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UNDERSTANDING VR/AR IN MARKETING & SALES FOR B2B: AN EXPLORATIVE STUDY

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﴿ يَرْفَعِ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ وَاللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ﴾

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Abstract

The research explored the impact of immersive reality technologies, particularly VR and AR, in marketing and sales for the B2B sector. Study interests were fuelled by both an industrial hype and vehement investments on these technologies, especially in the last five years. However, the potential of these technologies is still unexplored and widely misunderstood by businesses as the innovations are slowly taking off. Additionally, existing literature showed a need to clearly define various simulated realities in the continuum, including VR and AR, as well as a general misunderstanding of the potential of immersive reality technologies, and a shortage of studies covering holistically different VR/AR applications in marketing, especially for the B2B sector.

Therefore, this research aims to bridge the gap between managerial and academic' understanding by providing a holistic framework explaining the impact of immersive reality technologies in B2B marketing and sales and provide a clear distinction between VR and AR in the Virtuality-reality continuum. This research also aims to assist marketers and managers in embracing these technologies to better meet the needs of future generations. The study adopted a qualitative exploratory approach allowing researchers to gain an in-depth understanding of the topic from an industrial perspective. The study used an abductive thematic analysis approach to analyse empirical results and ten semi-structured interviews with eleven VR/AR providers for primary data collection. Results were structured based on four main themes, namely: VR and AR definitions, customer technology adoption factors, VR/AR impact and applications on B2B marketing, and last, VR/AR impact on sales performance outcomes.

This study contributes to the existing literature by proposing a tentative definition for each terminology "VR" and "AR" separately that merges academic perspectives and industry insights. Overall, empirical study suggests that immersive reality technologies can affect both marketing activities and sales performance outcomes for the B2B sector. However, successfully embracing these technologies calls for collaboration to overcome financial, technical and social barriers while also enhancing aspects like the user experience to step out of the still immature VR/AR market. VR and AR together have an impact on marketing for B2B by enhancing customization, non-verbal communication, learning and experiential marketing while also creating memorable experiences that stick in the minds of the consumer. Concerning the customer's purchasing journey, this study extends existing literature to cover all customer purchasing stages, including the pre-purchase, purchase and post-purchase. Results emphasize the pre-purchase phase as the most impacted by immersive reality technologies, followed by post-purchase and purchase stages, respectively. Finally, this study suggests that the use of VR/AR as sales support tools can yield positive efficiency returns through higher task performance and a reduction in sales-related costs, and positive effectiveness returns through greater customer and social engagement, stronger collaborative business relationships and the enhancement of proactive (sales planning) and reactive (adaptive selling) behaviours in the sales process.

Keywords
Virtual Reality, Augmented Reality, Sales Technology, Sales Performance, Technology Adoption factors, B2B Marketing

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ABBREVIATIONS

AR	Augmented Reality
AV	Augmented Virtuality
B2B	Business-to-business
IDT	Innovation Diffusion Theory
MR	Mixed Reality
RBV	Resource Based View
ST	Sales Technology
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology
UX	User Experience
VE	Virtual Environment
VR	Virtual Reality
XR	Extended Reality

INTRODUCTION

The choice of our research topic and perspectives of the study were not random but rather backed up on both a theoretical gap in academic research and the growing managerial implications related to VR and AR applications covered in the following section.

1.1 Research gap & study interest

From a business perspective, Virtual Reality tools and applications have been attracting vehement investments fuelling research in the field in the hopes to uncover the full potential of these new technologies in optimizing business operations and processes. Facebook, for instance, spent $2 billion on its “Oculus Rift” headset while Google invested about $542 million on its “Magic Leap” in March and October 2014, respectively. The New York Times, on the other hand, allotted over a million free Google Cardboard headsets to its readers (Barnes, 2016). Novelty and mass interest in Virtual Reality is depicted through monumental sales of Head-Mounted Displays since 2017, for the first time, reaching over a million US dollars in just a quarter and US$1.5 billion during the same year (Flavián et al., 2018). By 2022, the global market size related to virtual environments is expected to reach over 209.2 billion U.S dollars (Loureiro et al., 2018).

Besides VR, augmented reality was selected, according to Gartner (2017) in the top ten strategic tech trends for organizations (Flavián et al., 2018; Hagl & Duane, 2020). AR, in this sense, is sought to uphold a promising future evidenced with a market valuation expected to increase over 21 times from a mere US$2.9 billion (in 2016) to US$61.3 billion in 2020 (Flavián et al., 2018; McCarthy, 2017). An additional projection speaking of AR’s success in business is reflected in an industrial compound annual rate rising at 55.71% between 2017 and 2023 (McCarthy, 2017). Positive predictions also mirror the aggregate industrial sales success of both AR and VR with a rising market volume for these technologies from $3 billion in 2016, to an expected $40 billion in 2020 (Hagl & Duane 2020). Other recent predictions by the Bellini et al., (2016) evaluate the joint VR and AR market size to vacillate between $80B and $182B in value by 2025, mirroring sales for both B2B and B2C industries.

As the production costs of these new technologies are yet to keep plummeting in the future, cheaper versions of VR and AR tools translate into higher accessibility to the public, and by extension, greater adoption rates (Barnes, 2016; Loureiro et al., 2018). This is particularly true with the fast deployment of mobile devices and applications that consequently made AR a more financially viable and accessible tool to utilize by organizations (Gervautz et al., 2012; Hariharan et al., 2020; Loureiro et al., 2018; Liao, 2015 & Porter et al., 2017) while transcending ergonomics and other common processing and storage limitations that once jeopardized the quality of the user interface (Gervautz et al., 2012). And as VR and AR technologies keep developing, they will increasingly influence marketing and business decisions, which, according to Loureiro et al. (2018), calls for further investigation and research studies on VR and AR. Such data reflect not only an industrial trend to VR/AR technologies but also a promising future for their integration into society and organizations.

As a matter of fact, a topical assessment commissioned by the global network ABI Research, investigating penetration potential of VR technologies in a set of American firms, exhibits that 85% of companies were "considering the adoption of virtual reality" (Boyd & Koles, 2018). The growing consumer base, however, does not only include businesses but also young individuals (Barnes, 2016; Flavián et al., 2018 & Singh et al., 2018). These generations being future leaders of tomorrow´s society, and provided an ageing population as Finland, it only seems natural that effective communication of products and services in the upcoming years would require a thorough understanding of how Virtual Reality and Augmented Reality can add value to marketing processes and in what aspects can marketers apply these tools to build long-term bonds with customers.

Both AR and VR have seen a boom in applications, especially starting the technology take-off (hype) that happened between 2014 and 2017. According to Flavián et al. (2018), Virtual Reality tools have a future in almost every industry, including but not limited to education, retail, tourism, leisure, healthcare, and research. Likewise, although the augmented reality was more commonly known in entertainment with the advent of games like Pokémon-Go or Snapchat filters (Porter et al., 2017), AR is also flourishing in sectors like architecture, medicine, education, retailing, tourism, and used for varying purposes like interactive marketing and sales, training, design, maintenance and instructional guides (Gervautz et al., 2012; Loureiro et al., 2018).

Thanks to their powerful visualization and spatial capabilities, VR and AR together are shifting from the gaming and entertainment to more commercial use cases (Hariharan et al., 2020).

More specifically within the marketing spectrum, and in a B2B setting, VR and AR together allow for a palette of use cases, including but not limited to industrial production of equipment and machinery, communication of complex product configurations, a safer representation of hazardous and/ or heavy materials, and corporate sales processes requiring strong stakeholder involvement from different teams (engineering, sales and marketing, production..) within and beyond a firm's confines (Hariharan et al., 2020). Similarly, Hagl and Duane (2020) argue that organizations worldwide are already embracing AR and VR tools in their marketing and sales strategies, primarily to design engaging and interactive ads, create immersive brand experiences, and allow for innovative ways to engage with customers, or what Hariharan et al. (2020) calls visualizing customer expectations. In a similar line of thought, Hariharan et al. (2020) add about the business potential of these technologies that both AR and VR provide opportunities for co-creation interactive experiences and co-design throughout the sales process. Thus, acknowledging customer experiences at the heart of simulated technologies, this field is hence providing fertile grounds for studies in marketing and consumer behaviour (Barnes, 2016).

Such focus on experiential marketing, being immersive and social, speaks of the promising virality of this technology as a marketing tool (Barnes, 2016). In-depth interviews with marketing experts emphasize the need for companies to embrace "aggressive moves" and radical digital revolutions to keep up in the competition arena (Schwartz & Rousselet, 2017) and a chief transformation involves understanding and capitalizing on marketing opportunities created by Virtual Reality technologies (Silverberg, 2016). Likewise, Cuomo et al. (2014) emphasize the importance of adopting AR technologies for companies to overcome challenges of the current marketing era, especially regarding the enablement of novel interaction tactics and digital engagement strategies nurturing experiences, persuasion, sharing and relations. Simply put, both VR and AR technologies are viewed amongst the greatest disrupter tools of the current era (Hariharan et al., 2020) and, hence, are both essential to understanding the potential of virtuality-reality technologies in business.

The fervent interest for Virtual Reality in marketing is not only limited to a need from the marketplace but also stems from a gap in academic research and literature. According to Bonetti et al. (2017), AR and VR evolution and applications have started as an exploratory work in the 1990s (Gold 1993) and did not develop to further research studies until recently. The few studies that were published with regards to these technologies have only been covering fragmented areas of VR and AR applications, mainly concerned with consumer-oriented industries (Flavian et al., 2018; Loureiro et al., 2018). So, while VR literature was extensively oriented to tourism and entertainment, Hilken et al. (2017) argues that AR research was focused on advertising and media (Hopp et al., 2016; Javornick, 2016) virtual fitting (Beck et al., 2016), online shopping experiences and retailing (Boletsis & Karahasanović, 2018; Huang et al., 2015; Poushneh and Vasquez (2017); Poncin and Mimoun, 2014 & Spreer and Kallweit, 2014), and mobile AR applications (Dacko, 2017; Olsson et al., 2013), which again are directed to the B2C sector. Cuomo et al. (2014) also add that a theoretical baseline is of the essence for businesses to fully comprehend and define an augmented customer (purchasing) experience enabled by VR and AR technologies.

From the afore-mentioned, we identify two main research gaps: first, a lack of literature covering B2B applications of VR and AR technologies and second, a focus on specific areas (rather than holistic view) in discussing the topics. Capitalizing on these research gaps, our paper aims to provide a holistic overview exploring the impact of Virtual Reality and Augmented Reality on B2B marketing activities (such as co-creation, design and prototyping, support, presentation...) and sales performance for companies. And from the customers´ side, our research will also uncover the impact of VR/AR on shaping a new immersive purchasing experience, including the pre-purchase, purchase and post-purchase stages. Thus, our first theoretical contribution entails setting a framework for understanding VR/AR impact on company and customer levels, explaining how these new technologies add value to the customer's purchasing journey and to the company's sales performance outcomes.

Former academic research also provides blurred definitions related to boundaries between different realities, that is, Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) as researchers barely delineated these terms (Flavián et al., 2018). Some definitions even consider AR under the broader umbrella of VR technologies.

An illustration is mentioned by Milgram et al. (1995) defining augmented reality as "*a form of virtual reality where the participant's head-mounted display is transparent, allowing a clear view of the real world*." Another research gap includes theoretical misperceptions on how VR and AR technologies impact marketing (Barnes, 2016; Flavián et al., 2018) and a shortage in literature discussing applications and use of VR in this field (Loureiro et al., 2018). In fact, no article explored different applications of VR in marketing (Loureiro et al., 2018). And from an industrial viewpoint, AR potential in business is still a topic that many companies are unaware about, mainly provided the technology is in an infancy stage (DeMers, 2016; Economist, 2017; Jin & Yazdanifard, 2015). Liao (2015) adds, in discussing theoretical gaps related to AR, that the latter technologies lack an understanding of their driving industries. Based on the latter, this paper also aims to discuss, through examples and business cases, different VR and AR applications in marketing with a particular focus on B2B context, providing a comprehensive view of Virtual Reality potential and a baseline for mainstream research in this field.

Additionally, frequent misunderstandings exist in grasping different uses of VR in practice (Barnes, 2016). Hagl and Duane (2020) add that emerging technologies like VR and AR lack distinguishable business use cases. This could be partially justified by similarity in sampling and data collection methods focusing mainly on surveys to consumers (particularly students) (Loureiro et al., 2018), hence reflecting a one-sided perspective. Another justification to the poor understanding of VR and AR potential may be backed up by the common attention in former research to studying particular sectors only, mainly the tourism (hospitality and entertainment), or retailing industries (Loureiro et al., 2018). Therefore, we decided, in this paper, to adopt another approach and explore the "VR/AR in B2B marketing" topic through in-depth interviews with Virtual Reality and Augmented Reality experts themselves. This data collection method will not only be adding a new perspective to extant, consumer-focused, literature but also allowing us to discuss any similarities and reflect on differences or new insights that might have otherwise been ignored in former research studies.

In this report, our study about the aggregate effects of VR and AR on marketing and sales, instead of tackling one technology only, is backed up by justifications from prior literature. In fact, while Milgram et al. (1995) argue that both technologies are related,

Porter et al. (2017) add that AR and VR, although upholding separate implications, are complementary to one another. And thus, as advanced by Milgram et al. (1995), it only makes sense to consider both technologies for a deeper understanding of their implications. In former literature, researchers have also provided different umbrella terms to combine VR and AR (and sometimes mixed reality as well) when discussing the collective applications of these technologies in business and/or marketing. For instance, while Bekele and Champion (2019) refer to AR/VR together by "immersive reality technologies", Loureiro et al. (2018) coined both innovations as "simulated realities" for their ability to simulate various types of reality to the user, and Bonetti et al. (2017) simply referred to them as "advanced technologies". Likewise, to avoid falling in too much redundancy while discussing these technologies together, "*immersive reality technologies*" serve as a substitute for designing the combined technologies VR/AR. Nevertheless, like Bekele and Champion (2019), each technology will be referred to specifically when there is a distinct justification for their roles.

Next is a brief discussion of this study objectives, bridging the gaps between researchers and managerial understanding of VR and AR implications in business, and more specifically in B2B marketing and sales.

1.2 Aim of the research

Through this research, we aim to:

For Researchers:

- Clearly define and differentiate between different realities to improve academic and managerial understanding of each term, and by extension, their use in the future.
- Set a theoretical framework for understanding immersive reality technologies impact on company and customer levels, explaining how these new technologies can add value to a company's sales performance and throughout a buyer's purchasing journey.

- Bring a different perspective to explore VR/AR uses and applications in marketing through semi-structured interviews with experts in Finland and abroad and consequently provide researchers with directions for future research.

For Businesses:

- Enhance marketers and managers' understanding of VR and AR applications in marketing for the B2B sector, allowing them to have a holistic view on ways they can use immersive reality technologies to efficiently optimize their marketing activities and better serve the evolving needs of future generations.
- Assist marketers in their efforts to embrace immersive reality technologies through insights from VR/AR experts and a holistic study of the topic.

The following section unveils, in brief, the research design, methodology, and data collection used to build an understanding of immersive reality technologies in B2B marketing and sales. The section also lays the theoretical framework parts designed to as a baseline for structuring later analysis and discussions, prior to discussing different subsequent thematic analysis themes.

1.3 Research design

Our research will be qualitative in nature, using both primary and secondary data to allow for a more reliable baseline (Saunders et al., 2007). The study draws upon reliable sources such as academic and journal journals, whitepapers, published books, and case studies. Following an exploratory approach, the theoretical background provides a starting point for the empirical study and defines the impact of VR on marketing in the B2B environment. In our primary data collection, we will be using semi-structured interviews with ten AR/VR providers in developed countries, including Finland, Sweden, USA and UK.

Our paper starts with a theoretical background defining Virtual Reality, Augmented Reality and providing a conceptualization baseline for both terms for distinction purposes. The theoretical foundation of VR and AR is also structuring research

subtopics in the following parts: attitudes and purchase intentions (exhibiting different frameworks to justify and understand innovation adoption by customers), VR impact throughout the buyer's purchasing journey (evidenced through application examples and discussion of their impact on different buyer stages), and finally, VR/AR contribution to the company's sales performance outcomes.

Therefore, analysing the interview will be following a thematic analysis, sorting out the data under four main categories (Aronson, 1992), namely: *VR and AR definitions, VR/AR technology adoption factors, VR/AR applications across the buying journey, and VR/AR impact on a company's sales performance*. Throughout the data analysis, we will be referring to theory in an "iterative" cycle, thus, using an abductive research approach. The analysis will bring together fragmented thoughts and insights to give researchers a concrete understanding, from an industrial viewpoint, of the potential brought about by VR/AR technologies in B2B marketing, and for companies a holistic view on how to better market for these innovations to corporate customers.

The section below unveils our main research question while also discussing the sub-questions needed to better answer the latter.

1.4 Research question

In light of the aforementioned theoretical and managerial interests, and provided novelty on academic research addressing virtual reality and augmented reality topics in marketing, our research paper will be exploratory in nature, providing a better understanding on the impact of VR and AR in B2B marketing and sales, for both customers and businesses.

Our research question is:

How VR/AR technologies impact marketing and sales in the B2B sector?

To answer the latter, we will be addressing the four sub-points below:

- What exactly are Virtual Reality and Augmented Reality?

- What factors drive customers' adoption of VR/AR technologies in the B2B sector? And why are those relevant?
- What is the impact and applications of VR/AR technologies in B2B marketing? And which purchasing phases are impacted by VR/AR applications in the B2B sectors?
- What are the potential sales performance outcomes enabled by using VR and AR as sales tools?

THEORETICAL BACKGROUND

Prior to discussing Virtual Reality and Augmented Reality in B2B marketing, it is first necessary to put the recent take-off of these innovative technologies in context. This section will cover first the historical evolution, development, and conceptualization of VR technologies, including the different VR definition perspectives to date from coining the term, and the inherent VR attributes that define the technology's particularities. Similarly, the section will then follow with a conceptualization of AR with the discussion of the Virtuality-reality continuum as a backbone model for distinguishing different reality from which VR and AR, a discussion of different AR definitions and the inherent AR components including AR content, active and passive ingredients.

2.1 Historical evolution of VR

According to the Franklin Institute (2019), VR technologies started to develop first upon ideas rooted in the 1800s, mainly through the invention of stereoscopes (1838) and eventually the "View-Master" (1939). Later in 1956, Morton Heilig, whose background was in the Hollywood Motion Picture industry, was on the verge of developing the "Sensorama" experience using a multisensory simulation of a real city environment. The experience allowed individuals to "see the road, hear the engine, and feel the vibration" while riding a motorcycle in the simulated world. Four years after, Heilig patented a head-mounted display device called the "Telesphere Mask" upon which future inventions were founded (The Franklin Institute, 2019).

By mid-1960s, Ivan Sutherland´s work on interactive computing resulted in "the Ultimate Display", a design of a computer-human interface that he suggested would serve as a "window to the virtual world" (Schroeder, 1993). Sutherland based his work on the possibility of a computer display to simulate the real world with which we could interact directly through different senses. Later in 1970, the first research on the development of an operational interactive head-mounted display was carried on by Sutherland and other scholars (Schroeder, 1993). Virtual reality, however, was not officially labelled as a term until 1989 by Jaron Lanier, founder of gloves, goggles and

VR products´ manufacturer called VPL Research Inc (Steuer, 1992). Lanier was, hence, the pioneer in coining fully immersive displays with “Virtual Reality” term.

The 1980s was not only a period for an official conceptualization of VR but also an era of burgeoning industrial applications of this new technology. Applied virtual reality has first seen the light in art, flight & robotics, military and space fields (Schroeder, 1993). In arts, Myron Krueger pioneered in uncovering the potential of VR immersive computing devices, that he designed by “artificial reality”. Flight & robotics industries, on the other hand, contributed to shaping preliminary VR applications with the design of flight and other vehicle simulations by the 1960s for training purposes. As for military contributions, NASA was active in training pilots using interactive 3D displays and performing remote operations in space through headsets (Schroeder, 1993). At this level, however, VR displays were purely industrial in nature.

The above-mentioned research and preliminary applications of Virtual Reality were driving the wheel of development for such technology. And while the conceptual foundation of VR is rooted in many earlier works presented beforehand, it was until the 1980s that actual technical means allowed for the design of more than prototype systems. The upsurge of affordable computing power in the 1980s is an important condition facilitating the commercialization of Virtual Reality, provided that it is a requirement for producing computer graphics and designing a three-dimensional environment (Schroeder, 1993). As a result, VR was introduced to the computer gaming industry in the 1990s, and then in the manufacturing of Ford vehicles in 1999 (Barnes, 2016).

Academic research on the topic, on the other hand, is quite recent, dating back to the 1990s in attempts to define Virtual Reality through technological and sensory dimensions, like in the work of (Frederick & Brooks, 1999; Milgram et al., 1995 & Slater and Wilbur, 1997). Others discussed the historical evolution of this technology from pre-conceptualization up to take-off and concrete applications in aviation, art, movies, and military industries (Schroeder, 1993), movies and military industries (Schroeder, 1993). Authors like Milgram et al. (1995) and Steuer (1992), laid an early foundation in suggesting taxonomies to differentiate between multiple realities. At this

point onward, the conceptualization of Virtual Reality developed from a purely technical aspect emphasizing on hardware and software needs (Coates, 1992; Gold, 1993 & Greenbaum, 1992) to a more experiential value of the technology, emphasizing aspects like interactivity (Brooks, 1999; Biocca, 1992 & Schuemie et al ., 2001) immersion (Brooks, 1999; Guttentag, 2010; Krueger, 1993; Mazuryk & Gervautz, 1996; Slater & Wilbur, 1997), presence & telepresence (Steuer, 1992; Biocca, 1992; Sheridan, 1992; Lombard and Jones, 2015; Baus and Bouchard, 2017). The 1990s period also witnessed a mushrooming interest in VR research with surveys unveiling different capabilities of this new technology like in the case of Sturman and Zeltzer (1994). Following is a timeline reflecting important events in the VR take-off.

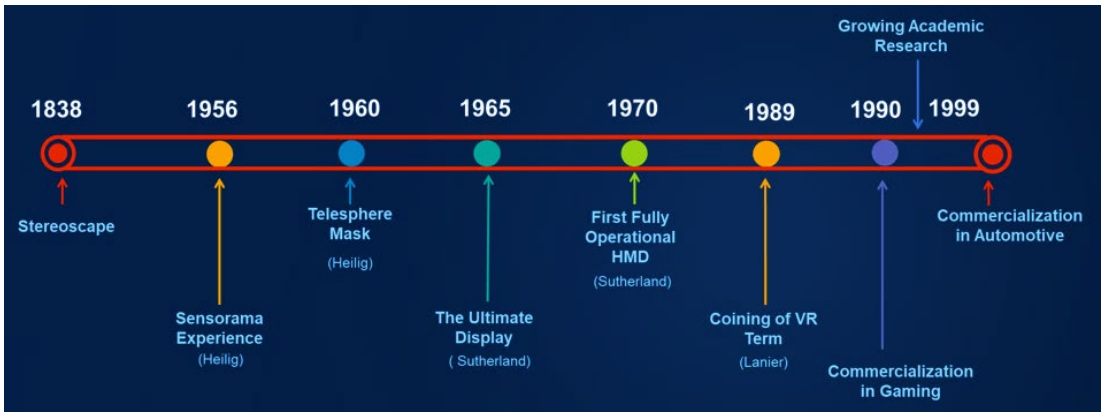

Figure 1. Timeline compilation of VR take-off events

2.2 VR conceptualization

Sutherland (1970) pioneered in reflecting on Virtual Reality, describing it as a real-time model of the physical world and emphasizing the multisensory "sound" and "feeling" experiences. Later definitions of Virtual Reality used the term interchangeably with "immersive computing technology" (ICT) (Berg & Vance, 2017), or provided various corresponding definitions as for "virtual worlds", "virtual environment"," artificial reality", and "synthetic experience" (Grudzewski et al., 2018; Menzies et al. 2016;). In attempts to define Virtual Reality, prior literature started by relating this new technology to the apparatus, including software and hardware

equipment needed for the proper functioning of VR. In this sense, Virtual Reality was viewed from a purely technological perspective, as a corpus of machines (Steuer, 1992) or a 3D computer-based simulating environment (Kerrebroeck et al., 2017; Pratt et al., 1995). Likewise, Krueger (1991) describes VR as a "three-dimensional reality experienced with viewing goggles and reality gloves". On the same wavelength, Coates (1992) defines virtual reality as an "electronic simulation of environments experienced through head-mounted eye goggles and wired clothing, enabling the end-user to interact in realistic three-dimensional situations". Other scholars like Greenbaum (1992), Pratt et al. (1995), and later Baus and Bouchard (2014) shared a similar perspective on VR, limited to the technology capabilities aspect. The common point is that defining the VR system typically encompasses three must-have equipment, namely: a head-mounted display, motion-sensing gloves, and a computer.

Acknowledging the limitations that the above device-driven definitions bring about, from which a failure to provide any meaningful insight regarding the "effects" or "processes" from using VR, and an equal failure to equip customers with a basic understanding of the inherent experience (Steuer, 1992), other scholars channelled their understanding of Virtual Reality to a distinct aspect, that of the human experience enabled through this technological innovation. In fact, the human experience is at the heart of the very creation of Virtual Reality, as it was initially designed to imitate interpretations of the surrounding world (Berg & Vance, 2017) humanly. A famous saying by Harry Houdini perfectly reflects the purpose from VR to users in that ''What the eyes see and the ears hear, the mind believes" (Berg & Vance, 2017). As such, researchers focused on defining the concept of presence (Biocca, 1992; Sherman, 2003; Sheridan, 1992; Slater and Wilbur, 1997; Schuemie et al., 2001) and telepresence (Steuer, 1992; Schuemie et al., 2001) in virtual environments while differentiating between both through dimensions inherent in each. Other authors like Slater and Wilbur (1997) and Brooks (1999) defined virtual reality through the immersive or even interactive (Mazuryk and Gervautz, 1996) characters of this technology. In this regard, VR is defined as being an "experience in which the user is effectively immersed" (Brooks,1999) and present (Biocca, 1992) in a simulated virtual environment. A more comprehensive definition mentioning both the technology aspect of VR, being a medium involving multiple computer-generated simulations, and the experiential aspect emphasizing the multisensory response, immersion and presence

experiences, was provided by Sherman (2003) as follows: ¨Virtual reality is a medium composed of interactive computer simulations that sense the participant's position and actions and replacing or increasing feedback to one or more senses, giving the participant a sense of being mentally immersed or present in an exceedingly simulation (a virtual world)".

