compound annual growth rate (CAGR) ranging from 30% to 40% during a forecasted period from 2025 to 2030 or 2034 (depending on the agency).

On the other hand, the market research agencies Statista (2025) and Markets and Markets (2024) estimated the value of the global Extended Reality (XR) market at 25.7 and 24.42 billion USD respectively. Statista (2025) predicts the value of the market to reach 41.8 billion USD in 2028 and Markets and Markets (2024) to reach 85.86 billion in 2029. These projections are noticeably lower than the first four agencies, as we can see in Figure 5. A possible explanation for these differences can be the scope of the XR global market and what it encompasses. Indeed, the XR market can be segmented, for example by components dividing the market into two segments: hardware and software. For instance, the figures from Statista (2025) were sourced from the "hardware" section of the platform, suggesting that they may only account for the hardware segment of XR. However, no further details could be verified, as access was restricted to premium accounts. These differences in the segments covered can also explain the differences found between the other agencies with higher expectations. For example, Precedence Research (2025), the agency with the highest expectations, did not only take the segments of hardware and software into consideration but also the services segment which could be an explanation of their higher evaluations and predictions in the market size.

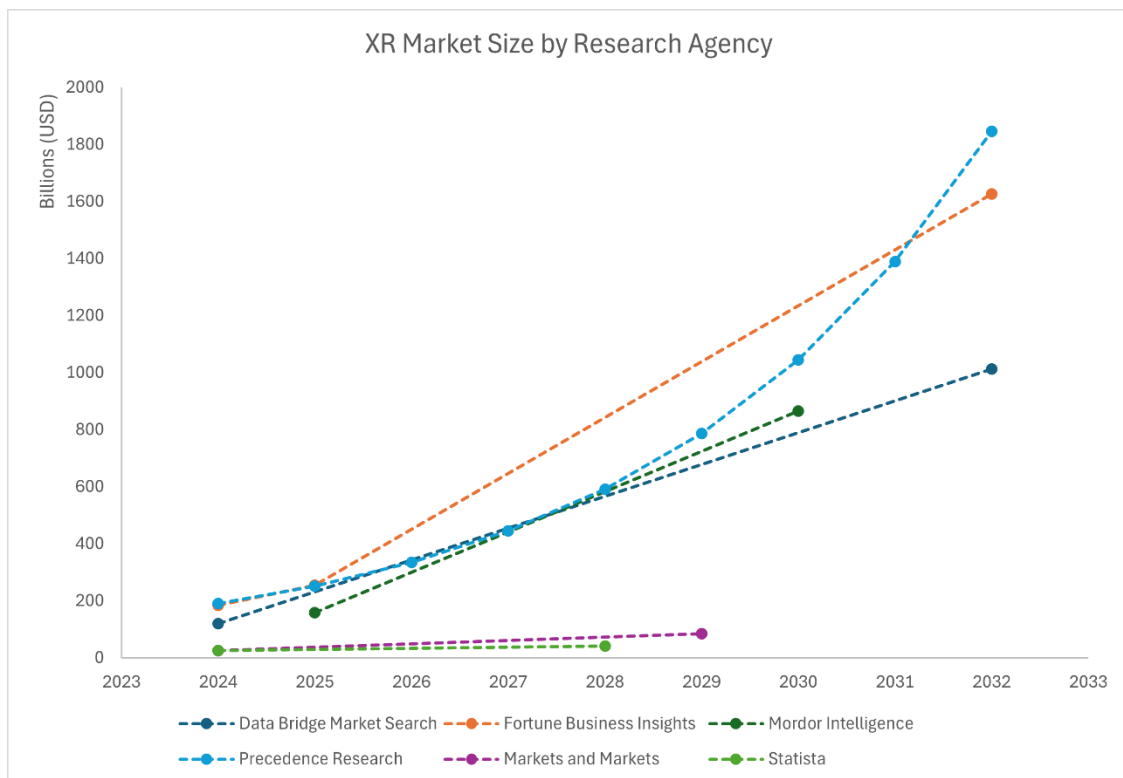


FIGURE 5: XR MARKET SIZE BY RESEARCH AGENCY

In January 2025, XR Today, which is a platform that delivers information about the latest developments and trends in XR technologies, published the results of a survey on XR transformation including 200 industry professionals. Their findings highlight a strong interest in Extended Reality (XR) technologies. Indeed 45% are already using XR devices in their organizations and 39% are considering using them. This shows a strong interest in exploring their potential benefits. XR Today concludes that the fact that 84% of organizations have either adopted or are considering proves that “XR is seen as a viable area for innovation” (XR Today, 2025). The findings of the report of XR Today support the expected market growth of XR.

1.7. Drivers of growth

The growth of the Extended Reality (XR) market is being driven by multiple factors with advancements in technologies playing a crucial role. First, 5G technological advancements are seen as a great opportunity to enhance XR technologies and are anticipated to drive its market growth (Fortune Business Insights, 2025; Mordor Intelligence, 2024; Markets and Markets, 2024; Precedence Research, 2025). The integration of 5G with XR technologies enables users to engage in real-time interactions without any delay or interruptions. This is possible thanks to 5G low latency capabilities (Markets and Markets, 2024). Similarly, Generative AI is believed to represent a great opportunity for XR technologies improvement as it allows faster and easier development (Markets and Markets, 2024) and more responsive and realistic experiences (Data Bridge Market Research, 2025).

Mordor Intelligence (2024) identifies the rising demand for immersive technology experiences across both consumer and enterprise sectors as a primary growth factor. The agency also emphasizes the convergence of real and virtual worlds, including developments in the digital twin industry. Similarly, Data Bridge Market Research (2025) highlights the growing consumer appetite for interactive and immersive experiences. As they deepen their engagement with digital content, they are seeking new and more engaging ways to interact with virtual environments. The market research agency also suggests that the increasing interest in the metaverse drives the adoption of XR devices fueling market expansion (Data Bridge Market Research, 2025). The growing device adoption is also due to the rising demand for VR headsets in the gaming and entertainment sectors (Fortune Business Insights, 2025).

Lastly, analysts predict that advancements in XR hardware, such as the development of more compact, more comfortable and fashionable devices combined with the improvements in software applications and connectivity, will support greater adoption of XR by consumers and across industries (Alsop, 2024).

Besides the drivers of growth, one commonly cited factor is restraining the market growth of XR: the high cost of hardware. As XR devices become more technically advanced, they offer significantly improved performance and user experience but also increase the demand for powerful computing systems and cutting-edge components. Although these improvements act as a growth driver by enhancing the quality and appeal of XR solutions, they simultaneously contribute to rising costs, which can restrain broader market adoption (Data Bridge Market Research, 2025; Fortune Business Insights, 2025).

1.8. Market trends

The gaming industry dominates the Extended Reality (XR) market with a 29% share of the global market, and this is partly due to the fact that companies developing games are among early adopters of XR solutions according to Fortune Business Insights (2025). In their report, gaming is followed by the sectors of education, healthcare and automotive. The penetration of XR technologies into the healthcare sector is driven by innovations that help surgeons learn new skills or improve existing ones in a safe environment. In this sector, XR technologies also help to reduce operating costs and make better diagnostics (Fortune Business Insights, 2025). Precedence Research (2025) also highlights the rapid acceptance of Extended Reality (XR) in the healthcare industry. Concerning education, XR has the potential to make learning more engaging and interactive by increasing information retention and bringing subjects to life (Marr, 2023). In the automotive industry, XR can be leveraged at several levels such as enhanced training and improved production process (Cureton, 2023). Next come the media & entertainment and retail & e-commerce industries with slightly smaller market shares (Fortune Business Insights, 2025). Concerning retail & e-commerce, XR technologies are gaining ground to meet consumers' growing demand for online shopping. Especially Augmented Reality that might provide a “try before you buy” shopping experience which was impossible with previous traditional online experiences. This also benefits companies by reducing return rates (Precedence Research, 2025).

Mordor Intelligence (2024) explored the market shares of Extended Reality (XR) by solution segments in 2022. They divided it into two segments: customer engagement and business engagement. They highlighted that the largest market share was customer engagement with 58% of the share in 2022 and explained its dominance by the increased adoption of the technology in retail, entertainment and interactive experiences. Meanwhile, the business engagement segment is driven by XR applications in training, collaboration and productivity (Mordor Intelligence, 2024).

When segmenting the market by type, the Extended Reality (XR) market is split into the three categories of technology that we have already seen: Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR). Markets and Markets (2024) states that AR is expected to capture the largest share of the XR market in the forecasted period of 2024 to 2029. In accordance with this, Mordor Intelligence (2024) states that AR is expected to be the fastest-growing segment in the near future. The agency explains the rapid growth of this segment by the adoption of the technology in sectors such as retail, manufacturing and healthcare. Besides, AR integration into smartphones and the development of AR glasses have made this technology more accessible and functional for everyday use (Mordor Intelligence, 2024). However, Mordor Intelligence (2024) states that in 2023, Virtual Reality (VR) still had the largest global market share and explains this dominance by the extensive applications of the technology in gaming, entertainment and training simulations.

Concerning the hardware segment, we can identify a significant headset trend that is the convergence of Augmented Reality (AR), Virtual Reality (VR) and Mixed Reality (MR) devices. Traditionally, they were viewed as separate and distinct technologies but now we are experiencing a rise in headsets that are combining Virtual, Augmented and Mixed Realities.

The Meta Quest 3 and Apple Vision Pro are leading the transition by allowing users to choose which type of immersion they want (XR Today, 2024).

Another hardware trend is the significant advances in the smart glasses industry. The goal is to produce devices that are more comfortable and practical for everyday use in order to make them appeal to a wider audience. This trend has been identified by Mordor Intelligence (2024) and can also be observed in the innovations that have been presented at the CES 2025. The Consumer Electronics Show (CES) is a globally renowned technology event that gathers world's leading tech brands. CES ignites innovation and shapes the technological landscape for the year ahead. The 2025 edition of the event was held in Las Vegas on January 10th, showcasing the wide range of innovations and groundbreaking technologies (CES, 2025). Among the presented innovations were several next-generation smart glasses, which featured lightweight design, enhanced aesthetic appeal and were getting close to resembling traditional eyewear. Among the companies introducing their latest smart glasses were XREAL, Rokid and Halliday (Auganix, 2025).

1.9. Privacy concerns

Extended Reality (XR) introduces privacy challenges due to their advanced and pervasive sensing capabilities. Indeed, XR enables the capture of a new range of data types. Unlike traditional devices, their systems are equipped with sensors that gather data from their surroundings, including the user's environment, nearby bystanders and a wide range of physiological and behavioral inputs (Abraham et al., 2022; Hadan et al., 2024; McGill, 2021). These systems do not only monitor user actions but also track detailed biometric data such as eye movements, pupil dilation and even brain activity, allowing for a level of surveillance that far exceeds that of mobile or IoT devices (Hadan et al., 2024; McGill, 2021). As a result, XR raises new and critical concerns about privacy.

The issue with such a collection of data is the potential of XR to infer and estimate sensitive information. With data recorded from its sensors, XR systems can estimate users' emotional states, cognitive patterns, personality traits or even mental health conditions (Abraham et al., 2022; Hadan et al., 2024). This capability enhances the potential to profile individuals, sometimes with higher accuracy than other devices. Research has demonstrated that even basic data, such as positional tracking within virtual environments, can be used to identify users with up to 95% accuracy, rising concerns about anonymity (Abraham et al., 2022; McGill, 2021). Sensed data may enable the XR application to gather information not only on the identity of a person but also on his characteristics and protected traits (McGill, 2021). This risk extends not only to direct users but also to bystanders, who may unknowingly be tracked or recorded, creating ethical and legal dilemmas around consent and surveillance (Abraham et al., 2022; McGill, 2021).

Despite these risks, user awareness remains low (Abraham et al., 2022; Hadan et al., 2024). Studies reveal that XR users often do not understand what data is being collected, when it is being captured, or the implications of this data being processed (Abraham et al., 2022). The immersive nature of XR experiences makes it difficult for users to recognize privacy breaches in real time, leading to a false sense of security and anonymity, especially in

multi-user environments where personal conversations and emotional expressions are common (Hadan et al., 2024).

The development of XR has outpaced the creation of adequate privacy and security standards. Many XR platforms do not offer granular controls for users to opt out of specific data collection practices. This lack of preparedness is exacerbated by slow industry adoption and insufficient transparency mechanisms. There is a growing call for user-centric privacy tools, including real-time notifications about data collection and applications that allow users to manage their privacy preferences dynamically. Additionally, standardized privacy frameworks and clearer communication about how user data is utilized are urgently needed to mitigate the unique risks XR poses (Abraham et al., 2022).

2. XR Marketing

2.1. Genesis of Extended Reality in Marketing

Retailers began exploring Extended Reality (XR) applications in the late 1990s. Early adopters introduced Augmented Reality (AR) as a research topic, using mobile phones as visual and interactive interfaces. However, these early systems had limited immersive capabilities. Around the same time, Virtual Reality (VR) research focused on replicating physical shopping experiences within consumers' homes. These efforts typically relied on computer screens and traditional input devices, resulting in low-immersion systems (Alcañiz et al., 2019).

Head-mounted displays (HMDs) were first used in 1995 to support cost-effective supermarket redesigns within the virtual world Second Life (Alcañiz et al., 2019). Second Life, developed by Linden Lab in San Francisco, allows users to interact with one another through customizable avatars in a shared digital space (Second Life, 2025). In the 2000s, marketers and advertisers began to view virtual worlds like Second Life as promising tools. Three-dimensional virtual shopping malls offered immersive and interactive social experiences that included digital spokes-avatars, introducing a new approach to interactive marketing (Alcañiz et al., 2019).

Studies have been conducted on the role of Second Life as an advertising and communication channel but the low graphical realism and low immersion levels that were offered at that time make the conclusions from this research irrelevant today. At the same time, VR was also being used as a testing tool in laboratories to develop metrics to predict consumer behavior in physical retail environments (Alcañiz et al., 2019).

During the 2010s, research interest in VR interfaces grew significantly. Despite this increase, most studies continued to use medium to low-immersion systems, such as fishtank VR or large stereoscopic screens. It was in 2018 that researchers began to explore more immersive technologies, such as 360-degree videos. These studies included tracking eye movements and analyzing the impact of interactivity on emotional responses, marking some of the earliest uses of high-immersion HMDs in marketing research (Alcañiz et al., 2019).

With the launch of Microsoft HoloLens in 2017, one of the first devices enabling Mixed Reality (MR), some studies have started to investigate how consumers react to MR interfaces (Alcañiz et al., 2019). As stated earlier, Extended Reality (XR) technologies are expanding at a fast pace today and many other studies and applications of XR in marketing have emerged. Research and applications of Extended Reality (XR) in marketing since its surge are tackled in the following sections.

2.2. Customer Experience and Extended Reality

2.2.1. Immersion, presence and flow

Extended Reality (XR) technologies offer unique potential to transform the customer experience through their immersive capabilities. Central to this transformation are three key constructs: immersion, presence and flow. These interconnected concepts help explain why XR environments are particularly effective in capturing customer attention, enhancing engagement and driving behavior. Immersion refers to the technical and sensory depth of the experience, presence describes the psychological sense of "being there" in the virtual environment, and flow represents the optimal cognitive state of complete absorption in an activity. Together, these elements create highly engaging and persuasive experiences that surpass traditional digital formats, offering valuable opportunities for consumer engagement.

Immersion refers to the level of realism of XR technology (Wedel et al., 2020) and is results from the quality of technical features of XR systems and devices (Atiker, 2023; Flavián et al., 2019; Wedel et al., 2020). The degree of realism is determined by various sensory inputs such as sight, hearing and touch, which are the most stimulated in immersive experiences setups (Atiker, 2023; Wedel et al., 2020).

In other words, immersion is defined by the quality of visual, auditory and haptic feedback that makes the virtual world feel like a real place (Atiker, 2023). Visual cues and interactivity, relating to sight, have the potential to enhance consumer perception of informativeness and playfulness, and seeing products in virtual environments positively impacts attitudes and intentions. Stimulating the hearing sense has been found to have an impact on behavior by generating higher levels of engagement and presence. Additionally, incorporating haptic functions has been shown to positively influence consumers' purchase intentions (Wedel et al., 2020).

As a conclusion of their research, Pathak and Prakash (2023) found that highly immersive experiences lead to positive psychological experiences, and which ultimately translate into favorable behavioral outcomes such as purchase intentions. Similarly, Putri et al. (2024) found a positive relationship between immersive experiences and purchase intentions.

Immersion can also be applied to other types of technologies such as computers, but the level of immersion is much higher with XR due to the technological embodiment of the devices. Here, the embodiment is defined as the degree of sensory engagement. Since XR devices allow a more multisensory experience, the degree of immersion is higher than with other technologies. This multisensory stimulation enabled by XR technologies has been found to increase the memorability of the experience (Flavián et al., 2019).

To put things differently, immersion refers to the user's interaction with the medium, during which they feel fully absorbed in the experience, leading to an enhanced sense of presence (Atiker, 2023; Flavián et al., 2019). Thus, immersion can be considered as a determinant of presence (Flavián et al., 2019; Lee, 2025). In their experiments, Orús et al. (2021) found that the realism of XR content is critical to generate a sense of presence, suggesting the importance of the technological quality in creating a realistic virtual environment. This finding confirms the role of immersion as an antecedent of presence, as it reflects the realism of a virtual environment.

While immersion is related to the technology's capabilities, presence refers to the user psychological perception of "being there" (Flavián et al., 2019). Presence is a subjective state of being in a particular environment. This perception is not necessarily related to the use of a technology, but previous studies have introduced the fact that technologies can induce a sense of presence (Orús et al., 2021). In this case, presence describes a user's mental state of existing within the virtual environment and being able to take actions that impact it (Wedel et al., 2020). Presence is also related to transportation as the level of presence is determined by the feeling of the user of being transported in an alternative place (Flavián et al., 2019). Another important factor affecting presence is attention which can be considered as an underlying psychological mechanism of presence. Attention has been argued to be closely related to presence in the sense that the more attention is focused on the virtual environment, the greater the sense of presence (Wedel et al., 2020).

Flavián et al. (2019) consider presence in virtual environment as a continuum ranging from a sense of "being here" to the sense of "being elsewhere". The highest level of presence is at the end of the continuum on the "being elsewhere" side where the technology could transport the user completely to the virtual environment to the point that he is not feeling "here" in his actual environment but "elsewhere" in the virtual environment. The authors emphasize that Augmented Reality (AR) glasses, Mixed Reality (MR) glasses and head-mounted displays (HMD) induce higher levels of presence compared to traditional two-dimensional (2D) interfaces such as websites and 2D videos. By creating a sense of presence, XR technologies have high potential to enhance emotional engagement and sensory stimulation (Flavián et al., 2019).

The third and final concept in this triumvirate is flow. Flow was first introduced by Csikszentmihalyi. The pioneering author and his colleagues significantly contributed to the concept through later research (Batat, 2021; Hassan, 2020; Pathak & Prakash, 2023). Csikszentmihalyi defines flow as an optimal psychological state characterized by total cognitive immersion (Batat, 2021; Pathak & Prakash, 2023), leading to "an intense experience in which the individual loses the notion of time and develops the awareness of being entirely in union and fusion with the activity they are engaged in" (Batat, 2021, p.95).

Flow arises when attention is focused "on the task at hand, at the expense of everything else" (Wedel et al., 2020, p.446). It is the sensation of being entirely absorbed and engaged in a task or activity (Atiker, 2023). Csikszentmihalyi, in his work, linked flow to the capacity of artists to be fully absorbed by their creation to the point that they ignore other areas of their lives such as eating, sleeping, etc. (Batat, 2021). As flow is an optimal psychological experience, flow-inducing activities generate engagement from consumers. For example,

consumers are more likely to remain loyal to online retailers where they experience flow (Hassan et al., 2020).

An example of a flow-inducing experience is the Renault experience. In 2008, Renault launched its first experiential website, introducing the use of Virtual Reality and avatars in an effort to induce the state of flow among consumers. The introduction of avatars reinforced interactions between the user and the website, increased brand value and generated both positive emotions and behaviors. The three-dimensional (3D) environment was one of the most important factors contributing to flow and immersion (Batat, 2021). In this case, the 3D environment and the avatars allowed consumers to experience flow. These aspects become even more significant using Extended Reality (XR) technologies which lead us to flow in XR.

In the same way as discussed earlier with immersion and presence, experiences with XR induce greater levels of flow than two-dimensional (2D) channels such as websites (Hassan et al., 2020). However, in the XR literature, there is a lack of unanimity around the relationship between flow, immersion and presence. Batat (2021) cites Csikszentmihalyi who affirms that flow depends on the intensity of immersion and that it is the degree of immersion that determines if an individual will experience flow or not. Similarly, Hassan et al. (2020) state that flow is experienced in XR as a consequence of the efficiency of immersion and presence. Conversely, Pathak and Prakash (2023) in their studies, place flow as an antecedent of immersion. Meanwhile, Wedel et al. (2020) state that flow is closely related to presence suggesting that they do not consider an antecedent relationship between the concepts. For the purpose of this work, we will focus on the perspective that flow is the translation of the highest degree of immersion and is closely related to presence.

In sum, immersion, presence and flow are what make XR technologies uniquely powerful in creating more impactful and enduring customer experiences. Immersion, driven by high-quality multisensory inputs, lays the groundwork for presence, the psychological perception of being transported into a virtual environment. When both are achieved effectively, the state of flow emerges, a state of deep engagement and satisfaction. These features do not only enhance customer experience but also bring benefits, such as enhanced emotional connection, increased attention, higher engagement and positive behavioral outcomes. As XR technologies continue to evolve, this triumvirate will be essential for designers, marketers and experience creators aiming to deliver impactful and meaningful virtual experiences.

On a final note, it is important to briefly highlight a key challenge associated with immersive experiences using XR technologies, particularly with head-mounted displays (HMD): motion sickness or cybersickness. These conditions can hinder the success of customer experiences with XR. Motion sickness usually occurs when there is a mismatch between what your eyes see and what your body feels. The classic example is feeling dizzy in a car or boat. While using a headset, motion sickness arises from the mismatch between the user's actual movements and the movements perceived in the virtual environment (Rauschnabel et al., 2022). Cybersickness, which is more specific to virtual environments, can be considered as a form of motion sickness. It is defined as the symptoms of discomfort and malaise suffered from Virtual Reality (VR) exposure (Alcañiz et al., 2019).

2.2.2. Extended Reality in the customer journey

When studying customer experience, it is crucial to examine it across the different stages of the customer journey. The changes that occur at each stage have a considerable influence on the quality of the customer experience (Batat, 2021). Throughout the customer journey, Extended Reality (XR) can significantly impact customers' perceptions, intentions and behaviors.

