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Degree Program in Management

Course of Advanced Marketing Management

Mapping the Metaverse: Interdisciplinary Insights and Experimental Studies into its implications in the development of Attitudes, Emotions and Behaviors towards High-End Fashion products.

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INTRODUCTION

In the ever-evolving landscape of technology and digital innovation, the concept of the Metaverse has emerged as a revolutionary paradigm, capturing the imagination of individuals and industries alike. Rooted in science fiction and now rapidly becoming a tangible reality, the Metaverse represents a digital universe where people can interact, create, and explore in a virtual realm that seamlessly integrates with our physical world (Buhalis *et al.,* 2022). With its potential to reshape our social, economic, and cultural landscapes, the Metaverse has garnered immense attention and speculation (Gursoy *et al.,* 2022). Furthermore, with the aid of marketing technologies, the link between consumers and brands is becoming more fluid and connected with a virtual dimension, thus generating new avenues and perspectives for stakeholders such as technology companies, social media platforms, content creators, businesses and brands. Indeed, thanks to the use of technology tools and innovative devices, there is an increasing ability to exploit products and services within immersive, sensory and interactive environments, thus enhancing the perceptual impact of products and improving the overall user experience. Several studies have described the application of the sensory marketing strategy to improving the consumer experience (Hultén, 2011; Krishna, 2012). Indeed, some Vitual Reality devices have become popular recently, supporting the customers' demand for entertainment, such as the 360 Degree Panoramic Video (360-degree video), which captures the majority of, or the entire, spherical field of view and have been applied in many sectors such as retail (Pantano & Servidio, 2012) and fashion (Papagiannidis *et al.,* 2013).

The foundation of the Metaverse lies in the convergence of several cutting-edge technologies, including virtual reality (VR), augmented reality (AR) that, combined with the boundless creativity of individuals and organizations, have paved the way for an interconnected digital domain that transcends physical limitations and opens up new avenues for communication, collaboration, and commerce (Dwivedi *et al.,* 2022). Accordingly, the

Metaverse not only holds the promise of transforming how we engage with entertainment and media, but it also has profound implications for business models, education, healthcare, advertising, retailing, hospitality and even governance (Dwivedi *et al.,* 2023). It has the potential to revolutionize industries, disrupt traditional internal processes, and reshape our understanding of reality itself. As such, it becomes imperative to explore the opportunities and challenges that arise from this nascent concept, addressing also issues of privacy, security, ethics, and inclusivity within the Metaverse.

Although the topic of the Metaverse can be approached from multiple perspectives, this manuscript will investigate the phenomenon across the board with an in-depth look at new marketing frontiers among different industries and domains, thus developing comprehensive frameworks for understanding its implications. Through two experimental studies, quantitative analysis, and critical evaluation, this study will contribute to the growing body of knowledge surrounding the Metaverse, shedding light on its potential benefits, risks and possible applications with the goal to provide valuable insights and recommendations for individuals, organizations, and policymakers.

Specifically, this manuscript consists of three articles, each of these divided as follows: (a) general introduction to the topic of the study (b) analysis of existing literature and formulation of hypotheses (c) methodology (d) results (e) managerial implications and avenues for future research.

The first chapter involves a methodical examination of the Metaverse concept through a systematic literature review and bibliometric analysis. The objective is to elucidate the origins and existing body of literature surrounding this phenomenon, while also identifying the principal clusters of authors who have extensively deliberated upon the Metaverse and its diverse manifestations and applications spanning a period of three decades. In addition, this first chapter generated insights and research gaps on topics such as sustainability in the

metaverse and its application in the high fashion industry, which will be developed in the following chapters.

Accordingly, the second chapter focuses on the high-end fashion industry and the emergence of CSR practices in this sector, providing valuable guidance to companies on choosing between different media settings to share a better perception of sustainability of high-end fashion products.

Finally, the third chapter focuses on analyzing behavioral and psychological variables of human beings, by investigating individuals' emotional responses to sustainable high-end fashion products when exposed in the Metaverse environment.

Overall, relevant contributions and insights emerge from this thesis that further fuel the previous literature on the topic of the Metaverse in marketing. First of all, the work certified that the Metaverse has the potential to transform a wide range of industries and domains, including advertising, tourism and hospitality, education and retail, providing managers with a promising roadmap of actions to engage with consumers, deliver engaging and personalised experiences and unlock new sources of value and revenue. Secondly, it analyzed the potential of this 3D media environment in enabling the transmission of more information, thereby increasing customers' emotions, attitudes, and behaviors toward sustainable products, offering managerial perspectives to strengthen brand development planning and insights on how to develop appropriate settings to engage customers and stimulate discussions about the perceived sustainability of brands and products. Ultimately, the thesis expands the extant literature on the Metaverse marketing by highlights the presence of a differential effect in emotional responses when customers, engaged in group discussion, interact in a Metaverse/ 3D virtual reality environment vs. when they do the same in a 2D environments, and thus suggesting marketers to consider the influence of the Metaverse in setting-up proper immersive experiences to discover fresh emotional approaches for promoting products and brands.