Below is a table compilation of Virtual Reality definitions that served as a foundation for which future academic papers were based. The table is not inclusive of all definitions but presents a list of the most cited definitions for early work in VR research, derived from 40 articles in the topic. The following section is a deeper discussion about VR conceptualization from the "Virtuality-Reality Continuum" set forth by (Milgram et al., 1995) along with different dimensions inherent in the VR experience, namely: presence, telepresence, vividness, interactivity and immersion.

Table 1. Compilation of VR definitions from existing literature

Scholars	Date	VR definition	Perspective
Sutherland	1970	A model of the real world that is maintained in real-time, sounds and feels real, and which the user can manipulate directly and realistically.	Abstract/Multisensory
Krueger	1991	Three-dimensional reality implemented with stereo viewing goggles and reality gloves.	Technological
Steuer	1992	When the perceiver experiences telepresence in a real or simulated environment.	Experiential (Telepresence)
Biocca	1992	An environment created by computer or other media, and in which the user feels present.	Experiential (Presence)
Coates	1992	Electronic simulations of environments experienced through head-mounted eye goggles and wired clothing, enabling the end-user to interact in realistic three-dimensional situations.	Technological
Greenbaum	1992	An alternative world full of computer-generated images that reply to the movements of humans. In general, these simulated environments are visited with the assistance of an upscale data suit featuring stereophone video lenses and video lenses. Fibre-optic data gloves.	Technological

Milgram and Kishino	1994	The environment in which the participant-observer is totally immersed in a completely synthetic world, which may or may not mimic the properties of a real-world environment.	Experiential (Immersion)
Pratt, Zyda, Kelleher	1995	An application which, in real-time, allows a user to navigate through, and interact with, a 3D computer-generated environment.	Technological
Mazuryk and Gervautz	1996	An interactive and immersive (…) experience in a simulated (…) world.	Experiential (Immersion + Interactivity)
Brooks	1999	An encounter in which the user is effectively immersed in a responsive virtual world in a way that allows dynamic control over his or her viewpoint.	Experiential (Immersion)
Sherman	2003	A medium consisting of interactive computer simulations that sense the position and actions of the participant and replace or increase feedback to one or more senses; offering the participant and feeling to be mentally immersed or present within the simulation.	Technological + Experiential (Immersion & Presence)
Baus and Bouchard	2014	A 3D digital space generated by computing technology.	Technological + Experiential (Immersion)
Berg and Vance	2017	A set of technologies that allow people to immerse themselves in a world beyond reality.	Technological

2.3 VR attributes

2.3.1 Presence & telepresence

Senses are the channels of perception (Gibson, 1966). These senses are working to make human feel and experience the physical environment. This physical experience is called presence (Steuer, 1992). Presence can also be defined as being in an environment through physical senses. Loomis (1992) argues that presence is about the externalities that humans could perceive by their organs. According to Waterworth and Waterworth (2001), presence is the core of VR. The main objective of VR designers and developers is to make the user feel present through an existing and engaging environment (Waterworth and Waterworth, 2001). Schubert et al., (1999) defined presence as the "embodied cognition", they said that the presence exists when it is physically created in the virtual environment. Thus, the presence in the virtual

environment occurs between virtual reality and the real physical world (Waterworth and Waterworth, 2001).

According to Baus and Bouchard (2017), the presence concept has existed from the telepresence feature. Telepresence is conceived when the work is done remotely from a different location and site (Sheridan, 1992). Thus, the telepresence is happening from a physical location but a far distant. However, the existence in the virtual environment or location neither distant nor close is called presence (Baus & Bouchard, 2017.). According to Steuer (1992), the concept behind the communication of the telepresence occurs through a medium. In other words, the telepresence occurs in a mediation environment, but the presence is happening in a natural environment. Hence, the VR can be defined regarding a hardware system (Steuer, 1992). Some authors refer to the presence by focus, which in turn reflects the combination of virtual reality with the physical world (Waterworth & Waterworth, 2001).

There are two dimensions for presence: vividness and interactivity (Kerrebroeck et al., 2017). Steuer (1992) illustrated vividness as the richness of telepresence. Besides, interactivity reflects the ability of participants to edit and modify the telepresence content in real-time (Steuer, 1992).

2.3.2 Vividness and interactivity

There is a high level of vividness and interactivity in VR and 3D product presentations, and thus, the level of richness in the imagery is high (Coyle & Thorson, 2001). the imagery richness could be used interchangeably with the vividness. According to Cheng et al. (2014), marketing communication is much more efficient when there is a high level of imagery richness. This vividness enables customers to view the product more realistically. In addition, some attributes may affect the vividness such as the animations, audios or videos (Cheng et al., 2014).

According to Kerrebroeck et al. (2017), the customer is willing to respond positively with a high level of vividness and richness imagery. Choi and Taylor (2014) add that the customer is more likely to respond with visual products when he can interact with the product itself. Also, informational marketing communications are playing a crucial

role in presenting product features via VR or 3D models. That could be the real impact of using VR in marketing communication.

It is clear from prior literature that the focus in interactivity is less than that of vividness. That means that the main attribute affecting VR and telepresence is the vividness. In fact, vividness is affecting telepresence three times more than interactivity (Cheng et al., 2014). Nevertheless, Steuer (1992) argues that there is a positive relationship between vividness, interactivity and telepresence. Given that, a high level of vividness attributes such as images, videos, audios and animations are directly affecting telepresence and customer response. Other studies such as McLuhan (1964) took a more cautious stand with regards to telepresence, by arguing that extreme telepresence levels may also lead to a defect in perception. Probably, this is true because not all the customers are the same.

2.3.3 Immersion

While experiencing vividness, interactivity and telepresence, immersion is a natural consequence. According to Biocca (1992), immersion occurs when the user is moving from the physical world to the virtual world by blocking the physical one. That being said, immersion cannot happen in the physical world. According to Sheridan (1992), putting a user in an immersive environment can only happen through hardware. Besides, the user must have his/her own space to move these organs in. This kind of interaction in VR increases the immersion level of the user (Hudson et al., 2019). The customer is sought to positively respond when the immersion is high. Slater et al., (1994) said that the immersion and presence are not the same nor they can be used interchangeably; however, high levels of immersion perhaps lead to a high level of presence. In a nutshell, the immersion quality usually depends on the quality of the hardware used in the VR, for example, the HMD (Head-mounted display) gives a high level of immersion than a normal desktop VR (Waterworth & Waterworth 2001).

2.4 AR conceptualization:

2.4.1 Virtuality-reality continuum

According to Flavián et al. (2018), boundaries distinguishing different realities, corresponding technologies, and resulting experiences have not yet been clearly categorized by fellow researchers. Yung & Khoo-Lattimore (2019) add that further studies ought to address a proper classification of different reality terminologies. Prior literature is inconsistent in the use of different realities, and this issue is hampering both academia and business understanding of their subsequent potential (Flavián et al., 2018).

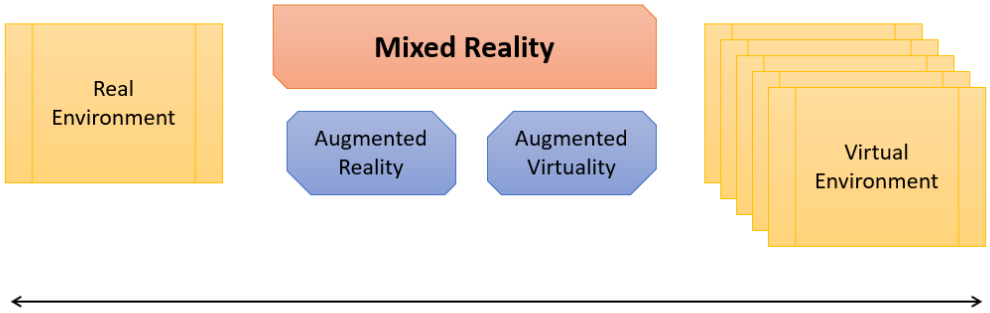

Figure 2. Virtuality-reality continuum (adapted from Milgram & Kishino (1994))

The starting point from providing a raw classification of reality terminologies is the so-called "Virtuality-Reality Continuum" set forth by Milgram & Kishino in 1994. The framework, as depicted in Figure 2, distinguishes between reality levels (left to right), starting from the most real-world context to the purely virtual environment. Starting with the end left, Milgram and Kishino (1994) categorize by Real Environments (RE) the reality itself, including direct or indirect (through a video display) views of a real scene and objects. Moving to the right end of the framework, the computer-generated stimuli level rises, and the existing realities between these continuum ends are coined as "Mixed Reality" (MR) environments. This reality is, in fact, representing various continuum points combining both real and virtual objects

(Milgram & Kishino, 1994). In other words, mixed reality refers to the state when the real world and virtual world elements are merged to enable a real-time interaction in an environment that does not physically exist (Deborah, 2014).

A Mixed Reality environment is, in turn, encompassing "Augmented Reality" and "Augmented Virtuality", respectively. In an attempt to define the latter realities, Milgram and Kishino (1994) categorization are solely reliant on visual displays, which is more relevant for a technical VR expert to grasp but is limited on reflecting the overall Virtuality experience of the user and, again, addresses reality differences from a technology perspective. First, augmented reality was contrasted based on either a "see-through" (also optical see-through) AR display or monitor based displays (also video see through the display). The former is based on translucent optics enabling consumers to view the surrounding environment alongside the digital content. Bajura et al., (1992) mentions the primary application for see-through video AR being in the medical field and ultrasound echography, in particular, to enable real-time 3D visualization of human fetuses. While monitor based AR is opaque (Yadav, 2018), non-immersive, and is also called a "window-on-the-world" referring to computer-generated images that are digitally overlaid onto live or stored video images and capturing the surrounding environment (Milgram & Kishino, 1994).

With technological progress, a third AR category emerged, called handheld AR, which uses smartphones and tablets to display the augmented reality content, such as the case of Pokémon Go and Ingress (Yadav, 2018). A simpler and more comprehensive technology-based definition of AR speaks of its ability to modify the observer's real surrounding by overlaying virtual elements, be it a video, a picture, or a virtual object (Azuma, 1997; Javornik, 2016; Van Krevelen & Poelman, 2010; Yim et al., 2017).

A second underlying type of mixed reality in Virtuality-Reality continuum is called "Augmented Virtuality", which simply refers to a display technology overlaying real-world elements on virtual environments (Regenbrecht et al., 2004; Tamura et al., 2001). At this level, the main distinction between AR and AV is the interaction place. So, while augmented reality occurs in the real world with virtual elements superimposed on the live view, augmented virtuality happens in the virtual world where real-time models of the physical world are displayed. An illustration of

augmented virtuality is an aeroplane maintenance expert visualizing a real-time 3D model of an engine from thousands of km away (Spacey, 2016).

At the extreme right end of the continuum are “Virtual Environments” (VE), which refer to computer graphic simulations displaying entirely virtual objects on a device (Milgram et al., 1995). A prominent example in the gaming industry would be when users are able to create avatars of their own and interact in real-time through a technological interface with other avatars (Flavián et al., 2018; Penfold, 2009; Schroeder, 2008).

2.4.2 AR components

According to Scholz et al. (2016), there are five components in the physical and augmented world that support AR. Four ingredients are mainly created to support the fifth one, which is the AR content (Scholz et al., 2016). AR content is including Active ingredient which includes, users and target. On the other hand, there is a passive ingredient which includes bystanders and background (Scholz et al., 2016).

AR Content. AR content is the augmented digitalized information that the customer or users can interact with through their smartphones, tablets or any kind of flat screen (Scholz et al., 2016). Accordingly, the AR content can be created and formatted in various ways. It could be created with videos, animations, images, texts, etc. Thus, AR content could be possibly customized through AR applications or browsers that create the AR layer.

Active Ingredients. Like any other technology that needed to be used, there must be a *user* to use it. These users are considered as an active ingredient in the AR components. According to Scholz et al., (2016), the people who are directly in charge of using AR experience are called *users*. The *users* can experience AR layer through a shared screen or their tablets or smartphones. Hence, users can share the same physical space by sharing the same screen and content. Furthermore, *users* can view the same content from different devices and different physical areas if they received the same AR layer and material from their smartphones or tablets. The second active ingredient is the *target*. Scholz et al. (2016) defined *target* as

“The entities in the physical world that are augmented with digital information”. Likely, it could be said that targets could be known as objects. Moreover, it could be said that sometimes people are the *objects*. Specsavers, the well-known eye-glasses brand, is using AR feature on their website. This AR feature is allowing the people to see the selected glass in their face without going physically to the store. Hence, in that case, the people are the *target*.

Passive Ingredients. As mentioned in the prior text about the users who are directly experiencing AR. On the contrary, some people are not experiencing or using AR by themselves; however, they are observing the direct users’ AR experience. Hence, Scholz et al. (2016) called them bystanders. Therefore, the users' experience could be affected by those bystanders in the engaging AR experience (Mead, 1934). The second passive ingredient is the background which is the physical environment and the surrounding physical world of the non-augmented objects (Scholz et al., 2016). Thus, the background is not an active ingredient in the AR experience and content; however, it could affect and influence the users' experience rather positively or negatively.

UNDERSTANDING VR/AR IMPACT ON MARKETING FOR BUSINESSES

As in the case of any new technology or product/service solution, successfully marketing for it requires an in-depth investigation of the customers' requirements and understanding of their value-in-use (Boyd and Koles, 2018), especially in the more complex and mature B2B context. This section discusses factors driving customers' purchasing decisions, either enhancing or hindering the acceptance (and by extension the purchase) of immersive reality technologies. The section will then move to debate different VR/AR applications throughout the customer's purchasing journey, including the pre-purchase, purchase and post-purchase stages. And finally, the section will unveil literature understanding of VR and AR impact on sales strategy, including these technologies' contribution to the sales process as well as to the company's sales performance outcomes, namely: effectiveness and efficiency.

3.1 Attitudes & purchase intentions

According to Bonetti et al. (2017), chief debates related to the evolution of AR and VR research were first and foremost structured from an adoption, acceptance and applications viewpoints. However, former literature was focusing on specific models and/or applications; hence, research was fragmented (Bonetti et al., 2017). Likewise, the extant VR/AR literature, which is heavily B2C oriented (Loureiro et al., 2018), is said to be hardly palpable on a B2B environment as both contexts differ in terms of factors such as technology adoption or engagement (Boyd & Koles, 2018). Thus, a study of the latter is of the essence. Starting with the viewpoint in mind, this section will examine in more scrutiny the research to date about customers' adoption of innovative technologies, integrating various school of thoughts for a comprehensive outlook of purchase-influencing factors in a B2B setting, namely: Technology Acceptance Model (TAM), Innovation Diffusion Model, Value-in-use, User Experience (UX), and Unified Theory of Acceptance and Use of Technology (UTAUT).

3.1.1 Technology acceptance model (TAM)

Rooted back to information systems, technology acceptance research (TAM) forms the baseline for VR studies exploring the underlying customer adoption mechanisms (Rauschnabel & Ro, 2016). Researchers like Rese et al. (2014) and Spreer and Kallweit (2014) and have all based their work on the TAM model in examining AR technologies on devices. The model was first conceived by Davis, (1989) investigating users' intentions in adopting new technology and ended up being a backbone for future theories like the theory of reasoned actions (TRA) (Bagozzi et al., 1992; Ajzen & Fishbein, 1980). The model brings about two attributes, namely the perceived ease of use (PEOU) and the perceived usefulness (PU) of new technology in driving customers' acceptance of new technology, and eventually the intention to adopt it (Davis et al., 1992; Davis, 1989). Overall, TAM is based on the idea that a technological product and/or service is perceived as more "useful" by the customers when it's easy to use. Additionally, the actual use of technology is also predicted by the purchase intention (Rauschnabel & Ro, 2016).

Usefulness is the innovation's capability to enhance the performance of a task. In this line of thought, usefulness is more linked to the functional technology benefits also labelled as the "utilitarian performance expectancy", (Devis,1989; Cuomo et al., 2014), or utilitarian value derived. The utilitarian and functional value of the technology is particularly relevant in the post-purchase stage after the customer has experienced with VR technology. At this level, customer emphasizes on the product's efficiency, performance and ability to allow employees and the organization to achieve their goals, or a particular task (Boyd & Koles, 2018; Blut et al.,2016). The ease-of-use, on the other hand, may encompass convenience as a chief adoption driver for "augmented services". Convenience, in turn, reflects how simple and user-friendly the technology interface or innovation is. The more complicated usage is, the higher are the barriers to adopting the technology.

Hence, the model here presents the perceived value from technology as holistic, including the customer's outcome or main purpose achieved through that system (Macdonald et al., 2011), be it emotional (WOW effect) or utilitarian (functional). Later, however, the TAM model was subject to a series of critics (Bagozzi, 2007)

debating for its need to be revised for VR and AR purposes, and more equally important factors to be included, such as the case of the Innovation Diffusion Theory of Rogers (1995, 2003).

3.1.2 Innovation diffusion theory (IDT)

Based on his book "Diffusion of Innovations", Roger's theory of innovation diffusion served as a classic and one of the richest, most complex and prominent innovation adoption models there is (Sahin, 2006). The framework was later extended to the use of technologies in several disciplines, from which public welfare, economics, education, and communication (Dooley, 1999; Stuart, 2001). In his work, Rogers (2003) used technology and innovation terms interchangeably. In this regard, the technology consists of a hardware and software components and is defined as a "*Design of instrumental action that reduces uncertainty in the cause-effect relationships involved in achieving the desired outcome*" (p. 13).

Rogers (1995) acknowledges the value of understanding customers' adoption mechanisms, especially in the initial penetration stages of innovative technology (as is the case for VR and AR markets). He argues that early adopters serve as influencers (opinion leaders) for future customers through their evaluative information. The core of the theory is to consider the innovation or technology adoption process as a series of knowledge compilation by customers to limit uncertainty level (Agarwal et al., 1998) that may hinder the purchasing or adoption rate. In turn, technology-related information, the what, how and why of the product/service, what Rogers (2003) calls awareness, how-to and principles knowledge, flow through the customers' social system, an essential antecedent of technology adoption behaviour (Agarwal et al., 1998). Similarly, Barnes (2016) acknowledges the role of technology-related knowledge by highlighting the lack of technical expertise, and more specifically the hard skills required for marketing professionals as a barrier preventing them from successfully embracing immersive reality technologies. Additionally, Zabel and Heisenberg (2017) emphasized the knowledge aspect by presenting a lack of technology awareness as a chief barrier to adoption.

Technology diffusion, according to Rogers (2003), reflects the "*The process in which innovation is communicated over time between the members of the social system through certain channels*" (p.5). The theory, hence, places emphasis on technology communication channels and social influence or social complexity, as referred to by Boyd and Koles (2018), in driving adoption behaviours and customer acceptance. Recognizing social influence as a crucial driver of technology adoption, Scholz et al. (2016) suggest that marketers ought to create a company-specific digital AR content that is fitting with customers' physical and social context.

Another essential component in the technology diffusion equation lies in the innovation attributes, including relative advantage, compatibility, triability, complexity, and observability. So while TAM model recognizes technology usefulness and ease-of-use perceptions as driving adoption attitudes of technology, the Innovation Diffusion Theory referred to such beliefs as "an innovation's perceived attributes " (Argawal & Prasad, 1998). The TAM's perceived usefulness is equivalent to Roger's relative advantage attribute by focusing on the innovation's ability to achieve higher task performance levels. While the ease of use is the opposite definition of Roger's complexity attribute: "the difficulty of understanding or perceiving an innovation". In addition to these two aspects, Rogers posits compatibility, triability and observability as equally important in influencing customers' technology adoption rates.

Compatibility and relative advantage are, in some prior work, considered alike (Sahin, 2006). However, far from the mere functional benefits of technology, compatibility also encompasses the innovation's consistency with customers' values and past experiences (Rogers, 2003). Also, in line with this viewpoint, and discussing adoption challenges of VR and AR applications, Swann (2001) points out to the importance of producing customer-specific solutions that are fitting with organizational requirements as corporate customers are more relating to "applications closer to their area of experience".

The second attribute, triability, is particularly relevant for early adopters of new technologies stands for the technology's ability to be experimented with, or tried, on a limited basis. This is relevant for the case of VR and AR applications that offer the possibility of trying products in 3D models, 360 views at prototyping, and design

stages before actual conceptualization take place. Finally, observability portrays the degree to which a technology results are noticeable to peers, which is closely related to the social influence described by Venkatesh et al. (2010), and Rauschnabel and Ro (2016) or the peer observation of Parisot (1997).

In summary, Rogers (2003) claimed that technologies providing a higher relative advantage, compatibility, user-friendliness, trialability options, and greater observability are more likely to enjoy a fastened adoption rate.

3.1.3 Value-in use

In addition to the ease of use and usefulness values from TAM model, Boyd and Koles (2018) discuss the importance of understanding customers' value-in-use throughout the purchasing journey, as a key through which VR technologies can ensure the success of B2B marketing. In fact, VR impact on value in use is particularly relevant in the further complex B2B relationships, as they leave more opportunity for the relationship to benefit from VR's key features (immersive, interactive and real-time) (Boyd & Koles, 2018). At initial penetration phases as it is the case of VR, businesses usually have little to no understanding of the potential uses of these new technologies, hence, grasping the utility benefits derived from buyers, or value-in-use, is also essential as it may help in attracting new customers (Kumar et al., 2013) that might share similar needs or requirements (for instance, businesses operating in the same industry). And after full adoption of VR technologies, that is in the post-purchase phase, customers value-in-use experiences are still equally important as they allow for promoting these new technologies in the corporate environment (Ruokolainen & Aarikka-Stenroos, 2016) through positive word of mouth (Jin and Yazdanifard, 2015) and ultimately raise customer satisfaction (Raja et al., 2013).

However, understanding the value-in-use is a collaborative process between buyers and suppliers or technology providers which, after strong ties are developed, form a considerable switching cost affecting turnover (Boyd & Koles, 2018). The term value-in-use, in this case, is more generally reflecting the aggregate utility benefits or perceived benefits from adopting a specific technology. Boyd et al. (2018), in this regard, found the hedonic value a less relevant factor for driving VR technologies'

purchase in a B2B context and rather stressed on other value benefits like performance (utilitarian value), or even costs (Boyd and Koles., 2018; BCG,2018) related to the technology. Other researchers like Rauschnabel and Ro (2016), Geiger (2017) and Shin (2015) also emphasized technology upfront costs as essential purchase driving elements. Cost is, in fact, more pertinent during the purchase stage, particularly at negotiation levels (Boyd & Koles, 2018). According to Kemm (2017), an average custom AR app costs about US$ 30 thousands. Needless to say, the difficulty in predicting economic impacts regarding AR innovations, particularly in the initial introduction phases. Trubow (2011) estimates a large and complex VR project to be priced between $10,000 to $300,000 according to the desired interactive solutions. However, he firmly believes that production costs are likely to keep plummeting in the future as VR gets further accessible with the lower production costs resulting from an increased rivalry and decreasing costs of software licensing. With this viewpoint in mind, he argues that an interactive augmented reality experience can even be produced at lower costs than a common corporate video (Trubow, 2011).

Boyd and Koles (2018) also point out the importance of asset management effectiveness and supplier coordination as other crucial value-in-use factors driving customer purchase of the VR technologies. These factors mirror the "*quality of the process by which supplier and buyer resource integration are coordinated, and assets are managed during the buyer's adoption and usage of a supplier's solution*". Simply put, a healthy and close collaboration with the VR/AR solution provider ensures a successful resource integration, be it software, or hardware, at customer premises, and ultimately an effective adoption of VR technologies. An effective asset management and supplier coordination will enhance the customer's (company) internal capabilities in terms of technical and other training or expertise needed for successful implementation of the innovation (VR). This is particularly important to consider as evidenced by a Boston Consulting Group benchmarking study of over 50 senior marketing executives from top 200 advertisers in the USA, reporting that lack of internal expertise counts for 31% of VR adoption challenges, followed by a lack of awareness (16%).

In line with the coordination focus brought about by Boyd and Koles (2018), Raja et al. (2013), stresses on the quality of interaction with the supplier, and by extension,

the relationship experience with the provider throughout the technology's lifecycle. With this regard, customer purchasing decision and satisfaction rely on the so-called relational dynamics, or degree of involvement, exchange and collaboration between buyer-supplier, and access, reflecting the technology's flexibility of access regardless of where the customer is located. Examples include POINTR, Vivar, and ScopeAR applications that provide remote communication solutions through augmented reality. Field technicians and industrial workers can now access to 3D augmented equipment models provided in the platform for instructions on use, maintenance of equipment/machinery, anytime, anywhere. Industrial workers can also call engineers and share the equipment view in real-time (see-what-I-see technology) and get feedback in the form of real-time annotations on-the-view by engineers/experts located at the other side of the globe. So, in terms of high accessibility capabilities, AR is bypassing the challenge.

3.1.4 User experience (UX)

Apart from the more generic value-in-use perspective of Boyd and Koles (2018), or the more specific interaction-quality focus of Raja et al. (2013), other adoption models built upon the importance of User Experience (UX), especially in the retail industry, as a primary factor for customers with regards to their purchasing decision of VR and AR technologies.

In general, user experience is viewed to enhance experiential marketing Bonetti et al. (2017), through the enhancement of a reality Poushneh and Vasquez (2017), immersion, and interactivity (Cuomo et al., 2014) aspects, and a customized pleasant experience Bonetti et al. (2017) that in turn results in raising customer satisfaction and willingness to purchase (Poushneh & Vasquez, 2017). Several studies identified different user experience attributes with an impact on purchase decisions. While Bellini et al., (2016) places UX at the most imperative factor or rather the main barrier to influence the adoption of immersive technology, Gartner (2017) approves that successful penetration of VR is closely contingent upon user quality. Poushneh and Vasquez (2017), takes a step further in focusing on UX quality with regards to three particularly relevant features, namely: pragmatic quality (PQ), aesthetic quality (AQ)

and hedonic quality (HQ), that all stem from the AR/VR interactivity aspect enabling user entertainment and personalized experience.

Pragmatic quality stands for usability and speaks of the "*effectiveness, efficiency and satisfaction of the UX*" (Butler, 1996). In this sense, factors like usability (Boyd and Koles, 2018), usefulness (Devis, 1989) and aesthetics may all impact the user experience (Poushneh & Vasquez, 2017). In addition, with their ability to add layers on information to the product at hand, AR technologies improve and smoothen the complex decision-making process (Poushneh et al., 2017), and this is particularly true for the more sophisticated business setting.