2.2.2.1. Virtual Reality in the customer journey: Farah et al. (2019)

Virtual Reality (VR) plays a dynamic yet stage-specific role in the customer journey, offering unique advantages in early engagement while revealing limitations in later conversion stages. Farah et al. (2019) examined the impact of Virtual Reality (VR) throughout the consumer journey stages. They define the stages as follows: Awareness, Consideration, Engagement, Purchase and Loyalty. They found that the use of VR complements early stages of the customer journey, particularly in the awareness and consideration phases. At these stages, VR has the potential to substitute visits to the physical store, offering consumers a convenient and immersive alternative. The study also revealed that VR reaches its effectiveness peak during the engagement stage, where it excels at generating excitement and engagement through innovative and entertaining experiences. However, VR lacks direct sales conversion, making the effectiveness of the technology drop at this stage of the customer journey. Notably, the research also suggests that VR can come as an interesting tool at the end of the customer journey by supporting loyalty development.

Conversely, in-store traffic seems to be slower in the initial stages of the customer journey, likely due to the preferred convenience of at-home entertaining and playful experience at these stages of the shopping journey. Nevertheless, the in-store traffic outperforms VR at the purchase stage where the consumer feels the need to have a real encounter with the product and the store (Farah et al., 2019).

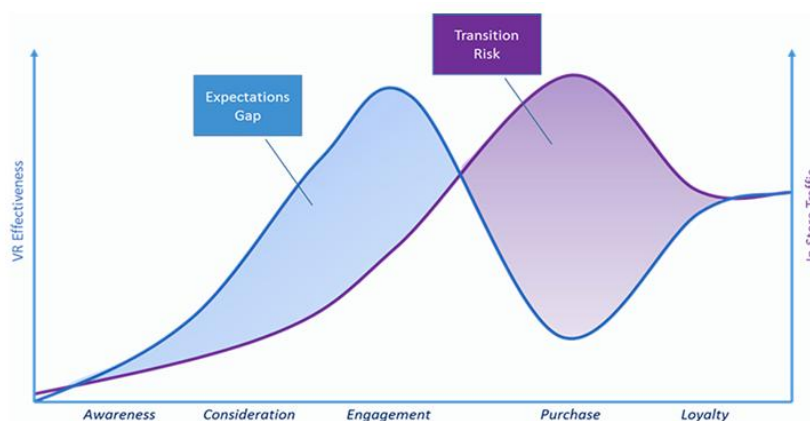


FIGURE 6: THE IMPACT OF VR THROUGHOUT THE CONSUMER JOURNEY STAGES

Source: Farah, M. F., Ramadan, Z. B., & Harb, D. H. (2019). The examination of virtual reality at the intersection of consumer experience, shopping journey and physical retailing. *Journal of Retailing and Consumer Services*, 48, 136-143. ScienceDirect. <https://doi.org/10.1016/j.jretconser.2019.02.016>

2.2.2.2. Virtual Reality and Augmented Reality in the three stages of customer journey: Wedel et al., 2020

Wedel et al. (2020) studied the different applications of Virtual Reality (VR) and Augmented Reality (AR) across the customer journey, dividing it into three stages: pre-purchase, purchase and post-purchase. They roughly associate these stages with three areas of consumer marketing: communication/advertising, retailing/selling and product consumption experience.

At the pre-purchase stage, VR and AR serve as powerful tools in marketing communication and advertising. These technologies enhance traditional advertising by increasing engagement, improving brand perception and stimulating purchase intentions. AR ads, in particular, have been shown to achieve higher click-through rates and elicit more positive brand attitudes compared to standard formats. VR commercials also outperform traditional advertisements in generating immediate behavioral responses. Brands across sectors, such as Coca Cola, IKEA, Sephora and Timberland, have adopted these technologies to create novel consumer experiences. Key applications include mobile AR ads on social media that allow users to interact with and explore products, AR interactions through QR codes in print and outdoor media and haptic advertising that enhances sensory engagement via smartphone vibrations. Additionally, digital AR displays in public spaces promote engagement and social sharing, while AR-facilitated product placements and immersive 360-degree video ads contextualize products in virtual environments. Collectively, these applications serve not only to inform consumers but also to create emotions and personalized interactions that drive interest and intention during the pre-purchase phase (Wedel et al., 2020).

At the purchase stage, AR and VR technologies are playing a transformative role in retailing and selling by enhancing customer experience, reducing friction in the buying process and ultimately increasing both purchase intentions and revenues. In physical retail spaces, AR enables stores to function as interactive showrooms, allowing customers to locate items through reverse image search. These tools improve in-store navigation through geolocation and beacon technologies. Additionally, immersive experiences such as smart dressing rooms, virtual shelves and holographic displays enhance product interaction and engagement. AR also allows consumers to visualize products in their own environment using applications like IKEA Place or Amazon AR View. In both physical and digital contexts, mobile AR apps allow consumers to try on or try out products virtually, whether on their bodies, in their homes, or on avatars, thereby reducing return rates and improving purchase confidence. Retailers use these technologies to support in-store fittings through smart mirrors and AR screens, particularly in the fashion and cosmetics sectors. Furthermore, VR applications offer personalized and immersive shopping environments, including virtual product demonstrations, store walk-throughs and tailored retail spaces. Innovations such as virtual pop-up stores and fully virtual malls, like Yihaodian and ShelfZone, represent the next frontier in retail, providing consumers with customized shopping experiences that integrate convenience, personalization and entertainment. Together, these AR/VR applications significantly optimize the purchase process by blending physical and digital retail environments into innovative and customer-centric ways (Wedel et al., 2020).

At the post-purchase stage, VR and AR technologies play a crucial role in enhancing product consumption experiences, often by extending the value of the product beyond the point of sale. In some cases, the virtual environment itself is the core product or experience, thereby constituting the product consumption experience. This is particularly common in sectors such as gaming, entertainment, travel and media. Beyond these stand-alone experiences, AR and VR are widely used to supplement product usage and enjoyment. Applications enable consumers to co-create or customize products such as fashion items, cosmetics, or jewelry within their own environments, enhancing personal relevance and satisfaction. In-store or on-premises experiences, especially in sectors like automotive, real estate and travel, are also enriched through mobile AR interfaces that offer interactive demonstrations and contextualization. Additionally, gamification strategies, interactive training modules and usage simulations via head-mounted displays (HMDs) help users engage more deeply with their purchases, particularly for consumer electronics, appliances and travel-related experiences. Finally, these technologies support post-consumption reflection by allowing users to revisit or relive their experiences, thereby reinforcing brand attachment and overall satisfaction. Collectively, AR and VR contribute to a more immersive, engaging and personalized post-purchase journey that strengthens consumer loyalty and long-term product value (Wedel et al., 2020).

2.2.2.3. Hospitality and tourism industry

Extended Reality (XR) technologies can be very impactful on the hospitality and tourism sectors as they create “try before you buy” experiences. The intangible and experiential nature of the tourist experience makes immersive technologies a great opportunity for this sector. Immersive technologies can have a significant impact on the tourist’s experience throughout his entire customer journey (Flavián et al., 2019; Flavián et al., 2024). Before travelling, they offer a realistic preview of the destination, increasing the willingness to visit specific destinations and enhancing enthusiasm about future trips. During the trip, they offer opportunities to enhance emotional engagement and captivate tourists, leaving enduring impressions and enhancing loyalty after the trip.

At the pre-travel or pre-consumption stage, immersive experiences have the potential to increase the intention to visit a destination by letting prospects experience the destination virtually (Flavián et al., 2024). Indeed, XR technologies offer a solution to create a realistic teaser of a potential future trip. Research has been conducted especially on Virtual Reality (VR) capabilities to enhance the pre-travel experience of tourists. VR enables immersive exploration of travel destinations through 360-degree tours, providing realistic previews and supporting more informed decision-making (Kieanwatana & Vongvit, 2024; Shahab et al., 2022). It provides a preview that is closer to reality than with other channels, setting customers’ expectations properly before they book (Shahab et al., 2022). By turning imagination into a realistic experience, VR increases users’ confidence and excitement about future trips (Kieanwatana & Vongvit, 2024). Immersive experiences can also trigger emotions and enhance engagement leading to increased likelihood of positive behavioral responses (Flavián et al., 2024; Kieanwatana & Vongvit, 2024).

Tourism Australia (n.d.) has conducted research on the use of Virtual Reality (VR) for destination marketing. The results show that “VR brings a destination to life and can make

consumers consider travelling to places they otherwise would not have considered.” Another finding is that “Those who have used VR to select a holiday destination highlighted benefits such as the ability to get a feel of the destination and to preview the experiences on offer, assisting with managing expectations.” (Tourism Australia, n.d.). Moreover, Shahab et al. (2022) conducted research on the impact of VR and videos on consumer decision-making in selecting a tourism destination. They found that VR has considerable potential to be considered as the most effective mode of communication for selecting a destination. This is thanks to its 360-degree views that provide an actual idea about the destination. Consumers have shown more trust in VR than video for directly influencing an intention to visit. Similarly, Kianwatana and Vongvit (2024) research highlights the influence of VR on travel intention. They conducted research on VR and destination images influence on travel intentions and concluded that VR could increase tourists’ interest and engagement while destination images significantly impact travel intentions. Suggesting that VR would complement better the early stages of the decision-making process while destination images would have a stronger impact on the intention (Kianwatana & Vongvit, 2024).

VR allows destination marketers to present a realistic digital teaser. Creating this “try before you buy” experience is a real opportunity in intangible industries such as hospitality and tourism which could not offer such experiences before the advancements of XR technologies. Orùs et al. (2021), conducted experiments on the difference between visualizing hotel rooms with a smartphone and with a head-mounted display (HMD) (Virtual Reality tours of the room). They found that the intention to book a room when it was visited with HMD was higher than with smartphone tours. The researchers also stress the importance of presence in creating an effective pre-consumption experience and driving potential guests’ intention to book (Orùs et al., 2021).

This “try before you buy” experience has been successfully used in other sectors than hospitality and tourism. We can cite the well-known example of IKEA Place, an Augmented Reality application that allows consumers to realistically place furniture in their house, office, or any other space. The application automatically scales products, allowing visualization of how they would look like in consumers’ own spaces. Michael Valdsgaard, Leader Digital Transformation at Inter IKEA Systems says, “IKEA Place makes it easier to make buying decisions in your own place, to get inspired and try many different products, styles and colours in real-life settings with a swipe of your finger” (IKEA, 2017).

Constantin et al. (2023), for McKinsey & Company, have identified the touchpoints along the traveler journey where virtual experiences seem promising (see Figure 7). The three touch points that show the greatest potential are travel inspiration, virtual events and visitor support. Aligning with the discussion of the above paragraphs, at the inspiration and planning stages, Constantin et al. (2023) highlight the potential of XR to spark the desire to travel and give a holistic idea of a destination by realistically showcasing destinations, hotel rooms, etc. They also point out the rise in awareness for unfamiliar locations, aligning with the findings of Tourism Australia (n.d.). During the trip, the leisure and entertainment touchpoint (point 5. in Figure 7 below), also presents opportunities, especially for virtual

places before physically visiting them, VR offers a powerful “try before you buy” experience that was previously unavailable in such an intangible industry. As the journey progresses, immersive experiences continue to enhance the consumption stage by augmenting perceptions of authenticity, deepening emotional engagement and increasing overall satisfaction. These technologies not only elevate in-the-moment enjoyment but also leave lasting impressions that may shape future travel decisions and foster customer loyalty.

2.3. Current marketing strategies and trends

Extended Reality (XR) technologies are increasingly integrated into marketing strategies and practices (Hilken et al., 2022; Alcañiz et al., 2019), not only as a result of recent and rapid technological improvements but also due to their alignment with contemporary successful marketing strategies and trends. In this section we will explore how XR enhances and contributes to experiential marketing, omnichannel development, gamification, personalization and storytelling.

2.3.1. Experiential marketing

We went through a significant shift from traditional marketing to experiential marketing. Today, consumers buy experiences rather than products or services, so conceiving qualitative experiences is becoming a priority for marketers (Batat, 2021). Batat (2021) references a Gartner report indicating that 89% of companies will mostly compete based on customer experience. Today, individuals do not want to consume a product anymore, it is about living the experience with the brand, most frequently using all their senses. They seek to be fully immersed in experiences (Batat, 2021).

In the previous section on Customer Experience and Extended Reality, we explored immersion in the context of technology and its ability to create compelling virtual environments. However, immersion extends beyond digital environments and plays a crucial role in other areas, particularly experiential marketing. Indeed, immersion can be used in two contexts: immersion as technology and immersion as experience (Lee, 2025). Immersion as technology has already been explored, now we will focus on immersion as experience. In her book on experiential marketing, Batat (2021) introduces immersion as a key enabler behind customer experience marketing. While this concept is related to the technological notion of immersion as we have seen previously, here it encompasses a broader meaning. According to Batat, immersion refers to a brand’s ability to design access to enjoyable and emotionally engaging experiences for consumers. In this context, immersion involves activities that are distinct from everyday life and are captivating enough to evoke intense emotions and leave lasting, memorable impressions (Batat, 2021).

Batat (2021) considers immersion as a relevant approach to customer experience as it is considered a process allowing the customer to live an intense experience with the brand as well as the result of a satisfying experience. Customers who experience immersion with a brand are prone to develop positive emotions and memories towards the brand. Batat adds that creating emotionally satisfying experiences can be done through immersive technologies. Indeed, by inducing high levels of immersion, Extended Reality (XR) technologies have the power to enhance customer experience (cf. supra pp.15-17).

Batat (2021) cites Cova and Carù, who emphasize that what makes an experience enjoyable is total immersion in a unique setting. Extended Reality (XR) technologies have the potential to deliver such uniqueness by enabling virtual experiences within entirely new environments and imaginary worlds (Alcañiz et al., 2019; Farah et al., 2019). These technologies can simulate scenarios and contexts that are otherwise impossible to encounter in the physical world (Alcañiz et al., 2019). By incorporating graphic elements, digital artworks and out-of-the-box visuals, XR enhances customer's satisfaction level (Farah et al., 2019). As a result, the ability of brands to craft distinctive, immersive experiences with XR becomes an even more powerful competitive advantage.

2.3.2. Omnichannel development

In the digital era, when consumers need to make a purchase decision, they no longer limit themselves to a single sales channel. Instead, they constantly move from one channel to the other (Kotler et al., 2020a). Omnichannel marketing aims to integrate all these channels in order to create a coherent and homogeneous customer experience. It goes beyond simply having a presence on multiple platforms; it focuses on delivering a seamless, personalized experience that transitions smoothly across all channels (Ritcher, 2025).

Omnichannel development is one of the marketing trends that is shaping today's marketing strategies. It consists of creating a unified experience across channels, physical and digital. Companies must seamlessly stitch together experiences across the customer journey as customers expect seamless and cohesive experiences across physical and digital channels. Even though online shopping is growing, it does not reduce the importance of physical channels (Deloitte Digital, 2024).

According to Deloitte Digital (2024), there are three key drivers to this trend. First, customers expect seamless and consistent experiences across all channels they use. Secondly, technological advances now enable the integration of these channels more effectively than ever. Finally, adopting an omnichannel approach can be a powerful differentiator for companies looking to enhance customer satisfaction and build loyalty (Deloitte Digital, 2024).

Macy's, an American department store and a pioneer in omnichannel marketing, reports that its omnichannel consumers spend eight times more than those who use only one channel. The company implemented omnichannel strategies in 2008 in response to the increasing presence of e-commerce. But today, Macy's views the full integration of its sales channels as a major driver for growth (Kotler et al., 2020a).

Technological advancements, changes in consumers' lifestyles and shifting expectations continue to accelerate the adoption of omnichannel strategies (Hilken et al., 2022; Kotler et al., 2020a; Ritcher, 2025). Integrating offline and online experiences has become a strategic priority (Hilken et al., 2022). The global pandemic further reinforced this trend. Retail businesses that had shut down experienced a surge in online shoppers. However, once physical stores reopened, brands faced a new challenge: how to retain the customers gained during lockdown. The key was delivering a seamless omnichannel experience (Ritcher, 2025).

In an omnichannel strategy, channels can be divided into two main categories: online and offline. Both are essential, as they enable different types of interactions. As mentioned earlier, the online channel is becoming increasingly popular due to its numerous advantages such as timesaving and the convenience of shopping from anywhere (Batat, 2021; Dey, 2024). Indeed, virtual stores provide an at-home shopping experience without the need for travel and even facilitate remote collaboration with friends when making purchasing decisions (Alcañiz et al., 2019). Consumers also believe that they have access to more information and options, helping them find products and services that better meet their needs and desires (Batat, 2021).

However, physical stores remain crucial, as they offer aspects that would be very difficult to replicate in virtual stores such as touching or tasting the product (Alcañiz et al., 2019), which is particularly important for consumers who value hands-on interactions (Dey, 2024). Consumers state that when using an e-retail channel, their experience is not as rich as in physical stores, including, multisensory interactions with the product, the store and the salesperson (Alcañiz et al., 2019). Moreover, physical channels remain the only means for brand interaction, product discovery and in-person engagement (Deloitte Digital, 2024).

As stated earlier, one of the drivers to the implementation of omnichannel strategies is technological advancements. Among these innovations are XR technologies, they are introducing a new channel and creating new opportunities for companies to deliver a seamless experience to consumers. Nevertheless, the role of XR technologies in omnichannel strategies goes beyond simply adding a new technology or sales channel. They can bridge the gap between online and offline experiences by addressing the limitations of online channels by incorporating the affordances of offline channels (Alcañiz et al., 2019; Gonçalves et al., 2023; Hilken et al., 2022).

XR technologies increasingly enable multi-sensory interactions and thus are poised to substitute for the lack of sensory experience in online settings (Gonçalves et al., 2023; Hilken et al., 2022). For example, they allow to interact with products virtually, potentially overcoming the limitations of traditional e-commerce (Gonçalves et al., 2023). Another example is the “Feelreal” scent mask that can be attached to headsets, enabling the user to smell up hundreds of smells during the immersive experience (Hilken et al., 2022).

XR technologies provide a new innovative channel that can be considered half-way between physical and digital channels (Farah et al., 2019). They merge reality and virtuality, for example virtual fitting rooms that are the perfect combination of physical and virtual channels (Kotler et al., 2020a). Furthermore, they offer advantages such as high levels of interactivity and engagement and new features such as immersion and presence (Farah et al., 2019).

2.3.3. Gamification

Gamification refers to the use of game design elements in non-game contexts (Kotler et al., 2020a). During the last decade, gamification emerged significantly in the field of marketing after researchers found out its potential to generate behavioral changes (Yang et al., 2023) and improve engagement from consumers (Kotler et al., 2020a; Yang et al., 2023). It has

also been successfully used in other fields, and the trend is expected to keep expanding (Yang et al., 2023).

As a result of its increasing presence in marketing, gamification has been shown to enhance desirable consumer behaviors (Ebrahimi et al., 2024) and to have a positive impact on purchase intentions (Liao et al., 2024). This phenomenon can be explained by several factors. First, gamification has the capacity to create positive emotions (Liao et al., 2024; Ebrahimi et al., 2024) and increase emotional engagement (Liao et al., 2024). Then, it brings immersion to the user and promotes extended engagement (Ebrahimi et al., 2024). In addition, gamification increases customers' knowledge and comprehension about the brand. All these characteristics are eventually leading to brand engagement as well (Ebrahimi et al., 2024; Yang et al. 2023).

When used in advertising, gamification should not be mistaken with in-game advertising which is the implementation of advertising content into video games. Advergaming, which is the use of gamification in advertising, are specific games created to deliver marketing content and achieve advertising objectives. Past studies on advergaming have demonstrated their strong potential to improve companies' marketing performance (Yang et al., 2023).

A powerful tool that has already been successfully used in gamification strategies is Extended Reality (XR). In recent years, gamification in XR has gained significant attention as a method to enhance engagement and motivation. Indeed, XR allows a level of interactivity in gamification activities that was not possible with traditional channels (Atiker, 2023). These new interactive experiences “can create brand awareness, increase brand loyalty and create a deeper emotional connection with the brand” (Atiker, 2023, p.324).

In conclusion, gamification presents a valuable opportunity to enhance the use of Extended Reality (XR) in marketing by adding layers of interactivity, engagement and emotional connection. As XR technologies evolve, especially with advances in Mixed Reality (MR), gamified experiences become even more immersive, allowing users to interact directly with digital content.

2.3.4. Personalization

Personalization in marketing allows companies to tailor their messages and products to each customer. It helps consumers feel more satisfied and build a stronger relationship with the brand (Atiker, 2023). In their experience with brands, consumers now expect personalization across all digital channels (Bansal, 2024). According to Deloitte Digital (2024), “75% of consumers are more likely to purchase from brands that deliver personalized content”, making personalization one of the top marketing trends for 2025 (Bansal, 2024; Deloitte Digital, 2024). Each year, the business value of personalization becomes more evident, as customers increasingly favor brands that recognize and understand them as individuals. Companies that excel in personalization consistently exceed their revenue targets, as their customers make more frequent purchases, spend more and demonstrate long-term loyalty (Deloitte Digital, 2024).

Personalization in Extended Reality (XR) technology can be achieved through User-Centered Design (UCD), a design methodology that prioritizes understanding the needs, goals and perspectives of users throughout design processes. By focusing on the user, XR solutions can incorporate interfaces that meet individual's preferences and expectations. Another important factor in delivering personalized experiences is customer profiling. It is the process of gathering and analyzing data about customers to gain insight into their behaviors, preferences and needs. This approach enables the creation of tailored experiences. In XR experiences, personalization can allow users to modify and customize products according to their wants and tastes, ultimately creating a unique experience and fostering meaningful interactions (Atiker, 2023).

2.3.5. Storytelling

Storytelling plays a crucial role in marketing, particularly in the domain of experiential marketing. It is an essential driver of customer experience consisting of telling a story to consumers by creating a unique universe, a brand identity and an emotional journey. Storytelling can help brands stand out from the competition, bring authenticity and communicate their values (Batat, 2021). As stated previously, consumers are no longer just buying products, they are seeking meaningful experiences (cf. supra p.23). Storytelling enhances these experiences by involving a strong narrative, uniqueness and emotions (Batat, 2021).

Extended Reality (XR) takes this even further by offering new dimensions of immersion. XR enables brands to bring their stories to life in ways traditional media cannot. By surrounding consumers in fully interactive environments, XR enhances engagement and fosters deeper emotional bonds, making the brand feel more authentic and alive. In doing so, it elevates storytelling into a truly immersive, experiential form of marketing (Atiker, 2023).