The second quality attribute is called hedonic quality (Poushneh et al., 2017) and consists of emotional reactions (Hassenzahl et al., 2006; Norman, 2004), or the emotional value derived from the VR/AR experience (Kim et al., 2008); (Cuomo et al., 2014) enabling users to promote the technology to others while also enhancing its playfulness. This is often the result of a so-called surprise element or WOW factor experienced using the technology (Jin & Yazdanifard, 2015). Hedonic value here stems from a subjective experience vis a vis the technology or solution. VR technologies, including AR, are in this sense viewed to positively affect customer's senses, mainly through immersion (Cuomo et al., 2014), and generate strong customer engagement (Schultz & Block, 2011; Jin & Yazdanifard, 2015). Hedonic quality is, in turn, impacted by whether the UX stems from a pure enjoyment (a need for innovation and challenge, and/or symbolic meanings) or is more dictated by social influence (a need for self-representation) (Hassenzahl et al., 2003). In turn, social influence is described as the injunctive or social norms defining peers' perception of the technology (Rogers 2010, Venkatesh et al., 2010; Rauschnabel and Ro, 2016;) as a driving factor for the adoption of new technologies.

Finally, the aesthetics quality involves pleasurable experiences, through the senses (olfactory, visual, auditory...), hence, the sensory marketing experience. Trubow (2011) and Cuomo et al. (2014) point out that touching a product increases customer intention to buy and their willingness to pay a higher price (Trubow, 2011; Cuomo et al., 2014). Aesthetics quality also includes the social connection and the user

relationship with others, users' own subjective value set like the taste, or even cognitive and emotional reactions (Poushneh & Vasquez, 2017).

Taking the latter into account, it seems that hedonic (emotional) quality aspects are somewhat overlapping with the aesthetics quality as they both infer emotional reactions to the experience and are both impacted by social influence. Acknowledging this limitation, Lorentschk (2018) defines UX as a "*holistic approach for optimizing the user's encounter with and journey through a product or workflow*", and recognizes only two quality attributes in assessing UX, namely: the hedonic quality and the pragmatic quality. The latter covers the technology's ability to achieve goals and workflow barriers for optimal effectiveness and efficiency, what Lorentschk (2018) refers to as "removing friction".

In a B2B setting characterized by a more rational decision making, we expect the hedonic or aesthetics quality to be less relevant to the buyer than the efficiency and performance attributes. In facts, Zabel & Heisenberg (2017) B2B survey is strongly confirming this position with 94% of respondents emphasizing the usability and easy handling and navigation of the immersive technology as the central factor for adopting VR, compared to a mere 47% for the high-ended look and feel. Lorentschk (2018) approach to classifying VR technology profitability factors in B2B is comprehensive, grasping more industry-relevant features. The author doesn't only recognize the utilitarian (functional) aspect of the technology, but also its value-in-use for the customer, and ultimately, the efficiency and economic benefits to the company.

3.1.5 Unified theory of acceptance and use of technology (UTAUT)

Taking a step further in addressing technology acceptance factors, Venkatesh et al. (2003) combined findings from eight prominent models, namely the technology acceptance model (TAM), the theory of planned behaviour (TPB), the theory of reasoned action (TRA), innovation diffusion theory (IDT), the model of PC utilization (MPCU), social cognitive theory and a model merging TAM and TPB together. The model brings about new constructs defining and affecting the usage behaviour, which Venkatesh et al. (2003) call "moderators" and include the organization setting (voluntary or mandatory), demographic factors (age and gender) as well as user

experience. The relevance of this model is in the fact that by unifying eight former models and integrating the usage intention moderators, UTAUT allows for justifying 70% of the variance in technology usage intention (Venkatesh et al., 2003). An equally important factor justifying the relevance of UTAUT lies in the fact that, unlike other models which considered few similarities and differences between technology acceptance drivers, the UTAUT model is the most comprehensive model unifying literature views from all eight technology adoption models. Accordingly, UTAUT refers to four key determinants of behaviour usage and intention, primarily: performance expectations, effort expectations, social impact and conditions facilitation (Venkatesh et al., 2003).

Similarly, to TAM's technology "usefulness" adoption factor, and IDT's relative advantage attribute, the performance expectancy in UTAUT is deemed to be the strongest predictor of technology usage and reflects the degree to which a system is able to achieve gains in performance (Venkatesh et al., 2003). In turn, performance expectancy is affected by two moderating influences, namely age and gender. Accordingly, Venkatesh et al. (2003) argue that young males are more likely to value the technology's performance capabilities when deciding upon the usage or adoption of an innovation. This can be backed up by research on gender roles, socialization and gender differences advancing that men's tendency to be more task-oriented justifies the fact that they may be rather focused on performance expectations and task accomplishments (Mintona & Schneider, 1980). Similar to the gender moderator, age also appears to influence the relationship strength fueling a technology adoption behaviour. And this is mainly justified by former research on work-related behaviours arguing that younger, rather than older, workers are more prone to value extrinsic rewards on the job (Porter, 1963). Overall, age and gender differences appear in other technology adoption literature such as Venkatesh & Morris, 2000.

A second technology adoption factor, namely the efforts expectancy, is similar to TAM's ease of use and with the opposite meaning to IDT's complexity attribute. The factor, therefore, reflects the extent to which technology is simple and convenient of use. According to Davis et al. (1989), the ease of use is more relevant in the earlier stage of technology adoption as the how's of usage are more significant at the start. Once the system or technology is much more digested to the user; that is, it becomes

easier to navigate through, instrumentality concerns start to take over a technology's efforts expectancy in driving the adoption. At this level, gender, age and experience level are all moderating efforts' expectancy influence on a technology's usage intention. Accordingly, prior research suggests that older women with little to no experience using the technology are more concerned with efforts expectancy (ease of use) from that technology than their male and/or younger counterparts (Venkatesh et al., 2003). This is simply justified by gender role studies and the fact that as the age gets more advanced, issues towards processing complex stimuli get more salient, making it harder to use a technology or a system (Plude et al., 1985).

A third technology adoption factor referred to in the UTAUT model is social influence, mirroring external observers (also called significant others)' perception of the technology or innovation. The social influence here is similar to Rogers (2003) social system through which the technology needs to go prior to validation and acceptance by the customer. Such a concept is more specifically referred to as "observability" attribute in the innovation diffusion theory (Rogers, 2003), reflecting the degree to which technology results are noticeable to peers. A similar terminology, acknowledging for the (external) social influence, is portrayed in the peer observation of Parisot (1997). In turn, social influence appears to be moderated by all factors, namely age, gender, experience and voluntariness in such a way that their impact is more salient in earlier stages of technology adoption for older women in compulsory settings. In fact, discussing social influence as a technology adoption driver in an organizational setting is non-significant when these four moderators are not included in the analysis (Venkatesh et al., 2003).

The fourth technology adoption driver in the UTAUT model is the facilitating conditions. Simply put, the latter reflects the extent to which the existing technical and corporate structure is facilitating or allowing for the use of the new technology (Venkatesh et al., 2003), and is hence, mirroring the compatibility attribute brought forward in Rogers (2003) innovation diffusion theory. The moderating influences for this last technology adoption determinant are age and experience. Accordingly, Venkatesh et al. (2003) state that the impact on usage intention is higher for older employees with more experience in using the technology.

Later, Venkatesh et al. (2012) suggest an extension to the organization oriented UTAUT technology adoption model to investigate acceptance factors from direct users (consumers) perspective. They, hence, proposed the so-called UTAUT2 model integrating three additional technology adoption drivers, namely: hedonic motivation, price value and habit that are all moderated by the effects of user experience and demographic influences (gender and age). Simply put, while UTAUT was reflecting the overall organizational acceptance of technology use, UTAUT2 is further tailored to mirror the needs and justify requirements in a user (consumer) context, which makes it more relevant to our study as we investigate the adoption factors for future VR and AR technology users in a B2B (organizational) context from marketers and sales managers themselves.

The first additional technology adoption factor, hedonic motivation, mirrors the perceived enjoyment, fun and pleasurable experience derived from the technology use (Venkatesh et al., 2012). This concept is in line with the user experience's hedonic quality stemming from a pure enjoyment as advanced by Poushneh and Vasquez (2017), as well as Lorentschk et al. (2018) concept of UX hedonic quality that speaks of the emotional value derived from the technology experience. According to Venkatesh et al. (2012), future adopters are more inclined to use technology, especially men in earlier stages of adoption, primarily for its novelty and innovativeness rather than pragmatic qualities like efficiency and effectiveness.

The price value is the second new construct added to the initial UTAUT model. The factor reflects the user's "cognitive trade-off between the perceived benefits from technology usage and the actual cost of usage". This factor is particularly relevant in the B2B context where creating immersive storytelling or representing the more complex and heavy machinery equipment can be more costly than for a B2C context. Cost concerns were also put forth in prior research such as Boyd and Koles (2018) and the Boston Consulting Group report (2018). In debating the effect of age and gender moderators on technology usage intention, Venkatesh et al. (2012) argue that women, especially older ones, are more price sensitive regarding purchases. And this was mainly justified by their roles as family caretakers (in older age) and their tendency for being more cost-conscious of family expenses than their male counterpart Venkatesh et al. (2012).

The last addition to the former UTAUT model is the “habit” factor. The latter mirrors either a former behaviour or automaticity in performing specific behaviours that might be backed up by learning from repetition. Venkatesh et al. (2012) argue that, unlike the rest of the factors with direct impact on usage intentions, the habit can directly influence both the usage intention and/or behaviour and is more relevant for older men with high experience levels vis a vis the system or new technology. Figure 3 is a graphical representation of the more comprehensive UTAUT2 model adapted from Venkatesh et al. (2012) work, incorporating the initial UTAUT technology acceptance model.

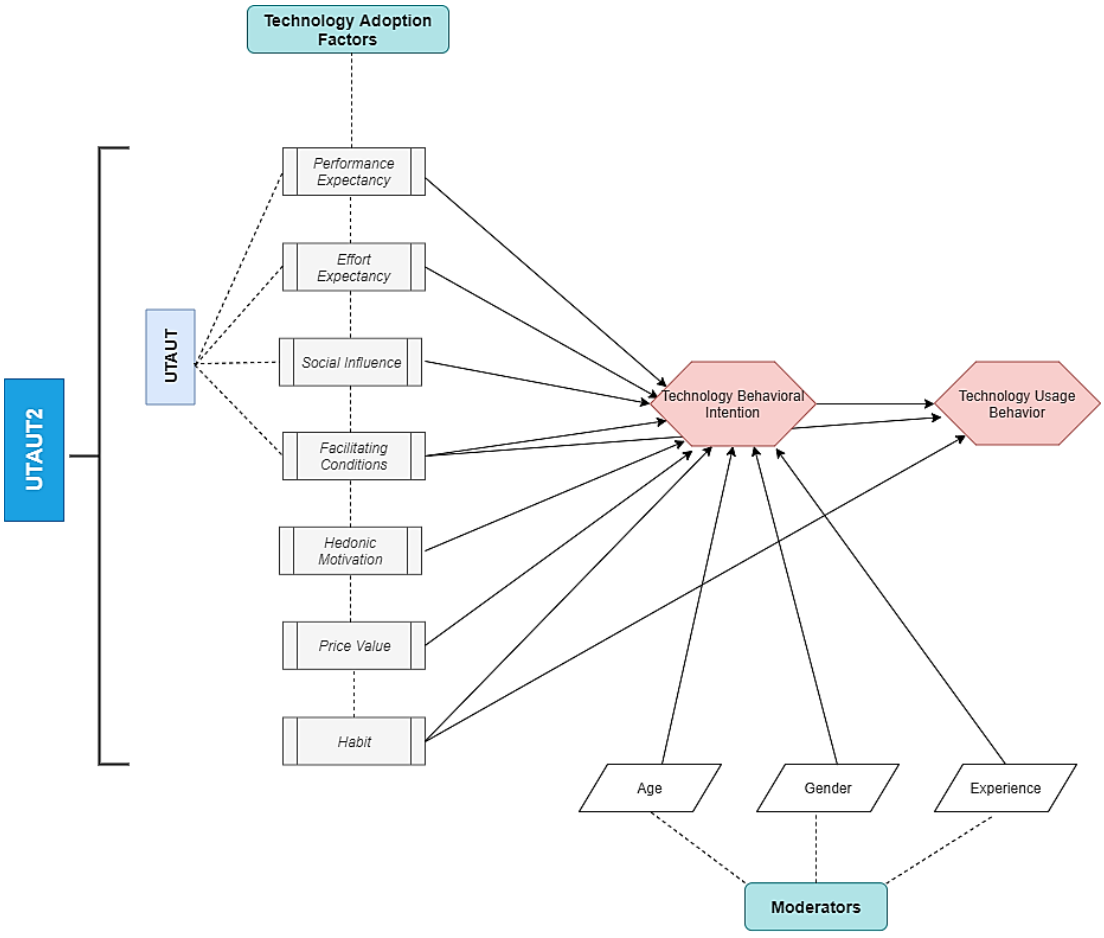

Figure 3. Simplified UTAUT2 model (adapted from Venkatesh et al. (2012))

3.2 VR/AR applications throughout the purchasing journey

This section will illustrate cases from different companies and industries in the B2B sector. These cases are showing how VR/AR is used in the pre-purchase and post-purchase phases in the purchasing journey.

3.2.1 Pre-purchase

Using VR in B2B marketing is not new for Siemens; the company was using it a few years ago. According to Boyd and Koles (2018), Siemens has developed a prototype of a power plant for a Libyan customer without going to Libya via VR. Hence, Siemens is using the VR in the pre-purchase stage. That kind of prototypes allows the customer to fully experience with the product, inspecting all its features and attributes before the company can start to actually spend resources building the physical product (or plant in this case). This way, the company can work on defining customer needs and product requirements, saving for the buyer costly defects that might arise in the physical conception of the product, and addressing any concerns before they arise (Siemens, 2018).

In 2017, Philips healthcare started using VR in its marketing and sales department (Lorentschk, 2018). The company is using VR for planning and presenting the medical equipped rooms through RRPT and HTC Vive. RRPT is a rapid room planning tool that was invented by the marketing and sales departments in the health sector. According to Lorentschk (2018), RRPT is designed to support both the pre-purchase and purchase stages through VR. The idea of the app is to design the room virtually instead of presenting it in 2D and 3D models. Thus, planning costs and potential errors will be decreased with the introduction of this immersive technology.

A third example is DIRTT environmental solutions; the well-known construction company provided an enormous VR application in the pre-purchase phase of its buyer (DIRTT Environmental Solutions Ltd, 2017). The company designed a whole hospital, through a realistic 3D model, that was presented in VR platforms. The stakeholders, doctors, nurses and the whole medical staff were able to walk into the hospital and experience every single room in it thanks to VR capabilities (DIRTT Environmental

Solutions Ltd, 2017). Thus, the customer was able to not only to visualize the model of the hospital as it happens traditionally but to experience it as it is already constructed. Besides, this kind of pre-purchase VR, applications allow both customers and companies to save significant amounts of resources in terms of time gains, economic expenses (Boyd & Koles, 2018), and environmental footprint.

VR is also used in one of the most complex industries: aviation. An early adopter of this immersive technology is Airbus. The company was using VR/AR a few years ago for its B2B marketing communications. According to Marcellin (2016), Airbus has used VR for designing the cabin for its various customers. Each customer has different needs and requirements. Hence, Airbus shall meet each customer needs to guarantee customer satisfaction. Airbus is customizing each cabin design through VR for its customers (Marcellin, 2016). Prior designs were done through 2D modelling, which is not as clear and vivid as VR. This new technology allows the customer to experience the cabin design and modify whatever they want before Airbus starts the production process of its cabins. As can be seen, Airbus is using VR successfully in the pre-purchase stages of design and prototyping for new product development.

Schnaithmann Maschinenbau GmbH, a German engineering company, is using VR in B2B factory planning (Schnaithmann, 2018). The German company is using VR software called “Cross Connected” which synchronized with the HTC Vive hardware (Lorentschk, 2018). The company is uploading the CAD model to the VR software, and the customer can examine the whole factory in the pre-purchase stage. Not only that but also Schnaithmann Maschinenbau is using the VR technology in the post-purchase stage for training the workers with the machines and equipment.

IKEA is one of the best companies that applies VR and AR in its marketing and sales. IKEA VR app is innovated precisely to support the pre-purchase phase (Boletsis & Karahasanović, 2018). Thus, IKEA is engaging with its customer in an emotional and innovative way by providing an immersive experience to sell the products. IKEA allows its customer to interact with its kitchen using the VR headset. The customer is able to interact and change how the kitchen looks like. Furthermore, the customer is able to use IKEA AR app to place and try the object he wants to buy in his apartment to see how it looks. According to Boletsis and Karahasanović (2018),

in 2017, IKEA was selected as the best innovative brand by the Norwegian customers for using this innovative VR/AR solutions.

3.2.2 Post-purchase

There is no such situation as Covid-19 that makes the organizations and businesses realize the crucial role of VR in B2B marketing. Siemens, the well-established German company, has realized that earlier. Siemens just created a virtual laboratory which allows scientists to resume their work in the current quarantine situation (Siemens, 2020). Siemens has announced that the VR laboratory will allow their customers tracking the activities of their projects. Hence, Siemens is prioritizing the customers' work while they keep their employees safe in the pandemic situation. According to (Barnard, 2020), using the VR glasses with the controllers from home kept their customers satisfied and their employees as well. Again, without the existence of such platform, the company's operations could have been jeopardized, and virtual reality is in this case applied to assist Siemens' employees in serving their customers in exceptional times without interruption. VR allows a context-based interactive relationship to nurture (Boyd and Koles., 2018), through virtual communication and tracking in this case, between different stakeholders.

Understanding the benefits of VR in B2B marketing is yet to be realized by companies. However, Siemens is using VR in the purchase and post-purchase (sales-support) stages alongside with the pre-purchase (prototyping) one. By revisiting the previous example, Siemens did not stop at this level of VR usage. It moved to develop a maintenance solution for its customers (Boyd & Koles, 2018). The solution aims to satisfy their customers on a post-purchase level. That will happen only through a VR system that reduces the time of solving the technical issue and keeping the work activities to the track. According to Boyd and Koles (2018), if the problem is raised in Libya, the technical expert who is travelling from Germany will take two to three days to solve the technical problem. On the contrary, by using VR/AR technologies, the problem will be solved in real-time in approximately 45 minutes, let alone the travel expenses of its engineers and the economic losses associated with delayed operations.

“The more we can show rather than tell, the better we do”, said Katrina Craigwell (Boyd & Koles, 2018). That is how the director of global content and programming in GE described using VR in marketing, particularly for virtual storytelling and communications. GE realized the power of VR at a very early stage; the company is using VR to maintain the relationship with its customers, employees and stakeholders (Boyd & Koles, 2018). According to Egan (2017), GE is using VR to train nuclear engineers for the maintenance activities to keep customers satisfied and sustain long-run relationships with them. GE is using VR in this case, as a support to the equipment and other products sold to customers, hence, reflecting a post-purchase application.

The digital twin simulation takes place in Comau S.P.A, an Italian robotics company. The company is using VR to support marketing and sales in the post-purchase stages for its industry buyers (Lorentschk, 2018). The Italian company is doing it virtually and physically at the same time. That happens by creating a digital virtual twin from the physical machinery setup that allows the customer to experience the setup virtually (Comau, 2018). Comau is also using VR as a predictive maintenance solution for customers. According to Comau (2018), this maintenance system allows the company to perform all inspections and maintenance works virtually without visiting the customer factory, which might be miles if not countries apart.

Using VR in the post-purchase stage is also the case for the aviation giant, Airbus. The company is providing a VR trainer for its new cockpit (Airbus, 2019). The company realized the future shortage of trained and qualified pilots in the new cockpits. Consequently, starting from 2020, Airbus will provide a comprehensive VR training with any cockpit that it will sell. Moreover, Airbus is providing a remote VR maintenance service to its customers to save cost and time (Airbus, 2019).

The pharmaceuticals sector also takes its portion from using VR technologies in B2B marketing. Pacira, a pharmaceuticals company, is using VR as an educational tool for its customers (Boyd & Koles, 2018). Pacira has developed an innovative product for post-surgical pain called EXPAREL. Accordingly, Pacira launched its VR educational program for customers to qualify them to use the new product. According to Kavanagh et al., (2017), the interactive education between Pacira and its customers would never occur without using the VR platform. Thus, Pacira has excelled in the assisting

stakeholders in the post-purchase by using VR. Pacira has also developed a VR app to allow clinicians access through their tablets or smartphones (Pacira Pharmaceuticals, 2016). This VR app is developed especially for the post-surgical treatments (Boyd & Koles, 2018). Pacira is an example of a company that successfully integrated immersive reality technologies for their B2B marketing communication in both pre-purchase and post-purchase stages of the buying journey (Boyd & Koles., 2018).

In an attempt to unveil the theoretical understanding of VR/AR impact on a company's B2B sales, the following sections are divided into three main parts. First, a discussion of the extant sales technology (ST) literature and a justification for why immersive reality technologies can be considered as sales technologies is provided. Second, building on extant ST research, we will investigate AR/VR technology benefits on the sales performance outcomes, principally showcasing how these sales support tools can enhance a company's effectiveness and efficiency returns. And third, we will bring forward a theoretical understanding of AR and VR impact on the sales process, especially for the initial "demand generation and lead qualification" stages, as well as subsequent phases like "sales negotiation and propositioning" phases.

3.3 VR/AR impact on sales performance

Debating new technologies in sales processes for B2B, prior literature and research scholars focused on understanding first the use of what they call "sales technologies" (ST) and the subsequent impact, either direct or indirect, on tasks and results and sales performance outcomes (Hunter, 2019). The relevance of such orientation mainly stems from the fact that sales technology tools account for major investments and costs in the aggregate B2B sales operations. Additionally, technology use, is important in the modern sales setting, especially with the more aggressive market competition and unexpected fluctuations in the economy (Hunter, 2019).

A sales technology, according to Hunter & Perreault (2007), is any tool enhancing the salesperson's work or facilitating sales tasks' performance. Perhaps the most prominent example of an ST is CRM. Additionally, a sales technology is sought to

perform three distinct purposes, namely: allowing to access information, communicate information and/or analyze information (Hunter, 2019). In turn, accessing reflects the learning through knowledge acquired, analysis stands for information interpretation ways, and communication relates to the distribution of knowledge. The latter called intermediate purpose-specific use measures to help in relating technology use, in this case, VR and AR innovations, to the sales performance outcomes (Hunter, 2019). Drawing upon the latter alongside extant literature, we investigate how VR and AR technologies can be considered as sales tools.

3.3.1 VR/AR as sales technologies

According to Davenport & Kirby (2015), AR technologies go beyond automating work, like what CRM do in sales, to augmenting it. The difference here is that while automation allows for replacement of human tasks by AI, augmentation allows companies to investigate ways in which they could deepen instead of cutting down work tasks through machines. Additionally, according to Porter al. (2017), AR allows for a new information-delivery model, which affects the way data is organized, managed, and distributed either on the internet or across devices. The author also argues that by enhancing customers' visualization capabilities, AR is providing a new way to access data, including but not limited to the way customers receive and follow guidance instructions about a specific product or piece of machinery (after-sales), and also the immersive three-dimensional way they engage with the product. In fact, AR platforms allow for like an X-ray vision (Porter et al., 2017) that uncovers as many details about a product, equipment or a process as the customer or user would like to see. Furthermore, AR platforms and applications have the ability to process, through Cloud computing, voluminous and unstructured big data in real-time (Ekren et al., 2017), integrating them in a user-friendly context to provide a historical view of up to 60 years back worth of data, such as the case of Llamazoo AR product for mining (Llamazoo, nd; Tectoria, 2017). AR platforms are highly scalable, allowing data to be accessed remotely from any portable device (Ekren et al., 2017), and can be easily deployed either on companies' premises (internal infruscture) or on Cloud for safer access and sustainable storage of data. From the latter, we consider AR technologies affecting information access mentioned in Hunter (2019) research.

Immersive reality technologies do affect not only data accessibility but also communication. According to Cho & Leckenby (1999), interactivity portrays a two-sided communication between a sender and a receiver. Being one of the essential attributes inherent in VR technologies (Biocca, 1992; Frederick & Brooks, 1999; Schuemie et al., 2001; Kerrebroeck et al., 2017), these innovations provide a new immersive and engaging way to communicate and present a product to customers. Additionally, Cheng et al. (2014) state that marketing communication is much more efficient when there is a high level of imagery richness reflected in the high vividness aspect that is enabled by VR. Such vividness, in turn, enables customers to view the product as realistically as possible, enhancing their sense of presence. Porter et al. (2017) also views AR and VR technologies as product communication tools complementing the traditional marketing collateral (print and two-dimensional) such as AR brochures and catalogues (Trubow, 2011), or sometimes even completely replacing them, such as immersive product demos, virtual exhibitions and 360 virtual reality tours (Regt et al., 2019). The user-friendly interface (UI) and user experience (UX) are two essential elements enabling the 3-D digital information integration in those product communications (Porter et al., 2017). Also, AR and VR technologies are sought to completely revolutionize marketing communication by means of creating a new way of showcasing products that transform the try before you buy concept through the so-called "virtual storytelling" experiences (Boletsis & Karahasanović, 2018; Regt et al., 2019). This new form of storytelling allows marketers to effectively build the company's brand image and relate it to showcased experiences, thus, nurturing compelling customer interactions (Boletsis & Karahasanović, 2018). From the afore-mentioned, immersive reality technologies are sought to enable tasks of communicating information.

Nevertheless, immersive reality technologies can also provide a new opportunity for analysis of metrics and data, especially through AR. An augmented reality platform can already integrate and present multiple data sets, particularly related to company's assets, resources, training, and equipment health/functioning on-site, in a 3D dashboard that allow for managers and other stakeholders to analyze (overlaid) information of a mine site through AR (Mining Technology, 2018). This means that AR technologies are enabling not only new ways of accessing and communicating information as claimed by Porter et al. (2017) but also analysis of the latter through

3D dashboards. And therefore, we consider AR and VR as sales technologies that companies can utilize to improve or facilitate different sales aspects as well as communicate, access and analyse information.

3.3.2 Effectiveness outcomes

Building on Hunter (2019) framework of ST use in sales, which in turn applies a Resource-based View perspective, we investigate how AR/VR technology use influences two aspects of sales outcomes, namely: effectiveness and efficiency. Other researchers such as Rapp, Agnihotri, & Forbes, 2008 also discussed ST use in sales for B2B markets from the efficiency-effectiveness viewpoint (Hunter, 2019). According to Barnes et al. (2005), former ST literature used an RBV perspective in understanding how resources capabilities (in this case AR/VR technology investments) enable firms to achieve the effectiveness- efficiency returns. In a sales context, efficiency speaks of the ability to achieve a higher performance internally. While effectiveness is rather linked to the cultivation of relationship across the sales process (Hunter, 2019), and is hence, more reflective of the different interaction aspects benefitting both parties of the sales process (Hunter et al., 2006). Thus, from the effectiveness viewpoint, we discuss AR/VR technology use outcomes on both company and customers, respectively.

Within the effectiveness outcome, Hunter (2019) argues that technology used for access, communication, and/or analysis drives effectiveness by enhancing behaviours such as forging solid collaborative relationships in business. The following section discusses VR and AR potential, as a sales technology, in forging strong business relationships (Hunter, 2019), both within and outside of a company's confines through collaboration and engagement respectively.

Collaboration. Bekele & Champion (2019) highlight that collaboration is enabled with both VR and AR technologies, with emphasis to remote collaboration enhancement. Regt et al. (2019) add that AR technologies enable effective collaboration, especially between different teams in the organization throughout what he calls a VR ecosystem or a virtual reality value chain. Porter et al. (2017) shed light on how AR allows HR to custom training sessions in different

departments from which sales, according to employee experiences and background. Effective collaboration is also enabled through AR platforms that facilitate collaboration in terms of knowledge access and distribution related to pre-sales tasks like the design of digital twins too. Additionally, the improved collaboration also applies to after-sales tasks such as remote maintenance, inspection, and other industrial works enabled through AR platforms like POINTR, VIVAR, and Llamazoo. In the mining sector, MineLife AR platform of Llamazoo company is one of the most relevant cases showcasing the collaboration aspect in VR/AR technologies. The AR provider was partnering inside and outside of the organization (customers, software providers...) to collect and integrate data coming from different mining silos and non-interoperable databases, such as infrastructure data, environmental information, ore body and other mining-specific data, all under a single AR platform. After data integration, MineLife AR platform can create effective marketing collateral such as 360-degree images, flight paths, or even realistic fly-through videos (virtual tours) of the whole mining site from a 10,000square feet view, with an overlaid real-time description of resources in the mine (equipment, infrastructure, drivers..), all as a presentation of the product's capabilities to customers, management and other potential stakeholders (investors) (Llamazoo website, nd). All presentations and media materials can be exported to more common access points such as the internet or shared through the Cloud for easier accessibility.

Another feature enhancing cross-teams collaboration is virtual meetings (Regt et al., 2019). Again, Llamazoo provides a virtual meeting platform where, as Kolo (2019) said: " you might be in Peru at the mine, and I might be in the Vancouver office, and we would virtually both be together at the mine site, at its one-to-one scale, totally immersed in it". The company is also dedicating other products like OCC 3D and Clarity 3D for conducting predictive maintenance and monitoring of maintenance compliance. Both AR products enable centralized off-site access to any part, process, or machinery/equipment health data. Product information, in this case, can be accessed (visualized) through VR glasses and industrial wearables as well as desktop. With different metrics and data displayed, Llamazoo is also creating a 3D dashboard for companies (management) and other stakeholders to analyze (overlaid) information of a mine site through AR (Mining Technology,

2018). This means that AR technologies are enabling not only new ways of accessing and communicating information as claimed by Porter et al. (2017) but also analysis of the latter through 3D dashboards.

Such collaboration examples speak of AR's potential in strengthening and enabling close business relationships (Hunter, 2019) in the pre-sales stage with product demonstrations, prototyping, and virtual meetings, as well as the after-sales services like inspection and maintenance work. Many scholars discussed the benefits of AR and VR enabled collaborations. These include an effective knowledge transfer primarily, and an improved decision making within and between teams and stakeholders (Porter et al., 2017; Regt et al. 2019, Hariharan et al., 2020). By "transcending the physical limitations of real-world interactions" (Regt et al., 2019) and representing physical entities of the real world, VR and AR technologies allow managers and marketers and other stakeholders to process both the physical and digital information at the same time (Porter et al., 2017), which improves their knowledge absorption faculties, and in turn, their ability to make more informed decisions (Porter et al., 2017; Regt et al. 2019). In a similar line of thought, Hariharan et al. (2020) mention the benefit from these immersive reality technologies as a decision support aid.

Engagement. Apart from the collaboration benefit inherent in the effectiveness outcomes of VR and AR use as a sales technology, other researchers like Regt et al. (2019); Mujber et al., (2004) and Hammerschmid (2017), add stakeholder engagement as another potential outcome. Bekele and Champion (2019) also highlight the engagement enabled by AR ensures through interactivity, and in VR through immersivity and degrees of "realism". He broadly defines engagement as the "*ability of the virtual environment to enable engaging experiences*" as a by-product of immersivity and intuitive interaction with the VE content. Scholz et al. (2016) go a step further in differentiating between four levels of engagement enabled with immersive reality technologies, as follows:

Consumer engagement refers to the process of integrating (immersing) consumers (basically VR and AR users) in specific interactive experiences so as to develop and nurture a strong relationship with the consumer himself (Brodie, Ilic, Julic, &

Hollebeek 2013). Such engagement creates a strategic differentiator for brands, especially in retailing, that is concretely enabled through mobile marketing that allows a more personal interaction in consumers' everyday life. For the B2B context, customers can access any AR application from their own portable device.

User-brand engagement is the type of engagement that is enabled by any AR campaign or application, regardless of whether it's B2B or B2C oriented. Such engagement is reflected through the user's ability to act vis a vis an inert object (Scholz et al., 2016). Examples may consist of viewing how certain machinery, a building or an industrial product is embedded in a three-dimensional context, or actually providing annotation (modifying colours, size, adding shapes...) as a feedback to a digital product in the conception and design phases. This kind of in-depth interaction, or what Porter et al. (2017) call "companion experiences", offers an authentic "contact time" with the product (Trubow, 2011), that not only expands its traditional capabilities but improves product loyalty (Porter et al., 2017). Augmented reality, in particular, is a powerful tool to create positive brand experiences and a strong customer-brand relationship. This can be justified, as Jin and Yazdanifard (2015) stated, by AR's potential to showcase brands in a completely innovative manner, while also allowing customers to engage in interactive, three-dimensional experiences.

User-user engagement: In many AR settings, such as the case of virtual meetings, customers and other stakeholders are able to engage and interact with each other and are digitally represented by avatars. This kind of sociability aspect enabling social engagement between specific or all team members in a digital environment is what defines the user-user engagement. In this case, any user manipulation of the AR content is consequential to others in the same digital environment, who can view the updated content and can even act on it (Scholz et al., 2016).

User-Bystander Engagement: occurs when users of VR and AR technologies act as opinion leaders to their peers and inform bystanders about their immersive experience, or even inspire them to engage in the same experience (Scholz et al., 2016). This engagement level can be explained by the technology diffusion model of Rogers (1995) exhibiting the importance of social influence, and social systems

in peers' adoption of a certain technology. Social influence is particularly relevant in B2B sales as a decision about a specific product is a more complex process, usually taken by a team rather than one individual.

3.3.3 Efficiency outcomes

In the B2B sales context, it is now visible how extant literature provides grounds justifying the effectiveness benefits, from both forging strong collaboration bonds, and different engagement levels associated with the interactive-immersive experience. Outcome-based benefits, however, also consist of operational efficiencies and task performance improvement (Hunter, 2019). Results of Hunter (2019) study show that utilizing technologies to access and communicate certain information may lead to substantial improvement in efficiency for organizations. In turn, Hunter (2019) argues that sales efficiency is sought to result from improved behaviours allowing the salesperson to work smarter, like effective sales planning, adaptive selling or what he calls "adaptive selling". Hunter (2019) defines working smarter as enabling behaviours like adaptive selling, or improved sales planning. Adaptive selling can occur throughout a sales interaction. At this level, the ST facilitates a salesperson's ability to present an adapted and customized solution to each buyer, while also minimizing efforts to address customers' objections through the presentation (Hunter, 2019). Amongst adaptive behaviours are providing mutually beneficial solutions or altering the sales approach subsequently to the sales interactions. A sales technology can also enhance planning for different sales activities, or what Hunter (2019) refers to as "sales planning". Amongst sales planning activities are ST's ability to facilitate a sales forecasting by making it more practical or even enable faster and more convenient access to information and response to customers' concerns and objections in a sales interaction (Hunter, 2019).

Relating the afore-mentioned literature to our VR and AR context, existing research and industrial examples focused mainly on the collaboration benefit from using VR and AR technologies, and no concrete evidence exists so far about if and how these innovations affect working smarter in sales, including the sales planning and/or adaptive selling behaviours. However, literature discusses immersive reality

technologies enabling sales efficiency through cost reductions and enhanced task performance, as explained below.

Cost Reduction. Efficiencies can take many forms. First, in the pre-sales stage, VR and AR technologies significantly reduce design (Porter et al., 2017), time and prototyping costs (Trubow, 2011; Mussomeli et al., 2018). An illustrative example is the case of construction and engineering firms, which, in an attempt to cut down on costs in the sales process, revert to AR modelling instead of physical mock-ups. This, in turn, enables them to be more cost-effective and design the building prototype in lower time (Trubow, 2011). In a Deloitte article, Mussomeli et al. (2018) argue that digital replicas result in up to 30% savings in the prototype phase and 50% lead-time savings in design. Such realistic product representation models also provide an opportunity to not only design but also test different prototypes and simulate various what-if scenarios including interactions with the product or system, product functionalities' testing, and evaluating customer experience (Mussomeli et al., 2018). In the same line of thought, Scatena and Mardegan (2012) state that high customer engagement enabled through AR and VR technologies leads to increased profits and improved company turnover.

As regarding the after-sales support, Porter et al. (2017) state that immersive reality technologies like AR lower costs of service support, training for the use of a product, machinery or equipment, and ultimately leads to reduced error rates in task performance. Porter et al. (2017) additionally emphasize the logistical costs reduced by AR provided that these technologies remove the need for physical interfaces and travelling to the customer's location that may be thousands of miles apart. Lee Company, a provider of building systems, used AR to support their after-sales service and maintenance work to different customers. By centralizing real-time support for their clients, the company was able to save over a monthly $500 per technician in costs related to labour and travel, equivalent to a $20 return on every one dollar invested in AR (Porter et al., 2017).

Task Performance. From a task performance viewpoint, AR and VR technologies are sought to fasten the execution of tasks, improving product support and service quality by allowing for more efficient predictive maintenance. In fact, the General Electric company achieved a 34% rise in worker productivity since the introduction of AR applications in their manufacturing and maintenance processes (Porter et al., 2017). In a sales context, remote maintenance, inspection and collaboration are particularly relevant, such as the case of platforms showcasing the real-time health status of equipment (Llamazoo, nd). In turn, proper asset optimization and preventive maintenance significantly reduce operating and capital expenses (Shetty, 2017), and enhances the product's life, leading to greater product loyalty and customer satisfaction. Porter et al., (2017) additionally points out to the reduced error rates in task performance from the introduction of AR technologies in the sales pipeline. In a Boeing study case, the company used AR in training for aircraft assembly work and was able to complete the work in 35% less time than when using traditional two-dimensional long instructive documentations. Additionally, over 90% of inexperienced or low experience workers were able to complete the assembly task successfully from the first time.

3.4 VR/AR impact on the sales process

Mechanisms by which to justify the positive impact of implementing VR and AR technologies as sales tools lie heavily within the psychology scope, and more particularly the study of neuro-linguistic programming in sales, alongside cognitive load theory (Trubow, 2011; McCarthy, 2017). Indeed, strategic use of VR has the potential of creating new business models that serve as selling points for a company, enabling it to mark a competitive differentiator from the rest of rivals (Regt et al., 2019). And this differentiation is particularly relevant in a B2B sales context (Trubow, 2011; McCarthy, 2017; Ventana Research, 2019).

3.4.1 Demand generation & lead qualification

A critical element in the B2B sales process is, of course, customer acquisition (Trubow, 2011). A customer has a problem or wants to take advantage of an opportunity from a basic point of view. In order to guarantee the prospective customer

that a product or service is the correct solution, there are sales and marketing materials. If combined with the conventional marketing content, Virtual Reality will help potential customers in their quest for answers. VR is a technology for the capturing of interest, but it is more important than the 'wow' element exhibited in literature. VR is a powerful non-verbal communication tool which can enable any company to demand its products (Oliva, 2006.). The purpose of this initial pre-sales stage is to use VR to evaluate what a client needs or wants. At this level, the customer might (or might not) be persuaded of the need to purchase a product, equipment or machinery but is still assessing all potential alternatives.

Being highly persuasive and influential in communication (Mccarthy, 2017) is how AR and VR technologies can assist in this stage of the sales process. AR and VR technologies allow blending the effects of a site visit, a trade show and a marketing presentation all in one single tool through the strong sense of presence that is experienced. AR and VR technologies can be effective and powerful non-verbal communication sales tools that convince and persuade when neurolinguistics and virtual storytelling are applied as selling techniques (McCarthy, 2017; Trubow, 2011). Storytelling in AR can be utilized for different purposes from the problem identification, to exploring a new product's functionalities and/or proving its performance and benefits (Trubow, 2011). Storytelling is viewed as one of the most effective tools in a sales individual's armoury, and its power is not only limited to entertaining but also influencing the customer's purchase decision (McCarthy, 2017). This logic is backed up with a psychological justification through which storytelling is sought to resonate with a person's emotional core and leads to improved information processing (Bruner, 1986) and building trust, in this case in the product visualized. According to Harvard psychologist Bruner (1986), a story-focused message is 22 times further memorable in the mind of the receiver than a traditional passive message, and McCarthy (2017) emphasizes that stories are more effectively understood with enhanced visuals like AR. Likewise, Trubow (2011) states that AR technologies have the ability to create a narrative around a product.

An important part of the pre-sales phases include sales presentations (McCarthy, 2017) and/or providing customers with marketing collateral to explore. Here, the sales through AR is different from traditional sales with regards to the materials used for

product marketing and advertising. Thompson (2017) mentions digital twins as effective sales tools to replace traditional infographics and informative videos, cumbersome physical tradeshows that are both costly and unsustainable, are reconceptualized with virtual tradeshows and exhibitions (Ventana Research, 2019). So in this case, customers are not only offered a seamless digital walkaround experience with the product but also trained virtually on how to operate it safely before its conception, what is terms as the try before you buy concept (Regt et al., 2019). Traditional brochures are also substituted with AR catalogues, allowing for customers, through a simple mobile device camera or a headset wearable to virtually explore and operate the machinery or equipment in the setting of their choice such as IKEA VR Catalog or Hyundai Virtual Guide (Boletsis & Karahasanović, 2018; Ventana Research, 2019). In this new AR-enhanced sales situation, salespersons' roles shift from being a central presenter in a passive one-sided sales pitch to a collaborative coach or facilitator in a dynamic sales process (McCarthy, 2017).

An Experia study (2016) investigating the importance of data in a B2B sales context (n= 400), 56% emphasized data quality as a reason driving sales failure and resulting in loss of sales deals. And in that matter, McCarthy (2017) focuses on the ability of AR technologies to integrate and process large amounts of big complex data (through Cloud Computing) that would otherwise be overwhelming for customers and present them in a simple, highly realistic and engaging way. With improving personalized (Jin and Yazdanifard, 2015), customer-centric and highly engaging content that successfully grabs the full attention of the audience (customers) through hands-on interaction (McCarthy, 2017), AR leaves room for customers to feel more in control of the purchasing situation (manipulating different product configurations, exploring the use in an interactive 3D setting..) and collaborate on the initial development and design phases (McCarthy, 2017; VentanaResearch, 2019). The latter results in higher purchase commitment and thus leads to fastening the purchasing experience. Simply put, effective engagement and collaboration discussed more in detail in the previous section enhance customers' purchase confidence (VentanaResearch, 2019) and allows the company to effectively address customers' needs from very early stages of the sales process. With a confident and engaged customer, it takes less effort to follow up on customers after a successful sales start, and the risks from a delayed or longer cycle

are also reduced because of a fewer need for requotes or reconfigurations of the product (VentanaResearch, 2019).

By streamlining the initial phases of the sales process all in one effective AR presentation, salespersons are able to reach a larger audience and the acquisition of new customers (Jin and Yazdanifard, 2015; Smith, 2014), and ultimately, a yielding a greater market share (DeMers, 2016; Jin & Yazdanifard). Using AR and VR as sales tools are also increasing sales velocity, allowing salespeople to achieve more in less time and with light-weight compelling resources like a mobile device or a headset. As mentioned earlier, transportation, logistics, and travel costs for shipping large and complex industrial equipment to a tradeshow event or customer's premises for exploration are all unnecessary costs erased with the use of AR as sales tools (McCarthy, 2017; Trubow, 2011 and Ventana Research, 2019) in the initial demand generation and prospecting phases.

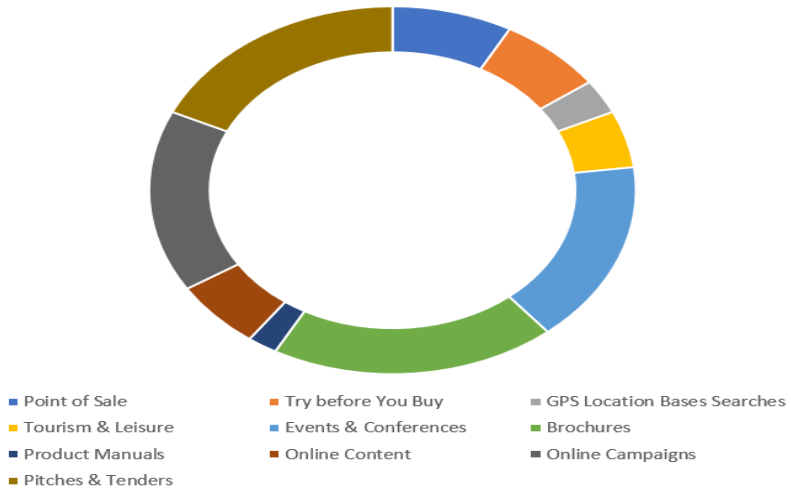

Figure 4. How AR is used in sales (adapted from Trubow (2011))

3.4.2 Propositioning & negotiation

Through the development of an attractive proposal, especially in the B2B field, a good relationship with a potential new customer is crucial. In this phase, a credentials' meeting is the firm's opportunity to make a first good impression (Trubow, 2011). Bringing goods to life via virtual reality enables marketers to display a much better deal than a PowerPoint deck. 'PowerPoint death is a well-known concept that most

practitioners will recognize (Trubow, 2011). VR removes the frustration, usually accompanying several methods of presentation. If the salesperson is not present to have a specific solution, as is often the case with the face-to-face process, the virtual reality is truly outstanding. VR allows managers to stand out by providing the actual answer to the future customer. In this kind of selling scenario, virtual reality speaks loudly and is a perfect way to build a disruptive attentiveness proposal. (Trubow, 2011.). In fact, Cuomo et al. (2014) mentions one of the uses of AR technologies in sales pitches and tendering.

Apart from the linguistics and storytelling aspects advanced in the initial pre-sales phases, Trubow (2011) covers additional selling techniques that if used in conjunction with immersive reality technologies, enable the success of the sales process, namely: risk management. Risk management is of particular interest in sales negotiation as it reflects the company's ability to predict buyers' objections and deal accordingly. In this case, AR is viewed as an effective tool to address buyers' concerns before they can concretely materialize. This can be justified by the technology's ability to enhance effective learning and in-depth education about the product at hand at very detailed levels. As Cuomo et al. (2014) state that the mind is the sole boundary to AR customization potential for customers.

Enhanced learning through AR may be justified by former literature investigating AR's ability to improve individual's information retention rates, such as Bujak et al. (2013) study of AR impact on learning in a math class. McCarthy (2017) believes a classroom audience is similar to a B2B sales audience provided that both entail learning and retention of complex data. In this case, AR technologies can improve customers' learning processes due to different reasons. First, the memory encoding is assisted with physical motor actions, and different data learned (abstract, metaphysical) are processed in different brain parts which raises the customer's ability to memorize these data. Another reason is the fact that AR-enabled collaboration between salespeople (teachers) and customers (learners) allows personalizing the aggregate learning journey and raises learning motivation. The third reason for enhanced learning is justified by the fact that AR technologies reduce an individual's cognitive loads as they simulate attention, which leads to focused information processing. Finally, as AR technologies provide a sense of control over the virtual

environment, customers are more eager to engage and learn from the environment (McCarthy, 2017).

The improved learning can also be explained by the faster but more efficient time of exploring and experiencing with the product. As McCarthy (2017) states, a traditional PowerPoint presentation or passive sales pitch may take up to two hours of boring explanations where the customer gets many distraction opportunities. With introducing AR in a sales pitch or proposal, the customer is able to explore overlaid information of their own interest in the digital environment and skip what is less relevant to them (McCarthy, 2017).

Another AR and VR capability enabling the success of sales negotiation is the called mass intelligence gathered with these technologies. Simply put, following each sales presentation with AR, specific usage data exhibiting customers' unique interests are captured (Boletsis & Karahasanović, 2018; McCarthy, 2017 & Trubow, 2011). Trubow (2011) defines the latter as feedback stemming from the customer's activity that was logged and recorded throughout their engagement with the product augmentation. Insights from these data allow salespeople and marketers to better position their offering to suit customers' needs and direct existing or new product development. This consequently removes barriers associated with closing a sale or winning a proposal (Trubow, 2011). Hence, the high personalization aspect coupled with the ability to capture intelligence related to customers' interests improves future tenders and proposals to more customer and case focused ones (McCarthy, 2017) that ultimately lead to customer satisfaction, and a more positive purchase decision (Jin and Yazdanifard, 2015) driving the sales forward (McCarthy, 2017).

In a nutshell, using immersive reality technologies to support the sales process ensures sustaining customer's interest throughout the journey, from early introductory phases up to the pitching and propositioning (Trubow, 2011).

RESEARCH METHODOLOGY

This section covers the study's research methodology, including a discussion of the research type, research design and approach, data collection methods, ethical considerations, and finally, sampling and data analysis methods, as exhibited in Figure 5.

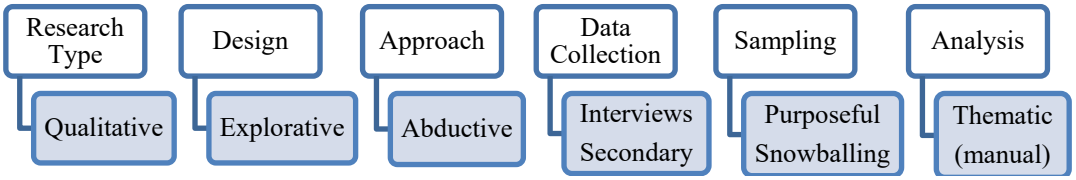

Figure 5. Overview of research methodology

4.1 Research design

Our research will be qualitative in nature, using both primary and secondary data to allow for a more reliable basis for research (Saunders et al., 2007). First, the study draws upon secondary data from Google Scholars and Oulu University databases to build a theoretical foundation. Sources include reliable websites and academic and journal journals, whitepapers, published books, and case studies. Search keywords like "virtual reality", "VR", "augmented reality," "AR", "Business-to-business", "B2B", "Sales", "interactive technology," "innovation", "advertising," "marketing," "Purchase intentions", and a combination of these terms were used to gather our secondary sources. Our primary data, on the other hand, is collected through semi-structured interviews. To address the research objective, the abductive reasoning approach "mixed approach" is applied in this research, allowing to go back and forth to literature

This research follows an exploratory qualitative research approach to define how could virtual reality impact marketing in the B2B sector. Generally, there is no hypothesis for this study for testing and generalization. According to Yin (2003), the exploratory research setting is done to explore, examine and define a phenomenon that has not widely examined before. Basically, qualitative research is done to define the nature of

the problem, not to provide a concrete solution for the existing problem. As the outcomes of the exploratory research can be usually used as a hypothesis for further quantitative research trials to validate the primary results and extend the trials to examine further research themes.

Meanwhile, Yin (2003) suggests that the qualitative approach should be used when answering the research question of how and why. Further, qualitative research is defined as a research methodology that gathers various sets of non-numerical data, then interpret them in accordance with study scope (Yilmaz, 2013). In this case, the theoretical background has been formulated to understand the evolution and attributions of VR and develop border understanding of the VR impact on marketing in the B2B context. Then, the data collection was conducted in the empirical study part to validate the theoretical foundations. The themes for data collection were formulated based on the theoretical foundation of this study. Overall, the theoretical background of this research provides a starting point for the empirical study and defines the impact of VR and AR on marketing in the B2B setting.

To address the research objective, the abductive reasoning approach "mixed approach" is applied in this research. Hence, the abductive reasoning mixes between the inductive and deductive reasoning to empirically move towards the foundation of theoretical background (Stebbins 2001; Yin, 2003). The inductive method approaches the theory through data analysis. Mainly, it starts with the observation of certain behaviour, then approaching the theoretical framework by its end (Gilgun, 2001), while the deductive approach aims to test certain theory (Yin, 2003). Thus, this study uses the abductive research approach, combining both the inductive and deductive methodologies.

In our primary data collection, we will be using semi-structured interviews. Semi-structured interviews are in-depth interviews with a pre-defined set of open-ended questions (Jamshed, 2014). They allow the interviewee to establish a so-called "interview guide" with clear instructions for interviewers, and a schematic structuring of questions (Bloom and Crabtree, 2006), that ensures not only preparation and competency in answering but also reliability and comparability of the qualitative data (Cohen et al., 2006). The interview includes open-ended questions but does not prevent

further discussions or questions to naturally emerge in the flow of discussion (Bloom & Crabtree, 2006). The interviewees are selected based on knowledge of the research topic, shared critical similarities and relevance to the research question, also called "purposeful sampling", to optimize richness and depth from derived data (Bloom & Crabtree, 2006). However, due to time constraints, few interviewees were selected using a snowballing approach, mainly through contact networking, allowing us to complete our data collection within the assigned timeframe.

At this point, the interviews aim to develop meanings and interpretations (Tuunainen, 2019) from the perception of VR/AR industry experts about potential applications of these innovative technologies and how managers and marketers can take full advantage of those in their marketing strategies and sales processes, while addressing customer concerns, throughout the purchasing process. We also aim to add an industrial opinion, through these interviews, in debating the extant technology adoption literature with factors influencing the adoption of immersive reality technologies for customers in different industries. We conducted ten interviews with eleven AR/VR providers in developed countries, including Finland, the USA and the UK. Our interviewees are sales directors or C- suite managers in these companies provided their ability to better elaborate on VR and AR technology capabilities and applications using a more business-like jargon that would eventually facilitate our interpretations in discussing the findings. A detailed list of entailing company names with description and interviewee details (code, position, and interview date) are presented in Table 2 below. To facilitate empirical analysis, we assigned a specific code, ranging from A to K, referring to each of our eleven interviewees.