2.4. XR in Marketing: Use Cases

In 2020, fashion weeks were forced to be held online but the French fashion house Balenciaga took it as an opportunity to use technology innovations (Delinikolas et al., 2022) to create the next generation of virtual runway shows (Dimension, 2025). The Fall 21 collection was first presented on a Virtual Reality runway via a headset sent out to a limited number of guests. It was then introduced to the public as a video game, *Afterworld: The Age of Tomorrow*, designed specifically for the collection (Balenciaga, 2025). In the video game, the player chooses an avatar and is embarked on a journey in New York in 2031, navigating through levels (called zones in the game), the user encounters a total of 50 characters wearing Balenciaga Fall 21 collection (Balenciaga 2025; Delinikolas, 2022; Dimension, 2025). According to Sarah Mower for Vogue, Demna Gvasalia, the designer of Balenciaga, “makes the ‘Quantum leap’ the industry has been waiting for” (2020) with the *Afterworld* video game.

Balenciaga was not the only fashion house to leverage Virtual Reality in delivering an innovative customer experience. The brand Louis Vuitton launched a Virtual Reality experience called *Asnières immersive*. The idea of this experience was to allow people from around the world to visit the emblematic home of Louis Vuitton in Asnières and discover

iconic pieces of the Louis Vuitton collections. Pedro Tome, Head of Client Relations EMEA, says: “We knew the client was hungry for new technologies and to experience the brand in different ways”. To create this experience, the house of Asnières was taken as the starting point of the virtual journey and the element that the client is going to connect with. The goal of this scenario was to fully immerse the user in a captivating virtual story. Instead of relying solely on traditional emotional triggers, emotion was created by introducing the client to an entirely new environment, transporting them into another universe. According to the project’s experts the experience amazed the clients who tried it. Anne Pezet, Digital Innovation Client Experience Manager, reports that “everyone comes out saying: “Wow, I had an incredible time, I learned things, I felt privileged.”” And Agnès Vissoud, Digital Innovation Director says that: “It’s a huge accomplishment for us to be able to immerse our clients in VR for 20 minutes. They had no idea; they didn’t suspect the richness of the history of Louis Vuitton. And when we see them come out with a sparkle in their eyes, there is no greater joy.” (Louis Vuitton Jobs, 2023).

Fashion brands are also establishing a presence within metaverse platforms by creating their own virtual environments and offering digital products within them. An example is Gucci, which launched the Gucci Garden experience on Roblox (Arya et al., 2024). This interactive space allowed users to explore a surreal, dreamlike environment inspired by Gucci’s aesthetic, while also offering exclusive, virtually wearable fashion items (McDowell, 2021). Some of the items are limited-edition like the Dionysus bag which was sold for more than its physical counterpart (Digital Delight, 2022). Gucci is not the only fashion brand who sells virtually wearable assets in the metaverse, we can also cite Adidas, Ralph Lauren, Louis Vuitton, Burberry, Zara, Levi’s and H&M (Arya et al., 2024). By entering the metaverse, fashion brands found a new opportunity to connect with potential customers (Digital Delight, 2022) and reach new audiences (McDowell, 2021).

Another example of a brand that leveraged the metaverse to create a unique and immersive experience is H. Moser & Cie, a luxury Swiss watch manufacturer. In collaboration with Deloitte Digital, they developed a space in the metaverse to support the launch of their new watch collection in an innovative and engaging way. This virtual environment aimed to serve as a unique platform for unveiling the collection while also establishing new, interactive touchpoints with clients. The result was the Moser Lounge, a modern Swiss chalet surrounded by the Swiss Alps. This immersive setting hosted press conferences and offered visitors a captivating journey through the brand’s heritage, craftsmanship and collection (Digital Delight, 2023).

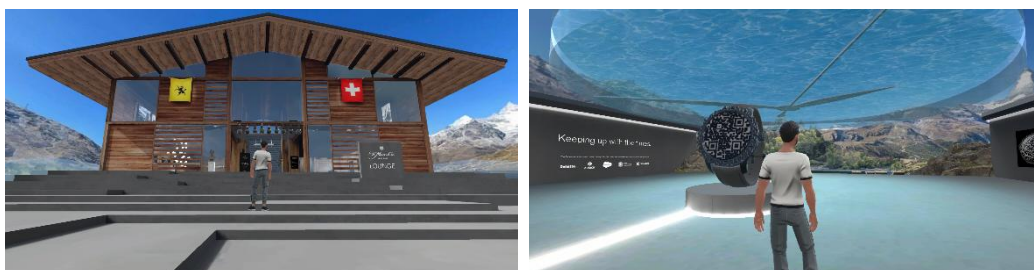


FIGURE 8: MOSER LOUNGE

Source: Digital Delight. (2023). *New client space in the metaverse for a luxury watch brand*. Accessed April 21, 2025, at <https://digitaldelight.be/new-client-space-in-the-metaverse-for-a-luxury-watch-brand/>

This initiative was part of a larger effort to redefine customer engagement by merging the physical and digital worlds, ultimately opening a new, immersive marketing channel. The watch launched, the Endeavour Centre Seconds Genesis, features a QR code engraved inside sapphire crystal. When scanned via the accompanying app, the code unlocks a full Web 3.0 experience (Digital Delight, 2023).

Porsche is also among the brands that have successfully embraced Extended Reality (XR) to enhance their customer experience. First, the Porsche Augmented Reality Visualizer App offers customers a cutting-edge way to experience and configure their dream sports car in three dimensions. By combining the familiar features of the Web Configurator with Augmented Reality, the app allows users to virtually place a photo-realistic Porsche model in any real-world environment, in driveway, living room, or outdoor space. Customers can make modifications like paint color directly in the app and even explore technical details using a unique “highlight function” that reveals hidden components such as the powertrain (Porsche, 2019).

At the end of 2019, Porsche introduced the Taycan VR Experience, offering customers an immersive and interactive way to explore the brand’s first all-electric performance car, the Porsche Taycan. Even in regions where the vehicle had not yet launched, the Taycan could be virtually showcased in Porsche showrooms using Virtual Reality headsets. This innovative experience allows users to get up close to the vehicle, viewing it from every angle, including underneath and interact with features like simulated airflow to observe the car’s aerodynamics in real time. Customers can also explore the interior, discover detailed design elements and customize the paint finish to their liking. “The information needs of our customers in the dealerships are enormous – we can now meet these needs with the VR Experience even before the physical market launch,” explains Robert Ader, Head of Customer Relations at Porsche (Porsche, 2020).



FIGURE 9: TAYCAN VR EXPERIENCE

Source: Porsche. (2020). *Taycan VR Experience*. <https://newsroom.porsche.com/en/2020/company/porsche-taycan-vr-experience-application-20158.html>

In 2024, Porsche embraced Mixed Reality (MR) technology to offer an even more immersive and informative experience for its customers. By integrating MR with the Meta Quest 3 headset, Porsche enables users to see their real-world surroundings while interacting with virtual three-dimensional models of their vehicles. This technology allows users to view cars from different angles and perspectives, offering a deeper understanding of the vehicle’s design and features compared to traditional screen-based images. The ability to isolate and focus on specific parts of the car provides an in-depth exploration of its technical aspects, enhancing the user experience and making the content more meaningful (Porsche, 2024).

Augmented Reality (AR) use cases apply to a wider audience due to their accessibility via smartphones or tablets. A notable example that we already cited earlier is the IKEA Place app, which allows users to visualize how furniture would look in their own space (cf. supra p.21). Another brand leveraging AR is L'Oréal, which offers virtual try-ons through their app or directly on their website. Consumers can experiment with different products, including hair colors and makeup, from the comfort of their homes (L'Oréal Paris, 2025). In the beauty industry, Estée Lauder has taken AR a step further with the launch of its Voice-enabled Makeup Assistant, the first app of its kind designed to assist visually impaired users in applying makeup. By combining AR and AI, the app provides real-time audio feedback on the uniformity, boundaries and coverage of the makeup (Shoaib, 2023). Expanding beyond beauty, Warby Parker, a glasses manufacturer, allows users to virtually try on glasses through their app or website (Warby Parker, n.d.).

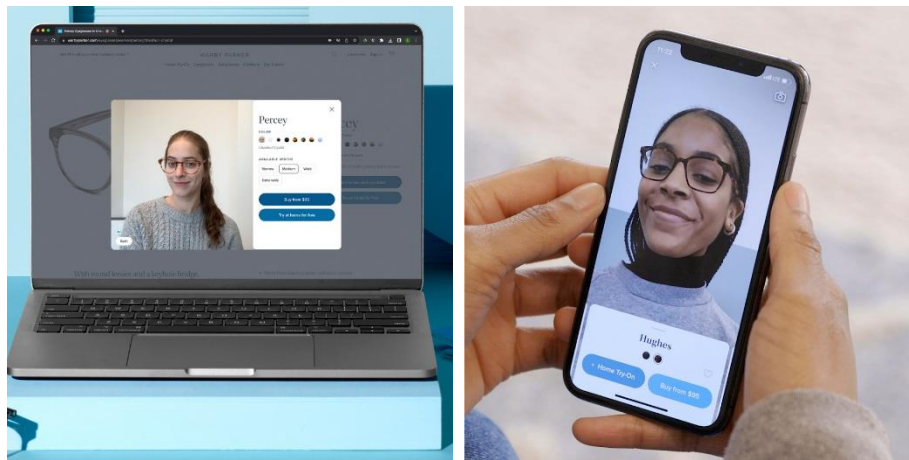


FIGURE 10: WARBY PARKER VIRTUAL TRY-ONS

Source: Warby Parker. (n.d.) Ways to try. <https://www.warbyparker.com/ways-to-try?msocid=0600088d42cd677c3f7d1c124385663c>

2.5. B2B immersive marketing

At present, the consumers' adoption rate of headsets is still low due to their high costs, indicating limited access for end-consumers to Extended Reality (XR) and making it complicated for companies to reach them. Consequently, "in Business-to-Consumer (B2C), except for the few consumers who own a headset, reaching the client will mostly be done through events" says Thomas Kubski, the Director of Digital Strategy and Immersive Experiences at Deloitte Digital. During events, headsets can be brought by companies and loaned to clients. Consequently, the return on investment from immersive experiences in B2C marketing is still in its infancy. Thomas also adds that currently, the return on investment is mostly at a brand image level rather than at a sales level.

On the other hand, in Business-to-Business (B2B), there are already more use cases. During the interview with Thomas Kubski, he said that something that truly differentiates the two segments is that in B2B, we are more often in situations where the client has time available. In addition, the product or service is often more complex and requires more detailed explanations. In contrast, in B2C, the attention time dedicated to brands has been drastically decreasing in recent years. In B2B, with the longer time available with clients,

there is an opportunity for immersive experiences to enhance information recall and memorization, as well as to facilitate the explanation of complex concepts (Kubski, 2025).

Thomas Kubski outlined two strategies that can be adopted in B2B immersive experience marketing: equipping the sales force with headsets or leveraging events and fairs. During my internship, I had the opportunity to gain insights into a project based on the strategy of equipping the sales force with headsets. The immersive experience was developed by the XR team I worked with, in collaboration with the client.

The client, a leading multinational in the nutrition sector, organizes visits to their factory for the prescribers of its products. Approximately 500 prescribers visit the factory each year at a cost of \$1,500 per visit. The client wanted to launch an immersive experience with the objective of reaching more prescribers while reducing costs and lowering its carbon footprint. This experience, using XR, would also enhance message recall and improve brand perception, thanks to the emotional engagement it generates.

The experience developed by the XR team of Deloitte Digital consists of a 15-minute presentation of the factory through a combination of Mixed Reality and Virtual Reality. The tour is guided by interactive storytelling and integrates 360-degree videos and hyper-realistic 3D models. These 3D models are interactive thanks to gesture recognition technologies present in the Mixed Reality headsets.

The results of this solution proved to be highly impactful on multiple levels. The company is now saving 60 tons of CO₂ annually thanks to the significant reduction in travel. The cost savings were also substantial, 500 prescribers travelled each year at a cost of \$1,500 per person, amounting to a total of \$750,000 annually. Within six months after the launch of the experience, 4000 prescribers were reached with an excellent satisfaction rate of 95%. Hosting this many visitors at the factory would have cost approximately \$6 million whereas the experience solution required only half a million investment, plus the cost of the headsets of \$200 per device (after tax amortization). Moreover, the solution allowed the company to extend their reach to prescribers from 19 different countries.

This use case is characterized as prescriber marketing which refers to the strategies used to influence healthcare professionals who have the authority to prescribe medications or recommend medical treatments. In this case, the recommended product was a specific food item, placing it within the context of dietary recommendations, but the underlying process remains the same. The goal is to educate, inform and influence healthcare professionals rather than directly selling to consumers. It is interesting to mention that even though this is a B2B strategy, there is still an indirect impact on end-consumers. They are indirectly affected by the experience as the company has succeeded in creating trust from the prescribers, who, in turn, will recommend the product to end-consumers. This can be seen as a strategic way to circumvent the low adoption rate of headsets among consumers.

From the perspective of the end-consumer, these prescribers are positioned within the social context element of the General model of consumer behavior (Mullen & Johnson, 2013), which will be further discussed in the next section. In brief, the social context is characterized by the presence of others who influence an individual's intentions, behaviors and internal psychological processes. The success of this prescriber marketing campaign

highlights the potential of further exploring the role of social context in influencing decision-making. While this approach has proven effective with healthcare professionals, its principles can be extended to other types of “influencers” across different product categories. Just as healthcare professionals influence dietary decisions through their trusted recommendations, other industries could leverage immersive experiences with their key opinion leaders or trusted intermediaries.

Consider, for example, an optician who purchases and recommends glasses frames and lenses, acting as both an intermediary and an influencer in the end-consumer’s decision-making process. In this industry, it is common practice for sales representatives to regularly visit opticians to present new collections of frames, spectacle lenses, contact lenses or other optical products. There is an opportunity to equip these representatives with immersive experiences that showcase the brand's expertise, taking the optician behind the scenes of the manufacturing process. Through virtual factory tours or immersive demonstrations, the sales representative can provide a deeper understanding of product quality, innovation and craftsmanship.

Unlike the case of prescriber marketing with healthcare professionals where the primary goal is to influence recommendations, this scenario involves a more direct sales approach. The sales representative aims to convince the optician to purchase the product. This presents a dual opportunity: immersive experiences can drive both sales and product recommendation. If the immersive experience succeeds in convincing the optician of the product’s quality thanks to enhanced understanding and trust, then the optician is likely to recommend it. This introduces both a direct and indirect effect of the immersive experience (see Figure 11).

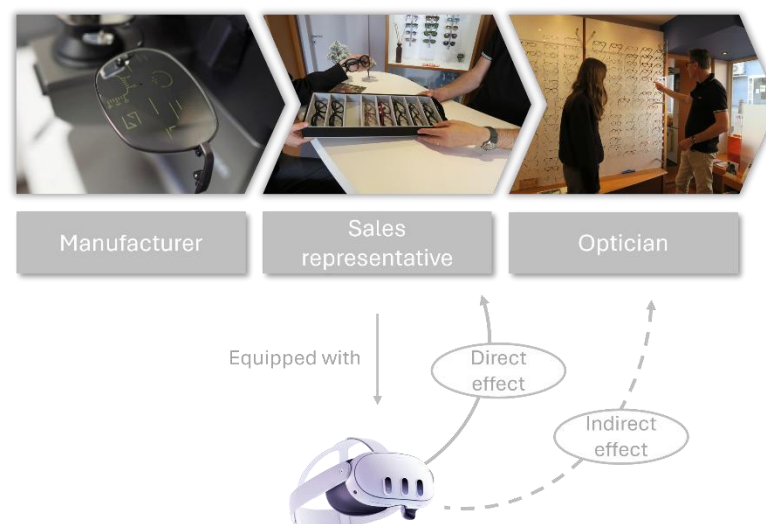


FIGURE 11: EQUIPPING SALES REPRESENTATIVES WITH XR (OPTICIAN USE CASE)

Source: Photos taken by the author, April 2025. Headset image: Meta. (2025). *Meta Quest 3*. <https://www.meta.com/be/fr/quest/quest-3/>

With this use case also comes the powerful concept of taking the audience behind the scenes of a brand, allowing them to discover it as they never have before and creating an emotional connection. From a completely different sector, we have seen the Asnières experience of Louis Vuitton, taking the consumers behind the walls of the home of Louis

Vuitton. After this experience, users developed a strong sense of privilege and exclusivity (cf. supra pp.27-28). By taking their audience behind their walls, brands can create a sense of exclusivity that helps build a stronger emotional connection and loyalty. This immersive access transforms the traditional customer-brand relationship into a more personal, almost like an insider's view experience. Instead of simply consuming a product, the audience feels as though they are part of the brand's journey, heritage and values. This insider perspective not only enhances perceived authenticity but also elevates the brand's storytelling power by making the experience memorable and something people want to share. Whether in luxury, manufacturing, or healthcare, offering exclusive behind-the-scenes access can act as a powerful differentiator in crowded markets, turning passive viewers into active advocates.

Another advantage that companies can retrieve from this type of strategy, which was very successful in the prescriber marketing case, is that the immersive experience can offer the advantage of scalability. In the example of the factory tour, many more prescribers have been reached and with an expanded international reach. This scalability can even be done without sacrificing personalization, another successful marketing trend seen in the literature review (cf. supra pp.26-27). For example, different versions of an experience could be adapted to the needs of different stakeholder groups, for instance, opticians, procurement teams or even educators in optical schools. Through modular content or interactive decision paths, the same immersive tool can adapt to various levels of expertise, interests or even languages.

Inviting professionals behind the walls of a company taps into a growing expectation for transparency and authenticity in business relationships. Immersive storytelling that feels genuine helps make the brand more relatable and builds trust. When a sales representative takes a client on a virtual tour of the factory or R&D center, the company is not just promoting a product, it offers proof of its values, quality standards and expertise. This direct, emotional connection becomes particularly valuable in industries where the stakes of recommendation or purchase are high.

Furthermore, as Thomas Kubski pointed out, products and services in B2B are often more complex and need a deep understanding from the customer. Immersive experiences can here play a crucial role in simplifying complex concepts, visualizing abstract processes and demonstrating value in a clear and engaging way. Instead of relying on brochures, slides or verbal explanations, companies can use immersive technologies to show rather than tell. For instance, a virtual tour of a production line or a simulated demonstration of a technical product allows clients to fully understand how it works, its quality and what it can do. This not only enhances comprehension but also accelerates the decision-making process, as the client is more informed and confident. In industries where product differentiation depends on technical details or innovation, immersive experiences can become a strategic asset for persuasion and trust-building. A great example of this is Porsche's 2024 adoption of Mixed Reality with the Meta Quest 3 (cf. supra p.29), allowing customers to interact with highly detailed 3D models of their vehicles in real-world environments. This approach exemplifies how immersive technology can simplify complex product features and elevate understanding, making the customer journey more engaging and informative.

Finally, this strategy also aligns with the shift towards omnichannel (cf. supra pp.24-25). Traditionally, engaging prescribers and intermediaries relied on physical visits and printed materials. Today, immersive experiences enhance these efforts by bridging physical and digital channels, creating a seamless and impactful experience. Taking the audience behind the walls of a brand through virtual factory tours or immersive product demonstrations was not possible before. Immersive experiences now enable this level of transparency and emotional connection, adding significant value to sales visits. This strengthens trust and reinforces influence in a way that aligns with modern omnichannel expectations.

3. Consumer Behavior

In order to understand the concept of purchase intentions outlined in the research question and to later link it to immersive experiences (see section “4. Hypotheses elaboration”), we need to explore the broader field of consumer behavior. Micro economy was the first field to be interested in consumer behavior. This approach viewed consumption decisions as the result of rational and conscious calculations. This rational economic view began to be minimized due to its ignorance of many other more irrational factors of consumer’s consumption decision. Mid-20th century, other fields of human sciences started to emerge like behaviorist theories, psychoanalytic approaches or the cognitivist vision (Brée & Pantin-Sohier, 2023).

In the 1950s, marketing experts started formulating theories to explain, understand and predict consumer behavior. From this period, the theoretical conception of behavioral models has evolved greatly, and a wide range of models have been developed (Reina Paz & Rodríguez Vargas, 2023). Among these models, the General model of consumer behavior (see Figure 12) proposed by Mullen and Johnson (2013) in their book *The Psychology of Consumer Behavior*, will help us understand the mechanisms behind consumer behavior.

On the left side of the model is the stimulus situation, Mullen and Johnson wrote: “The stimulus situation is the complex of conditions that collectively act as a stimulus to elicit responses from the consumer” (2013). Then, several internal processes are depicted, they are defined by the authors as “a related series of changes that occur within the individual” (2013). The authors emphasize the interrelationships between internal processes and the fact that there is no predetermined sequence between them. One could occur before the other and influence it or the other way around. Resulting from the direct and interactive effects of the internal processes are intention and behavior. Intention is defined as the plan to purchase or use the product while the behavior is the actual purchase or use of the product. A feedback effect also exists from behavior to internal processes. Surrounding this whole process are the social and cultural contexts. They respectively correspond to the totality of social and cultural stimulations that influence the individual (Mullen & Johnson, 2013).

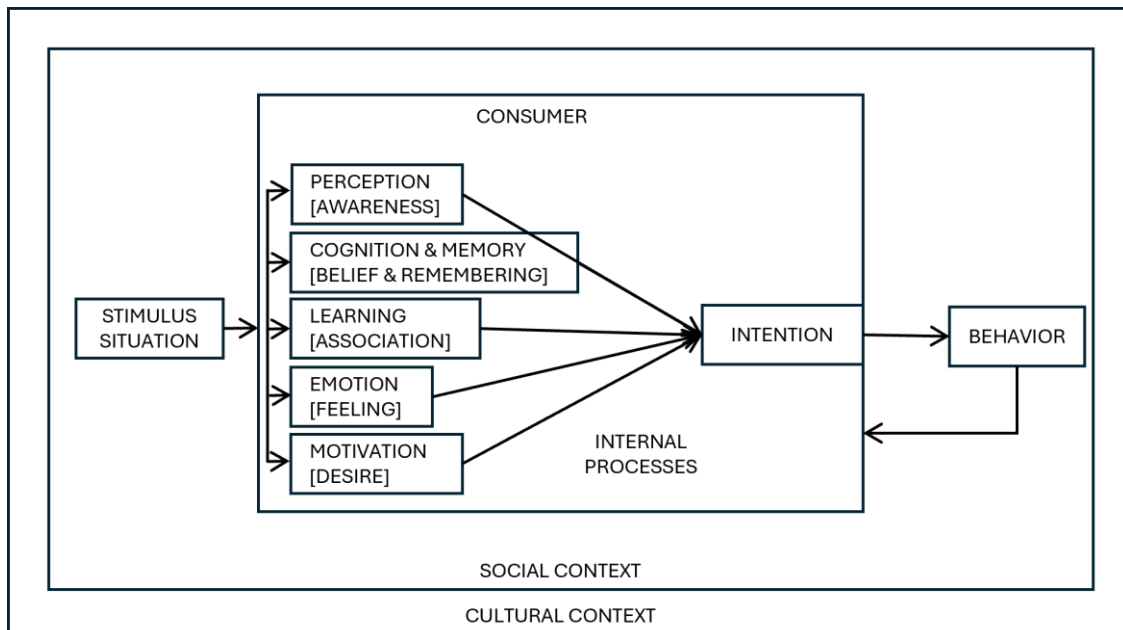


FIGURE 12: GENERAL MODEL OF CONSUMER BEHAVIOR

Source: Mullen, B., & Johnson, C. (2013). *The Psychology of Consumer Behavior*. Psychology Press; O'Reilly. https://www.oreilly.com/library/view/the-psychology-of/9780898598575/?_gl=1*9tuhxy*_ga*MTc3MzEyMjE4MS4xNzI5NTIzNTI0*_ga_092EL089CH*MTc0MDIxOTA5Ni40LjEuMTc0MDIxOTEyNi4zMzC4wLjA.