Table 2. List of interviewee and company details

Company	Description	Interviewee Position/Date	Code
Wakeone (Finland)	Design, deployment and support of immersive internet solutions https://www.wakeone.co/	(Software Services Director) 29/04/2020	A
Zoan (Finland)	Interactive digital environment provider in digital building, marketing and entertainment. https://zoan.fi/	(Sales Director) 30/04/2020	B
Mekiwi (Finland)	AR/VR development agency https://mekiwi.org/en/	(Sales & Account Manager) 01/05/2020	C
Stereoscape (Finland)	Smart product communication solutions through VR, AR & MR https://www.stereoscape.com/	(Account Executive) 04/05/2020	D
Vobling (Sweden)	Global Industry AR/ VR technologies https://www.vobling.com/	(Sales Manager) 05/05/2020	E
Littletar (USA)	Cross-platform distribution of AR/VR content https://littlstar.com/	(CEO/Founder) 01/05/2020	F
Hidden Ltd (UK)	Interactive VR/AR provider https://www.hiddenltd.com/	(CEO/Founder) 04/05/2020	G
Arylin (Finland)	Augmented Reality Provider https://arilyn.com/	(Sales Director) 05/05/2020	H
Varjo (Finland)	Advanced VR/ XR Solutions provider for industrial use https://varjo.com/	(Technical Support Specialist)	I
		(Product Manager) 06/05/2020	J
3D Talo (Finland)	VR & AR Industrial Solutions https://3dtalo.fi/	(Sales Director) 06/05/2020	K

4.2 Ethical considerations

To ensure a smooth research flow, we keep ethical considerations in mind, particularly concerning the interview process. These include (Bloom & Crabtree, 2006):

Protecting respondent's data: recognizing the priority to protect our interviewees' data, and the potential of leaking undesired information in jeopardizing the interviewee's position, we ask in advance to the interview about approval for recording the interview and interviewee anonymity preferences, should the interviewee desires to keep their identity and/or that of their company private. At the end of the interview, we ask again should there be sections or answers to specific questions not to publish, which has all been taken into account in this paper.

Properly introducing the study in question is also of essence to ensure a good understanding from interviewees about the possible directions of the interview question/discussion, as well as their ultimate right to be knowledgeable of the study in which they will participate.

Reducing exploitation risks: according to Bloom and Crabtree (2006), interviewees ought not to be exploited for personal benefits. We avoid this issue by acknowledging their participation and contribution to the success of our research, while also sending them the final research work, after publishing, if they wish so.

4.3 Sampling & data analysis method

Our paper starts with a theoretical background defining Virtual Reality, Augmented Reality and providing a conceptualization baseline for both terms for distinction purposes. The theoretical foundation of VR and AR is also structuring research subtopics in four main parts: VR and AR definitions, attitudes and purchase intentions (exhibiting different frameworks to justify and understand innovation adoption by customers), VR impact through the buyer's purchasing journey (evidenced through application examples and discussion of their impact on different buyer stages), and finally, VR/AR impact on sales (particularly sales performance outcomes). The latter theoretical foundation allows us to put the research into context and eventually direct the data collections (Tuunainen, 2019) through pre-defined questions. Within and after gathering and examining our data, we will be referring to theory in an "iterative" cycle. (Tuunainen, 2019). Therefore, we will be using an abductive research approach, combining both inductive and deductive reasoning.

Regarding the interview data, we will be conducting semi-structured interviews. We used this approach as it doesn't strictly follow specific questions, but rather some pre-set ones (Myers, 2013). Research gaps from our literature review enabled us to draft some interview questions that would serve as guiding and structuring of the interview discussion, while also ensures the interview includes all sub-topics (themes) underlying the research question. Interviewees, however, remain free to develop their answers further, hence, enabling the discussion to flow with the interview (Myers, 2013), and richer data to be derived.

Analysing the interview will be following a thematic analysis. According to Spradley (1979), the thematic analysis must start by transcribing the interviews to gain ideas and the needed insights. After transcribing the interview, the data must be gathered under its categories and patterns (Aronson, 1992). Following, these categories must be combined and transferred to a sub-theme. Thus, the analysis will bring together the fragmented thoughts and insights to give the researchers a concrete meaning. Finally, these themes will be compared back with the literature background to illustrate a valid argument by contrasting or proofing the prior studies (Aronson, 1995).

Following primary data collection and analysis findings, we can then compare the interview insights with literature review trends. At this stage, we identify differences and similarities regarding factors driving purchase intentions and attitudes for B2B buyers between theory and practice, alongside the impact of VR and AR technologies on sales performance outcomes and buyer purchasing process, while also acknowledging any changing trends throughout time.

DATA ANALYSIS & FINDINGS

This section discusses data analysis findings between theory and practice (from interviewee insights). The discussion starts with showcasing different perspectives for VR and AR definitions concluded from the interviews, followed by technology acceptance factors in B2B marketing that include financial, technical and social barriers, alongside market maturity and user experience concerns. And following is a discussion of how VR/AR impact B2B sales, from a sales performance outcome through efficiency and effectiveness returns.

5.1 VR & AR definitions

5.1.1 VR definitions

As Sutherland (1970) defined Virtual reality in terms of the multisensory and feeling; (A), also defined VR as something that takes the senses to another place. *"I usually think that virtual reality is something that takes you to another place…that takes your senses. Like audio and people out and you have some digital work or 360 cameras. Yes, I think it is something that takes you to another place.*". According to (C), VR is a computer-simulated 3D world. His definition goes along with other authors Baus and Bouchard (2014); Coates (1992); Greenbaum (1992); Krueger (1991); Pratt et al., (1994) and Steuer (1992) who defined VR from a technological hardware-software perspective as a 3D digital stimulation generated by the computer. In this sense, for (C), virtual reality is "*a computer-simulated 3D world in which the player is inside of the simulation with the glasses*".

"It's always a tough question! In VR, you use all computer or electronic devices to either copy existing environments or like recreate existing environments or to create fully new ones. It's trying to use sensory stimulation to make you believe you are in the environment that is created for you." said (B). Hence, VR seems to be defined as the computerized environment created to suite and fit with user preferences. Milgram and Kishino (1994), defined VR as a digitalized environment created by a computer which the user immerses into it. Likewise, Sherman (2003), said that VR is an interactive computer simulation which immerses the user and his senses in another world. (F),

(D), (G) (I) (J) and (K), defined VR in the same way. The interviewees said that VR is a technology that takes you to another place or world. This is similar to Berg & Vance (2017), definition whereby VR is viewed as an immersive experience technology taking people beyond their real world. Moreover, Mazuryk and Gervautz (1996) illustrated that VR is an immersive experience taking the user in another world.

> *"So virtual reality, we really think about it as it's replacing your reality entirely. Everywhere you look, and everything that you hear and even things that you feel are virtual or not, not real at all." (F)*

5.1.2 AR definitions

(A), (B), (C), (D), (F) and (G) agreed that AR is a technology which brings objects to the real world. Hence, AR is a non-immersive technology overlaying a digital object like videos, images and texts in the surrounding environment (Milgram & Kishino, 1994). Likewise, (C) described AR as an open reality because the interaction of the user occurs in the physical world. Moreover, (B) said that through an AR glass, the customer could interact with an object like a table in a real room.

> *"Anything that amalgamates the real world or a real-world setting or objects or anything within the virtual environment becomes either an augmented reality or mixed reality." (G)*

5.1.3 VR/AR attributes and features

Making the user feel present through an engaging environment is the main objective of VR designers (Waterworth & Waterworth, 2001). Likely, (A) (C), (F) and (D) expressed their thoughts about the most important attributes in VR and AR. (D) said that "*VR and AR help people experience things faster, quicker. So, I would say the experience is the most important attribute*". Hence, it could be said that the differentiation attribute of VR and AR is the experience that the user is immersed into. Moreover, (A) emphasized vividness and interactivity as other crucial features and attributes of VR. Cheng et al., (2014) also illustrated the same attributes as of essence in marketing communication, provided that they enable customers to view and experience the product more realistically.

> *"You are not listening to it, you are not seeing it, you are not acting on it, but you are experiencing it and all of it at the same time. Like it's, it's just a complete experience." (C)*

A customer is willing to respond more positively with a higher level of rich imagery and visualization (Kerrebroeck et al., 2017). With this viewpoint in mind, (B) emphasized that the richness of imagery and graphics quality are the most important AR feature. On the other hand, (G) argues that flexibility and safety are crucial features of VR. Additionally, (G) said "*the most important attributes of the AR are the ability to communicate clearly with anyone and the transfer of skills and knowledge*." said (C), however, refers to accessibility and the ease of use of AR applications, enabled through mobile devices (smartphone or tablet) as the most important attribute for a user.

> *"When you design experience in VR, interactivity is one thing there for people; they're socializing in VR, then it starts to work. Then it's better than today's website or video". (A)*

5.2 Customer adoption factors

5.2.1 Financial barriers

With regards to technology adoption factors, the primary aspect that was sought to clearly hinder customers' acceptance and delay the diffusion of VR and AR technologies in marketing for the B2B sector is the financial burden associated with these innovations. In fact, the cost was the most prominent element recurring in many interviews. (C) puts an emphasis on the high cost of implementing an interactive and immersive technology. (C) points out that even though labour costs are quite high in Finland, the costs of creating content in a non-flat screen (unlike tablets, phones...) is what makes the technology particularly expensive to the eyes of customers. He mentions user experience and packaging solutions need to be created from scratch, and as every use case is different, producing customized content takes a longer time to test, optimize and conceptually design. Likewise, (B), (H), (D), and (E) all stressed on expensive upfront costs of content creation and production as essential barriers of

adopting VR and AR technologies. (D) argues that high cost is why AR and VR technology adoption is more relevant, resulting in a more favourable attitude and positive purchase intentions for big and well-established firms that are actually able to put tens of thousands of dollars in a single product demonstration or interactive 3D solution. Similarly, with (C), (D) and (B), Boyd and Koles. (2018) and the Boston Consulting Group (2018) study results are all reflecting a shared opinion about the importance of technology costs, with particular emphasis on upfront costs like Rauschnabel and Ro (2016), Geiger (2017) and Shin (2015), in hampering purchase decisions and adoption of technologies. On the other side of the spectrum, interviewees (A) and (G) both recognize costs as a less pertinent factor. Although (A) acknowledges that lacking budgets from company (customer) sides to produce expensive content is a true fact, the cost is actually not the primary barrier to adoption, especially the hardware expenses as the "benefit is clearly higher than the purchasing price" of these technologies. A little more problematic for companies are the costs to scale up the technology (VR) for training in company sites. It is only when there is a need to scale VR training for hundreds of people in a company that cost might come into consideration. Also defensive about the cost perspective, (G) is still firmly upholding his viewpoint about costs by arguing about a false perception of expensive prices of VR and AR technologies that are not reflecting reality. Customers think that the technology is costly, but this may be justified, according to him, by a lack of understanding of the real value-adding aspect of AR and VR for business. Such misunderstanding can, in turn, be deeply rooted in a more socio-cultural context, whereby advanced age barriers from decision-makers come in place to justify the strong reluctance or resistance to adopting these innovative technologies (E & G). Younger managers, are in this sense, more prone to accept embracing new technologies like VR and AR, which is partially in line with Venkatesh & Morris (2000) perspective.

The lack of understanding of AR and VR's real potential for businesses can also be evidenced by a difficulty to concretely measure their business impact, as mentioned by (E). A few years before, (G) points out to the declining technology costs in the future, mainly evidenced with higher accessibility as the cost of producing an augmentation decreases, and also a higher market rivalry and reduction in licensing expenses for softwares.

5.2.2 Technical barriers

The second most referred to factor justifying the slow take-off of AR and VR technologies and adoption from a B2B customer perspective is related to technical, or technology, barriers (interviewees A, D, & G). While (A) and (D) point out to the lack of hardware and overall devices production globally, with a mere 10 million devices worldwide, both also identified, alongside (G) the issue of whether the device is AR capable or not. This concept is closely related to Rogers (2003) technology compatibility attribute, where he explains that innovations ought to be consistent with the users' past experiences. A non-compatible device, that is, one that doesn't support the interactive content of VR and AR technologies, causes what (F), founder and CEO of LittleStar in the USA, calls a content distribution issue. He emphasizes that too many options exist to distribute a video, but for immersive content, you have to think about a story where there is a distribution of AR content. (F) brought about the example of 360 videos that are supported by the company (Little Star) resources but are not supported by Instagram, which automatically removes this possibility as a distribution channel. Distribution does not only reflect the channel through which interactive content can be visualized but is also affected by customers' access to those channels. According to (E), the low access to VR devices is, in turn, creating a distribution barrier. Accordingly, businesses can take different approaches depending on the content that they are creating and how much distribution they are looking for.

In the same line of thought, (A) argues that getting the right content to the right devices is problematic for companies as more user-friendly software and hardware need to be developed. Especially in sales where time is a constraint, customers need user-friendly technologies, which is more a work in process at the present times (A). Relating to the extant literature, the emphasis on user-friendliness aspect of the technology figures in the perceived ease-of-use (PEOU) of the technology adoption model brought about by (Davis, 1989; Davis et al., 1992) and (Cuomo et al., 2014). The same concept is also mentioned, as an opposing attribute of technology, in the innovation diffusion model of Rogers (1995, 2003) called "complexity". Simply put, the more difficult it is to use (the interface) and understand the technology, the lower are the chances of a successful adoption from customers side. For marketing and sales purposes, (A) agrees that AR technologies are most heavily used by companies because of the user capabilities

enabled through them. VR, on the other hand, is still a too complicated technology to use, and users are more comfortable with tablets and phones (old experiences), which justifies why AR is mostly relevant for companies to use. A general tendency is that AR makes for an easy-to-use technology (C & D), especially in terms of content access with its mobile centricities like Hololens or Magic Leap (C & F), and the ability to deliver extra content without bringing any physical burden (C). Augmented Reality, in this case, is better suited for the more complex B2B environment (F & G) and a technical audience (A).

Apart from the software and hardware development and convenience of use, (D) adds the processing power as another relevant attribute for customers to purchase a technology like VR or AR. From a business perspective, salespeople simply do not have time to wait on a slow running AR application in the midst of an important corporate deal, let alone the further software installations that might be essential to perform prior to running the apps (A), which is linked to the infrastructure barriers brought about by (G). In a similar line of thought, Barnes (2016) raises a concern for a still under-developed infrastructure to support the use of virtual reality. At the other end of the spectrum, technology adoption barriers also reflect a persistent lack of technical knowledge for the use of VR and AR in sales and marketing activities (A & H). Such knowledge is more related to the how is of creating a compelling 3D content (H), the different ways to create stories and different tools needed to embed the narratives in an immersive world (F). Similarly, Rogers (2003) refers to such knowledge as a technology "awareness" that goes hand in hand in supporting the use of a specific innovation. Going a step further, Barnes (2016) specified the knowledge needed by mentioning a lack of standards on how to easily utilize these technologies in business and especially marketing settings, emphasizing the importance of setting clear guidelines about software development, other quantitative and computing hard skills related to VR applications for managers. Such lack of expertise from end-user , brought about by (C and F), makes customers more reluctant to try or adopt immersive reality technologies, particularly related to the usability of VR and AR (A). This, in turn, is in line with Zabel and Heisenberg (2017) B2B survey confirming that 94% of respondents emphasize the usability and easy handling and navigation of the

immersive technology as the central factor for adopting VR. Also comparing with existing literature, Boston Consulting Group benchmarking study of over 50 senior marketing executives in the USA reported that lack of internal expertise accounts for 31% of VR adoption challenges, followed by a lack of awareness (16%). This is why (A), (B), (C), and (D) called for a need to educate and inform businesses about the real value-adding potential of VR and AR. While (C) argues about sharing knowledge and internal expertise to people outside of the VR AR developers circle in more informative (rather than selling-oriented) events, (A) adds that training staff and employees for the specific usage of these technologies could take one to two years but is still beneficial in understanding the business value derived from AR and VR. (D), on the other hand, points out to the need of hiring experts in the field, that is outsourcing AR and VR expertise, for a smooth diffusion of these technologies inside the company.

5.2.3 Social barriers

Acknowledging the importance of social influence and decision making channelled through a social system as discussed by Rogers (2010 and later endorsed by Venkatesh et al., 2010 and Rauschnabel and Ro, 2016, (B) points out to the influence of the external environment, including people who are not experiencing the immersion by themselves, but are observing direct users, what Scholz et al. (2016) call by "bystanders". He said: "*usually those VR demos are done in a place where there's probably people, and one of them puts on the headset and others are kind of poking this one person. It's really hard to forget about your surroundings and immerse yourself*". Likewise, Mead (1934) argues that users' experience could be affected by those bystanders in the engaging AR experience, and by extension, in customer satisfaction from that experience. Therefore, (B) calls for targeting the opinion leaders in the company, those with "perfect" knowledge and/or experience in the technology, to diffuse adoption and drive acceptance of AR and VR in firms. He also stresses on the need to build purpose-specific cases (what he called "best use case") from the use of AR and VR, that would better fit for the needs of the industry and customers specifically. Similarly, in the extant literature, Swann (2001) discusses the need for VR and AR applications to be customer-specific because prospective customers relate best to VR applications that are close to their area of experience. Additionally, Scholz

et al. (2016) suggest that marketers ought to create a company-specific digital AR content that is fitting with customers' physical and social context, what (F) referred to as the "contextual value" from AR and VR. Finally, (E) and (G) emphasize demographic factors like age in hampering the adoption of AR/VR in businesses, whereby advanced age barriers from decision makers come in place to justify the strong reluctance or resistance to adopt these innovative technologies. Age is also brought about in Venkatesh et al. (2003, 2012) as moderating the impact of technology adoption factors on driving the usage of the latter. Reluctance is justified with the fact that younger individuals tend to value extrinsic rewards when deciding upon the usage or adoption of an innovation, and that older individuals face more difficulties in processing complex stimuli relevant to new technologies like AR/VR (Venkatesh et al., 2003).

5.2.4 Market maturity

The third barrier to adoption commonly shared by interviewees and the Boston Consulting Group (2018) report from literature is related to market maturity level for both VR and AR technologies that seem to drive other resistance behaviours. (C) states that VR AR are still in the economic infancy phase, while (D) defines a barrier to the adoption being market immaturity, and (B) adds that these technologies are still "new". (A), (C), (D) and (F) all mention the big technology hype happening between 2014 to 2017 where VR technologies have known a big explosion in the market, such as 360videos for Nissan, Visa, Star wars and fashion brands (F), and other VR hardware becoming available like Oculus (D) and attracting vehement investments (A). However, the hype happened so fast that people did not actually get to digest or understand the real value of VR, creating confusion in the minds of customers (D), and then investments started plummeting again (A). The decline in interest can be justified by what (C) calls a lack of trust from customers as people's expectations of what these technologies can deliver were not reflecting the reality of what AR and VR was actually able to deliver at that time. This same problem is what (H) called an anticipation barrier, one that reflects *"something is happening not as fast as anticipated"*.

5.2.5 User experience (UX)

With higher expectations than reality, coupled with a lack of knowledge and misunderstandings, a mistrust in the usefulness of AR/VR was installed from customers' side, also affecting (although at a lower extent), the adoption of immersive reality technologies for marketing and sales in B2B (C). In turn, market immaturity affects the user experience with the technology (D), and a lack of the latter consequently impacts technology adoption (interviewee A). In this sense, both (D) and (A) emphasize Gartner (2017); Lorentschk (2018) and Poushneh and Vasquez (2017), the viewpoint of User Experience quality (UX) as an essential technology adoption factor for customers. However, while Poushneh et al., 2017 speaks of the hedonic, aesthetic and pragmatic quality, and Lorentshck (2018) addresses hedonic and pragmatic user experience quality, (A) & (D) were more focused on the usability knowledge of the technology, which is closely related to the pragmatic quality of UX. As Butler (1996) states, Pragmatic quality stands for usability and speaks of the "*effectiveness, efficiency and satisfaction of the UX*" (Butler, 1996). (A), (B) and (G) briefly mentioned the look and feel aspect of AR/VR technologies and how they are a "cool" way to gain interest and bring people to the stand in a tradeshow (B) and entertainment to the user (A). These technologies are, in fact, so "exciting" that once people see them, they are bound to explore them even deeper, as (G) said. However, although acknowledging the WOW effect and emotional reactions (Hassenzahl et al., 2006; Norman, 2004), from AR/VR as discussed in the literature, interviewees agreed that these aesthetics and hedonic aspects are only simulating users' interest to explore the technology, and not necessarily related to the actual adoption or acceptance of using AR/VR in companies. This confirms that hedonic value from AR and VR is less relevant purchase factor in the B2B sector, which is in line with Zabel & Heisenberg (2017) B2B survey showing that only 47% of corporate customers are interested by the "high-end look and feel" of the technology as primary drivers of adopting VR, compared with 94% for usability and easy navigation of the technology.

5.3 VR/AR impact and applications in B2B marketing

5.3.1 VR/AR market

The acceptance of a new technology is challenging; it required a lot to adopt it (Davis, 1989; Davis et al., 1992). Enhancing the performance of doing the task is the main useful point from using and adopting any technology. (A), (B), (C), (D) (E), (F), (G), (H), (I), (J) and (K) agreed that VR/AR market is still small and is facing a challenging adoption, but the market is growing. (A) said that he is expecting that the VR/AR use in marketing and sales will be grown by 80 or 90% in the few next years in B2B.

> *"B2B VR/AR market its interesting as there are lots of opportunities, but quite challenging because VR/AR B2B is still new. However, it is growing". (C)*

> *"I would say that VR is still a bit too complicated technology for people to use". (A)*

> *"Slowly taking up industry requiring a lot of tools and content creation". (F)*

> *"It is an emerging market, VR was still a confusing term, people misunderstood it". (D)*

Refereeing to the prior literature, the value in use is playing a crucial role in adopting VR/AR in marketing and sales in B2B. Kummar et al. (2013), argued that if the customers do not have the right understanding for the value in use of the new technology, they are not willing to pay for it and use it. Therefore, when (G) was asked about the VR/AR current market situation, he said: *"VR agencies showing people sophisticated things".* Hence, the situation explained itself regarding the currently small market of using VR/AR in marketing and sales activities.

> *"The majority of the companies are not interested yet in these technologies until we prove its usefulness". (K)*

In the prior literature, the triability, an attribute has been mentioned as a critical factor for emerging any new technology. Hence, the customer can try and see the value or benefits that VR/AR technologies are offering such as the immersion and interactivity. (A), (H) and (K) emphasized that the VR/AR industry is growing when the early

adopters and the pioneers are touching the benefits uses for VR/AR in marketing and sales in B2B.

> *"I remember this one, the IT manager of that company; he did not like the idea of VR at all. But at that same meeting, when he tried the VR headset for the first time in his life, he was so, you know, uh, blown away, that they purchased from us in the, in the next email he sent". (A)*

> *"At present, marketing and sakes via VR/AR seems to be very promising". (D)*

Also, (F) said that *"Showing signs of life and real commercial opportunities, future is probably taking over for B2B".* Accordingly, VR/AR for marketing and sales in the B2B market is overgrowing.

On the other hand, (C) argued that the current VR/AR market situation is quite small because of the high cost of the Finnish expert. He said that *"The developing costs are surprising; customers assume cost is cheaper than what is real". Hence, showing the utilitarian value of VR/AR or any other technology could demonstrate and explain the high cost for the customers* (BCG, 2018; Boyd & Koles, 2018).

> *"Because of the current situation of Covid-19, there are many requests for VR/AR solutions in marketing, sales and training". (C)*

5.3.2 VR/AR impact on B2B marketing

Memorable Experience. (C) argues that using VR/AR in marketing is effective for keeping the campaign in the user's memory. In prior literature, the story messages in marketing are sought to be more effective than the traditional one by twenty-two times because of the interactivity built with the receiver (Harvard psychologist Bruner, 1986). McCarthy (2017) argued that the receiver is more willing to remember the marketing message when it has a higher visualization. Similarly, (D) said: "Immersive experience help to remember, memorize and sticks in your head". Hence, the immersion, which is the main attribute VR, is allowing customers and

users to remember the whole experience, differentiating from the traditional methods and ways of delivering marketing messages.

> *"I think that is really, really effective, especially in marketing, because you want to make your customer remember your brand and maybe have some memory. Also, in augmented reality, especially in e-commerce, there are already data showing that it increases customer engagement". (A)*

(A), (B), and (E) believe that the "WoW factor" is crucial in making the VR/AR a memorable experience. The customer can remember the whole experience and enjoy the new technology in presenting and visualizing the product in a joyful, memorable way. Moreover, the Wow factor experience is creating the "hedonic quality" Poushneh and Vasquez, (2017) which consists of emotional reactions derived from the VR/AR experience (Cuomo et al., 2014 & Kim et al., 2008). Thus, the playfulness is enhanced by promoting the product to the customers in such a memorable and interactive manner (Jin & Yazdanifard, 2015). Building on the latter, the brand recall is enhanced with the use of immersive reality technologies.

> *"So, you can sit and have a PowerPoint presentation. It is a little bit of a stiff business meeting, but the ones who try out the virtual reality and you have this little WoW factor, the atmosphere gets much more playful, and you have much more fun. You have already like common experience together that you can talk about and so on. So that, I mean, to sort of bond with your customers is also a huge positive impact". (E)*

Enhanced Learning. According to Bujak et al. (2013), VR/AR is affecting learning positively. (D), also said: "The closer you get to the experience; the faster customers learn and understand; B2B marketing is about understanding". Also, other interviewees agreed that VR/AR could be used as an educational tool for the customers to demonstrate the product features. Referring to the existing literature, VR/AR technologies reduce an individual's cognitive loads as they simulate attention, which leads to focused information processing. In a similar line of thought, McCarthy (2017) argues that customers are more eager to engage and learn with an immersive and interactive virtual environment.

> *"There are a lot of different companies that are using this technology to do marketing. And it could be a good way to describe a product or a service. It is*

engaging; it's educational. So, I think that is the main reasons for using VR/AR". (E)

Experiential Marketing. Both (I) and (J) emphasized the effectiveness of using VR in marketing . Accordingly, (J) said that “In marketing, one of the greatest benefits is being able to see objects in real size and right scope makes a huge difference in understanding”. Thus, seeing the real product before even it is concretely produced is an enormous advantage from using VR in B2B marketing. Furthermore, (I) said that the immersivity is the best-adding value for B2B marketing, and it applies the "Try before you buy" concept.

"It is all about the experience, being interactive and immersed with the content regardless whether it is a B2C or B2B it is more effective from a marketing perspective". (H)

“If you want to really like have a high detailed, finalized product without actually bringing the product into the event, you can still do that with VR and because in VR you are inside the experience, and you are part of the marketing experience”. (C)

(A), (B), (C), (D) (E), (F), (G), (H), (I), (J) and (K) argued that the immersive experience and visual content are more efficient when used in marketing activities. Additionally, (F) and (G) ensured that the immersion experience allows companies to take the customers' attention to a higher level than the traditional marketing ways. Likewise, Hudson et al. (2019) argued that a high level of immersion leads to a high level of customer response in B2B marketing. Furthermore, (K) said that VR gives more interesting marketing experience for the customers. In fact, the customer goes from listening to a boring sales pitches or a flat marketing content to be an active part of the marketing experience and content (A, C & H).