The term perception is often used to describe what consumers believe about a product. For instance, saying that an ad made someone develop a positive perception of a product. However, the authors consider this use as inappropriate and define perception as the “psychological processing of information received by the senses” (Mullen & Johnson, 2013). In other words, it is how consumers become aware of products through sensory information. Brée and Pantin-Sohier (2023) share the same view and add that perception is a process happening in three stages: exposure to the information, attention and decoding of the information. The importance of attention in the process of perception was also highlighted by Mullen and Johnson (2013) because consumers need to focus attention on elements in order to be aware of them. In their view, perception is measured through awareness. The authors propose assessing awareness during task performance through various techniques, including observation of pupil size, eye fixations, the Conjugate Lateral Eye Movement (CLEM) or the index of communication effectiveness (Mullen & Johnson, 2013). Perception is limited in time, the perceived information will be available for a very short period except if the process of memorization starts (Brée & Pantin-Sohier, 2023).

Moving on to the internal process of cognition and memory. Memory “refers to the process of retention of information” (Mullen & Johnson, 2013) and it results in encoding, storage and retrieval of information. Cognition involves the mental activities related to understanding, evaluating and forming beliefs about products. Memory and cognition can be seen as two interconnected aspects of how consumers process and think about products. Memory is measured by the retention of information and retention can be measured by four different measures: unaided recall, aided recall, masked recognition and recognition. They can be divided into two main processes: recall and recognition. Recall requires the reconstruction

of information while recognition requires discrimination between items. The distinction between the two processes is based on the context. Indeed, if a consumer is in a supermarket and needs to choose among different brands, he is engaged in a recognition task as he needs to choose among different brands. However, if the consumer needs to make a choice before going to a supermarket, he is engaging in a recall task. To better understand this analogy, we can consider the example of different exam formats. In a multiple-choice exam, students primarily rely on recognition as they identify the correct answer from a set of options. In contrast, writing an essay requires recall, where students must retrieve and organize information from memory without any cues. Measuring cognition is done through the measurement of beliefs consisting of consumers evaluating attributes of a product (Mullen & Johnson, 2013).

Learning as an internal process of consumer behavior refers to the relatively permanent changes in a person's responses due to experience or practice. It explains how consumers form associations between two stimuli or a stimulus and a response, like connecting a brand with satisfaction or disappointment (Mullen & Johnson, 2013). Brée and Pantin-Sohier (2023) define learning as the shift of punctual behavior to becoming a habit. Learning can happen through classical conditioning (associating a brand with positive stimuli), operant conditioning (reinforced behavior through rewards), or observational learning (imitating others) (Brée & Pantin-Sohier, 2023; Mullen & Johnson, 2013).

Then, emotion is the internal process involving arousal and feelings in response to stimuli, often coupled with physiological reactions. In consumer behavior, the internal process of emotion results in feelings. Feelings are often measured through both self-report and physiological methods. Self-report techniques include surveys or rating scales where consumers describe their emotional responses to products or ads. Physiological measures, like tracking pupil dilation, heart rate, or skin conductance, capture automatic emotional reactions. Mullen and Johnson (2013) argue that the best practice is a combination of both techniques.

Motivation is the internal tension or drive that energizes, directs and sustains behavior toward a goal. In the context of consumer behavior, it is what pushes a person to fulfill needs or desires (Mullen & Johnson, 2013). According to Brée and Pantin-Sohier (2023), motivation is the consequence of the activation of a need. In other words, "a need becomes a motive when it is aroused to a sufficient level of intensity" (Kotler et al., 2020b, p. 155). Needs are typically measured using self-report or projective measures. Self-report involves surveys or questionnaires where consumers identify their needs or motivations. With projective techniques, consumers respond to ambiguous stimuli, revealing underlying desires and needs (Mullen & Johnson, 2013).

Transitioning to intention and behavior, intention refers to a consumer's plan or readiness to perform a specific behavior, such as purchasing a product, while behavior is the actual execution of that action. These are the end-results of internal processes. For example, after forming positive attitudes and motivations, a consumer may form an intention to buy, which may or may not lead to actual behavior depending on situational factors. Behavior also provides feedback into the system; positive experiences can reinforce internal processes and intentions (Mullen & Johnson, 2013).

The social context encompasses interpersonal influences that shape consumer decisions, including friends, family and salespeople. This context provides social cues and norms that affect how consumers interpret product information and make choices. Word-of-mouth recommendations, social proof and the opinion of respected others can validate or discredit products. Social roles and relationships also determine consumer priorities and behaviors (Mullen & Johnson, 2013).

Cultural context refers to the broader societal and cultural influences on consumer behavior, including traditions, values, subcultures and social classes. This context provides the framework within which preferences, needs and behaviors are shaped. Cultural norms affect everything from brand perception to what is considered appropriate consumption (Mullen & Johnson, 2013).

4. Hypotheses elaboration

First of all, let me remind the research question: “How do immersive experiences influence consumers’ purchase intentions?”. As explained earlier, immersive experiences refer to experiences with a headset allowing Virtual Reality and Mixed Reality. The purchase intention is characterized by the consumer’s plan or readiness to purchase a product or service.

Obviously, the first hypothesis is the direct relationship between immersive experiences and purchase intentions. Immersive experiences engage consumers in highly interactive and multisensory environments. This immersive quality captures attention and fosters a strong sense of presence, which, in turn, drives deeper engagement and increases purchase intentions. At the pre-purchase stage of the customer journey, these experiences enhance the level of informativeness and help consumers feel more confident in their decisions. This is particularly impactful in industries like tourism and hospitality, where “try before you buy” options were previously limited or unavailable. Additionally, immersive experiences align well with modern marketing strategies such as omnichannel and experiential marketing. Omnichannel marketing meets consumers’ demand for seamless brand interaction across multiple platforms, while experiential marketing satisfies their desire for memorable and engaging experiences. Furthermore, immersive technologies amplify trends like gamification, personalization and storytelling, working together to answer customers’ needs for meaningful, unique and personalized interactions with brands.

This leads us to the elaboration of the first hypothesis:

- Given their ability to engage customers emotionally and cognitively while enhancing decision confidence, immersive experiences likely have a significant positive effect on purchase intentions.

After reviewing the literature, I noticed that researchers who have tried to answer similar research questions, for example testing the impact of immersive experiences on intentions or customer experience, have used models and tested the relationship between variables including a mediating effect. I have decided to use the same type of methodology by constructing my own research model.

By looking at the models that have been used in other research to test the impact of Extended Reality (XR) on customers' intentions, either the researchers elaborated their own model, or they adapted existing models to fit their study. For example, authors like Orús et al. (2021) and Putri et al. (2024) developed their own models. Orús et al. (2021) tested the impact of device and content type on presence and intention, as well as the mediating effect of ease of imagination and visual appeal in the relationship between presence and intention. Putri et al. (2024) analyzed the factors influencing consumers' purchase intentions mediated by immersive experiences. On the other hand, Shahab et al. (2022) and Kieanwatane and Vongvit (2024) chose to adapt existing models to their research. Shahab et al. (2022) incorporated the Elaboration Likelihood Model (ELM) with the Theory of Planned Behavior (TPB) to create an adapted model to their research focusing on comparing the impact of VR and video on consumer behavior. Kieanwatane and Vongvit (2024) used the Technology Acceptance Model (TAM) to examine travel intentions through Virtual Reality (VR).

Most research in the field of Extended Reality (XR) marketing has primarily examined the characteristics of XR experiences and their effects on consumer experience and behavior. For example, testing it through presence or visual characteristics. However, I suggest a different approach by focusing on the internal psychological processes that influence consumer intentions. Specifically, I aim to explore how XR experiences shape these internal processes, which, in turn, affect consumers' purchase intentions. To this end, I took inspiration from the General consumer behavior model (Mullen & Johnson, 2013) to create my research model.

In the selection process of a model, I reviewed the following papers and books:

- Main theoretical consumer behavioural models. A review from 1935 to 2021 (Reina Paz & Rodríguez Vargas, 2023)
- Comportement du consommateur (Brée & Pantin-Sohier, 2023)
- Theory of Planned Behavior (Ajzen, 1991)
- Psychology of Consumer Behavior (Mullen & Johnson, 2013)

The idea was to find a model that can be adapted to create a research model to answer the research question. Consequently, it was essential to select a model including the concept of intention but also factors influencing it. It was also crucial that it was not too complex to be able to adapt it easily to a specific context. From the review of the above papers and books, it is the General model of consumer behavior developed by Mullen and Johnson (2013) in their book, *The Psychology of Consumer Behavior*, that suited the most this study purposes.

It was chosen for its simple representation of the complex study of consumer behavior. Although it is simple, it still incorporates the most fundamental and important elements found in other models of consumer behavior. Moreover, this model was adaptable to the research question as it directly addresses the concept of intention with a clear link with other factors of consumer behavior.

I made the choice to adapt the model and to narrow it down to the stimulus situation which will be the immersive experience, two internal processes and the intention. The purpose is

to analyze the mediating effect of emotion and memory between the immersive experience and purchase intention. I chose to focus on only two internal processes for simplification purposes but also because emotion and memory are the most relevant in the context of immersive experiences.

This leads us to the second and third hypotheses:

- Immersive experiences create emotionally engaging experiences which translate into higher purchase intentions.
- Immersive experiences enhance the information memorization which leads to better knowledge of products or services and translates into higher purchase intentions.

Another reason why I chose not to incorporate perception, learning and motivation is because the measurement of these variables would not have been possible in the context of the data collection method I will be using to test the hypotheses. This will be further explained in the next section.

Use Case: Namur office of tourism

1. Context

The empirical analysis of this research focuses on an immersive experience developed for the Namur office of tourism. Before diving into the use case, it is important to understand its context. In this section, an overview of the Namur office of tourism is provided, including its missions, positioning and communication channels. Following that, the challenges faced by the tourism office are explored, along with how they could be addressed through an immersive experience.

The Namur office of tourism is a non-profit organization (ASBL) partially funded by the City of Namur. Its two missions are to inform and promote. The informational role focuses on serving visitors already in the city, either tourists or inhabitants, by welcoming them at the physical location of the tourism office in Namur. There, staff members are available to answer questions and provide recommendations. Brochures and travel guides are also available. Promoting the city, the second mission, involves activities aimed at increasing Namur's visibility. These include digital communication, international fairs and working with the press. In order to promote the city, each year, the office launches a 360-degree marketing campaign tailored to specific target audiences, and on an everyday basis, they post on social media. At the international level, they participate in tourism fairs in bordering countries; otherwise, in more distant markets, the city is represented by Visit Wallonia, the official body promoting the region of Wallonia as a whole (Voglet, 2025).

If the city's assets had to be summed up in one word, it would be its charm. Namur is claimed to be a small city that has everything to offer: the proximity of water, nature, the town's conviviality, etc. It is a small city but with big ambitions, as it is the capital of Wallonia and it assumes that role. Moreover, Namur is recognized by UNESCO among the Creative Cities Network. This translates into the installation of infrastructures and research in the digital and technological fields (Voglet, 2025).

Dimanche and Andrades (2024) highlight the current challenges and trends that the tourism sector is facing, among which are technology and digitalization. While this century's technological disruptions are revolutionizing every sector, in the tourism industry, digitalization stands out as an opportunity for destinations to create a competitive advantage and enhance the tourist experience. In a discussion with Margaux Voglet, Communications and Press Relations Officer at Namur's tourism office, on which issues and needs could be addressed by an immersive experience for the office of tourism, she also highlighted the need for digitalization.

Moreover, Margaux emphasized two other main issues to which an immersive experience at the office of tourism could be beneficial. The first is crowd management: during the high season, the office can receive up to 400 visitors per day. This affluence creates waiting times, as only two people are available to welcome visitors. An immersive experience would allow people either to wait in a more engaging and playful way or to absorb part of the crowd by providing information through this alternative channel.

Next, she highlighted the importance of welcoming public with different needs. She gave the example of visitors with disabilities who may not have an auditory memory and may retain little information after a traditional explanation from the staff. This might require an adapted version of the immersive experience but would allow the tourism office to better meet the specific needs of a disabled audience.

Finally, to a lesser extent, it would be a great way to provide an overview of what is available to do in Namur. Indeed, with the city's growth in tourism, the number of activities and places to discover is multiplying, making it increasingly difficult (if not impossible) for the staff to give an exhaustive answer to the question, “What can I see in Namur?”. With an initial overview provided through the immersive experience, it would become easier to offer more precise information on specific aspects.

In conclusion, an immersive experience would offer the Namur office of tourism a new channel to address current challenges while aligning with the city’s recognition in the UNESCO Creative Cities Network. It would support digitalization efforts, improve crowd management, enhance accessibility for diverse audiences and offer a clear, engaging overview of Namur’s growing range of activities. Ultimately, it would reinforce its forward-looking identity.

2. Development and description of the experience

During my internship at Deloitte Digital, I had the opportunity to develop an immersive experience specifically for the purpose of my research. With the XR team, we collaborated with the Namur office of tourism to create an experience that highlights the city's key points of interest, aiming to spark curiosity and encourage potential visitors to explore Namur. The experience will be available at the tourism office, allowing visitors to discover the city’s main attractions.

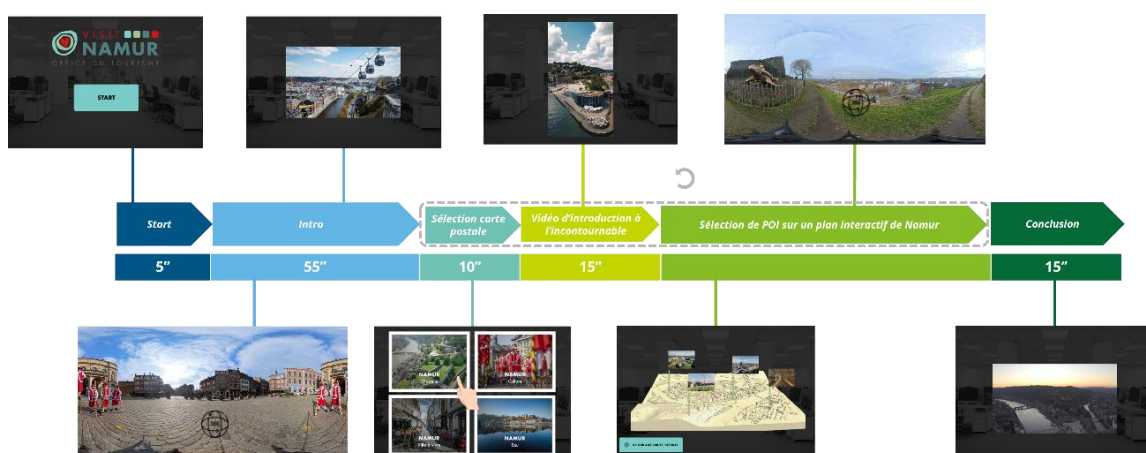


FIGURE 13: STORYLINE OF THE NAMUR IMMERSIVE EXPERIENCE

Source: Deloitte Digital. (2025, March). *Storyboard, Office du Tourisme de Namur.* [Power Point Presentation].

Our team worked closely with Amélie Lefèvre, the Director of the office of tourism and Margaux Voglet, the Communications and Press Relations Officer. Their valuable insights helped us design an experience that brings together the city's must-see attractions and sites. They identified four main themes, such as "Culture", each linked to specific points of interest, like the Archaeological Museum. Based on this selection, we developed ideas and concepts to showcase these elements. The first step of the development was to create a storyline (see Figure 13) to validate the concepts with them.

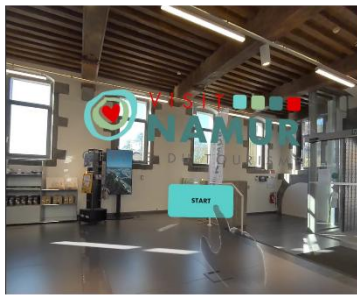
Once the storyline was validated, we could start creating the storyboard which depicts the scenes that will be present in the experience along with the audio, interactive elements and so on. The storyboard elaboration occurred in iterations that we validated each week through a meeting with Amélie and Margaux. Additionally, we collected inputs from their side, such as the graphical chart of the office of tourism, logos, photos, videos, etc. We also went on-site to film 360-degree videos of the selected locations that we wanted to feature in the experience. After the final version of the storyboard was approved, we could start developing the experience which was carried out by the team's developers specialized in immersive experiences.

The experience combines several elements of XR, such as Mixed Reality, Virtual Reality videos and 3D interactive elements. It starts in Mixed Reality with the "Visit Namur" logo in the background and a "START" button. After the user clicks on "START", he is immersed in a 360-degree video of the narrator introducing himself. The narrator is embodied by a stilt-walker, stilt-walking "fights" called "joutes d'échasseurs", are a typical tradition from Namur making the narrator a symbol of the culture of the city.

The introduction continues with a Mixed Reality video introducing the experience. Following this, four postcards appear, each representing one of the four themes of the experience from which the user can choose: "Citadelle", "Culture", "Ville à vivre" and "Eau". Once a theme has been selected, they each lead to an introductory Mixed Reality video followed by an interactive map of the city. From this map, the user can select between three to five points of interest (POI).

When a POI is selected, the user is immersed in a 360-degree Virtual Reality video of that location in Namur. Informational overlays are added to these videos to enrich the experience. The user has the possibility to select as many themes and points of interest as he wishes, allowing for flexibility in terms of both the duration of the experience and the content he wants to explore. Finally, by clicking on the "END" button, a concluding Mixed Reality video appears inviting the user to visit Namur. Figure 14 provides a visual representation of the experience with screenshots illustrating the several scenes.

Introduction



Mixed Reality with interaction

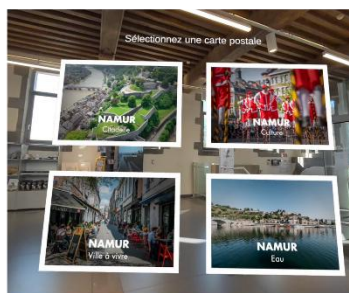


360° video

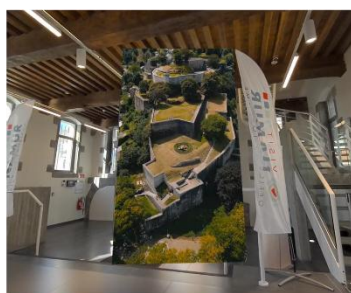


Mixed Reality video

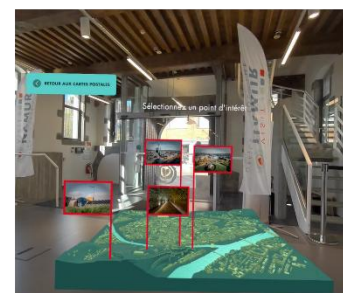
Theme and POI selection



Mixed Reality with interaction



Mixed Reality video

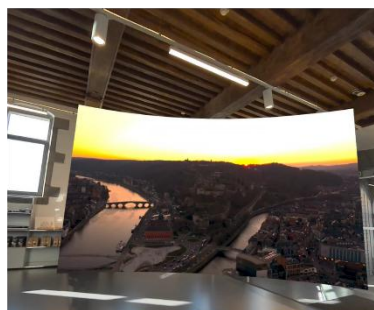


Mixed Reality with interaction

Conclusion



360° video with overlay



Mixed Reality video

FIGURE 14: NAMUR IMMERSIVE EXPERIENCE, VISUALIZATION

Thanks to Deloitte Digital's expertise, key success factors of an immersive experience were integrated into it. One of the most important aspects was designing a progressive onboarding process through Mixed Reality. At the beginning of the journey, users are introduced to the experience in a Mixed Reality environment, rather than immediately being immersed in a fully virtual world. This approach is particularly beneficial for first-time users, as it allows them to gradually adapt to the virtual environment. By maintaining a connection to the real, physical environment, users feel more comfortable and confident before transitioning into deeper levels of immersion. This step ensures a smoother, more intuitive beginning of the experience, reducing potential discomfort.

Secondly, we integrated interactivity as a core component of the experience. Interactivity plays a crucial role in enhancing customer engagement and satisfaction. From the very

beginning of the development process, we carefully considered ways to integrate interactivity into the experience. To achieve this, we implemented a selection of postcards representing the four themes as well as interactive maps of the city that allow users to select points of interest, giving them control over their journey.

The ability to select points of interest not only enhances interactivity but also enables personalization, a key factor identified in the literature review as crucial for user engagement. By tailoring the experience to individual preferences, we ensured that each user's journey felt unique, making the experience more compelling and memorable.

Lastly, engaging storytelling was developed to accompany the entire experience. A key element shaping the narrative was the choice of an embodied narrator, someone the user could connect with as a personal guide throughout the experience. We chose a traditional stilt walker and proud inhabitant of Namur to bring the story to life. Acting as both a local and cultural symbol, he speaks directly to the user, sharing his love for the city, its history and his favorite places. His voice and perspective offer an intimate, conversational tone, as if he were walking alongside the user.

3. Segmentation, Personas and Customer Journeys

In parallel to the development of the immersive experience, I elaborated a segmentation of potential customers, created personas and mapped out their customer journeys. These steps are essential in understanding the target audience. Through this, I could identify their needs, preferences and behaviors.

3.1. Segmentation

The segmentation started by choosing segmentation criteria followed by the elaboration of four segments based on these criteria.

TABLE 1: SEGMENTATION FOR TOURISM IN NAMUR

<i>Criteria</i>	<i>Segment 1</i>	<i>Segment 2</i>	<i>Segment 3</i>	<i>Segment 4</i>
<i>Purpose of the visit</i>	Discovery of the city	Relax	Cultural event	Sport and adventure
<i>Duration of the stay</i>	One to two days	One day	One to two days	One day
<i>Origin</i>	Belgium and bordering countries	Belgium	Belgium and bordering countries	Belgium
<i>Season</i>	All seasons	All seasons	High season	High season

The most relevant and interesting target for the immersive experience is the first segment. This group is characterized by individuals who are visiting Namur for the first time and therefore have a desire to discover the main points of interest of the city. As the primary goal of the immersive experience is to discover Namur, this segment aligns perfectly with that objective. These first-time visitors are naturally curious and open to learning about the city's history, culture and atmosphere. By focusing on this audience, the experience can

create a memorable and meaningful introduction to Namur that leaves a lasting impression.