"It is no longer just listening to someone's sales page or reading something in a like poster, but you are active. You are an active member or active part of the marketing campaign or the black visuals". (C)

On the other hand, (G) argued that VR is facilitating marketing for both the company and the customer. He said, *"When you are marketing to companies, it needs to be something so easy for them to digest and the VR could do that",* reflecting the ease of use of immersive technologies (VR in particular) and their in

simplifying complex product presentations. Nevertheless, he argues that AR could not be used for marketing in B2B because it depends on tablets and smartphones, which he considers brings no new additional value for businesses. On the contrary, researchers like Poushneh and Vasquez (2017) see the potential of augmented reality technologies for B2B businesses by emphasizing its role to accelerate and smoothen B2B complex decision-making process. The impact on B2B marketing is, in this sense, not solely contingent upon enhancement of presentation skills but goes beyond that to the whole decision making process related to B2B marketing activities.

Non-Verbal Communication Tool. (I) and (J) emphasized that “Seeing is believing”; which is in line with prior literature when Harry Houdini illustrated the main purpose of using VR saying that ‘‘What the eyes see, and the ears hear, the mind believes" (Berg & Vance, 2017). Hence, VR could be described as a powerful non-verbal communication tool that allows for visualizing the message in an interactive way (A, B, C, D, G & H). Refering to the existing literature, marketing communication is more effective when the visualization and richness of imaginary are high (Cheng et al., 2014).

> *“Seeing is believing, this is how we are working in the last four years”. (J)*

> *"3D and interactivity are important; it differentiates the message from linear ways of communication like videos, which makes the user interaction more effective and a stronger impact on the receiver". (H)*

Customization. (A), (B), (F), and (J) believe that VR is providing a customized marketing content which increases customer commitment and response. In a similar line of thought, Bonetti et al. (2017) argued that through immersion and interactivity means, simulated technologies enable customized marketing content which guarantees customer satisfaction and customer loyalty (F). Furthermore, (G) emphasized the crucial role of the contextual value and content customization for the customers. He believes the VR real impact in marketing is to customize the environment that could suit the customer's specific purposes and requirements.

> *"You cannot have mass marketing done with VR right now".(B)*

"With the virtual technology, not only can you show them, but you can change it so that it actually accommodates what they are hoping to achieve. So, you can actually put them in the picture or put them in an environment that has a contextual value to them specifically". (G)

5.3.3 VR/AR throughout the purchasing journey

Pre-Purchase. (A), (B), (C) and (K) agreed that the most affected phase by immersive reality technology is the pre-purchase. They all emphasized the efficiency of saving costs by using VR/AR in the pre-purchase phase. Moreover, the interviewees believe that VR/AR is heavily impacting the product's customization in the pre-purchase when the customer can immerse himself and see the whole features and dimensions of the product to the finest detail. This goes alongside what Boyd and Koles (2018) emphasized that using VR/AR in the pre-purchase is beneficial for companies and customers as it saves a significant amount of resources. Hence, the error will be decreased, which in turn means high customer satisfaction in the delivery phase.

"In VR and AR, we can show something not existing yet; it's cheaper to do digitally than actually". (K)

"Usually they benefit most in the pre-purchase phase. And for example, I gave you an example of the construction industry. There is actually one company that I know that is doing like, I do not know what the good grade term is, but they are in the construction industry, and they have actually created the entire buying journey, customer journey that is supported by VR. They are using mobile VR, so it is not as good looking, but it gets the job done. It does not have to be like the highest detail for their purpose. But basically, what they do is first they show, the construction plans or the building plans, blueprints basically on a flat-screen. And then they give you VR glasses and then you can see how it actually works. How big is the living room, how is the bedroom? And then after that, you can start discussing like, okay, I want this colour like shelves. I want the floor to be this material. Then you do the changes, and then you can see in VR how that looks, and all those uh, solutions can be then purchased". (C)

Post-Purchase. (E) believes that the post-purchase phase is the most beneficial one from using VR/AR in the customer's journey. He said that virtual technologies are supporting the customer for the maintenance and any other related issue it might

happen after the sales. Thus, companies can use VR/AR as a marketing differentiation strategy to set them apart from competition. Furthermore, the customers will understand the utilitarian and functional value of the virtual technologies in the post-purchase phase, particularly after experiencing it (Cuomo et al., 2014 & Devis,1989). Hence, customers will start promoting the value of using VR/AR through a positive word of mouth (Jin & Yazdanifard, 2015).

> *"The most beneficial would probably be the post-purchase, or post-sales because there are so many opportunities you can do there that have not been yet explored (…) A lot of revenue streams come from maintenance and support. But this area has not been explored so much".(E)*

Pre-Purchase & Post-Purchase. (D) and (F) argued that pre-purchase and post-purchase are both beneficial phases equally. They emphasized the integrity and combining VR/AR in the two phases is impacting customer satisfaction and customer incentivization. (F), said that "Brand loyalty is the ultimate purpose of using AR features into Apps in the post-purchase phase. In the pre-purchase phase, AR and VR capabilities are to incentivize people to buy the product". Therefore, the early adopters of using VR/AR technology in B2B marketing are differentiated than their competitors by increasing customer loyalty and customer satisfaction.

> *"It is more about the experience, how the experience is created. Like the heavier experiences you want to create, you can create to your customers, and hopefully, the more they believe in your products and services. So, it definitely goes through the whole life cycle of the product so that you basically can already start marketing with VR and AR-based solutions and then you can help your sales. And then even after sales, you can also, do like training and, you might be able to even, create some maintenance tools that are using AR". (D)*

Pre-Purchase, Purchase & Post-Purchase. While there are people who believe that VR/AR impacting the pre-purchase only, post-purchase only or both, there are also people who believe that VR/AR is impacting the three phases together. (H), (I), (J) and (G) argued that pre-purchase, purchase and post-purchase are impacted equally by using VR/AR in marketing activities.

"Well, I think that it could. I think it affects all three. I think all of them pre-purchase purchase post-purchase. In the pre-purchase, the immersive experience makes a superior impact; make a mark of contextual value. In the purchase, it enhances the safety of trying the product and no more not fun user manuals. Finally, in the post-purchase, it supports and enhances the maintenance activities". (G)

(H), (I) and (J) emphasized that the three phases are impacted especially in the heavy complex products. They said the VR/AR could impact the pre-purchase in planning and building a new manufacturing powerplant which could be done remotely without presenting physically to the customer. When it comes to the purchase, they said it goes perfectly with the product customization and delivery. Besides, the post-purchase is, particularly for support and maintenance, especially predictive maintenance. Given that, companies can create their integrated eco-system that can ensure customer satisfaction and loyalty without being physically existing at the same place. Moreover, companies and customers can save time, money and resources by using VR/AR in their marketing activities which ensure efficiency and effectiveness.

"A very easy answer, it impacts all phases". (J)

5.3.4 VR/AR applications in marketing

(A), (B), (C), (D) (E), (F), (G), (H), (I), (J) and (K) agree that heavy machinery companies (Automotive, Aviation, Construction, Forest, Factory planning, Mining) are the most beneficial businesses form using VR/AR in their marketing activities in B2B. They said that there is much higher efficiency using VR/AR in marketing when the product is heavier and complex to present its features in 2D or in the traditional way. The interviewees agreed that the cost is extremely high in such heavy, complex equipment products. Therefore, any potential error can cost both the company and the customer a lot of resources. Some interviewees mentioned about real example like PONSEE, the Swedish railway, Sandvik, Volvo, Nissan, Boeing, Rolls Royce, Baker Hughes, ABB, and General Electric.

“Any industry which suffers the typical challenges of logistics, safety, and sophistication will benefit more. because they have more barriers of selling the solution to their clients”. (G)

"All complex product industries will benefit, especially anything larger than fit in your suitcase". (J)

"Anything that relies on like large-scale manufacturing like machinery, aeroplanes, car industry, basically things that are uh, they are very expensive to prototype, expensive to test. Those are the facts that AR and VR, especially VR can help you to cut down costs in the development and testing phase". (C)

"Hospital, hospitals are great examples; they are really expensive to build. But the biggest cost comes from the operating expenses, which are usually that if you build something for 100 million euros, you each year will pay 100 million euros for operating costs. So if you design a space that, saves the operating costs by 5%, you know, it is really, even with that small advantage, it pays to use virtual reality in the early phase and get the doctors and the, and the nurses to go through the designed rooms, and say what they think about them". (A)

“So, rather than to bring a huge truck, or a forklift to the customer, you can bring an iPad or VR glasses to the customer, placing the virtual product, the virtual forklift, and then walk through all the unique selling points to get over the customer”. (E)

Furthermore, (D), (I) and (J) said that VR/AR could be used in the sales exhibitions and tradeshows as long they can provide a high level of photorealism.

"VR world for Nokia tradeshow created a virtual space of the lab in 3D. Visitors at Nokia tradeshow were able to visit the Oulu lab from the tradeshow event in Barcelona". (D)

Some interviewees said that health care is also benefiting from using VR/AR in marketing activities. (A), (E), and (F), argued that VR/AR is impacting marketing in the health care industry, while (E), adds that there is a health company using AR to showcase its innovative products feature and benefits.

"We did experience, an AR application with a company called Alpha Laval. Yeah, they do separators and a heat transmitter or whatever it is called. But in this case, it is a separator. So, it is a totally new product for the medical markets where this machine has any unique features that have not been on the market yet. And that feature is you can change the filter because this rotation speed and all the parts in the machine are sorts of quite hard to replace or have a

disposable product. So, the unique selling point of this product is that it is a disposable filter. And to demonstrate this, we built an AR application where you can place the machine into it in AR". (E)

(E) and (F) said that training is one of the successful applications in B2B marketing that VR/AR has delivered. Both interviewees agreed that training and the educational tutorial using VR/AR is affecting the buying decision of the customer.

"Training is benefitting in B2B, especially true for dangerous machinery and complex products". (F)

5.4 VR/AR impact on sales performance outcomes

In line with Hunter (2019) viewpoint, all respondents covered efficiency and/or effectiveness benefits from using VR and AR technologies throughout the sales pipeline. Although efficiency was mentioned in 90% of the interviewee's responses, it was often mentioned as a secondary effect while effectiveness was rather the most recurring response reflecting the primary outcome from using VR and AR technologies in B2B sales. This section will analyze and discuss efficiency and effectiveness returns of using VR/AR as sales tools between theory and practice.

5.4.1 Efficiency

In the efficiency spectrum, respondents consider first cost reductions, with particular emphasis on logistics and travel expenses, initial product development costs, environmental footprint, and/ or training costs as entailed in the quotes below. Another less common response mentioned an improved task performance from improved safety (F), (G) and (J), reduced errors (I), (J) & (K), and faster product delivery (I & J).

"I've talked with sales directors about when they decide to use these technologies, and after creating an experience to differentiate themselves, costs come second...including (cargo) how much it would cost them to take equipment on-site and how much they would par for the exhibition stand and so on, and third, you have the environment...especially if you're compensating CO2... So,

then you start to think that, okay, if we would use XR in this case, then we will say more money". (A)

"Taking the example of Nokia's 5G antennas, if you want to build an antenna in Oulu and take it to, for example, to customers in the Middle East, it will take at least two months to get the antenna in there in time. And then it would take some weeks to actually set up basically the antennas and the network to show to the client…the associated costs might get to 4 million euros to take the hardware over there, take your engineers to set it up and show it. And the customer might, for example, look at it for only 45 minutes and say, okay, then you have to take them back to Oulu. But if you would create these antennas in virtual reality, you would need one handbag that would have one set of goggles and, and a laptop and you'd be able to show the same thing". (D)

"I think it's difficult to estimate the cost-saving. The cost savings are there, and the more complex you go with the product, the more you're able to save". (J)

Logistics & Transportation Costs. A first B2B sales associated cost and one that most commonly takes a significant portion of the sales budget are logistics expenses. While (A), (C), (D), (G) and (K) all agree about the logistics cost removal barriers enabled through VR and AR innovations in sales, these costs include travelling and transportation of sales and engineering teams to the trade shows or customers premises (D & G), hotel and dining expenses associated with travel (G & K), or more commonly transportation of cargo and shipping costs of equipment to the destination (A, C, D & G).

Relating to the extant literature, McCarthy (2017); Porter et al. (2017); Trubow (2011) and Ventana Research (2019) are in line with the logistics, shipping and travel reduction enabled with the use of AR and VR as sales tools. And similarly, with Porter et al. (2017), (G) and (K) agree that reduction of logistics barriers can be justified by removal of the need for physical interfaces that are replaced by virtual or digital environments. He said that "*no physical prototype is needed, and anything can be modified into digital reality…there is no need to bring or transport the device or equipment physically where you can instead show it digitally*". Monetizing the gains from logistics costs, (D) provides an example of shipping 5G antennas from Oulu to the Middle East and explains how 3D modelling in virtual reality can save a company about 4million euros in traditional shipping and sales travel costs, only for a customer to see the product for a 45min before it gets shipped

back to the country of origin. Instead, all is needed is VR wearables and a device. Likewise, (G) illustrates logistics cost from an approximation of yacht shipping to trade shows abroad, that can amount to hundreds of thousands of pounds in savings. He adds that using VR to support the sales process can erase 90% of the logistics and travel overhead expenses for a company. In line with this viewpoint, Porter et al. (2017) discuss the case of a building systems provider (Lee company) that was able to save on labour and travel costs of their technicians a monthly $500 by introducing AR technologies in their sales support and maintenance system. However, as mentioned by (E) and (J), cost savings are still hard to measure in concrete value terms as cases are different and each project has its own specificities, which is in line with the economic and financial measurement barrier advanced by Kemm (2017) as one challenge hindering AR and VR adoption in business.

> *"But like if you are able to take down costs travelling around the world to take a look through something, I mean it very quickly, you can save up to tens of thousands of euros". (D)*

> *"I sold some virtual reality to a yacht maker, and I don't know if you've ever been to the art show or yacht, but the boats that they bring that cost them hundreds of thousands of pounds to be at the show and to bring these boats from halfway around the world to show off. Now, you bring all your boats in a VR headset". (G)*

> *"Obviously if I'm selling something like the boat or power plant or something like that, you have massive logistical issues. You have a flight, you have a hotel, you're meeting for small talk, and things like that. You can eliminate 90% of all of that overhead by having VR..it needs to represent the salesperson". (G)*

Initial Product Development Costs.

> *"It brings some like 3D modelling costs into the table. But that is, again, much cheaper to do than physically manufacturing different versions of the same prototype. So that is the biggest asset fund. It's logistically cheaper". (C)*

> *"The initial investment can be quite big. But after that, you can use the same solution, like over and over again without ever needing to rely on physical manufacturing before the sales process has been completed". (C)*

Another recurring cost saving from the use of immersive reality technologies in sales is related to initial product development costs. In this sense, although the initial investment in the latter technologies might seem large at start, (C) and (K) speak of subsequent savings in design and prototyping costs, especially as 3D modelling is a cheaper alternative to the physical mockups. To better illustrate the financial gains, (A) estimates about 5% saving in operating costs that might result thanks to VR design rooms for hospitals. Other justifications for production and design savings can be evidenced from the scaling capabilities (C) of these technologies and the try before you buy concept facilitated with AR and VR innovations (B, F, I, J & K).

> *"The biggest cost for B2B comes from the operating expenses, which are usually that if you build something for 100 million euros, you each year paid 100 million euros for operating costs. So, if you design a space that saves the operating costs by 5%, even with that small advantage, it really pays to use virtual reality in the early phase and get the doctors and the, and the nurses to go through the designed rooms". (A)*

Respondents bring about illustrations of initial production and prototyping costs from 3D modelling in VR for the interior and construction companies allowing to showcase building views and sell houses before they are physically built through computer-rendered showrooms (B & C). Other examples include factory and powerplant design (G), automotive manufacturing (I), or design for real estate (F). Using immersive reality technologies is able to simplify the way complex products are presented, and a product (or service) value is communicated to customers (D), what (G) coins as removal of sophistication barriers. In this sense, using VR is sought to bring efficiencies and cost reductions in design, prototyping and production phases. And this can be justified by the detailed interactive and three-dimensional visualization capabilities (C, F & I), coupled with high customization features that limit the amount of false purchases and other buying related mistakes, as discussed by (I) and agreed upon by (J).

> *"The amount of false purchase will cease to exist or at least are minimized because people will be able to see and visit their future product before buying it". (I)*

Relating to extant research, Porter et al. (2017) argues on how AR technologies significantly reduce design-related costs, while Mussomeli et al. (2018); Trubow (2011) and mention that immersive reality technologies allow not only to reduce the time of product development but also limit prototyping costs. Mussomeli et al. (2018) estimate digital twins can save up to 30% in prototyping costs and reduce lead time by half during product (or service) design. In turn, the latter cost reductions can be justified by AR and VR's enablement of active testing from early development stages (Mussomeli et al., 2018) that allow companies to co-design alongside customers by addressing their feedback in a stage where it is easier to fix issues instead of waiting until physical production has taken place. Inherent in these testing activities are what Mussomeli et al. (2018) call simulating "what-if" scenarios that include interactions at different levels, either with the product or system itself, hence reflecting Scholz et al. (2016) user-brand engagement or an assessment of customer experience mirroring the immersive experiential value discussed in the consumer (user) experience of Scholz et al. (2016).

> "*With active testing during delivery progress, companies can easily address feedback, so development time was faster than expected because problems were addressed in a stage where its easier to fix rather than wait for physical production". (C)*

> *"These technologies help unify the best scenario for a product". (E)*

Discussing the cost reduction impact of VR and AR technologies on the sales process, all respondents agree on the fact that different industries are affected in different levels, but the sectors that are most benefiting from production development expenses are mainly industrial (H) with a complex ecosystem (B), or companies producing and selling heavy machinery (A, E & K), dangerous machinery (B & F), or large physical products (A) that don't fit into a suitcase (A & J). Examples include forest machinery, construction companies, mining, and real estate. This is simply because such industries usually have high operating costs from early development stage (A) and suffer typical challenges of logistics, safety, and sophistication barriers (G) that require high levels of customization (J) preventing companies and salespeople from easily selling their solution to clients (G).

"To prototype and test, VR helps cutting down costs in the development phase... and the larger the product is, the bigger is the benefit". (C)

"The more complex you go with the product, the more you are able to save." (J)

Environmental Costs. Another subsequent cost reduction enabled by AR and VR used in sales is related to the sustainability costs, or more specifically addressing environmental impact from traditional travelling and cargo shipping emissions. At this level, (A), (C), and (G) argue that using virtual instead of physical travelling results in lower carbon dioxide (CO2) emissions. (C) adds another justification for a more environmentally friendly behaviour linked to the substitution of the polluting physical production, particularly during the initial design stage. In this sense, using VR and AR in the sales pipeline not only limits gas emissions but also polluting production substances. Such cost optimization is an added value to existing literature that, away from adopting a sustainability perspective, has been mainly oriented in financial and economic gains.

"And of course, 3D modelling is running on electricity. So, there is no other like effects to nature like there are there and not as much like CO2 emissions. So, it's also good for the environment for not needing to rely on physical production in the design phase". (C)

"the effectiveness in sales and the enablement of remote engagement. Not only is that beneficial in terms of gaining someone's time and far easier, but you're not flying around the world burning up the carbon". (G)

Task Performance. A less common response exhibiting sales efficiency outcomes enabled with the introduction and use of VR/AR technologies is related to the improvement of tasks performance capabilities. In this sense, (F), (G) and (J) all speak of AR's potential to increase sales efficiency through the enablement and enhancing of customers' safety. Simply put, one of the biggest challenges of selling

in B2B is related to selling heavy, dangerous machinery as advanced by (F) and (B).

Traditionally, customers and stakeholders' safety was jeopardized, but with the introduction of VR training, customers can be immersed in a completely safe digital environment simulating to the finest detail the product functionalities, allowing them to test, manipulate and even optimize the development of a dangerous product, what (G) refers to as accommodating the environment in customer's contextual value, with a VR headset only. This, in turn, facilitates selling for large complex industrial products that were traditionally hindered by safety and sophistication barriers (G).

> *"So, say like a building gets flooded or a building has burned down. How do you properly clean that up? The only way to train people to do that 20 years ago is to actually burn down a building or flood a building and then teach them how to clean it up, or do an apprenticeship program that people can go train on the job. But today, with virtual reality, you can do those kinds of things and significantly reduce costs for training, and you can train a lot more people in less time". (F)*

> *"If you go to the extreme of a nuclear power plant, well you can't show somebody a nuclear power plant. You can't show them these things for a number of reasons, primarily security and safety, among others. But with the virtual technology, not only can you show them, but you can change it so that it actually accommodates what they're hoping to achieve. So, you can actually put them in the picture or put them in an environment that has a contextual value to them specifically". (G)*

With the digital twinning technologies like Llamazoo case in mining (Llamazoo, nd), or a virtual walkthrough of a nuclear power plant advanced by (G), salespersons and customers can both virtually walk through a dangerous remote site or a factory and discuss the project's progress in a completely safe environment. Therefore, using AR and VR to support the sales process provides a safe selling environment for both the salesperson and the customer, making it easier to sell dangerous products than before. And besides the monetary gains from safe VR training (F), stakeholders can be trained more efficiently, that is, the company can train more employees like in simulating a fire or an explosion (F), a powerplant control room, a practice room or a flight simulation training (I); or customers on a product's use, functionalities and safety hazards (A) faster. Hence, immersive

reality technologies as a sales support tool provide an opportunity for companies to do things better by optimizing their resources in terms of time, money and people. In this sense, efficiencies are gained by leveraging immersive realities in increasing safe practices (F) for any interaction needed with the product or a system during the sales process, including a safe product presentation, a safe training and a safe sales support. As (K) said, success in B2B sales is not only about money, it's about more than that: ensuring people's safety.

> *"There are cases where it's not about money; it's about the safety of people training. I mean you can simulate an explosion, and you don't die, but you still know that I made these mistakes that led to this situation. So, if you are in a similar situation in real life, you will not make those mistakes because you've already gone through. So, it's not only about money". (J)*

Enabling sales efficiency with improved safety in task performance is a new perspective from which the industry tackles the sales outcomes of VR and AR use in B2B sales. Now with efficient and safe training, coupled with the lower training costs, Porter et al. (2017) state that immersive reality technologies like AR leads to reduced error rates while performing a task. In line with this viewpoint, (K) claims that virtual reality technologies enable customers and companies to check errors beforehand during initial pre-conception phases, while (I) and (J) add that AR technologies allow delivering exactly the right product faster with minimal buying errors. In this sense, AR and VR technologies enable efficiencies in task performance through a reduction in errors from both the customer (purchasing side) and salesperson or company (in product design). With the high customization and visualization capabilities enabled through AR and VR technologies, customers feel more committed and engaged in the development of the product or service, which explains why errors are dramatically plummeting (J). Existing literature, on the other hand, solely focused on errors made at the company level, especially for after-sales support like maintenance. An illustration is the case of Boeing, evidenced by Porter et al. (2017) and discussing AR's potential to enhance employee productivity at work. In that example, employees could complete work in 35% less time, and over 90% of inexperienced or low experience workers were able to complete the task successfully from the first time.

"...Delivering exactly the right product faster and minimizing errors". (J)

"The amount of wrong or false purchases will cease to exist, or there are minimized because people already have seen what they are getting a very small watch or an aeroplane or something. So, they have already visited their future product and uh, there will hopefully be no surprises". (I)

"...Minimizing the errors and therefore getting efficiency and shorter life cycle of the product development". (J)

5.4.2 Effectiveness

At the other side of the spectrum, effectiveness outcomes of immersive innovations as sales tools are steering discussions around an enhanced collaboration between different company stakeholders as the sales go forward and a subsequent strong engagement (A, B, C, D, E, F & H). Engagement, in turn, was reflecting Scholz et al. (2016) consumer experiential engagement, and the sociability of user-user engagement. Finally, using AR/VR as sales tools also drives effectiveness returns through the enhancement of smarter working behaviours, including effective sales planning and adaptive selling attitudes as defined by Hunter (2019).

Collaboration. In line with Hunter (2019) perspective about sales tools enablement of forging solid business relationships, and with Bekele and Champion (2019) discussion of AR/VR collaboration, all respondents agree about the strong stakeholder and customer collaboration resulting from the use of AR and VR in a B2B sales environment. In their debate about the latter, (B), (C), (E) and (F) argues that the current health crisis (Covid-19) is shifting current business models as the world is moving towards more digital meeting and remote work, and virtual sales. Consequently, new remote collaboration environments are not only deemed useful and needed (B) but are more likely to be the most permanent (F). The current global crisis is hence opening up opportunities for VR and AR to improve sales virtually, as mentioned by (F). (E) adds that due to the Covid-19 crisis, a lot of virtual meetings are held, and customers are asking for multiplayer VR experiences where they can collaborate and engage using virtual avatars for sales presentations, and

product demonstrations. And in that matter, (B) adds that using virtual reality and augmented reality allows companies and customers to collaborate from home using a more hygienic alternative, that is, their own headset wearables or mobile devices.

In discussing the collaboration outcome from using VR and AR in sales, (C) and (F) brought about examples of existing remote collaboration solutions in the market. Although still expensive to use (F), the photo-realistic scale features and accurate eye-tracking resolution quality are important details for a near-real collaboration, especially in B2B complex industrial tasks. For AR and VR providers, such features justify the costs of a quality industrial headset like Varjo's best in class mixed reality wearable (J).

Overall, all respondents seem to acknowledge the collaboration outcome from using these technologies in B2B sales, although at varying degrees. (C), for instance, strongly argues that "*VR can greatly enhance internal and external communications with already existing collaboration solutions*". (H) speaks of an improved dialogue throughout the sales process thanks to AR and VR tools. An enhanced communication, in turn, stems from these technologies' ability to enhance stakeholders' understanding (H), and effective visualization capabilities (D). In this sense, immersive reality technologies used in sales enhance stakeholder collaboration through improved communication, in turn, enabled by efficient understanding and effective visualization.

(E) explains the resulting collaboration as a byproduct of having a shared or mutual experience with the technology itself. This same VR experience creates a common point between the salesperson and customer, and a reason to bond in a new relaxed and pleasant sales meeting atmosphere. Acknowledging the Wow factor effect as advanced by Hassenzahl et al. (2006), Norman (2004) and Jin and Yazdanifard (2015), (E) adds that AR and VR technologies help both sides of a sales meeting to be inspired in generating new ideas. In this sense, immersive reality technologies enhance customer collaborations by allowing for brainstorming opportunities to happen. This perspective explains collaboration from both an experiential viewpoint while also acknowledging for the sociability (or social engagement) aspect of immersive reality technologies, as discussed by Scholz et al. (2016). (C),

on the other hand, justifies collaboration as a result of VR bringing a sense of physical presence that enforces physical relations.