3.2. Personas

Once the segments had been defined, the next step was to create personas accordingly. To gather field observations, I spent half a day at the tourism office. This was important to better understand the tourists, their behaviors, needs and expectations. I took note of elements such as the origin and the purpose of the visit of 18 groups of people.

The conclusion I drew from these observations is that the visitors I encountered that day could be categorized into Segments 1 and 2. This was not surprising, as it was the low season, and Segments 3 and 4 are associated with high-season visits. Based on my observations, the first group of visitors mainly came from Belgium (especially Flanders) or France and were looking to discover the city. The second group was primarily from Belgium, particularly the Namur region, and was seeking a more relaxed day in the city. This aligns with Segments 1 and 2.

Based on the segments and observations, I created four personas each representing one of the segments. Figure 15 is the persona of the first segment as it is the one that interests us the most, the other personas can be found in the appendices (see Appendix 3).



FIGURE 15: PERSONA TOURISM NAMUR - SEGMENT 1, CATHERINE

Source: Deloitte Digital. (2025, February). *Customer segmentation and journey*. [Power Point Presentation].

3.3. Customer journeys

The last step of the process was to create customer journeys. First, there is the “as-is”, current customer journey (see Figure 16), and then, the customer journey “to-be”, integrating the immersive experience (see Figure 17). The customer journeys represented are the journeys from the persona above (Catherine) representing the first segment and were inspired by observations at the tourism office.



Catherine

Parcours actuel

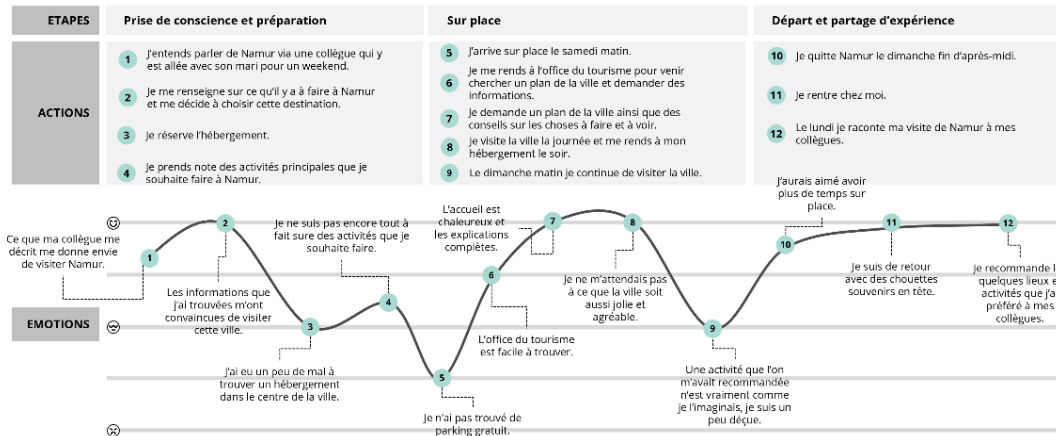


FIGURE 16: CUSTOMER JOURNEY TOURISM NAMUR - AS-IS

Source: Deloitte Digital. (2025, February). *Customer segmentation and journey*. [Power Point Presentation].



Catherine

Expérience immersive

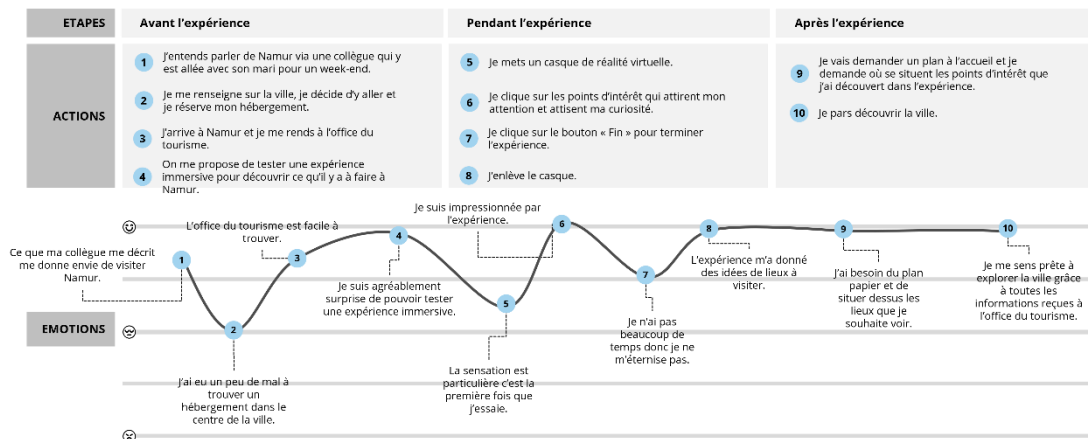


FIGURE 17: CUSTOMER JOURNEY TOURISM NAMUR - TO-BE

Source: Deloitte Digital. (2025, February). *Customer segmentation and journey*. [Power Point Presentation].

In these hypothetical customer journeys, we can see that the “as-is” journey already creates satisfaction at most of the touchpoints and that the immersive experience comes more as a complement to the journey rather than truly enhancing it.

4. Research methodology

4.1. Research model and variables

As previously stated in the hypotheses elaboration, the research model was developed by drawing inspiration from the General model of consumer behavior (Mullen & Johnson, 2013). From this model, I kept the stimulus situation which is the immersive experience, two internal processes and the intention. This is translated into the second and third hypotheses. The internal processes of emotion and memory were selected based on their relevance in the context of immersive experiences, as identified in the literature review.

Another reason for choosing these processes is that the other internal processes could not be included due to practical constraints in the experimental settings. Learning, for instance, involves conditioning and requires repetition (Brée & Pantin-Sohier, 2023; Mullen & Johnson, 2013). Since the immersive experience will intervene only once in the customer journey, it will not be repeated multiple times excluding the conditioning effect. Consequently, learning is considered irrelevant in this context. Perception would have required real-time assessment during task performance, typically involving techniques such as eye-tracking (Mullen & Johnson, 2013). However, such techniques were not available for this experiment. Finally, motivation is measured through needs assessment. While Mullen and Johnson (2013) do not propose a specific sequence for internal processes, many other consumer behavior models (e.g., Kotler et al., 2020b) position need recognition at the start of the decision-making process. Given that the immersive experience takes place at the tourism office, individuals had already recognized their need to visit Namur. Therefore, the experience cannot be considered a stimulus for the need itself.

The hypothesis testing will be conducted through a mediation analysis involving a control and a test group. The mediation analysis is a methodology used in research that studies the mechanisms through which an independent variable influences a dependent variable via one or more mediators. Mediation is further explained in section 4.4. Mediation (cf. infra p.50). In this study, mediation analysis will allow the examination of whether the immersive experience (stimulus) affects visit intentions indirectly through emotional engagement and information memorization (internal processes). The control group will experience a traditional visit to the tourism office and the test group will undergo the immersive experience. By comparing the control group and the test group, the analysis will provide insights into the presence and strength of these indirect effects. Additionally, the direct relationship between immersive experience and visit intentions will be assessed (Hypothesis 1).

The research model represents an adaptation of the General model of consumer behavior to a mediation analysis framework. For the purposes of clarity and statistical testing, the hypotheses have been simplified and adapted to the research model. The three simplified hypotheses are presented below and are represented in the model as H1, H2 and H3 (see Figure 18).

- H1: *Immersive Experience* has a positive impact on *Visit Intention*.
- H2: *Memorization and recall* have a mediating effect on the relationship between *Immersive Experience* and *Visit Intention*.
- H3: *Emotions* have a mediating effect on the relationship between *Immersive Experience* and *Visit Intention*.

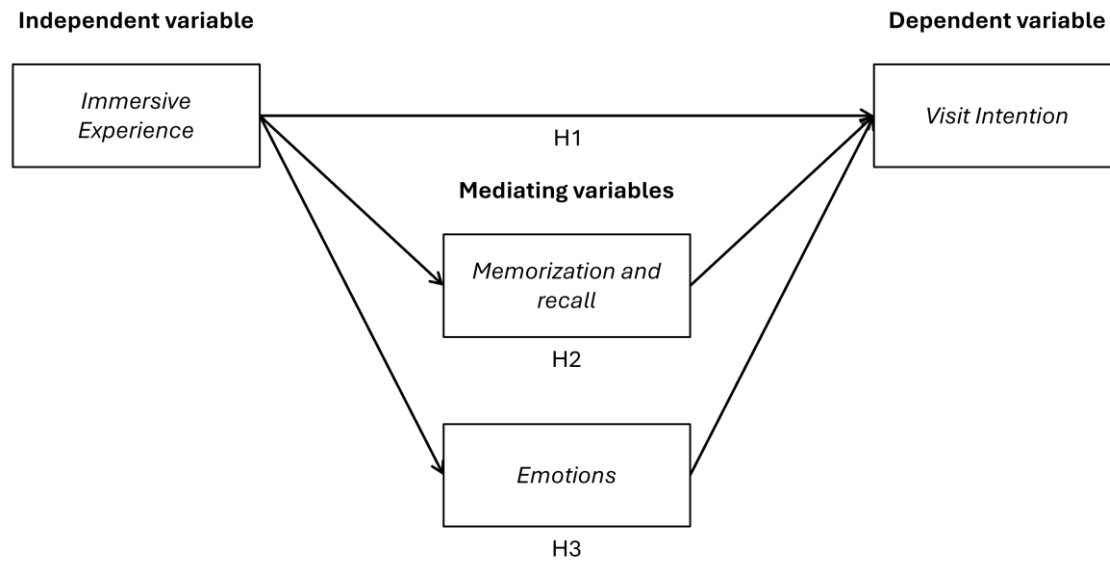


FIGURE 18: RESEARCH MODEL

First, the independent variable *Immersive Experience* makes the separation between the control and the test groups. Consequently, it is a binary variable defining whether the participant underwent the immersive experience or a traditional visit to the office of tourism. The dependent variable is *Visit Intention*, which captures the participant's intention to visit Namur following either the traditional or immersive visit to the office. The mediating variables or mediators are *Memorization and recall* and *Emotions*.

4.2. Questionnaire development and research participants

The questionnaire was developed using Qualtrics (Qualtrics, 2025) according to the research model. It contained questions to test the hypotheses, gather descriptive statistics and assess participants' satisfaction with the immersive experience (these questions being asked only to those who experienced the immersive visit). The collaboration with the tourism office of Namur enabled me to collect data directly on-site. The research design was decided at the beginning of the project with the office of tourism and Deloitte Digital. The experiment took place at the office of tourism of Namur and the participants were people visiting the office. They were divided into two groups, the control group and the test group. The aim was to test the difference between a traditional visit to the office and a visit with the immersive experience included. The control group went through the traditional presentation of the city and the test group underwent the immersive experience to discover Namur. Both groups were tested in the same environment and under the same conditions. For the control group, the main requirement was that participants visited the tourism office to receive a general introduction to the city, comparable to the purpose of the immersive experience. To distinguish the two groups the first question of the questionnaire was "Did you participate to the immersive experience? Yes - No". They were also asked to describe their visit/experience at the office of tourism in three adjectives.

In this context, the purchase intention is defined as the intention to visit Namur. Since the experiment was conducted at the office of tourism, the participants can be considered as "captive customers" since they are already in Namur and already willing to visit the city. For

this reason, their intention to visit Namur was measured as follows: “This experience/visit at the office of tourism reinforced my desire to visit Namur.” The response was measured with a Likert scale from 1 (= Not at all) to 5 (= Absolutely).

Memorization and recall and *Emotions* were each assessed using multiple items rated on a Likert scale ranging from 1 (= Not at all) to 5 (= Absolutely). These concepts were not directly measured but are considered latent variables, inferred from participants’ responses to related items. The specific items used to represent each mediating variable are presented in Table 2 below.

TABLE 2: MEDIATING VARIABLES AND RELATED QUESTIONNAIRE ITEMS

<i>Mediating variable</i>	<i>Related item</i>	
<i>Memorization and recall</i>	I remember clearly the information that I received. (1 = Not at all, 5 = Absolutely)	<i>memo_1</i>
	I feel able to explain to a friend what there is to do in Namur. (1 = Not at all, 5 = Absolutely)	<i>memo_2</i>
<i>Emotions</i>	I was curious. (1 = Not at all, 5 = Absolutely)	<i>emo_1</i>
	I felt a sense of wonder. (1 = Not at all, 5 = Absolutely)	<i>emo_2</i>
	I felt enthusiastic. (1 = Not at all, 5 = Absolutely)	<i>emo_3</i>

In addition to the questions designed to evaluate the research model, the questionnaire also included questions to assess participants’ satisfaction with the immersive experience, as well as descriptive statistics. The descriptive statistics were common to both groups, focusing on participants’ age and place of origin. Age was grouped into 15-year intervals, while *origin* was categorized into four regions: Flanders, Wallonia, Brussels and Foreign. To better understand areas for improvement in the immersive experience, particularly regarding audio-visual elements, a series of satisfaction questions was included. These were measured using a 5-point Likert scale.

The data has been gathered with a self-report questionnaire. The measures derived from a self-report questionnaire are described as explicit measures of consumer behavior. Unfortunately, these measures can be negatively affected by social desirability, data interpretation and subject knowledge (Alcañiz et al., 2019). In the case of reporting emotions, another risk is the fact that people may not be able to accurately describe their reaction to a stimulus or report a type of emotion in an attempt to “look good” (Mullen & Johnson, 2013). The second category of measurement techniques of consumer behavior involves implicit measures. Some of the most used techniques to gather implicit measures are eye tracking, facial expression analysis and heart rate variability (Alcañiz et al., 2019). Using both explicit and implicit measures allow a more accurate and complete understanding of consumer behavior (Alcañiz et al., 2019; Mullen & Johnson, 2013). However, these measures could not be gathered in the context of the experiment at the office of tourism due to the lack of appropriate eye tracking or heart rate systems.

4.3. Data collection and sample size

Data was collected over five nonconsecutive days at the tourism office with the questionnaire that participants could answer online. After completing their respective visit or immersive experience, participants were invited to fill out the questionnaire. Below is a picture of a user testing the immersive experience at the tourism office (see Figure 19).



FIGURE 19: IMMERSIVE EXPERIENCE TESTING

Source: Photo taken by the author, March 2025.

The required sample size was not determined in advance due to time constraints, instead, the aim was to gather as many participants as possible within the available timeframe. After five days the sample size reached 49 with 19 participants for the control group and 30 for the test group. The limited time made it impossible to collect a larger sample or to ensure equal group sizes. While these limitations may affect the statistical power of the results, the objective in the next sections is still to carry out the tests and develop a statistical methodology suited to this type of research model.

4.4. Mediation

In the research model, mediating variables were introduced between the independent and the dependent variable. Mediating variables, also called mediators, answer the question why the independent variable can predict the dependent variable. In the context of this research, it means that *Memorization* and *Emotions* answer the question why or by which mechanism *Immersive Experience* predict *Visit Intention* (Valente et al., 2017; Zhang & Wang, 2017-2025). “A mediating variable explains and identifies the causal process underlying the relationship between two other variables” (MacKinnon, 2001, p. 9503). The mediated effect refers to the influence of a mediating variable when it is measured. It can also be called the indirect effect because it reflects the impact of the independent variable on the dependent variable that occurs indirectly through the mediator. If only part of the effect of independent variable on dependent variable passes through the mediator, it is considered partial mediation since there is still a direct link between independent and dependent variable even after accounting for the mediator (MacKinnon, 2001). For instance, if our first hypothesis is validated, indicating a positive relationship between the *Immersive Experience* and *Visit Intention*, this would suggest the presence of partial mediation.

4.5. Statistical model

Before running any analysis, it was important to verify whether the data was normally distributed, as normality is a common assumption in many statistical tests. The normality of the data was assessed with the Mardia's multivariate normality test (Arya et al., 2024). Wulandari et al. (2021) tested the reliability and stability for multivariate normality using skewness and kurtosis and the results showed that Mardia's test was the most stable and reliable. For this reason, Mardia's test was selected for our study. The test results showed that the data significantly deviated from a normal distribution, based on both skewness and kurtosis values, which are measures used to assess the shape of the data. Specifically, the p-values for these tests were below 0.05, indicating that the assumption of normality was not met (see Appendix 4).

Given these results, Partial Least Squares Structural Equation Modeling (PLS-SEM) is chosen to test the mediation effects in the research model. This type of statistical analysis is particularly useful when the data is not normally distributed as is the case here. Indeed, one of the main strengths of PLS-SEM is that it is a non-parametric method which means that it does not rely on the assumption that data is normally distributed (Hair et al., 2021).

PLS-SEM is also known to perform well with smaller sample sizes, which makes it a good fit for this study since the sample size is small. In addition, it works well with the types of variables used in the questionnaire, such as ordinal scales (Likert scale responses) and binary variables (yes/no answers). Another benefit is that it can handle cases where a few data points might be missing, without seriously affecting the results (Hair et al., 2021).

This method allows the assessment of both how measured variables relate to underlying concepts and how those concepts influence one another within the model. The measurement model assesses the relationships between the survey items (measured variables) and the broader concepts they represent. The structural model evaluates how those concepts interact and affect each other. In our case, the measured variables are the specific questionnaire items, while the underlying concepts are the mediating variables *Memorization and recall* and *Emotions* (see Table 2). Measurement and structural models are represented below on Figure 20.

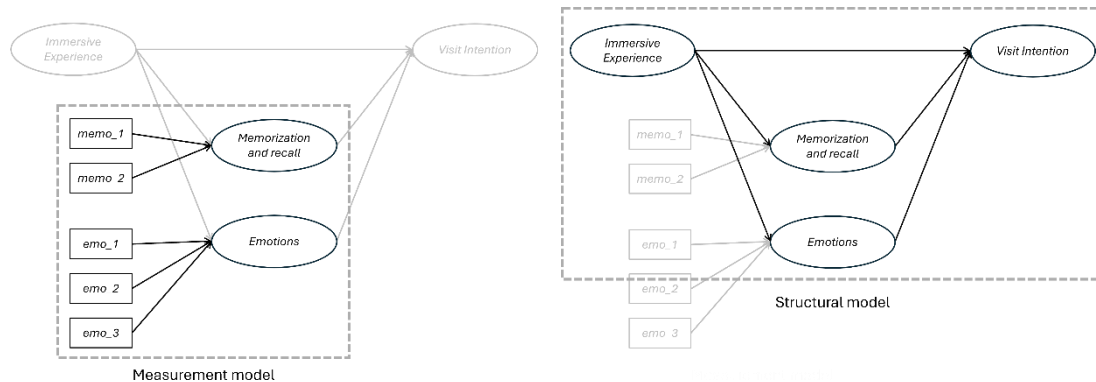


FIGURE 20: MEASUREMENT AND STRUCTURAL MODELS

PLS-SEM is particularly effective for testing mediation, as it allows us to assess whether the relationship between two variables is fully or partially explained by a third variable. It uses

a procedure called bootstrapping to estimate the significance of these indirect effects. Bootstrapping works by repeatedly resampling the data to generate a more accurate picture of how strong the mediation effect is, and it does not require the data to meet strict conditions like normal distribution (Hair et al., 2021).

Finally, using PLS-SEM in this research aligns with what has been done in the studies reviewed in the literature, particularly studies featuring similar research models to the one presented in this work (Arya et al., 2024; Pathak & Prakash, 2023).

5. Data analysis and findings

The data analysis begins with descriptive statistics in both the control and test groups, followed by a preliminary examination of the relationship between the immersive experience and the intention to visit Namur. After that, we will dive into the mediation analysis and the hypothesis testing, using the Partial Least Squares Structural Equation Modeling (PLS-SEM). Statistical analyses will be performed using R, a programming language and environment for statistical computing and graphics (R Project, n.d.) via the RStudio software (RStudio Team, 2023). The code developed can be found in Appendix 4.

Statistical computations in R build upon the knowledge I acquired during a data mining course taken last semester, as well as insights gained from scientific literature and the book *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R* by Hair et al. (2021). This book serves as the primary reference for the entire PLS-SEM analysis. Additionally, the analysis is informed and inspired by a range of scientific articles reviewed during the literature review phase.

5.1. Descriptive statistics

The total number of participants was 49, with 19 in the control group and 30 in the test group. Descriptive statistics are presented separately for each group. The questionnaire only included two descriptive questions, as the purpose of the experiment was not to establish a relationship between descriptive variables and the variables of interests. These two descriptive variables were *age* and *origin*.

In Figures 21 and 22, we can observe that the control and test groups differed substantially in both age and regional origin. The control group tended to include older participants and a higher proportion from Flanders and foreign countries, whereas the test group was younger and primarily from Wallonia and Brussels. The difference in *origin* can probably be explained by the fact that the immersive experience was in French, so it was mainly French speaking people who participated to the immersive experience.

These differences could influence both the mediating and outcome variables. This impact is known as the confounding effect, meaning that differences in outcomes between groups might be due to *age* or *origin*. These confounding variables can affect the relationship between two variables although they were not included in an experiment. Confounding effect is a significant and frequent issue that can undermine the validity of mediation analyses. It occurs when a third variable is associated with two or more variables within the mediation model. In order to address the confounding effect, there are two categories of

techniques. First, design-based techniques include several methods, such as the randomization of the variables in the models. However, these techniques must be implemented during the experimental design phase, which was not the case in this study, making them inapplicable here. This brings us to the second category of techniques: analysis-based methods, which involve statistical adjustments (Valente et al., 2017). Initially, the focus will be on the statistical model without including any confounding variables. In a second instance, the confounding effect will be introduced. This approach allows us to first establish the baseline relationships between variables and then assess whether any third variables may be influencing these relationships.

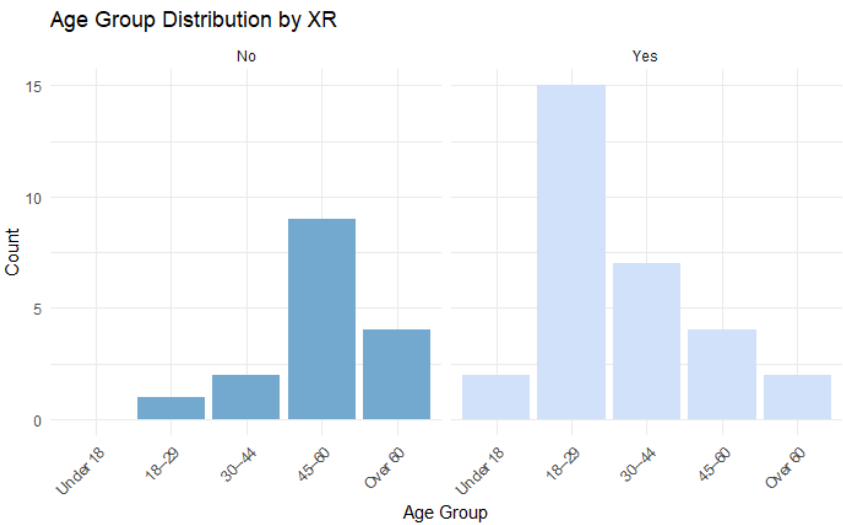


FIGURE 21: AGE GROUP DISTRIBUTION BY XR

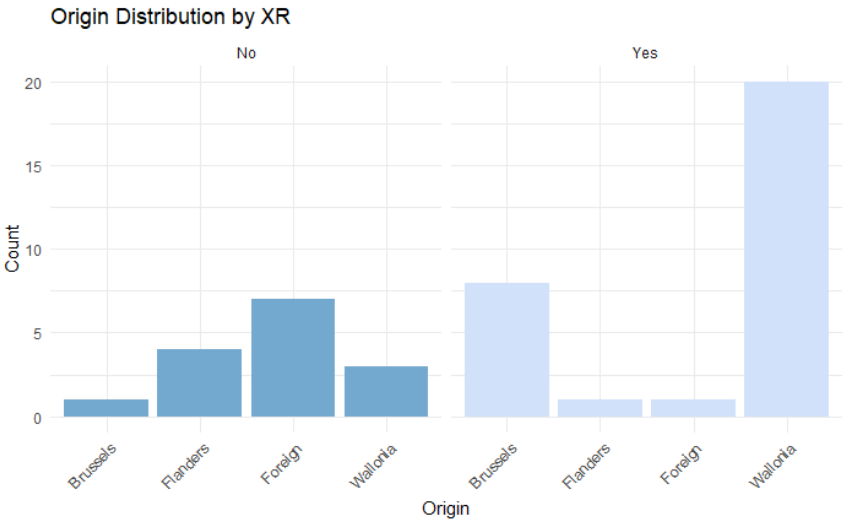


FIGURE 22: ORIGIN DISTRIBUTION BY XR

5.2. Preliminary analysis: Relationship between *Immersive Experience* and *Visit Intention*

First, two subsets of the data were created to separate the control group and the test group:

- Control: contains the values of the intention to visit of the participants who were not exposed to the immersive experience (n = 19)
- Test: contains the values of the intention to visit of the participants who were exposed to the immersive experience (n = 30)

Now that we have our two groups, we need to verify the normality of the distribution of both subsets; this is done with the Shapiro-Wilk test (Anderson, n.d.). For both subsets, the p-value was smaller than 0.05 which means that the data is not normally distributed. This can be visualized with histograms (see Figure 23), which show that both distributions are left-skewed.

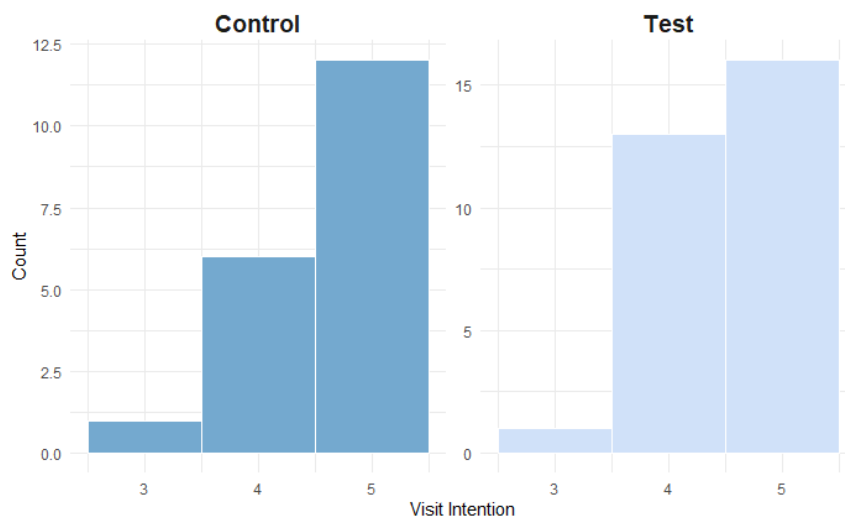


FIGURE 23: VISIT INTENTION OF CONTROL AND TEST GROUPS

Next, the homogeneity of variances is tested with Levene's test. The result of this test yields a p-value equal to 0.6479 which is greater than 0.05. This means that the variances of the two subsets are equal, signifying a homogeneity of variances.

Since the subsets are not normally distributed and the variances are equal, we need to perform a Mann-Whitney U test, also called Wilcoxon rank-sum test, to compare the difference between the control and the test subsets. This test is recommended when the distributions are not normally distributed, and the sample sizes are small ($n < 30$) (Bobbit, 2018). The result of the test is that the p-value is equal to 0.571 which is greater than 0.05. This indicates that there is no statistically significant difference in *Visit Intention* between the control and the test groups. This can be visualized with boxplots (see Figure 24).

The fact that there is no difference in the intention to visit Namur between the two groups already implies the rejection of the first hypothesis; we cannot establish a positive relationship between the immersive experience and the intention to visit. This also indicates that the mediation effect is unlikely to be significant if we can already state that the difference in visit intention does not vary between groups. Nevertheless, the statistical

model will still be constructed for learning purposes and to ensure the academic process is thoroughly completed.

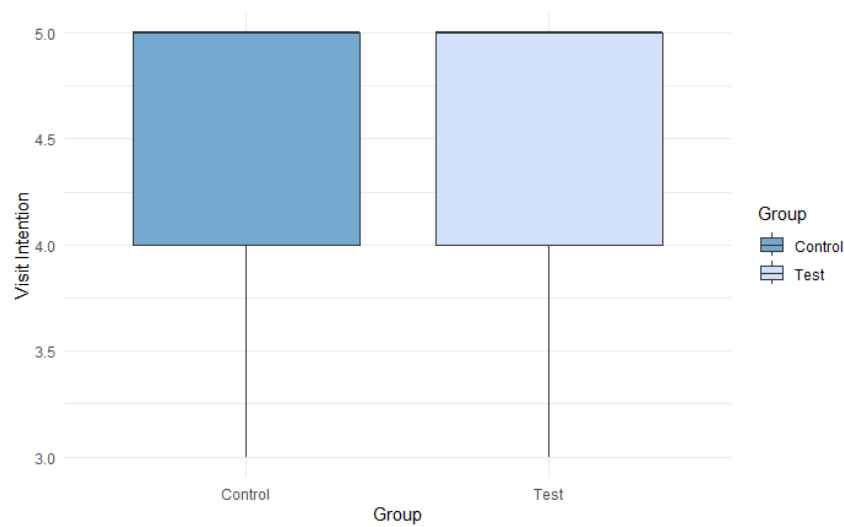


FIGURE 24: BOXPLOT OF *VISIT INTENTION* BY GROUP

5.3. Hypothesis testing with PLS-SEM

5.3.1. Reliability and validity

The first step of the PLS-SEM methodology is to evaluate the quality of both the measurement and structural models. First, the measurement model is estimated in terms of reliability and validity. In a second instance, we evaluate the quality of the structural model. Only once these evaluations are complete and satisfactory can we proceed with the mediation analysis.

The first phase of the evaluation of the measurement model involves the indicator reliability assessment. This refers to the extent to which a latent construct (also called factor) explains the variance in its indicators which are the measured variables or survey items. This is assessed using indicator loadings and indicator reliability (Hair et al., 2021). In our analysis, every indicator (*emo_1*, *emo_2*, *emo_3*, *memo_1*, *memo_2*) shows a strong relationship with its respective construct (*Emotions*, *Memorization*). Each factor accounts for at least 50% of the variance in its indicators, meeting the acceptable criteria (Hair et al., 2021).

The second phase involves examining internal consistency reliability. “Internal consistency reliability is the extent to which indicators measuring the same construct are associated with each other” (Hair et al., 2021, p.77). This is evaluated using composite reliability rhoC, Cronbach’s alpha and the reliability coefficient rhoA (Hair et al., 2021). All constructs in the model (*Emotions*, *Memorization*) meet the required thresholds, confirming strong internal consistency reliability.

The third step involves assessing the convergent validity of each construct. “Convergent validity is the extent to which the construct converges in order to explain the variance of its indicators” (Hair et al., 2021, p.78). This is typically measured by the Average Variance

Extracted (AVE) (Hair et al., 2021). In our study, all constructs meet the required thresholds, indicating adequate convergent validity.

The final and fourth step is to assess discriminant validity which ensures that a latent variable (factor) measures something unique and not something already captured by another construct in the model. Hair et al. (2021) recommend the heterotrait–monotrait ratio (HTMT) of correlations. In our analysis, all HTMT values are below 0.85, meaning discriminant validity is clearly established.

Based on the results of the indicator reliability, internal consistency, convergent validity and discriminant validity assessments, we can conclude that the measurement model demonstrates satisfactory reliability and validity. This confirms that the model is sound and can be reliably used for further analysis, including the evaluation of the structural model and subsequent mediation analysis.

We now proceed to the evaluation of the structural model which is conducted through a four-step process. First, we assess potential collinearity issues. Second, we evaluate the significance and relevance of structural model relationships. The third and fourth steps involve examining the model's explanatory and predictive power.

First, collinearity is assessed with the Variance Inflation Factor (VIF) which evaluates if two or more constructs of the model are not too closely related. In our case, all values are under the threshold of 5, indicating no collinearity issues within the structural model.

Next, we assess the significance and strength of the structural model. This step will allow us to see if the relationships between the several constructs of the structural model are significant. This is measured through the significance and magnitude of the path coefficients. The results from the analysis are as follows:

- *Immersive Experience* → *Emotions*: Not significant, weak relationship
- *Immersive Experience* → *Memorization*: Significant, weak relationship
- *Immersive Experience* → *Visit Intention*: Not significant, very weak relationship
- *Emotions* → *Visit Intention*: Significant, moderate to strong relationship
- *Memorization* → *Visit Intention*: Not significant, weak to moderate relationship

These results indicate that only two relationships are statistically significant, with the most notable being a moderate to strong effect of *Emotions* on *Visit Intention*.

The third step of the structural model assessment involves the evaluation of the model's explanatory power, and this is done by analyzing the R^2 and the f^2 effect size. R^2 shows how much variance in each construct is explained by its predictors and f^2 tells how much each independent variable contributes to explaining the target variable's R^2 . In other words, R^2 tells us how well all predictors together explain a dependent variable, f^2 breaks it down showing how much of that explanation is due to one specific predictor. The conclusions of the analysis of R^2 are:

- *Immersive Experience* explains 3% of *Emotions* (weak)
- *Immersive Experience* explains 5.1% of *Memorization* (weak)
- *Immersive Experience*, *Emotions*, *Memorization* together explain 33.9% of *Visit Intention* (low to moderate)

And the conclusions of the f^2 analysis are:

- *Immersive Experience* → *Emotions*: Small effect size
- *Immersive Experience* → *Memorization*: Small effect size
- *Immersive Experience* → *Visit Intention*: Very small effect size
- *Emotions* → *Visit Intention*: Medium effect size
- *Memorization* → *Visit Intention*: Small effect size

The fourth and final step is the assessment of the predictive power, but it could not be evaluated due to issues that could not be resolved with the literature available. In any case, with the previous steps we could already conclude that the structural model will not lead to a validation of the hypotheses.

In summary, the structural model shows limited explanatory strength. Although no issues of collinearity are identified, only a few relationships are statistically significant, like the moderate impact of *Emotions* on *Visit Intention*. *Immersive Experience* has very weak effects overall. The model explains 33.9% of *Visit Intention*, mainly driven by *Emotions*. Predictive power could not be assessed due to unresolved methodological issues.

As a general conclusion for both measurement and structural models' evaluations, the analysis confirms that the measurement model is robust and demonstrates reliability and validity. This provides a solid foundation for interpreting the structural model results. However, the structural model only shows a few meaningful relationships, particularly the influence of *Emotions* on *Visit Intention*. Its overall explanatory power is low, and most effects are weak or not significant. Notably, these findings allowed us to reject the first hypothesis, which stated that *Immersive Experience* has a positive relationship with *Visit Intention*. The analysis showed that this relationship is not statistically significant and has a negligible effect size, indicating that immersive experiences do not directly influence the intention to visit. Despite these limitations, we will proceed to further analysis with the mediation testing.

5.3.2. Results of the hypothesis testing

In this hypothesis testing phase, we evaluate the potential mediating roles of *Memorization* and *Emotions* in the relationship between *Immersive Experience* and *Visit Intention*. As suspected in the previous section, the analysis of indirect effects revealed that neither mediator produced a statistically significant effect. As a result, both the second and third hypotheses are rejected. Specifically, the data does not support the assumption that *Memorization and recall* mediate the relationship between *Immersive Experience* and *Visit Intention*, nor that *Emotions* serve as a mediator in this relationship.

The final plot of the research model (see Figure 25) visually summarizes the results of the previous analyses by displaying the key statistical values: path coefficients (β), indicator loadings (λ) and R^2 values for each construct. The β values illustrate the strength and direction of the relationships between constructs, reflecting the results of the structural model evaluation. We can see that the only strong relationship is between *Emotions* and *Visit Intention*. The λ values indicate the reliability of each indicator within its respective construct, supporting the conclusions from the measurement model assessment. All λ

values are significant, meaning that the measurement model is reliable. The R^2 values show the proportion of variance explained in each dependent variable, providing insight into the model's explanatory power. The R^2 values indicate that Immersive Experience explains very little variance in *Emotions* and *Memorization*, while *Immersive Experience*, *Emotions* and *Memorization* together explain a moderate portion of the variance in *Visit Intention*. Together, these elements offer a comprehensive representation of both the measurement and structural model evaluations, reinforcing the findings that only a few relationships are significant and that the overall model has low explanatory strength.

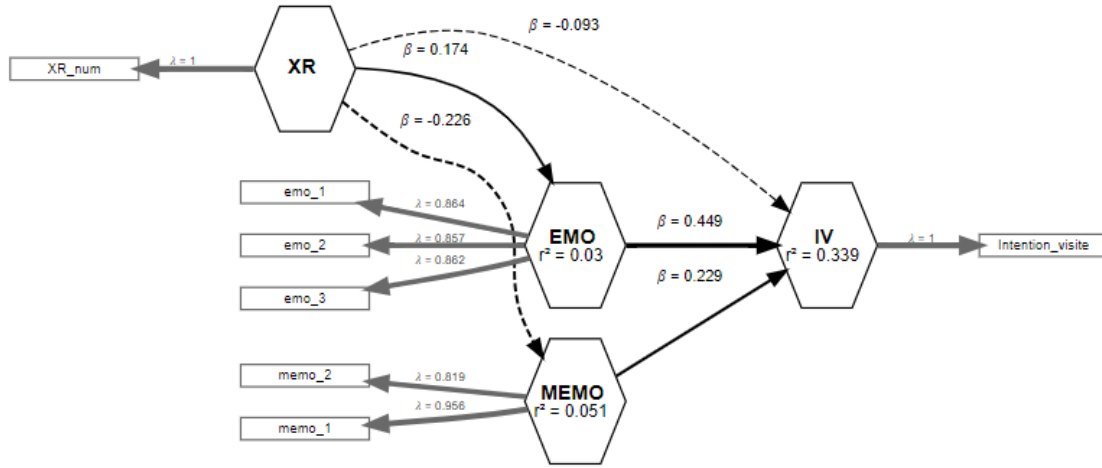


FIGURE 25: FINAL PLOT OF THE MEDIATION ANALYSIS WITH PATH COEFFICIENTS (β), INDICATOR LOADINGS (λ) AND R^2 VALUES

In this model, the names of the constructs have been shortened for practical purposes to facilitate easier manipulation during calculations and analyses. The abbreviated labels appear in the plot and correspond to the construct names used throughout this work: *Immersive Experience*, *Emotions*, *Memorization* and *Visit Intention*. Just to note, the construct originally referred to as *Memorization and recall* has been labeled as *Memorization* throughout this work for the sake of brevity.

5.3.3. Assessment of the confounding variables

In order to assess our initial suspicion that *age* and *origin* might act as confounding variables, we can introduce these variables into the model as control variables to evaluate their influence on the mediators and on the dependent variable (OpenAI, 2025b). However, the variable *origin* could not be included in the statistical analysis due to its categorical nature, which made it incompatible with the model's structure in this case. The variable *age* was tested as a potential confounder of the mediation model. It was found to have a significant direct effect on *Visit Intention* but did not significantly affect the mediators (*Emotions* and *Memorization*). Therefore, *age* does not confound the mediation process between *Immersive Experience* and *Visit Intention* (Valente et al., 2017). As suggested by ChatGPT (OpenAI, 2025b), a further step would be to explore the moderation effect of *age* on the relationship between *Immersive Experience* and *Visit Intention* (see Figure 26).

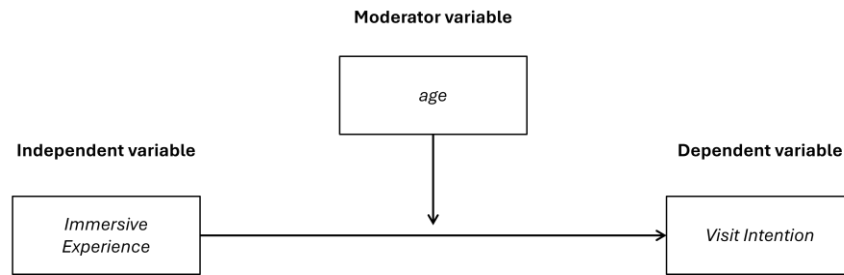


FIGURE 26: MODERATING EFFECT OF AGE

Let us now introduce the notion of moderation which differs from mediation. Hair et al. (2021) describe moderation as “a situation in which the relationship between two constructs is not constant but depends on the values of a third variable, referred to as moderator variable” (Hair et al., 2021, p.156). In other words, the moderator variable influences how strong the relationship is between the other two variables, and it can even alter the direction of that relationship.

The moderation analysis revealed that the relationship between *Immersive Experience* and *Visit Intention* does not significantly differ by *age*. This means that *age* is not a moderator of the relationship, it only independently predicts *Visit Intention*.

5.4. Word clouds

In the second question of the questionnaire, participants were asked to describe their visit/experience at the office of tourism in three adjectives. The responses from the control and test groups were separated and can be visualized in the word clouds below, respectively Figures 27 and 28. These two figures highlight the most frequently mentioned adjectives in each group. The size of each word corresponds to its frequency, offering a visual representation of dominant sentiments and impressions.



FIGURE 27: WORD CLOUD OF ADJECTIVES FROM THE CONTROL GROUP (GENERATED WITH TAGCROWD (STEINBOCK, D., N.D.))

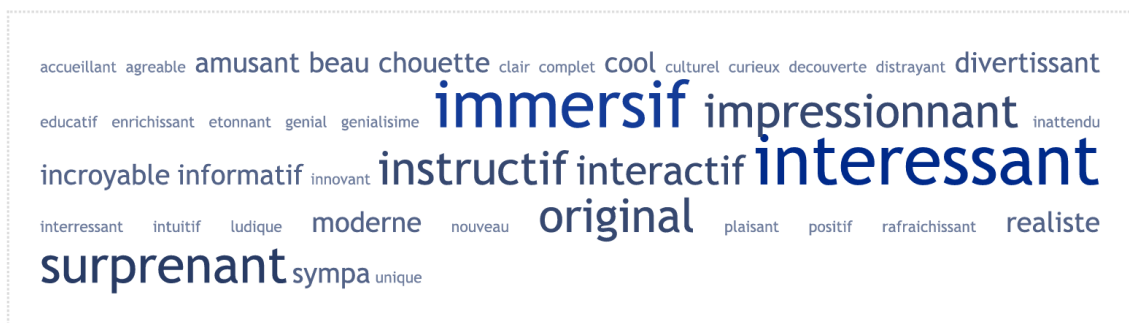


FIGURE 28: WORD CLOUD OF ADJECTIVES FROM THE TEST GROUP (GENERATED WITH TAGCROWD (STEINBOCK, D., N.D.))

In the control group, the most prominent adjectives are welcoming, friendly and warm, which reflects a positive evaluation of the human interaction and quality of service provided by the tourism office staff. These descriptors suggest that visitors valued the interpersonal and customer service aspects of the traditional visit. In contrast, the test group used adjectives such as interesting, immersive, surprising, original, instructive, impressive and interactive. These words point to a richer, more engaging and memorable experience, emphasizing novelty, emotional impact and active participation. This contrast indicates that while traditional visits are appreciated for their hospitality, immersive experiences create a deeper and more dynamic connection with visitors.

6. Satisfaction with the immersive experience

The participants in the immersive experience had a longer questionnaire with questions regarding their satisfaction with the experience. Their satisfaction was evaluated with a Likert scale from 1 to 5. First of all, the average satisfaction rating, expressed as the number of stars given for the experience, was 4.77 out of 5. This indicates a generally high level of satisfaction with the experience. Satisfaction by age range was visualized with a histogram (see Appendix 4) and the age of participants did not seem to have an impact on their level of satisfaction, suggesting a cross-generational appeal of the experience.

In addition, participants' satisfaction with the personalization and gamification elements of the experience were measured, aligning with two key trends identified in the literature review. Both aspects received high satisfaction ratings (see Table 3), especially gamification, which received the highest rating of all aspects. This confirms that these design strategies can significantly enhance user satisfaction and overall experience (cf. supra pp.25-27).

TABLE 3: MEAN SCORES OF SATISFACTION VARIABLES FOR THE IMMERSIVE EXPERIENCE

Averages of Satisfaction Variables	
Variable	Average Score
gamification	4.82
stars	4.77
sat_360_video	4.71
sat_mixed_reality	4.61
sat_music_sound	4.57
personalization	4.57
sat_ease_of_use	4.36
sat_visual_quality	4.32
sat_interactions_quality	4.25
sat_narration_audio	4.21

Furthermore, users' satisfaction with the audio-visual elements of the experience was assessed. Ratings for these components ranged between 4 and 5, indicating that overall, participants found the audio-visual aspects satisfactory. Among these elements, the 360-degree videos stood out as the most appreciated, suggesting that full immersion in Virtual Reality is preferred over Mixed Reality. This observation aligns with user reactions that I witnessed during the testing. Users seemed impressed by the 360-degree videos saying that it was very impressive and felt as though they were truly present in the depicted locations in Namur. This reinforces the idea that a high degree of immersion plays a crucial role in enhancing user's sense of presence and satisfaction in immersive experiences and aligns with the results of Orús et al. (2021) (cf. *supra* pp.15-16).

On the other hand, the narrative and audio component received the least favorable feedback. Some participants noted that the voice used for narration sounded artificial, revealing its AI-generated origin. While this presents an opportunity for improvement, either by enhancing the quality of the AI voice or considering the use of a human narrator, it is important to acknowledge the practical advantages of AI-generated voices, such as efficiency and adaptability, which were key considerations in their use.

In the literature review, the concepts of motion sickness and cybersickness were discussed as potential drawbacks of immersive experiences. To assess whether the experience could provoke such symptoms, a specific question addressing this concern was included in the questionnaire. Among the 30 participants who tested the experience, only one reported experiencing motion sickness. Motion sickness was rare among participants, indicating high tolerance for the experience.