> *"Once again, you have an experience together that you can talk about always, or at least in most of the cases. It also, it's an inspirational platform to generate new ideas. Like, Oh, we can do this and that as well and maybe we can do this and that. So yes, on a personal level that will enhance the collaboration". (E)*

> *It's a little bit of a stiff business meeting, but the ones who try out the virtual reality than have this little Wow factor... the atmosphere gets much more playful, and you have much more fun. You have already common experience together that you can talk about and so on. So that sort of bond with your customers is also a huge positive impact". (E)*

(J), goes a step further in explaining how collaboration is enhanced with immersive reality technologies. Accordingly, the latter technologies, when used in a B2B sales context, enable collaboration by removing the conflicts of interests and other interaction barriers, or what he calls "friction" between different parties involved in the process, including sales, R&D, and customers. In a traditional sales context, teams from different department uphold different views of what is beneficial to the company, depending on specific goals to be achieved in the department. And product managers are usually stuck in the midst of both parties, trying to find ways to compromise. The same goal-oriented perspective goes in line with Lorentschk, (2018) view about the pragmatic quality of technology, whereby he explains a technology's usability (pragmatic quality) is in achieving goals and removing workflow and interaction barriers that he also calls as friction barriers. In this sense, with streamlined interaction processes and removed friction obstacles, immersive reality technologies successfully enhance teams collaboration.

> *"So, you have a design, you have R&D, you have sales, you have marketing, and everyone has their own view. But how do you read into the conclusion? With VR and XR, you're able to visualize everything. And that makes it possible that even people from different disciplines will understand what we are talking about. With the ability to test and check for alternatives together, you create unity and get rid of all the friction". (J)*

Another perspective for debating justifications of enhanced collaboration with VR and AR technologies in B2B sales, (C) argues that collaborating in design and production phases coupled with the advanced visualization capabilities, facilitates

knowledge sharing with stakeholders, while (G) mentions collaborating in training through VR to enable the transfer of skill, knowledge, and expertise between dispersed members of an organization. Additionally, (C) speaks of an enhanced decision making enabled through AR. In a similar line of thought, Hariharan et al., (2020); Porter et al. (2017); Regt et al. (2019), and Hariharan et al., (2020) discuss AR's potential to effectively transfer knowledge while also fostering informed decision making between and within teams and stakeholders.

Collaboration, in the context of VR and AR for sales, was clearly emphasized during the design phase of new product development (C, D, F, G & K) where both companies (particularly stakeholders involved in the sale process) collaborate with customers as co-designers. In this sense, customers are asked to create a traditional CAD model and upload it to the VR platform (B & K), converting traditional CAD into virtual reality (G). This is when customers can discuss alternative design scenarios with salespeople. VR allows things to be seen in actual (eye) scale inside the same three-dimensional world with customers and stakeholders, assisting in collaboration by enabling companies to address customer needs and acting upon the collected feedback in real-time.

> *"VR allows you to test designs with customers beforehand. Companies can involve customers in the sales and product development". (K)*

Collaboration is not only sought with customers but also internally within the organization's teams involved in the sales process. (C) states that VR and AR foster internal communication inside teams. He brings about the example of a collaboration platform called "Glue" where everyone can access either on a monitor or with VR glasses. The platform allows a remote collaboration between employees wherever their location is and enables them to showcase their 3D models that have been produced, and other prototypes without having to be physically present, thus streamlining internal communication in design and product development efforts.

> *"I definitely do think that VR and AR help internal communications a lot. There are already solutions, for example, like Glue… You can be in China, in the U.S. or in Finland. Everyone is working on their parts of the design and looking at the production of the product from different parts and giving feedback without*

having to physically travel. So internally in internal development, design or just communication, that is the biggest advantage there". (C)

Apart from collaboration in design and prototyping, Glue platform allows companies to conduct virtual sales presentations with their branded and customized virtual spaces such as the case for Air France and KLM teams (Saarikannas, 2020). The virtual space is reflecting users' voices, gestures and movements altogether and using avatars that can be designed to represent each of the team's participants for an as realistic live remote collaboration as possible. Collaboration tools enabled through the platform include an interactive whiteboard, sticky notes, virtual presentations, sharing video content and visualization of the 3D model inside the digital environment (Saarikannas, 2020). Likewise, (C) adds that companies can show products in virtual meetings without the need to travel. (A) also brings about example of virtual spaces for remote collaboration as Mozilla Hubs or the more traditional SpaceVR.

"One of the funniest experiences that I have had is I actually spent three hours inside virtual reality without even noticing because I was talking to other people in the event. And because I had my controllers in my hands, I could physically move my hands on as I use a lot of body language when I like to explain things…And there were others around the room…people from Helsinki, Sweden, Tampere…and the voices in that software were created in a way that if you were like two meters away from others, you couldn't hear what they were talking at, just like in normal physical conversations. But they could see my hands floating around. So, this is an interesting virtual reality collaboration online". (C)

In discussing the collaboration effects of VR and AR in a sales, (C) brought about another example of AR by Telia, a cloud-based application that allows anyone to access AR marketing collateral and AR sales content of any Telia customer brand. This is an example of how a company help their business customers sell more through an AR collaboration platform, which is closely linked to Jin and Yazdanifard (2015) perspective of AR enabling salespersons to reach a larger audience and acquire new customers.

"The idea is that under one app, the AR by Telia app, you can access whatever companies' AR content that is produced mostly for sales and marketing

campaigns. And the idea behind that is that with this application you can access multiple companies' AR, provided that they are clients of Telia". (C)

On the other side of the spectrum, (G) believes that VR and AR technologies have little to no impact on forging business relationships. Instead, such technologies, when used for sales and marketing purposes, can only help to establish respect from customers and stakeholders as using them alone stands for a differentiation approach, a forward-thinking spirit, and a pulse for innovations. So, from the more personal business relationship level, gaining customers' respect is the positive outcome of using VR in B2B sales.

"On the B2B Sales, I don't think using these technologies have an impact on a business relationship so much other than the fact that I suppose from a relationship perspective, you always want to think that your clients are the best, the most advanced, and the most knowledgeable. And when you start to use technologies like this, it shows that you have your finger on the pulse of new technologies, new solutions, new methods. It's a really unique, industrious, forward-thinking way to do that. So, from that perspective, I suppose it does have a bit of a byproduct on the business relationship from a respect standpoint". (G)

Engagement.

Customer Engagement.

"If we think about VR, that's an experience platform that can really affect how hard the user feels when they go through a two- or five-minutes experience. And so, there are many ways to change the users in your state. I think that's really, really effective because you want to make your customer remember your brand and maybe have some memory. There are already data showing that it increases customer engagement". (A)

"I think that VR is a totally new engagement opportunity for brands and consumers... If you can do something that's engaging, then you will get people to stick with it and engage more with it and learn from it as opposed to just being bombarded with messaging that nobody can interact with. So yes, I think it presents a good opportunity to create value because you can engage with it more". (F)

"The customer gets an experience that they have listened to. So that is like the biggest impact I would say". (D)

"From an inside perspective, the outcome I would say is engagement with the audience (user) rather than collaboration". (G)

"For B2B, if you have complex products, it's quite a likeable technology that creates a WOW effect that also affects customer engagement. If you have a complex product, it's easier to demonstrate the benefits in AR rather than to have it on a paper form. The higher customer engagement, the higher customer understanding, and the lower is the return (churn) rate". (E)

"We had an example of an IT manager who didn't like the idea of VR at all. But at that same meeting, when he tried the VR headset for the first time in his life, he was so blown away that he made the purchase from us in the next email he sent". (A)

Apart from the stakeholder collaboration resulting from the use of VR and AR tools to support sales, (A), (D), (E), (F), and (G) bring about customer engagement as another potential outcome. (G) points out to the need for differentiating collaboration from engagement, as the former applies from an external perspective, and the latter is relevant from an internal viewpoint. He states that user engagement is more relevant than collaboration and illustrates with an example of HSBC training through VR, elaborating on how using virtual reality in training a client allows him or her to be fully immersed and engaged in the experience, and easily digest the learning outcomes from that training without being distracted. Customer engagement is, in this case, mirroring the immersive experience resulting from the use of VR.

(F) takes a step further by arguing that VR technologies provide new ways to engage for both customers and brands. Engagement is, according to him, particularly relevant for the B2B sales context as customers usually have a very short attention span. Engagement reflects using immersive experiences to sell a product, which not only keeps the company in the mind of customers but catches buyers' full attention. Companies can, therefore, create value in sales by enhancing customer and brand engagement through immersive experiences. In a similar line of thought, (H) stresses the importance of three-dimensional interactivity in enabling a strong user

engagement that differentiates from the linear sales presentation and traditional communication tools such as videos. Such engagement has a stronger impact on the user or receiver. Relating to existing research, (F), (G) and (H) are all defining the customer engagement from Scholz et al. (2016) perspective of immersing users in interactive experiences.

(E), on the other hand, particularly emphasized the importance of creating a WOW effect through the use of VR and AR in B2B sales to make a good impression in the customers' minds and keep the experience memorable. According to him, it is this surprising (interesting) element felt in the immersive experience that drives customer engagement and by extension, a higher product understanding and a lower customer churn rate. In a similar line of thought, (A) discusses VR's ability to alter users' feelings through the immersive experience, showing to the customers that they have been listened as mentioned by (D), which creates a strong brand recall in their minds, and consequently increases customer engagement. Both (A) and (E) discuss the contribution of immersive reality technologies' hedonic value expressed in former literature by Cuomo et al. (2014); Lorentschk (2018) Poushneh and Vasquez (2017) and Jin and Yadzanifard (2015), in driving customer engagement as mentioned by Cuomo et al. (2014). While (E) is in line with Jin and Yazdanifard (2015) viewpoint of creating a surprise element and WOW effect from experiencing the technology, (A) focuses on the emotional reactions, expressed through altered feelings and sensory experience, as discussed by Cuomo et al. (2014).

In a nutshell, VR technologies, including AR are viewed to positively affect customer's senses, feelings and emotions, principally through immersion (Cuomo et al., 2014) and interactivity, and consequently yield to strong customer engagement as explained by Jin & Yazdanifard (2015).

User-User engagement.

> *"One of the funniest experiences that I have had is I actually spent three hours inside virtual reality without even noticing because I was talking to other people*

in the event. And because I had my controllers in my hands, I could physically move my hands on as I use a lot of body language when I like to explain things... And there were others around the room... people from Helsinki, Sweden, Tampere... and the voices in that software were created in a way that if you were like two meters away from others, you couldn't hear what they were talking at, just like in a normal physical conversation. But they could see my hands floating around. So, this is an interesting virtual reality collaboration online". (C)

"We've also had an annual general meeting to demonstrate future technology. Basically, we had several people standing around the table with nothing on it, and they all have cognitive reality. They had the HoloLens on and they had a group experience so they could all basically see the same thing". (G)

"A lot of Virtual meetings are held, customers asking for multiplayer VR experience using virtual avatars to present products and powerpoints: multiplayer VR experience will be more commonly used in the future". (E)

"...Mozilla Hubs is an open-source project where you can have this virtual space accessed from desktop and mobile phones and VR headsets. It's kind of similar to the old space VR, but you can actually meet people in this three-dimensional space that create a more immersive feeling than just traditional teams' meetings. And the benefit in those meetings is that for B2B companies if you have a company-branded space with your own 3D models, you could easily gather people from around the world that you wouldn't usually get to see that often. And you could actually show them the latest product releases and so on". (A)

Besides the customer and brand engagement enabled through virtual technologies, (A), (C), (G) and (K) all referred to another type of engagement that reflects the sociability aspect of these innovations as discussed by Scholz et al. (2016), namely the user-user engagement. The interviewees particularly stressed on the role of virtual meetings in enabling a near-real interaction with other participants present in the digital event or virtual space. Participants can be teams from inside the organization, or customers from outside, which brings us to a more relevant term "stakeholder engagement" enabled through VR as discussed by Regt et al. (2019). (C) illustrates from his personal experience of engaging in discussion with people from Tampere, Sweden and Helsinki for three hours in a virtual gathering event. Space was successfully simulating a realistic physical interaction by representing participants with avatars, reflecting hand gestures through balls on the screen and

capturing nearby voices while turning off voices of participants standing beyond a two-meters distance. Remote collaboration platforms like Glue Universal Collaboration (C), or Mozilla Hubs (A) are a perfect illustration of virtual spaces allowing user-user interactions digitally.

Additionally, to the realistic meeting features, (A) points out to the enablement of collecting feedback from a different user in 3D spaces. This mainly stems from the high customization capabilities of these virtual spaces where people can share and discuss anything from product releases to inviting stakeholders for equipment maintenance (A). However, (A) also argues that virtual meetings in the sales context are still unstable, especially when a very good connection is of the essence. Such spaces also require software installations to support the meeting, and technicalities are not facilitating the adoption by customers simply because a salesperson does not have time to wait on a slow running AR application in the midst of an important corporate deal. Therefore, the effectiveness of user-user engagement in a B2B sales context still has to overcome technical barriers before it can successfully take off.

To sum up, virtual spaces are essential tools that foster social engagement between team members and/or customers in a digital environment, as discussed by Scholz et al. (2016). Such spaces are an example of what virtual reality technologies have to offer by inserting branded content to the digital environment to allow for smooth stakeholder interaction, be it in a sales meeting, a product demonstration, after-sales support, a negotiation, or simply a virtual event. Nevertheless, the effectiveness of these spaces has yet to bypass technical instability challenges relevant in a B2B sales context.

Smart Selling. As discussed by Hunter (2019), effectiveness returns are fueled by an enhancement of the so-called “working smarter” attitudes. A subsequent behaviour inherent in the latter is the ability to foster “sales planning” activities and nurture “adaptive selling behaviours” including enabling convenient access to information and response to customers’ objections proactively (Hunter, 2019). Prior literature did not evoke a link between sales planning or adaptive selling

enhancement and the use of AR/VR as sales tools. However, building on Hunter (2019) definition of sales planning enhancement, interviewees discuss AR/VR customization and high personalization capabilities enabled with large scale eye-tracking resolution (I) and (J), advanced 3D modelling and prototyping, and/or remote collaboration platforms. As Cuomo et al. (2014) states, the mind is the sole boundary to AR customization potential for customers.

In a similar viewpoint, (A) argues that with immersive reality technologies, a company could simply send a 3D file with all customized features required by the buyer and use VR to validate the buyer's choice. Another aspect of customization brought forward by (A) lies in immersive reality technologies' ability to easily gather people from around the world and show them product releases from a virtual space. (J) shares a similar viewpoint by pointing out that B2B customization is the primary benefit of using AR/VR technologies in sales. In the same line of thought, (I) shares the example of car manufacturing companies that allow buyers to customize the car's features using Varjo headsets even prior to the car's actual production, which leads us to the "try before you buy concept" mentioned by (B), (F), (I), (J) and (K), and discussed earlier in literature by Boletsis and Karahasanović (2018), and Regt et al. (2019). In a similar line of thought, (C) takes a step further by arguing that the ability to check on the progress and involve customers early in the development and design stages of the sales processes provides the company (by extension the salesperson) many upselling opportunities. From the latter, we conclude that the effectiveness returns achieved with working smarter can lead to an increase in sales efficiency as well.

> *"You can basically see the progress without visiting building site.. and you can upsell the customer a lot more instead of going with the most basic platforms. That's because customers have the ability to see and make decisions before purchasing". (C)*

Likewise, (D) states that immersive reality technologies provide an opportunity to create customized content dedicated specifically for the customers' product and allow them to visualize it in detail, or even create interactive experiences with that product, what (B) calls personalization capabilities. (C) views this customization,

especially that enabled by VR, as a way to actually accommodate the environment as a contextual value for the customer.

> *"With the virtual technology, not only can you show them, but you can change it so that it actually accommodates what they are hoping to achieve. So, you can actually put them in the picture or put them in an environment that has a contextual value to them specifically". (G)*

Another aspect of enhancing sales planning activities, according to Hunter (2019) is the ST's ability to facilitate addressing buyer objections and concerns. Relating this to immersive reality technologies, this can be achieved by the so-called mass intelligence capabilities discussed in literature by Boletsis & Karahasanović (2018), McCarthy (2017), and Trubow (2011). Likewise, (A) points out to immersive technologies' ability to collect feedback from a different user in 3D spaces. (G) illustrates such capability with an example from a micro-expression engine, an algorithm embedded in VR technologies, and that works by detecting facial muscles to read emotions and predict the customer state of mind (mind reader) and feelings. The algorithm uses shadows to detect emotions from the buyer's facial expressions, or what he calls "psychorgraphing". Other engines can also record customer behaviours and interactions inside the VR immersion experience and collect intelligence on what works, what makes a customer happy, what is frustrating for the customer, etc. As a consequence, (G) states that the salesperson can know exactly how to sell a specific product to a certain customer, mainly through what he/she predicts is going to make the customer satisfied.

Simply put, using immersive reality technologies, and particularly VR in sales, provides intelligence with the potential to show the salesperson how to custom-sell, what is referred to by Hunter (2019) as an adaptive selling behaviour, a product to the buyer and how to present it in a contextual value that is meaningful to him or her.

> *"There is the mass intelligence engine..it is embedded inside of the VR application, and is monitoring what you're doing. It can be adjusted to monitor anything..the speed in which you progress, everything". (G)*

"We were also developing something called the micro expression engine.. the algorithm would allow you to watch someone's face, like a mind reader. It is actually looking at the face and looking at the muscles in the face. There's between nine and 12 muscles on the face that actually depict emotion. So, if you understand how these work, you can tell what somebody is feeling to a decent degree. And what this MIT software does is it uses shadows. It is watching the face and determining the movement of these particular muscles in relation to the shadows. It can identify and it can tell you the emotion... How cool would it be if you were trying to sell somebody something and when you showed it to them, you knew they were getting excited So, you could base on what they're getting excited about., what is called as psychorgraphing. I'm basically getting you (customer) to tell me (salesperson) how to sell it to you". (G)

Finally, (D) helps to bridge the link between effectiveness and efficiency by arguing that the more experiential and the more visualization we have with immersive reality technologies, the higher is stakeholder's understanding, which consequently leads to a more efficient sales process. Additionally, collecting feedback and capitalizing on intelligence insights incorporated in immersive reality technologies is not only facilitating sales activities planning for salespersons but also enabling them to adopt an adaptive selling behaviour (G) that benefits both the buyer and the seller during the sales interaction. With this viewpoint in mind, we conclude that effectiveness and efficiency outcomes are not stand-alone outcomes but rather co-exist with one another. Simply put, the greater the effectiveness of business relationship and interactions, including collaboration and stakeholder engagement, as well as smarter working behaviours (planning & adaptive selling), the higher is the sales efficiency.

"With clever planning and industry knowledge, you can create a whole new customer journey using virtual reality". (C)

CONCLUSIONS

6.1 Empirical findings and answer to the research question

The purpose of this study was to bridge the gap between businesses and researchers in improving understanding of immersive reality technologies, particularly virtual reality and augmented reality, impact on B2B sales and marketing. The research progress brought about an industrial viewpoint, from VR and AR providers, in complementing, debating and contrasting the more-consumer-oriented academic literature on the topic. The study structure was composed of four main sub-topics covered in empirical findings. The first part brought about a thorough distinction between both terminologies (AR and VR) including definitions and technology-specific attributes, while the second part discussed technology acceptance models investigating different factors driving (or hampering) customers' adoption and diffusion of VR/AR technologies in the B2B sector. The third part, on the other hand, discussed immersive reality technologies' impact on marketing for businesses by unveiling a palette of applications in different industries and discussing their role in the customer purchasing journey (pre-purchase, purchase and post-purchase phases). Fourth, a theoretical understanding of VR/AR impact on a company's sales performance outcomes is discussed, based on an RBV perspective distinguishing two main outcomes: efficiency and effectiveness returns.

Building on the extant theoretical knowledge afore-mentioned, the study outline was set in place to provide a holistic understanding of VR and AR impact on B2B sales and marketing, hence bridging the gap between an impact on the company (through internal marketing activities and sales performance) and customer (throughout purchasing journey) levels. The empirical research was in line with both the theoretical baseline and the study structure.

Response to the Research Question

How VR and AR technologies impact marketing and sales in the B2B sector?

The empirical study suggests that immersive reality technologies can affect both marketing activities and sales performance for the B2B sector. VR and AR together have an impact on marketing for B2B sector by enhancing customization, non-verbal communication, learning and experiential marketing while also creating memorable experiences that stick in the minds of the consumer. Also, VR and AR technologies have the potential to augment and support the whole customer's purchasing journey, starting from the pre-purchase stage. In this sense, findings confirm that VR/AR allow for customization, resource optimization, and reduction of errors as well as customer incentivization and commitment. Customers can also attend product presentations in virtual meetings, virtual tradeshows or virtual exhibitions as in the case of Nokia. The purchase stage is the least impacted by these innovations, whereby these technologies are used to allow customers trying equipment and machinery in a completely safe environment (safety enhancement), in a more engaging and interactive manner. Immersive reality technologies can also be used in this stage (although less common at the moment) to perform sales negotiations through branded virtual spaces. Last, the post-purchase stage is the second most impact phase where results are in line with existing literature confirming the role of these technologies mainly in support of after sales services and remote maintenance operations, while also enabling predictive maintenance that , in turn, lead to higher customer loyalty and satisfaction.

On the other hand, empirical findings add that the use of immersive reality technologies on a company level, as sales support tools, can yield positive efficiency returns evidenced with higher task performance and reduction in sales costs related to logistics and transportation, design, prototyping and production, as well as environmental costs from lower CO2 emissions and substitution of polluting physical mock-ups. Furthermore, using immersive reality technologies in B2B sales proved to drive positive returns on effectiveness for a company exhibited in higher levels of customer and social engagement, a stronger collaborative business relationships vis a vis the customers, the sales team and other stakeholders involved in the sales process. A new insight from the empirical study suggests that immersive reality technologies enhance proactive (in sales planning) and reactive (adaptive selling) behaviours in the sales process that, in turn, drive the sales efficiency. Figure 6 below is a suggested framework summarizing the VR/AR impact on marketing and sales for the B2B sector, adapted from the theoretical and empirical understanding of the topic.

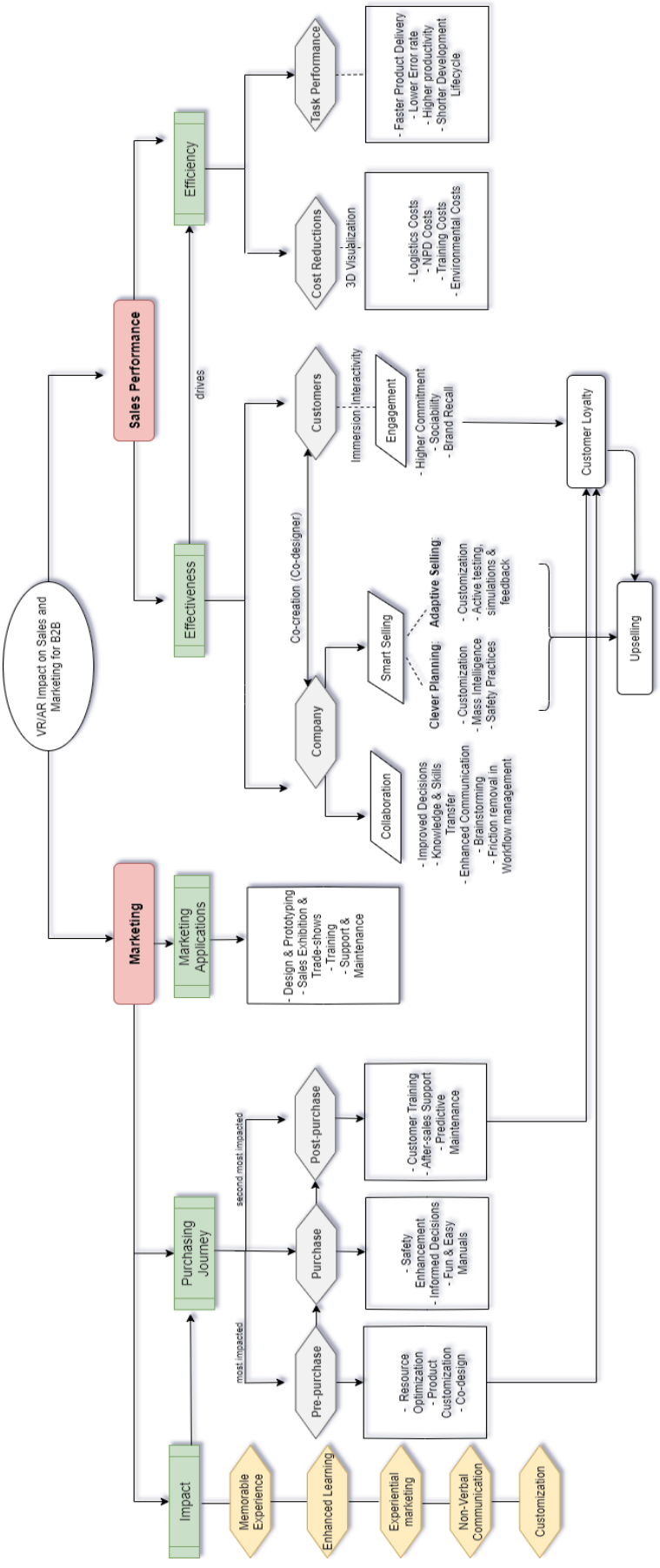

Figure 6. Summary diagram exhibiting VR/AR impact on B2B sales and marketing

However, embracing VR and AR in companies is not a straightforward task. The empirical study identifies relevant technology adoption factors that can hinder or slow the adoption of VR and AR in B2B marketing and sales. Critical adoption factors include financial barriers related to upfront technology costs, scaling costs and difficulties in measuring the concrete monetary impact of these technologies for businesses (ROI). Technical or technology barriers are also key factors to consider, including hardware and software development, accessibility and content distribution. Other barriers include social challenges related to age and social influence affecting both the user's experience and willingness to adopt a technology. Finally, a lack of technology experience (UX) and technical expertise on VR/AR usability are subsequent factors justified mainly from an immature market still in infancy stages.

To better answer the main research question, this study provided a profound exploration of four sub-topics that will be explained in the following sub-chapters.