Lastly, participants were asked whether they encountered any technical difficulties during the experience. Five individuals reported that they experienced such issues. The technical difficulties were related to interaction with the interface, specifically clicking on buttons. This is also reflected in the rating of the interaction quality which received the second least favorable score. This is a common challenge among users who are unfamiliar with Mixed Reality environments, as the interaction mechanics differ from more familiar interfaces like smartphone touchscreens.

7. Discussion, limitations and future research

As seen in the hypothesis testing section, the experiment led to a rejection of the hypotheses. We could not affirm that the immersive experience had a positive influence on the intention to visit Namur. We also concluded that neither the emotional engagement nor the enhancement in information memorization created by the experience translated into a higher visit intention. In this section we will discuss these results, the potential reasons for the rejection of the hypotheses, elaborate new hypotheses based on the findings and discuss other experiment designs that could have been more appropriate. These new research designs and hypotheses are also synthesized and structured in the next section: section 8. Proposition of new research designs.

7.1. Results discussion

First of all, the rejection of the hypotheses does not align with the literature review. Pathak and Prakash (2023), Putri et al. (2024) and Wedel et al. (2020) all suggest a positive effect of immersive experiences on purchase intentions. Moreover, in the tourism and hospitality industry, several studies have found that immersive experiences have a positive impact on visitors' intention to visit or book, including those by Flavián et al. (2024), Kieanwatana and Vongvit (2024) and Orús et al. (2021).

The only positive relationship that was found to be positive in the model is between emotions and visit intention. The fact that emotions predict the intention to visit the city aligns with the literature on experiential marketing (Batat, 2021) which highlights the significant importance of emotions in creating a satisfying customer experience. Designing for emotional impact may be more crucial than simply delivering informational content. However, before drawing conclusions from these findings, it is important to consider the limitations of the study.

7.2. Limitations

7.2.1. Sample size

The first limitation of the study is the small sample size ($n = 49$), which limits the statistical power of the findings. This constraint was due to timing limitations and the fact that the experiment was conducted at the office of tourism during the low season. As Amélie Lefèvre, Director of the office of tourism, noted, the number of visitors significantly decreases during this period. Indeed, throughout an entire day, I was able to gather an average of only 10 participants.

A proper sample size is crucial for drawing reliable conclusions, as analyses based on inadequate sample sizes may fail to detect effects that exist within a broader population (Hair et al., 2021; Memon et al., 2020). In the literature, sample size has consistently been highlighted as one of the key limitations of empirical studies (Memon et al., 2020). Based on their experiments, Memon et al. (2020) recommend a sample size between 160 and 300 valid observations for multivariate statistical techniques such as PLS-SEM. Unfortunately, the sample size of this study was three to six times smaller than this recommendation. Reaching a sample size between 160 and 300 would have required between 16 and 30 days of data collection at the office of tourism during the low season.

7.2.2. High scores and ceiling effect

It is important to highlight that both the control and test groups gave high scores for visit intention, emotional engagement, and memorization and recall of information. As a result, when the control group already achieves very high scores, it becomes difficult for the test group to surpass them. The high scores observed in the control group can be explained by the fact that a visit to the tourism office, even without an immersive experience, is already highly satisfying. The office staff is welcoming, friendly and warm, as reflected in the word cloud of adjectives associated with the control group (see Figure 27). In this context, the immersive experience could be seen more as a complement to an experience that is

already satisfying. Based on this, we can formulate a new hypothesis: immersive experiences may not provide additional value when the existing experience is already highly satisfactory.

The phenomenon of both groups achieving very high scores is known as the ceiling effect. According to the APA Dictionary of Psychology, the ceiling effect refers to “a situation in which the majority of values obtained for a variable approach the upper limit of the scale used in its measurement” (American Psychological Association, 2018a). This effect results in reduced variance in the data, making it difficult to compare the means between the control and test groups (Nikolopoulou, 2023). These exact challenges were encountered during the data analysis phase. This issue could potentially be mitigated with a larger sample size or by using different measurement scales.

7.2.3. Questionnaire design limitations

The questionnaire may have lacked specificity in assessing the intention to visit. Indeed, the survey question was broad, asking about the intention to visit Namur in general, without addressing specific locations within the city. The service at the office of tourism is already highly satisfying and contributes to a general increase in the intention of visiting the city. But what about the specific sites that tourists choose to visit? What if an immersive experience could heighten the desire to visit locations that do not currently receive a high visitation rate? A more targeted methodology might have been more effective, requiring a deeper analysis of the tourism scene in Namur. It seems that such an in-depth preliminary analysis was lacking in this experiment. Such an approach would also have required the collection of data related to the intention to visit individual points of interest, rather than the city as a whole.

Furthermore, the questionnaire design, particularly regarding the assessment of information memorization, could have been improved. The design choice was primarily motivated by concerns over participant fatigue and dropout rates. I aimed to keep the questionnaire short and straightforward, assuming that participants approached spontaneously might not be willing to engage with a lengthy or complex survey. However, in retrospect, this may have been a misjudgment. The brevity of the questionnaire likely compromised the depth and reliability of the data collected. A more effective approach would have involved conducting the experiment in a controlled environment, where participants are aware of the study's requirements in advance and are more prepared to engage fully. This would have allowed for the inclusion of more nuanced, targeted questions to better assess memorization and other cognitive outcomes without the risk of disengagement.

7.2.4. Self-report bias

A crucial aspect to consider when analyzing data from self-report questionnaires is the self-report bias. Conducting experiments involving human participants can be quite challenging, as there are many other variables influencing behavior that cannot be directly observed. According to the American Psychological Association (2018b), “self-report bias is a methodological problem that arises when researchers rely on asking people to describe

their thoughts, feelings, or behaviors rather than measuring these directly and objectively. People may not provide fully accurate answers, either because they do not know the full answer or because they want to make a good impression (social desirability)” (American Psychological Association, 2018b).

This challenge with self-reported measures was already discussed in section 4.2. Questionnaire development and research participants (cf. *supra* p.49). Several authors have noted how these measures can be influenced by social desirability (Alcañiz et al., 2019; Mullen & Johnson, 2013) and the difficulty people have in accurately describing their emotions and behaviors (Mullen & Johnson, 2013). Brenner and DeLamater (2016) emphasized that self-reports are particularly vulnerable to bias, which can affect the accuracy of research, especially in psychology and social sciences.

For this reason, using implicit measures, or a combination of implicit and explicit measures, would be a better methodology in some cases (Brenner & DeLamater, 2016; Mullen & Johnson, 2013). However, as mentioned previously, these types of measures require more resources, which are not always available. Consequently, the main takeaway is that dealing with behavioral measures is particularly challenging due to the complexity of human psychology and behavior.

7.2.5. Confounding variables

The variables of age and origin were identified as potential confounders of the mediating effect, meaning that they could have influenced the results of the mediation analysis. Although age was statistically controlled, it was not the case for origin which could have influenced the outcomes as well. However, the statistical control of the origin variable would have required more advanced statistical knowledge due to its categorical nature.

In addition, these two variables were the only descriptive variables collected, but it is important to note that numerous other confounding variables that were not captured in this study could have influenced the results. For instance, differences in personality traits like being open to new experiences, previous travel experiences, personal interests, or even how someone is feeling during the experiment could influence how participants viewed and responded to the immersive content. In behavioral studies, factors that we do not measure can create hidden biases, which might compromise the accuracy of the results. Not accounting for these variables makes it harder to clearly see the true effects of the immersive experience itself, and it also means that some of the changes we observe might be due to individual differences rather than the experiment itself. A solution would be to randomize the sample, and this could be done with a larger sample or in a controlled environment (Valente et al., 2017).

7.3. Future research perspectives

One way to interpret the results and formulate a new hypothesis for future research is to consider the fact that the experience showcased the same places that were already presented by the office staff. However, an added value that could have been drawn from using immersive experiences is their potential to highlight unusual and lesser-known places that may not be visited if presented through traditional means. According to this

hypothesis, immersive experiences would be particularly effective in revealing hidden or unfamiliar locations.

This aligns with the findings of Constantin et al. (2023) and Tourism Australia (n.d.), who observed that showcasing unfamiliar destinations in 360-degree Virtual Reality videos increases awareness and leads consumers to consider traveling to places they might not have otherwise considered. This also resonates with insights gathered during the experimentation, as some participants mentioned that visiting certain places through a 360-degree video increased their interest in visiting those specific locations.

Based on this, a recommendation for the office of tourism of Namur would be to use immersive experiences to promote lesser-known or under-visited places that may currently have a low visitation rate, even when promoted with traditional channels such as staff recommendations or printed materials. Presenting these locations through immersive experiences could help spark a stronger desire to visit them.

If we consider changing the methodology, one possibility would be to introduce the immersive experience at a different stage of the consumer journey. In this experiment, it was introduced at the travel stage, as participants were already in Namur and ready to explore the city. However, conducting the experience at the pre-travel stage might have a greater impact. As discussed in the literature review on the tourism and hospitality industry, it is at the pre-purchase stage that immersive experiences can be most influential. These experiences have the potential to raise awareness and spark the desire to travel (Constantin et al., 2023). They offer a realistic teaser of a potential destination, setting expectations that align with the actual experience (Kieanwatana & Vongvit, 2024; Shahab et al., 2022).

For example, the experiment could be conducted at a tourism fair where the Namur tourism office has a booth. In this setting, we could compare the traditional presentation of Namur through explanations, pictures and videos with the immersive experience. Another idea, if we had more time and resources, would be to conduct the experiment in a controlled environment. In this case, the control group could be shown the city's website or promotional videos, while the test group would experience the immersive content. Such adaptations would allow for a more meaningful assessment of how the immersive experience could influence intentions before the actual visit takes place.

Lastly, even though the experience did not increase the intention to visit Namur, it could have contributed to enhancing the innovative image of the office of tourism. During our interview, Thomas Kubski explained that in B2C marketing, the return on investment is often evaluated more in terms of brand image rather than in direct sales. This leads to the proposition of a new hypothesis: immersive experiences may enhance the innovative image of a city. This could have been evaluated by including brand image-related questions in the survey of both control and test groups.

7.4. Conclusions

In conclusion, the results of the experiment did not support the initial hypotheses, revealing no direct effect of the immersive experience on intentions to visit and consequently no

significant mediation through emotional engagement and memorization which contrast with the literature review. However, previous research on travel intentions typically compared immersive experiences to other digital channels, such as videos (Shahab et al., 2022) or images (Kieanwatana & Vongvit, 2024), rather than human interactions. This distinction forms the key finding of our research: immersive experiences are unlikely to replace or surpass already satisfying human interactions, but they have the potential to enhance digital interactions, as suggested in the literature.

Nonetheless, the research faced several critical limitations that impacted the statistical power and validity of the results. These include a small sample size, the ceiling effect in participants responses and the challenges of self-reported data. Additionally, since participants were already physically present at the tourism office, their pre-existing interest in Namur may have introduced a motivational bias. They likely already had strong intentions to visit, making it harder to observe an added effect from the immersive experience.

These challenges have provided valuable insights for future research. More targeted hypotheses such as the potential of immersive experiences to promote lesser-known destinations emerged as a promising alternative for the current setting of the experience at the office of tourism. Future studies would benefit from a larger, randomized sample in a controlled environment, with more precise and varied measurement tools. Additionally, focusing on specific stages of the consumer journey, particularly the pre-purchase phase, could yield more impactful results. Incorporating implicit measures and accounting for individual differences would also help strengthen future findings. Overall, this study has had its constraints, but it lays a useful foundation for future experimental approaches.

8. Proposition of new research designs

Based on the limitations and learnings from the initial experiment, I propose several new research designs. These designs vary depending on whether we keep the same resources and experience, or whether we allow changes in the experience itself, the available resources, or even the hypotheses. However, some improvements are common to all future designs:

- **Adding additional descriptive statistics:** Including questions such as whether participants have already visited Namur previously or have ever experienced immersive technologies before. This would allow better control over confounding factors.
- **Including qualitative insights:** Adding open-ended questions or conducting short interviews could capture richer, more nuanced feedback from participants. Although the study did not reveal any statistical differences between the control and test groups, the word clouds (see Figures 27 & 28) showed significant variations in the adjectives used to describe the experience. This highlights the fact that a qualitative approach can reveal differences that may not be observable through quantitative data alone.

8.1. If time and resources remain the same (same experience and hypotheses)

Even though the resources and experience cannot be changed, the research design could be improved in the following ways:

- **Focusing on a pre-travel stage:** Rather than targeting tourists already in Namur, the focus could be shifted to potential visitors at tourism fairs or travel expositions. Setting up VR booths at these events and comparing the immersive experience with traditional city presentations (e.g., brochures, static images, or standard promotional videos) would provide better insights into the impact of immersive experiences on travel intention during the critical pre-purchase decision stage.
- **Changing control group comparison:** Instead of comparing the immersive experience to a visit to the tourism office, which is already highly satisfying and warm, it could be compared to standard promotional material such as videos or websites. This would help assess the added value of the experience compared to a digital channel and could potentially offset the ceiling effect observed in the study.
- **Improving the measurement of memorization:** To enhance the assessment of memorization, objective tasks could be incorporated, such as asking participants open-ended questions about which places they remember being presented. This would provide a more reliable measurement and address some of the challenges posed by self-report bias.
- **Measuring visit intention at a more granular level:** Instead of measuring general visit intention, it could be more effective to focus on specific locations within Namur. Asking participants about their intention to visit specific sites provides more detailed insights into their travel preferences and the impact of the immersive experience on their destination choices.

8.2. If the experience could be changed (still at the tourism office)

If modifications to the content of the immersive experience were possible, the following change is proposed:

- **Focusing on promoting unusual and lesser-known places:** Developing new 360-degree videos that highlight lesser-known spots around Namur, which might have a lower visit rate, could be a valuable strategy. Rather than focusing on well-known tourist sites, these VR videos could offer a fresh perspective on destinations that are often overlooked. To assess the effectiveness of this approach, actual visits to these attractions could be tracked, but this would require collecting visit data before the immersive experience is implemented. Alternatively, both groups could be asked about their intention to visit these lesser-known sites after their visit to the tourism office, providing insights into how the experience influenced their travel choices.

8.3. If more time and resources were available

With more time and resources, the following improvements could be implemented:

- **Increasing sample size:** To enhance the statistical power and reliability of the results, a sample size between 160 and 300 participants should be aimed at, in line with the recommendations for multivariate analysis (Memon et al., 2020).
- **Conducting the experiment during peak tourist season:** Scheduling data collection during the high season would increase the volume and diversity of participants, leading to a more representative sample and better generalizability of the results.
- **Implementing a controlled environment for the experiment:** Creating a controlled experimental setting, where participants are randomly assigned to either the control or test group, would minimize external influences and ensure that participants are prepared and willing to spend time on the experiment. This approach would also allow for a more detailed and comprehensive questionnaire.
- **Combining self-report and implicit measures:** To mitigate the limitations of self-reported data, it would be valuable to incorporate behavioral and physiological tracking methods. For instance, eye-tracking technology like Tobii (Tobii, 2025) could be used to monitor participant focus and attention, either with VR headsets or through specific glasses for website analysis. While this is a more expensive option, it would be well suited for measuring perception. Additionally, interactions with the immersive experience could be tracked using tools like Unity Analytics (Unity, 2025), which would be useful for analyzing engagement. To further reduce self-report bias, tracking interactions for the control group on a website using similar analytics tools could provide more objective data.

8.4. New hypotheses elaboration

Finally, for future research, here is the elaboration of new hypotheses based on the conclusions from the research:

- **H1:** Immersive experiences showcasing lesser-known spots with lower visitation rates have the potential to increase the intention to visit these locations.
- **H2:** Immersive experiences enhance the perception of innovativeness of a city.

Recommendations for offices of tourism and marketers

Regardless of the original hypotheses not being supported, the results and their interpretation offer powerful suggestions for tourism offices and marketers. For instance, one suggestion is that immersive experiences do not appear to add significant value when the main experience is already in place and satisfactory. In this study, the traditional human interaction at the office of tourism was already rated very highly by visitors in terms of emotional engagement, memorization and visit intention, leaving little room for further improvement through an additional immersive experience. Thus, this highlights the importance of carefully determining the right context and situation in which immersive technologies are deployed.

Rather than applying immersive experiences broadly, a more strategic approach is recommended. Immersive technologies should be used where they can fill a gap, create additional value, or compensate for something missing. For example, immersive content could be particularly useful to highlight lesser-known attractions, hidden spots, or areas that might not capture visitors' attention through traditional channels. For these types of attractions, immersive experiences can generate emotional engagement, spark curiosity and influence perceptions more significantly than traditional means.

Another insight from this study is that immersive experiences could contribute to enhancing a place's innovative brand image. While brand perception was not directly measured in the experiment, an interview with an expert suggested that introducing innovative technologies like Virtual Reality and 360-degree videos can help a destination project an image of modernity, innovation and forward-thinking tourism services. Therefore, for a city like Namur, incorporating an immersive experience into the overall marketing strategy could reinforce its image as an innovative, forward-thinking city that embraces modern technologies and sets itself apart from other destinations.

Additionally, it is crucial to consider where potential visitors are on their customer journey. The findings of this study, combined with past literature, suggest that immersive experiences are particularly impactful during the early stages of the decision-making process, when individuals are still becoming aware of a destination and forming their initial intentions. At the pre-purchase stage, immersive experiences can stimulate desire, raise awareness and build an emotional connection with potential visitors. Conversely, once travelers are already physically present or have already decided to visit, the opportunity to influence their decision is reduced. Because of this, tourism marketers should be strategic about when they introduce immersive content, focusing on raising awareness and encouraging visitors to consider the destination before they make their final booking or arrive on site.

This interpretation offers some useful ideas for how marketing strategies can be shaped. Instead of focusing solely on on-site displays, tourism offices might want to consider including immersive experiences in their outreach before travelers even arrive. This could be through travel fairs, exhibitions, or collaborations with travel agencies. For example, offering virtual tours of attractions or leveraging strong storytelling related to specific spots to enhance emotional engagement could be effective ways to capture

travelers' attention early and inspire them to choose a destination. At this early phase, it is not necessary to focus solely on lesser-known attractions, since many travelers may not yet be familiar even with a city's most iconic spots. For a city like Namur, this approach could be particularly impactful: Namur often pleasantly surprises visitors with its charm and beauty, yet many potential tourists remain unaware of its full appeal until they experience it. By offering immersive experiences early on that display its hidden treasures, Namur can better position itself as a must-visit destination.

Another effective approach would be to develop "behind the walls" immersive content. Offering exclusive, insider access to a city's historic sites, artisanal production processes or hidden cultural spots could help spark curiosity and drive visit intentions if implemented during the pre-travel stage. If introduced during the visit stage, it could strengthen visitor loyalty and make the Namur experience feel more personal and memorable. Much like the successful strategies seen in the luxury and manufacturing sectors, taking visitors beyond what is typically accessible fosters feelings of privilege, authenticity and emotional closeness.

To make these efforts more flexible and scalable, tourism offices should look into creating modular immersive content. By customizing different experiences for specific audiences, such as international visitors, local schools or travel agents, cities can better meet varied expectations. This personalized approach, which aligns with current marketing trends, would help cater to different needs.

In addition to public-facing strategies, tourism offices might consider a B2B approach by providing travel agents, tourism operators and partner organizations with VR headsets and immersive content. Similar to how sales teams in other sectors use immersive experiences to explain complex products and build trust, travel intermediaries could experience virtual tours of a destination to better promote it to future visitors. This indirect strategy allows a destination to reach wider audiences without depending on consumers owning VR equipment, which could considerably boost its visibility in new travel markets.

The high satisfaction ratings observed in the immersive experience suggest that the tourism office of Namur and Deloitte Digital should keep developing the experience along the same lines. With an average satisfaction score of 4.77 out of 5 and no significant differences across age groups, the experience demonstrates a strong cross-generational appeal. The results also highlight the effectiveness of integrating key trends such as gamification and personalization, as these features received positive feedback. Personalized experience such as allowing users to customize their virtual tour according to their interests can deepen engagement, create a sense of control and foster emotional connections. Likewise, adding gamified elements can boost emotional involvement and make the experience more memorable.

When it comes to audio-visual elements, the 360-degree videos stood out as the most appreciated features, offering a sense of awe that is key to delivering delighting and impactful experiences. This insight suggests that future investment should focus on creating high-quality, visually impressive 360-degree content. Meanwhile, the feedback on the narrative and audio received the lowest satisfaction ratings. Some participants mentioned that the AI-generated voice sounded unnatural, while others felt it was quite

realistic, indicating mixed perceptions. To improve this, it would be helpful to compare user responses to AI voices versus recordings by professional voice actors, to determine whether a human voice could significantly enhance satisfaction and emotional engagement.

Additionally, the quality of the interactions was the second least satisfying element aligning with the participants' comments on technical issues reporting that they could not interact correctly with digital elements. This suggests that interaction quality should be improved or that the experience should include a quick tutorial before the start of the experience.

In conclusion, immersive technologies hold a great promise for tourism offices and tourism marketing, but their effectiveness depends on strategic deployment. For destinations like Namur, immersive experiences should not just be added to an already strong visitor offer but should be leveraged to address specific needs, enhance brand perception and reach potential visitors earlier in their decision journey. By creating high-quality, emotionally compelling content, designing user-friendly interactions and strategically positioning these immersive experiences both before and during the visit, tourism offices and marketers can maximize their impact. Customizing content for different audiences and exploring B2B partnerships can help expand the reach and effectiveness of these efforts.

Conclusion

Something is clear: spatial computing and consequently, Extended Reality (XR) are becoming more advanced and powerful, constituting the fourth wave of computing innovation. These technologies are being adopted across an increasing number of sectors thanks to their ability to blend the physical and digital worlds, transforming human interactions with digital content from flat screens to multi-dimensional experiences. Marketers must stay informed and anticipate the onset of this new era before it becomes mainstream.

Through this thesis, I had the opportunity to discover the potential of immersive experiences to redefine the way brands interact with consumers. By merging the physical and digital realms, these technologies have become valuable tools for marketers, helping to improve existing strategies, overcome the limitations of traditional digital channels, and create smoother, more engaging customer journeys. Extended Reality (XR) enhances marketing by offering highly immersive, interactive and emotionally engaging experiences that traditional formats cannot match. These technologies enable seamless experiences across touchpoints by integrating interactivity and bridging gaps where traditional approaches fall short. They allow consumers to visualize products in context, interact with virtual representations, and personalize experiences, leading to higher engagement, increased confidence during decision-making and ultimately, stronger purchase intentions. In the shift from traditional to experiential marketing, XR answers the growing consumer desire to truly experience a brand through high levels of immersion and emotional engagement. Moreover, XR aligns with key marketing trends like gamification, storytelling and personalization.