6.1.1 What exactly are virtual reality and augmented reality?

A thorough distinction between both terminologies (AR and VR) was set, compiling theoretical perspectives on the latter, including definitions and technology-specific attributes. Building on the latter and on interview insights, a clear definition inclusive of both technological and experiential features of each technology was concluded. Accordingly, we suggest the following Virtual Reality and Augmented Reality definitions:

Virtual Reality is:

"*A 3D computerized simulation world that immerses the user in a fabricated environment by blocking him completely from the surrounding physical world, allowing him/her to engage in an interactive multisensory experience through a VR headset.*"

Augmented Reality is:

"*An open environment, easily accessible through a flat screen, that allows the user to interact and engage with digital content, including other users and/or objects, overlaid onto the real world*."

6.1.2 What Factors drive customers' adoption of VR/AR technologies in the B2B sector? and why are those relevant?

The study built a theoretical understanding of customer adoption factors based on various technology adoption models such as "technology acceptance model", "innovation diffusion theory", " unified theory of acceptance and use of technology", and academic perspectives on further attributes such as "value-in-use" and "user experience". However, research results suggest a more comprehensive set of technology adoption factors relevant for the B2B sector that extend from a single model or perspective to comprise primarily: financial factors, technical factors, social factors, and other attributes like market maturity and user experience.

Accordingly, empirical research identifies financial barriers as the most recurring challenges that hinder the diffusion of VR/AR innovations in the B2B sector. In line with Venkatesh et al. (2012) "price-value" of the UTAUT2 acceptance model, alongside studies such as Boyd et al. (2018), Kim and Shin (2015) and later mentioned by Rauschnabel and Ro (2016) and BCG (2018) discussing upfront technology costs in driving technology acceptance and purchase intentions, this study advances understanding by discussing inherent challenges that justify expensive costs. The latter include high costs of creating custom 3D content and immersive virtual storytelling from scratch (specific to each company use case), the costs of scaling these technologies to employees in company sites, especially relevant when the technology is to be deployed to many employees in an organization. Other challenges justifying the financial barriers to adoption include lacking budgets from an organizational level and difficulties in measuring the real value-adding opportunities in monetary terms

(such as return on investment...) as cases are different and each project has its own specificities.

Additionally, the empirical study identifies the second most prominent barrier to adoption of VR/AR in the B2B sector as technical barriers. The research suggests that technology-specific challenges include hardware and software development issues, that need to be more user-friendly for salespeople to incorporate in their business activities. This is in line with extant literature discussing the importance of technology convenience and simplicity as portrayed in Davis (1989) TAM model by "perceived ease of use" (PEOU), in Venkatesh et al. (2012) by "effort expectancy" and opposite in meaning with Rogers (1995, 2003) "complexity" innovation attribute. Moreover, the empirical study points out to the lack of immersive reality supported devices, or what is coined as "compatibility" in the innovation diffusion theory (Rogers, 2003) as an essential infrastructure barrier to technology adoption in B2B. Infrastructural challenges are also depicted in UTAUT/UTAUT2 technology acceptance models by Venkatesh et al. (2012, 2003) as "facilitating conditions" including technical or corporate conditions enabling the use of technologies in companies. Finally, the study identifies a lack of internal (technology) expertise from end-user and misunderstandings about technology usability explained by a market immaturity, as discussed in Zabel and Heisenberg (2017) survey and the BCG report (2018). Additionally, the study suggests that the lack of technical expertise can also be justified by a lack of experiencing with the technology, which is in line with technology "habit" factor exhibited in the UTAUT2 model (Venkatesh et al., 2012).

Other barriers affecting customers' acceptance of VR/AR us in B2B marketing and sales relate to social factors. This study emphasizes the relevance of demographic factors like age in particular by confirming a resistance to use of VR/AR in businesses by older managers mainly from difficulties in seeing the real value-adding contributions of these technologies (performance..), and an opposing eagerness to support innovations by more younger individuals. Age is also brought about in Venkatesh et al. (2003, 2012) as moderating the impact of technology adoption factors on driving the usage of the latter. Empirical research is in line with UTAUT/UTAUT2 models stating that younger individuals tend to value the technology's performance capabilities when deciding upon the usage or adoption of an innovation. Additionally,

the study identifies that users' experience could be affected by those bystanders (Scholz et al., 2016) observing on a user's experience in the surrounding physical environment. With sometimes disturbing or funny comments and observations, these individuals can alter customer satisfaction from the immersive experience, making him or her uncomfortable and by extension hampering the adoption of these innovations. Results are confirming the social influence factor set forth by Rogers (1995, 2003) and Venkatesh et al. (2003, 2012) and discussed by Parisot (1997) in the "peer observation" attribute. However, unlike Venkatesh et al. (2003, 2012), neither gender nor organizational setting was mentioned as a technology purchase intention driver, which describes the effects of the latter as less relevant according to empirical results.

Finally, the study results point out to the importance of the user experience, particularly from a pragmatic quality as evidenced by Lorentschk (2018) Poushneh and Vasquez (2017). Empirical findings also confirm Zabel and Heisenberg (2017) results in that hedonic value, and the Wow factor derived from the immersive experience is less relevant in driving the actual adoption in B2B sectors. The look and feel from the use of VR/AR are, in fact, only simulating users' interest to explore the technology, but is not necessarily fuelling the purchase or acceptance of that technology.

6.1.3 What is the impact and applications of VR/AR technologies in B2B marketing? and which purchasing phases are impacted by VR/AR applications in the B2B sector?

After analysing the interviewees and synthesizing their interpretations with prior literature, the five following impacts on B2B marketing have been concluded, namely: memorable experiences, enhanced learning, experiential marketing, non-verbal communication tool and customization.

While prior literature focused mainly on experiential marketing for B2C and sometimes enhanced learning in other contexts like education (in classrooms), our empirical results confirm these outcomes are palpable on a B2B marketing setting as

well. In fact, the hedonic quality and the "WoW factor" allow the customer to better remember the brand, the products' features and the marketing campaign, which leads to creating a *Memorable Experience* in the consumer's mind. The second impact is *Enhanced Learning* which means that using VR/AR technologies allow customers to develop a faster learning and understanding of the product's complex specifications and features. Simply put, VR/AR enhance individual learning (for both customers and/or employees) with the extensive use of vision in explaining and simplifying complex processes and/or equipment. This also confirms literature (McCarthy, 2017) in the sense that immersive reality technologies, especially AR, reduce the dependence on lengthy, boring and hard-to process 2-D information (manuals..) on pages and screens while greatly improving our ability to understand and apply information in the real world. It is all about the experience, this what the third impact refers to by allowing customers to "Try before they buy" through immersion into an *Experiential Marketing*. The latter findings are also in line with prior B2C literature, stressing the role of AR and VR in enhancing experiential marketing by immersing the customer in completely simulated environments and allowing him or her to be an active part of the marketing experience rather than a mere passive receiver of it.

The fourth impact is *Non-verbal Communication Tool* that exhibits immersive reality technology's ability to create an interactive communication with the customer. While these findings confirm existing literature discussing VR/AR as powerful non-verbal communication tools, this study justifies such an impact through the enhancement of "seeing is believing" concept where these technologies deliver impactful messages through immersive and interactive virtual storytelling. A final impact from using VR/AR in B2B marketing lies in *Customization*, which positions these technologies as unlimited creative content tools. Companies are able to create customized content and environments to fit with any customers preferences, where the creativity potential is unlocked, hence, increasing customer satisfaction and by extension, customer loyalty. The relevance of customization impact is justified with the complexity of both equipment and decision making in B2B, that require the need for more detailed and yet simple explanations of products, equipment and processes to allow for an informed decision making.

The most successful VR/AR applications in B2B marketing relate to the prototyping and design for heavy industries and machinery companies. Companies such as PONSEE, Swedish railway, Sandvik, Volvo, Nissan, Boeing, Rolls Royce, Baker Hughes, ABB, and General Electric are successfully using immersive reality technologies to support their marketing activities. Additionally, VR/AR is also used intensively to support the maintenance activities in heavy industries. Other tech giants like NOKIA are using these technologies in virtual sales exhibitions and tradeshows. Finally, VR/AR could be used to support marketing in the health sector, and Alpha Laval is a great example of that.

With regards to VR/AR impact on the customer's purchasing journey, empirical findings extend existing literature that focused mainly on either pre or post purchase phases to cover all customer purchasing stages: pre-purchase, purchase and post-purchase. Accordingly, findings identify the pre-purchase phase as the most impacted by immersive reality technologies as they allow both companies and customers to optimize their resources and decrease initial product costs with co-design and product customization, leading to customer incentivization and ultimately, loyalty. The purchase phase is the least impacted stage. At this level, VR/AR help companies to enhance the safety of trying any hazardous products. Also, immersive reality technologies facilitate presentation of lengthy and complex product manuals by substituting them with a more simplified, engaging and fun alternatives. These technologies are also sought to support informed decision for customers and businesses alike. Finally, findings suggest the post-purchase as the second most impacted phase, in which VR/AR are used to increase customer loyalty by supporting the maintenance activities, especially predictive maintenance.

6.1.4 What are the potential sales performance outcomes enabled by using VR and AR as sales tools?

Empirical findings confirm extant sales technology literature by categorizing the use of VR and AR as sales tools with regards to two main sales performance outcomes: efficiency and effectiveness. Results portray efficiency as an improvement in task performance and the enablement of sales-related costs reductions, while effectiveness mirrors the strength and enhancement of interactions throughout the sales process

between customers and the company, including forging collaborative business relationships and engaging with customers and stakeholders (social). Engagement, in turn, was reflecting Scholz et al. (2016) consumer experiential engagement, and the sociability of user-user engagement. Finally, using AR/VR as sales tools also drives effectiveness returns through the enhancement of smarter working behaviours, including effective sales planning and adaptive selling attitudes as defined by Hunter (2019).

From an effectiveness perspective, the current global crisis is opening up opportunities for VR and AR to support sales virtually through remote collaborations allowing for multiplayer experiences using avatars in branded virtual spaces such as Glue Universal platform or Mozilla Hubs. Thus, our study is in line with Bekele and Champion (2019) results confirming remote collaboration can be implemented in all forms of immersive reality technology. Empirical results emphasize strong collaboration, especially in the pre-purchase phase during prototyping, co-design and product presentations. Participants can collaborate virtually through a set of features simulating a real meeting context. The empirical study concludes that immersive reality technologies used in sales enhance stakeholder collaboration by providing brainstorming opportunities and improving communication, in turn, enabled by efficient understanding and effective visualization. Findings also suggest collaboration happens as a result of an effective transfer of knowledge, skills and expertise, and an enhancement in decision making as discussed in Hariharan et al., (2020); Porter et al. (2017); Regt et al. (2019). Improved communication is, in turn, refining interaction processes and removing frictions associated with sales process intra-departmental conflicts of interests, equivalent to the friction barriers in workflow management set forth by Lorentschk (2018).

A second potential effectiveness outcome is related to engagement. Empirical study results identify two forms of engagement, namely: customer engagement and social engagement. Customer engagement is in partial line with Bekele and Champion (2019) and confirming Scholz et al. (2016) definitions of engagement experiences from the immersive perspective. At this level, engagement reflects using immersive experiences to sell a product and/or service, which keeps the company in the mind of customers (enhancing learning and memorization) while also catching the buyer's full attention. We also argue that immersive reality technologies positively affect customer's senses,

feelings and emotions, principally through immersion (Cuomo et al., 2014), and consequently yield to stronger customer engagement as discussed by Jin & Yazdanifard (2015).

Another type of engagement highlighted in empirical findings reflects the sociability aspect of these innovations allowing for a user-user engagement (Scholz et al., 2016), or what is referred to as "stakeholder engagement" by Regt et al. (2019). Such engagement is a result of interactions with the virtual environment content (specifically other users) which is partially in line with Bekele & Champion (2019) definition of engagement from an interactivity perspective. Again, virtual spaces are an example of what virtual reality technologies have to offer by inserting branded content to the digital environment to allow for smooth stakeholder interaction, be it in a sales meeting, a product demonstration, after-sales support, a negotiation, or simply a virtual event. Nevertheless, the effectiveness of these spaces has yet to bypass technical instability challenges relevant in a B2B sales context.

In addition to collaboration and engagement outcomes, empirical findings suggest a new effectiveness enhancement enabled with VR/AR, that is, the enhancement of smarter selling for salespeople. In this sense, immersive reality technologies are sought to enhance clever planning for sales activities and enable more adaptive selling behaviors, or what Hunter (2019) calls by "working smarter". In fact, mass intelligence recorded in virtual environments, together with the ability to address buyers' concerns proactively from early design phases and throughout the sales process with advanced 3D modelling are sought to facilitate proactive sales planning while enabling salespersons to adopt an adaptive selling behaviour that benefits both the buyer and the seller during the sales interaction. We suggest that these technologies in turn might lead to upselling opportunities for firms. Finally, bridging the link between effectiveness and efficiency, empirical results view effectiveness and efficiency outcomes as related to one another in a sense that the greater the effectiveness of business relationship and interactions, including collaboration, stakeholder engagement, and enhanced smarter working behaviours (planning & adaptive selling), the higher is the sales efficiency.

At the other side of the spectrum, empirical findings highlight sales efficiency from two chief outcomes, primarily: cost reductions and task performance enhancement. The former includes efficiencies in transportation and logistics costs related to travel, cargo and equipment shipping that are confirming efficiency results brought about by McCarthy (2017); Porter et al. (2017); Trubow (2011) and Ventana Research (2019). Other savings also include reduction in design, prototyping and initial product development costs, especially relevant for the B2B sector. These results validate Mussomeli et al. (2018), Porter et al. (2017), and Trubow (2011) outcomes on reduction in initial product development expenses. Finally, results point out to a new cost perspective, away from existing literature that solely addressed economic gains enabled with the use of VR and AR in the sales pipeline to sustainability costs evidenced with lower CO2 emissions and minimization of polluting production substances as virtual modelling substitutes physical mock-ups.

That being said, the empirical findings highlight that cost reduction impact of immersive reality technologies on the sales process is affecting industries in varying degrees, and there is no one fit for all rule. Results show that the sectors that are most benefiting from cost efficiencies are mainly industrially characterized with a complex ecosystem, or companies producing and selling heavy machinery, dangerous machinery, and/or large physical products that can not fit in a suitcase and/or require high customization levels. These results are partially in line with Barnes (2016) perspective emphasizing the usefulness of immersive reality technologies for complex, high value and/or customized products like real estate and car manufacturing. Accordingly, our study results point out that unlike extant literature focusing on benefits to sophistication and logistics challenges, businesses with safety challenges are also equally benefitting from sales efficiencies enabled by VR/AR.

Another sales efficiency outcome brought about in empirical study is an enhancement of task performance, mainly justified with reduced error rates from the company (primarily in design and production), which is partially in line with Porter et al. (2017) viewpoint. However, our study goes beyond product, design and other industrial related task errors to add further efficiencies justifying an improved task performance. These include allowing a higher productivity at work with more successfully completed tasks achieved in lower time, a faster product delivery and a shorter

development lifecycle that results in a subsequently shorter sales process. Moreover, efficiencies are gained by leveraging immersive realities in increasing safe practices for any interaction needed with the product or a system during the sales process, including a safe product presentation, a safe training and a safe sales support. In this sense, ensuring individuals' safety is primordial not only in enabling the sale of complex and hazardous products but also in enhancing employee performance at work, as is the case for virtual trainings. Thus, enabling sales efficiency with improved safety in task performance is a new perspective from which the industry tackles the sales outcomes of VR and AR use in B2B sales.

6.2 Managerial contributions

The current study provides threefold contributions for the managers, namely: developing integration mechanism, raising awareness and collaborating with the wider community.

One of the aims of the study is to investigate the impact of VR/AR on the business and customer sides. Thus, the first suggested managerial implication is for firms to *develop integration mechanism* based on literature and the collected interview insights. Simply put, in order to apply VR/AR technologies in marketing and sales, the company ought to integrate these innovation tools in an early stage from the design and product development. Additionally, companies ought to acquire the appropriate skills, especially hard skills related to technical knowledge of using the technologies (Barnes, 2016) before they can fully understand and enjoy using them in support of sales and marketing activities. And should there be sufficient funds, companies can also resort to outsourcing, or hiring expert 3D software developers to ensure mastering the effective and efficient use of these technologies from earlier marketing and sales phases. That being said, VR and AR should not be taught solely as sales and marketing support tools; instead, the company should integrate these technologies into their whole ecosystem, which requires shifting to what is called a "virtual value chain" (Reget et al., 2019).

A second managerial implication relates to *raising awareness* about immersive reality technologies. VR/AR providers should provide informative events to create awareness

in the market instead of adopting a heavily-sales oriented view. In this sense, providers ought to show expertise outside of their circle to educate the general public in seeing the real value adding potential justifying why businesses should invest in VR/AR in production, marketing and sales activities. Reaching the greater community with the right knowledge is key to attract further companies and customers in embracing these technologies. Besides, providers can also target opinion leaders in companies and/or industries as they can serve as a strong reference for future customers. Moreover, VR/AR agencies should think about an initiative creative process to start the storytelling and let customers try the immersive experience by themselves. In addition, VR/AR agencies can emphasize business benefits by quantifying the impact of these technologies in concrete measurable ways. Therefore, educating here is not only contingent upon technology-related know-how, but also knowledge of the business impact (in monetary terms) to customers from the use of VR and/or AR. Additionally, both providers and companies should ensure the quality of content and guarantee a smooth installation and integration within adopting organizations.

A third managerial implication from this study is the need for all players of the VR/AR ecosystem to *collaborate with the wider community.* This implies that VR/AR agencies and businesses have to work together with schools to produce, train and educate the next generation of workforce with expertise in 3D content production to bridge the current technical labour gap. Providers and adopters can both collaborate with universities and even governments to support and address the needs and benefits of using immersive reality technologies in production, design, marketing and sales. Moreover, VR/AR providers ought to keep frequent contact with their customers, especially the early adopters who can support and spread the impact of these technologies in the wider market. Finally, both providers and companies should understand that the purpose of VR/AR is to educate, inform, analyse, plan and manage.

6.3 Limitations & research evaluation

As with the case of any research undertaken, it is of essence to evaluate the research validity and reliability and point out any potential limitations to allow for a replicable study. While reliability reflects the extent to which the study results are consistent and can be replicable by other researchers (Leung, 2015), validity, on the other hand,

speaks of the research design accuracy (Saunders et al., 2012), reflecting the evaluation of research quality, integrity and character (Maxwell, 1992). Johnson (1997) distinguishes three types of qualitative research validity, namely: descriptive validity, interpretive validity, and theoretical validity.

Descriptive validity stands for the interview reporting accuracy. This was addressed through what is called an "investigator triangulation" whereby both researchers were recording interview answers and then cross-checking the agreement on interpretations of participants' viewpoints. The second type, interpretive validity reflects the accuracy by which interviewees' experiences, opinions, feelings and thoughts were presented in the research. Researchers addressed this issue by using the "participant's feedback" strategy (Johnson, 1997). In this sense, researchers discussed participants' feedback and conclusions with the interviewees to verify the validity of the interpretations and/or conclusion and reduce any potential misunderstandings. Researchers also addressed the validity of this study by interviewing industry experts in the field of virtual and augmented reality. Furthermore, researchers used several "low inference descriptors" or direct quotations from interviewees as they help grasp the actual inherent meanings and interpretations, and experience interviewees' language (Johnson, 1997).

The third validity type, theoretical validity, reflects the extent to which the theoretical basis for this study fits the data and can, thus, be considered as credible. Simply put, theoretical validity exists when the theory development goes beyond relating facts to actually explaining a phenomenon. At this level, researchers were able to address this issue with the use of the "pattern matching" strategy (Johnson, 1997) whereby predictions were first made on the basis of the theoretical construct about potential VR/AR applications in B2B marketing and sales, and building on the latter, interviews were set to test, compare and contrast those initial predictions. Researchers are able to find a pattern explaining the phenomenon when participants' answers are in line with the predictions. Finally, a "peer review" strategy was also used in enhancing the theoretical validity of the research, whereby both researchers discussed research explanations with peers to spot potential problems to be addressed and collect further data when necessary (Johnson, 1997).

Nevertheless, researchers identified several limitations discussed below:

A first potential limitation lies in the limited timeframe for completion of this research and the additional current health crisis (Covid-19) that slowed the pace of data collection and affected the general responsiveness of some companies. That being said, with tight time constraints, researchers resorted to a snowballing sampling method for some interviewees to complete the study in the due date and did not have time to go more in-depth in the interviews' analysis. The other sampling method selected, "purposeful sampling", is also subject to limitations as the interviewee selection is considered subjective (Saunders et al., 2012). This is why researchers performed a deep research about all VR/AR providers in Finland and selected those with experience in delivering solutions to the B2B sector principally. Participants were also chosen based on their positions, as sales directors or C- suite managers provided their ability to better elaborate on VR and AR technology capabilities and applications using a more business-like jargon that would eventually facilitate research interpretations in discussing the findings.

Another limitation to this study lies in the research methodology. This study used an exploratory approach to gain a deeper understanding of a still unexplored phenomenon in literature (VR/AR in B2B marketing and sales) through participants' lenses. However, an exploratory research can be subject to a validity threat called the "researcher bias" (Johnson, 1997). This means that, in attempt to build an understanding around a topic, researchers might fall in wrong interpretations of participants viewpoints mainly as a result from selective observations and recordings (Johnson, 1997). This is why researchers recorded and transcribed the whole interviews and used strategies to foster the research validity.

A third possible limitation lies in the generalizability of the study. With a sample size of ten companies, the research can still not be generalized to a great extent, especially that 70% of participants are all experts operating in one market (Finland). Likewise, getting on company from each of the foreign markets (Sweden, UK and USA) also falls short of generalizing empirical findings. Other limitations to consider in the sampling is that differences in the geographical locations of the markets explored (Sweden, UK, USA, Finland) might also reflect differences in market demands and

business requirements about immersive reality technologies. To better address those differences, outliers were identified in the analysis and answers that do not directly adress our research question (for instance are oriented in the B2C rather than B2B market) were eliminated to keep empirical findings consistent with our initial research investigation. In discussing generalization issues for qualitative research, Stake (1990) refers to the concept of naturalistic generalization. The term means generalization based on similarities, be it to other people, or other settings (Johnson, 1997). Therefore, researchers listed interviewee positions and described their corresponding companies and markets, while also transcribing their experiences to allow for future researchers to replicate the study with similar contexts and/or positions.

A fourth limitation for this research resides in the confidentiality of some data collected. To sustain ethical research conduct, researchers did not reveal some case studies about potential VR and AR applications in B2B sales as they were ongoing projects, and hence, sensitive data.

Overall, based on Johnson (1997), Maxwell (1992) and Leung (2015) perspectives on qualitative research evaluation, this study appears to follow research validity and reliability requirements to an appropriate level. The study results can also be used as a baseline for future research investigating VR and/or AR marketing implications in the B2B sector. Additionally, the study followed ethical guidelines for research including the use of citations in theoretical background, and structuring empirical research based on abductive thematic analysis by constantly cross-checking opinions and interpretations with existing literature to identify patterns and advance research results.

6.4 Direction for future research

This study aimed to fill the theoretical gap (heavily B2C oriented) in investigating the impact of immersive reality technologies, including both virtual reality and augmented reality in the B2B sector. Provided the novelty of the topic in literature, especially regarding sales, this study can serve as a baseline or hypothesis for future research in the field. For instance, future research can explore in more scrutiny the distinctive role of virtual reality or augmented reality in B2B sales and/or marketing, and conclude on which technology is more relevant for business customers.

Future studies can also use companies that have actually embraced VR and AR in their marketing and sales already, to bring a deeper understanding from customers' viewpoints and requirements, as opposed to VR/AR providers or experts. Such sampling can provide new perspectives to identify future research gaps while also allowing for a comparison and contrast between the provider viewpoints and customers perspective.

Additionally, for time constraint purposes, convenience and snowball sample can result in biased answers and future studies can use sampling methods that allow for generalizations of research findings such as questionnaires to managers, experts and/or employees with experience using the technology.

Finally, the existing study investigates the organizational enhancement, thus reflecting the positive impact, of immersive reality technologies on businesses. However, as mentioned in Alghamdi et al. (2017), and Boyd et al. (2018), the latter innovations can hide negative downsides that might even outweigh the positive outcomes, such as the workload psychological stress experienced with the strong immersivity of a VR experience. Therefore, future research can explore the negative impact of these technologies in a B2B marketing. Another potential direction for the research can be comparing effects of immersive reality technologies in a B2C and B2B contexts and investigating justifications for any perceived differences.

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APPENDIX

Outline of Semi-Structured Interview Questions

I. Introduction

1. Could you please introduce yourself and your company?

2. In what industries are your customers operating? (are they mainly B2B or B2C?)

3. Can you describe briefly the current VR/AR market (B2B)?

II. VR/AR Definitions & Customer Adoption Factors

4. How would you define Virtual reality and augmented reality? And how do you differentiate it from other realities in the continuum?

5. What AR/VR solutions does your company provide? (examples)

6. Which Virtual technologies (VR, AR, MR..) are B2B companies using more to support their marketing and sales activities? Why?

7. Do you think there are barriers to adoption of VR/AR technologies for businesses (you're your experience in commercializing VR/AR)? If yes, what are the main concerns expressed by customers in this regard?

8. How do you think can companies better address these challenges?

III. VR/AR Applications in B2B Marketing

9. Do you think VR/AR are beneficial (value adding) to marketing? Why (or why not)?

10. In your opinion, what are the most important attributes (features) of VR/AR?

11. How do you think these features support B2B marketing?

12. Could you possibly provide us with examples of companies (references), from your experience and knowledge, using VR/AR in marketing and sales?

13. In your opinion, do VR/AR technologies support the buyer's purchasing journey? If yes, which phases (pre-purchase, purchase, post purchase...) do you think can benefit most from these innovations, and how?

14. Which industries do you think are benefitting the most from the impact of VR/AR technologies in B2B marketing? Why?

IV. VR/AR Contribution to Sales

15. From your managerial and sales experience, do you think that VR/AR impacts the sales process for B2B companies? If yes, which stages (of the sales process) are impacted most by VR/AR, and how?

16. What do you think are the most important sales performance outcomes of using VR/AR technologies in B2B sales context?

17. What are the costs reductions enabled by VR/AR use in the sales?

18. Do you think VR/AR enhances collaboration inside and outside the company (stakeholders) during a sales process? If yes, how?

19. Do you think VR/AR impact learning in B2B sales? (Customer side and salesperson) if yes, why?

20. From you experience using VR/AR, do you think that these technologies can speed up the sales process? If yes, why?

21. What do you think is needed for successful implementation in sales? (skills, resources, etc…)

22. Do you use VR/AR in your company's sales strategy (for new prospects, customers)? If yes, how does it differ from the traditional sales strategy?

V. Market Outlook

23. What do you think would be the future of sales and marketing (for businesses) with VR technologies?