By combining the literature review and my professional experience at Deloitte Digital, I saw an opportunity to explore how immersive experiences influence consumer behavior and more precisely, the psychological processes that shape these behaviors. To explore this, I developed a framework integrating consumer behavior elements and tested it in a real-world setting, namely, the office of tourism of Namur. While the data collection phase offered valuable hands-on learning, it also presented several limitations such as a small sample size, ceiling effects and reliance on self-reported measures, which ultimately hindered the ability to statistically validate the proposed hypotheses.

Nevertheless, the experiment allowed me to draw meaningful conclusions that can inform both future research designs and the implementation of immersive experiences in tourism offices. This experimentation can be seen as a first phase from which we can learn to enhance future research. A major academic learning is that human behavior is extremely complex to assess and must be approached cautiously due to the many inherent biases. From a tourism marketing perspective, a key takeaway is the importance of strategically identifying where in the traveler's journey an immersive experience can be most impactful. Moreover, the current service offering should be carefully analyzed to spot where immersive technology can deliver genuine added value.

An insightful quote from Agnès Vissoud, Digital Innovation Director at Louis Vuitton, when describing the Asnières immersive experience, summarizes this idea perfectly: "It's never

technology for the sake of technology” (Louis Vuitton Jobs, 2023). I believe this succinctly captures the mindset that should guide the implementation of XR in marketing strategies. From the experiment, I concluded that immersive experiences should not aim to replicate or replace offline channels, but rather to enhance digital ones, specifically where they are lacking and where there is a true opportunity to improve customer experience. This also reflects the understanding that online and offline channels cater to different consumer needs.

In conclusion, this thesis highlights both the promise and the complexity of using immersive experiences in marketing. When implemented thoughtfully, these technologies have the potential to create a significant competitive advantage for brands. However, as they are still in their infancy and we only begin to see measurable returns on investment, we are at a strategic moment to act. Now is the time to differentiate, before immersive experiences become the norm for every brand.

Bibliography

- Abraham, M., Saeghe, P., McGill, M., & Khamis, M. (2022). Implications of XR on Privacy, Security and Behaviour: Insights from Experts. *Nordic Human-Computer Interaction Conference (NordiCHI '22)*. <https://doi.org/10.1145/3546155.3546691>
- Alcañiz, M., Bigné, E., & Guixeres, J. (2019). Virtual Reality in Marketing: A Framework, Review, and Research Agenda. *Frontiers in Psychology*, 10. <https://doi.org/10.3389/fpsyg.2019.01530>
- Alsop, T. (2024). *Extended Reality (XR) - statistics and facts*. Statista. Accessed March 08, 2025, at <https://www.statista.com/topics/6072/extended-reality-xr/#topicOverview>
- American Psychological Association. (2018a). Ceiling effect. In *APA Dictionary of Psychology*. <https://dictionary.apa.org/ceiling-effect>
- American Psychological Association. (2018b). Self-report bias. In *APA Dictionary of Psychology*. <https://dictionary.apa.org/self-report-bias>
- Anderson, B. (n.d.). *Comment effectuer un test Shapiro-Wilk dans R (avec exemples)*. Statorials. Accessed April 13, 2025, at <https://statorials.org/shapiro-wilk-test-r/>
- Arya, V., Sambyal, R., Sharma, A., & Dwivedi, Y. K. (2024). Brands are calling your AVATAR in Metaverse—A study to explore XR-based gamification marketing activities & consumer-based brand equity in virtual world. *Journal of Consumer Behaviour*, 23(2), 556–585. <https://doi.org/10.1002/cb.2214>
- Atiker, B. (2023). The Conceptual Design Framework for XR Marketing. *Communication Design and Branding*, 32, 317-341. Springer. https://doi.org/10.1007/978-3-031-35385-7_19
- Auganix. (2025). *XR Announcements from CES 2025: Products, Partnerships, and Technologies*. Accessed March 24, 2025, at <https://www.auganix.org/ces-2025-vr-ar-xr-announcements/>
- Balenciaga. (2025). *FALL 2021*. Accessed February 28, 2025, at <https://www.balenciaga.com/en-us/fall-21>
- Bansal, D. (2024, November). Digital Marketing Trends For 2025 And Beyond. *Forbes*. <https://www.forbes.com/councils/forbesbusinesscouncil/2024/11/13/digital-marketing-trends-for-2025-and-beyond/>
- Batat, W. (2021). *Marketing Expérientiel : Expérience client, comportement du consommateur et les 7E du marketing mix expérientiel*. De Boeck Supérieur.

- Big Think. (2022, August 26). *The metaverse explained in 14 minutes* | Matthew Ball [Online video (YouTube)]. <https://www.youtube.com/watch?v=4S-4mTvK4cl>
- Bobbit, Z. (2018). *Mann-Whitney U Test*. Statology. Accessed April 13, 2025, at <https://www.statology.org/mann-whitney-u-test/>
- Brée, J., & Pantin-Sohier, G. (2023). *Le comportement du consommateur* (5^e éd). Dunod.
- Brenner, P.S., & DeLamater, J. (2016). Lies, Damned Lies, and Survey Self-Reports? Identity as a Cause of Measurement Bias. *Soc Psychol Q.*, 79(4), 333-354. 10.1177/0190272516628298
- CES. (2025). *DIVE IN to the Future: CES 2025 Opens Today*. Accessed March 24, 2025, at <https://www.ces.tech/press-releases/dive-in-to-the-future-ces-2025-opens-today/>
- Constantin, M., Genovese G., Munawar, K., & Stone R. (2023). Tourism in the metaverse: Can travel go virtual? *McKinsey & Company*. <https://www.mckinsey.com/industries/travel/our-insights/tourism-in-the-metaverse-can-travel-go-virtual>
- Cureton, D. (2023). *How is the Automotive Industry Leveraging XR?* XR Today. Accessed April 6, 2025, at <https://www.xrtoday.com/mixed-reality/how-is-the-automotive-industry-leveraging-xr/>
- Data Bridge Market Research. (2025). *Global Extended Reality Market Size, Share, and Trends Analysis Report – Industry Overview and Forecast to 2032*. Accessed March 9, 2025, at <https://www.databridgemarketresearch.com/reports/global-extended-reality-market>
- Deloitte. (2024). *Tech Trends 2025*. <https://www2.deloitte.com/us/en/insights/focus/tech-trends.html>
- Deloitte Digital. (2024). *Marketing Trends of 2025: Embracing change and gearing up for the future*. <https://www.deloittedigital.com/nl/en/insights/perspective/marketing-trends-2025.html>
- Delinikolas, D., Hapek, M., & Wójciak M. (2022). The Spectrum of XR Marketing - Collective Case Study. *Zarządzanie Mediami*, 4, 299-322. <https://www.ceeol.com/search/article-detail?id=1179370>
- Dey, M. (2024). *Online Vs In-Store Statistics By Product Category, Shopping Habits, Sales and Users*. Sci-Tech Today. Accessed February 10, 2025, at <https://www.sci-tech-today.com/stats/online-vs-in-store-statistics/>
- Digital Delight. (2022). *The world of digital fashion*. Accessed April 21, 2025, at <https://digitaldelight.be/the-world-of-digital-fashion/>

- Digital Delight. (2023). *New client space in the metaverse for a luxury watch brand*. Accessed April 21, 2025, at <https://digitaldelight.be/new-client-space-in-the-metaverse-for-a-luxury-watch-brand/>
- Dimanche, F., & Andrades, L. (2024). Tourism Trends: Current Challenges for Tourism Destinations Management. In *The Spanish Model for Smart Tourism Destination Management* (pp.3-21). Springer. https://doi.org/10.1007/978-3-031-60709-7_1
- Dimension. (2025). *Balenciaga's Afterworld: The Age of Tomorrow*. Accessed February 28, 2025, at <https://dimensionstudio.co/work/balenciaga-afterworld-age-tomorrow-volumetric/>
- Ebrahimi, E., Irani, H.R., Abbasi, M., & Abedini, A. (2024). The effect of gamification on brand equity and desirable consumer behaviors in online retail stores: The mediating role of brand engagement. *Interdisciplinary Journal of Management Studies (IJMS)*, 17 (2), 379-391. <http://doi.org/10.22059/ijms.2023.352786.675544>
- Farah, M. F., Ramadan, Z. B., & Harb, D. H. (2019). The examination of virtual reality at the intersection of consumer experience, shopping journey and physical retailing. *Journal of Retailing and Consumer Services*, 48, 136-143. ScienceDirect. <https://doi.org/10.1016/j.jretconser.2019.02.016>
- Flavián, C., Ibáñez-Sánchez, S., & Orús, C. (2019). The impact of virtual, augmented and mixed reality technologies on the customer experience. *Journal of Business Research*, 100, 547-560. ScienceDirect. <https://doi.org/10.1016/j.jbusres.2018.10.050>
- Flavián, C., Tussyadiah, I.P. and Orús, C. (2024). How immersive technologies are redefining the customer journey. Guest editorial. *International Journal of Contemporary Hospitality Management*, 36 (11), 3557-3565. Emerald. <https://doi.org/10.1108/IJCHM-11-2024-215>
- Fortune Business Insights. (2025). *Extended Reality (XR) Market Size, Share & Industry Analysis By Type (Virtual Reality, Augmented Reality, and Mixed Reality), By Industry (Healthcare, Education, Retail & E-commerce, Gaming, Automotive, Media & Entertainment, and Others), and Regional Forecast, 2025 - 2032*. Accessed March 9, 2025, at <https://www.fortunebusinessinsights.com/extended-reality-market-106637>
- Gartner. (2018). *Understanding Gartner's Hype Cycles*. Accessed March 15, 2025, at <https://www.gartner.com/en/documents/3887767>
- Hadan, H., Wang, D.M., Nacke, L.E., & Zhang-Kennedy, L. (2024). Privacy in Immersive Extended Reality: Exploring User Perceptions, Concerns, and Coping Strategies. *Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI '24)*. <https://doi.org/10.1145/3613904.3642104>

- Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Danks, N.P., & Ray, S. (2021). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R. Classroom Companion: Business*; Springer. https://doi.org/10.1007/978-3-030-80519-7_1
- Hassan, L., Jylhä, H., Sjöblom, M., & Hamari, J. (2020). Flow in VR: A Study on the Relationships Between Preconditions, Experience and Continued Use. *Hawaii International Conference on System Sciences*, 53, 1196-1205. <http://hdl.handle.net/10125/63888>
- Hilken, T., Keeling, D. I., Chylinski, M., de Ruyter, K., Golf Papez, M., Heller, J., Mahr, D., & Alimamy, S. (2022). Disrupting marketing realities: A research agenda for investigating the psychological mechanisms of next-generation experiences with reality-enhancing technologies. *Psychology & Marketing*, 39, 1660–1671. Wiley Online Library. <https://doi.org/10.1002/mar.21678>
- IKEA. (2017, September 12). *IKEA Place app launched to help people virtually place furniture at home*. Accessed April 11, 2025, at <https://www.ikea.com/global/en/newsroom/innovation/ikea-launches-ikea-place-a-new-app-that-allows-people-to-virtually-place-furniture-in-their-home-170912/?msockid=0600088d42cd677c3f7d1c124385663c>
- Jeon, J. E. (2022). The impact of XR applications' user experience-based design innovativeness on loyalty. *Cogent Business & Management*, 10(1). <https://doi.org/10.1080/23311975.2022.2161761>
- Kieanwatana, K., & Vongvit, R. (2024). Virtual reality in tourism: The impact of virtual experiences and destination image on the travel intention. *Results in Engineering*, 24. <https://doi.org/10.1016/j.rineng.2024.103650>
- Kotler, P., Kartajaya, H., Setiawan, I., & Vandercammen, M. (2020a). *Marketing 4.0: L'ère du digital* (2e éd). De Boeck Supérieur.
- Kotler, P., Armstrong, G., Harris, L. C., & He, H. (2020b). *PRINCIPLES OF MARKETING* (Eighth European Edition). Pearson.
- Kubski, T. (2025, April 1). *Director of Digital Strategy and Immersive Experiences at Deloitte Digital* [Interview]. Brussels.
- Kunkel, N., & Soechtig, S. (2017) *Mixed reality: experiences get more intuitive, immersive and empowering*. [Powerpoint Presentation]. Deloitte University Press.
- Lee, H. (2025). A unified conceptual model of immersive experience in extended reality. *Computers in Human Behavior Reports*, 18. <https://doi.org/10.1016/j.chbr.2025.100663>

- Liao, Y., Zhou, F., Chen, Y., & Wu, Y.J. (2024). How Does Gamification Improve Purchase Intention? Through the Lens of Perceived Brand Coolness and Time Poverty. *Behavioral Science*, 14, 1226. <https://doi.org/10.3390/bs14121226>
- L'Oréal Paris. (2025). *Outil d'essai virtuel*. Accessed April 23, 2025, at <https://www.loreal-paris.be/fr-be/service-hub-page/services/virtual-try-on-maquillage>
- Louis Vuitton Jobs. (2023). *Asnières immersive : la force du collectif vers un voyage unique*. Accessed March 4, 2025, at <https://jobs.louisvuitton.com/fr/actualites/asnieres-immersive-la-force-du-collectif-vers-un-voyage-unique>
- MacKinnon, David. (2001). Mediating Variable. *International Encyclopedia of the Social and Behavioral Sciences*, 9503-9507. ResearchGate. 10.1016/B0-08-043076-7/00732-4.
- Markets and Markets. (2024). *Extended Reality Market Size, Share and Trends*. Accessed March 9, 2025, at <https://www.marketsandmarkets.com/Market-Reports/extended-reality-market-147143592.html>
- Marr, B. (2023, October). Unlocking The Future Of Learning: How XR Tech Transforms Education. *Forbes*. <https://www.forbes.com/sites/bernardmarr/2023/10/20/unlocking-the-future-of-learning-how-xr-tech-transforms-education/>
- McDowell, M. (2021, May). Inside Gucci and Roblox's new virtual world. *Vogue Business*. <https://www.voguebusiness.com/technology/inside-gucci-and-robloxs-new-virtual-world>
- McGill, M. (2021). The IEEE Global Initiative on Ethics of Extended Reality (XR) Report- Extended Reality (XR) and the Erosion of Anonymity and Privacy. *Extended Reality (XR) and the Erosion of Anonymity and Privacy - White Paper*. <https://ieeexplore.ieee.org/servlet/opac?punumber=9619997>
- Memon, M., Ting, H., Cheah, J., Ramayah, T., Chuah, F., & Cham, T. (2020). Sample Size for Survey Research: Review and Recommendations. *Journal of Applied Structural Equation Modeling*, 4, i-xx. 10.47263/JASEM.4(2)01.
- Mordor Intelligence. (2024). *Extended Reality (XR) Market Size, Share, Growth Forecast & Industry Trends (2025 - 2030)*. Accessed March 9, 2025, at <https://www.mordorintelligence.com/industry-reports/extended-reality-xr-market>
- Mower, S. (2020). *Balenciaga Fall 2021 Ready-to-Wear*. Vogue Runway. Accessed March 3, 2025, at <https://www.vogue.com/fashion-shows/fall-2021-ready-to-wear/balenciaga>
- Mullen, B., & Johnson, C. (2013). *The Psychology of Consumer Behavior*. Psychology Press; O'Reilly. <https://www.oreilly.com/library/view/the-psychology->

of/9780898598575/?_gl=1*9tuhxy*_ga*MTc3MzEyMjE4MS4xNzI5NTIzNTI0*_ga_092EL089CH*MTc0MDIxOTA5Ni40LjEuMTc0MDIxOTEyNi4zMC4wLjA.

- Mystakidis, S. (2022). Metaverse. *Encyclopedia*, 2(1), 486-497. <https://doi.org/10.3390/encyclopedia2010031>
- Nikolopoulou, K. (2023, February). *What Is a Ceiling Effect? | Definition & Examples*. Scribbr. <https://www.scribbr.com/research-bias/ceiling-effect/>
- OpenAI. (2025a). *ChatGPT*. (Version of the 5th of April 2025) [Large language model]. <https://chat.openai.com/chat>
- OpenAI. (2025b). *ChatGPT*. (Version of the 24th of April 2025) [Large language model]. <https://chat.openai.com/chat>
- Orús, C., Ibáñez-Sánchez, S., & Flavián, C. (2021). Enhancing the customer experience with virtual and augmented reality: The impact of content and device type. *International Journal of Hospitality Management*, 98. ScienceDirect. <https://doi.org/10.1016/j.ijhm.2021.103019>
- Pathak, K. & Prakash, G. (2023). Exploring the role of augmented reality in purchase intention: Through flow and immersive experience. *Technological Forecasting & Social Change*, 196. ScienceDirect. <https://doi.org/10.1016/j.techfore.2023.122833>
- Porsche. (2019). *New app makes three-dimensional vehicle configuration possible*. Accessed April 9, 2025, at <https://newsroom.porsche.com/en/2019/digital/porsche-augmented-reality-visualizer-app-car-configuration-17619.html>
- Porsche. (2020). *Taycan VR Experience*. Accessed April 9, 2025, at <https://newsroom.porsche.com/en/2020/company/porsche-taycan-vr-experience-application-20158.html>
- Porsche. (2024). *Immersive presentations: how Porsche is stepping into mixed reality*. Accessed April 9, 2025, at <https://newsroom.porsche.com/en/2024/innovation/porsche-mixed-reality-workshop-augmented-reality-34998.html>
- Precedence Research. (2025). *Extended Reality Market Size, Share, and Trends 2025 to 2034*. Accessed March 9, 2025, at <https://www.precedenceresearch.com/extended-reality-market>
- Putri, A. J., Rubiyanti, N. R., Widodo, A., & Silvianita, A. (2024). Factors influencing consumers' purchase intention mediated by immersive experience: A research agenda. *Journal of International Conference Proceedings*, 7(1), 55-66. <https://doi.org/10.32535/jicp.v7i1.3114>

- Qualtrics. (2025). *Qualtrics Experience Management Platform* [Software]. Qualtrics. <https://www.qualtrics.com>
- R Project. (n.d.). *What is R?* Accessed April 24, 2025, at <https://www.r-project.org/about.html>
- Rauschnabel, P. A., Felix, R., Hinsch, C., Shahab, H., & Alt, F. (2022). What is XR? Towards a Framework for Augmented and Virtual Reality. *Computers in Human Behavior*, 133. ScienceDirect. <https://doi.org/10.1016/j.chb.2022.107289>
- Reina-Paz, M. D., & Rodríguez-Vargas, J. (2023). Main theoretical consumer behavioural models. A review from 1935 to 2021. *Heliyon*, 9(2). ResearchGate. 10.1016/j.heliyon.2023.e13895.
- Ritcher, S. (2025). *4 Omnichannel Trends for Retail in 2025*. SAP Emarsys. Accessed February 10, 2025, at <https://emarsys.com/learn/blog/omnichannel-trends-retail/>
- RStudio Team. (2023). *RStudio: Integrated development environment for R*. (Version 2024.12.0) [Computer software]. Posit Software, PBC. <https://posit.co/>
- Second Life. (2025). *Second Life*. Accessed April 18, 2025, at <https://secondlife.com/?lang=fr>
- Shahab, H., Shahzad, F., & Yasin, G. (2022). VIRTUAL REALITY AS A MARKETING TOOL TO DRIVE CONSUMER DECISION-MAKING. *Pakistan Journal of Social Research*, 4, 1, 664-677. www.pjsr.com.pk
- Shoaib, M. (2023, January). Estée Lauder's new app helps visually impaired users apply makeup. *Vogue Business*. <https://www.voguebusiness.com/beauty/estee-launders-new-app-helps-visually-impaired-users-apply-makeup>
- Statista. (2025). *Extended reality (XR) market revenue worldwide from 2023 to 2028*. Accessed March 9, 2025, at <https://www.statista.com/statistics/591181/global-augmented-virtual-reality-market-size/>
- Steinbock, D. (n.d.). *TagCrowd*. <https://tagcrowd.com/>
- Tobii. (2025). *Home page*. <https://www.tobii.com/>
- Tourism Australia. (n.d.). *NEW RESEARCH CONFIRMS THE POTENTIAL OF VIRTUAL REALITY FOR DESTINATION MARKETING*.
- Unity. (2025). *Unity Analytics*. <https://docs.unity.com/ugs/manual/analytics/manual/overview>
- Valente, M.J., Pelham, W.E., Smyth, H., & MacKinnon, D.P. (2017). Confounding in statistical mediation analysis: What it is and how to address it. *J Couns Psychol*, 64(6), 659-671. 10.1037/cou0000242

- Voglet, M. (2025, May 2). *Communications and Press Relations Officer at the Namur office of tourism* [Interview]. Online.
- Warby Parker. (n.d.). *Ways to try*. Accessed April 23, 2025, at <https://www.warbyparker.com/ways-to-try?msocid=0600088d42cd677c3f7d1c124385663c>
- Wedel, M., Bigné, E., & Zhang, J. (2020). Virtual and augmented reality: Advancing research in consumer marketing. *International Journal of Research in Marketing*, 37, 443-465. ScienceDirect. <https://doi.org/10.1016/j.ijresmar.2020.04.004>
- Wulandari, D., Sutrisno, S., & Nirwana, M. (2021). Mardia's Skewness and Kurtosis for Assessing Normality Assumption in Multivariate Regression. *Enthusiastic: International Journal of Applied Statistics and Data Science*, 1, 1-6. 10.20885/enthusiastic.vol1.iss1.art1.
- XR Today. (2023). *What is Spatial Computing in simple terms?* Accessed April 5, 2025, at <https://www.xrtoday.com/mixed-reality/what-is-spatial-computing/>
- XR Today. (2024). *The Mixed Reality Headset Trends to Watch in 2024*. Accessed March 8th, 2025, at <https://www.xrtoday.com/mixed-reality/the-mixed-reality-headset-trends-to-watch-in-2024/>
- XR Today. (2025). *XR Transformation : Challenges, Use Cases, and the Role of AI*. Accessed March 8th, 2025, at <https://www.xrtoday.com/report-xr-transformation-challenges-use-cases-and-the-role-of-ai/>
- Xu, J., Papangelis, K., Tigwell, G.W., Lalone, N., Zhou, P., Saker, M., Chamberlain, A., Dunham, J., Mojib Luna, S., & Schwartz, D. (2024). Spatial Computing: Defining the Vision for the Future. *Association for Computing Machinery*, Article 583, 1–4. <https://doi.org/10.1145/3613905.3643978>
- Yang, X., Xi, N., Tang, H., & Hamari, J. (2023). Gamification and Marketing Management: A Literature Review and Future Agenda. *AMCIS 2023 Proceedings*, 1. https://aisel.aisnet.org/amcis2023/meta_res/meta_res/1
- Zhang, Z. & Wang, L. (2017-2025). *Advanced statistics using R*. Granger, In ISDSA Press. <https://doi.org/10.35566/advstats>