CHAPTER 1

Beyond Physical and Virtual Worlds: Evidence from a Systematic Literature Review and Bibliometric Analysis on the Effects of the Metaverse on the New Marketing Frontiers

Abstract

The emergence of the Metaverse is creating a novel landscape that blurs the line between the physical and virtual spheres. With the advancement of suitable devices and interactive physical-virtual connections, the way individuals interact with each other and their surroundings is moving towards immersive experiences. However, the categorization of these novel realities, technologies, and experiences is still a topic of ongoing research that not yet been clearly established by researchers and practitioners. Through a structured bibliometric and co-citation analyses, and a systematic literature review involving 148 papers, this research aims at systematizing the evolution of the literature on the Metaverse, investigating the presence of a consensus on specific topics through a co-citation analysis, and examining the evolution of the consensus and co-citation networks over time, providing practical applications of the Metaverse in multiple domains, and highlighting potential research gaps. Our findings demonstrate that only a limited number of self-reinforcing and well-established co-citation networks exist today as well as the emergence of novel managerial applications overlooked by the existing co-citation networks that might serve as potential future research avenues.

1.1 Introduction

Despite its 30-years history, the Metaverse is still in full development, and takes various form in which anyone can immerse themselves in an interconnected multimedia space. To date, the Metaverse concept seems ready to be further explored from a research and business point

of view, being one of the technologies with the greatest sustainable potential for the future (Hwang, G. J., & Chien, S. Y., 2022) and its various potential applications (Park & Kim, 2022).

Although the term "Metaverse" has only recently entered the common language of managers and academics, it was first introduced in 1992 in Neal Stephenson's novel *Snow Crash,* as a three-dimensional space within which individuals can move, share and interact through customized avatars. This was followed in 1999 by the release of *Matrix*, a cyberpunk-style film by Andy and Larry Wachowski that depicted the first traits of the Metaverse, where the explanation of the human, social, and cultural ramifications marks a significant advance and future scenario. Indeed, the "matrix" dimension characterizes an asymmetrical grouping of heterogeneous and mixed virtual and real communication areas, resulting in the global matrix of telecommunication and computer networks.

In addition to the literary and cinematic scenario, the entertainment and gaming industries brought and welcomed significant opportunities and technological developments on this topic. In this regard, Linden Lab's multimedia platform - *Second Life* (launched in 2003) -, allows users to create and control avatars and socially interact within a virtual world, has been described as an antecedent of the Metaverse (Ludlow & Wallace, 2007). The Second Life PC-based application was made available for free, and the world was not pre-populated with content or a narrative storyline given by the world's designers. Rather, it provided a set of content production and communication tools for users, who could build the places, objects, and activities of Second Life both individually and collectively (Jennings & Collins, 2007). Furthermore, residents built virtual items and services to be bought, sold, and swapped with others, also using the "Linden Dollar money system", which could be traded for real US dollars, to help this emerging economy (Kaplan & Haenlein, 2009). The press-reported shady activities within Second Life, as the Ponzi scheme scams using Linden Dollars and excessive freedom with regard to the content that can be created, hampered the full take-off of *Second Life*. Few

years later, other several 3D interactive platforms, such as Roblox and Fortnite, considered as forerunners to the Metaverse (Damar, M., 2021), started to create online spaces with features that allow users to create avatars and engage with other gamers within their own virtual realm (Dwivedi *et al.,* 2022). However, despite the fact that these platforms have been available since the early and mid-2000s and have a huge number of global users, their platform independence and functionality are restricted in the context of the Metaverse.

It was in 2021, with the launch of Horizon Worlds by Meta Platforms, that the concept of how the Metaverse might potentially change the way we work and socialize has fully triggered academics and practitioners' debates and interest. The new Metaverse concept as stated by Mark Zuckerberg, founder and CEO of Facebook, describes "the next evolution of social connection" (Meta, 2022). More specifically, the Metaverse has been described as "a third hybrid dimension in which online and offline complement one another to produce a world "beyond imagination". The project was designed with the goal of distributing more money than has previously been spent in this universe, and it varies from prior projects in that it benefits from users' increased awareness of virtual communication as a result of Covid-19's impact on people's life (Brown, A., 2021). Moreover, the shrinking use of Facebook by younger generations, particularly Gen Z, who prefer to utilize other social networks, prompted Zuckerberg to delve into new technological frontiers.

The use of the Metaverse therefore allows the user to immerse directly into the experience of a virtual 3D world, thus offering companies the possibility of generating significant opportunities for interaction with consumers and thus increasing the number of touchpoints. This type of virtual experience, also defined as "iMOT" or "Imaginary Moment of Truth" (Giorgino & Mazzù, 2018) encompasses all the virtual interactions that the consumer has with the brand through experiences, emotions and needs that are satisfied in overlap with, or in substitution for the real ones, with the same level of satisfaction for the customer. As a result,

the rapid technological change, social change and the proliferation of touchpoints have created the basis for evolving consumer decision-making processes and, in terms of business opportunities, have forced companies to reinvent and innovate (Giorgino & Mazzù, 2018).

Companies are currently examining how the Metaverse may be integrated into their present business models to gain economical and relational value, while users might be more easily intercepted and influenced by new forms of marketing technologies (MarTech) capable of shaping how they act, buy, perceive, work, and interact with others. As a result, several technological tools, designed to be applied simultaneously a high-involvement experience within the Metaverse. Among those, technologies that power the development of this third-dimensional world are growing rapidly, with the usage of VR headsets, haptic gloves, augmented reality (AR), and mixed reality (MR) allowing users to fully enjoy the high levels of engagement and immersive experience.

Drawing on the theoretical framework of Milgram and Kishino (1994), it is possible to distinguish between several types of reality that differ in their level of immersiveness and interaction. At the extremes of the Virtual Continuum, this classification ranges from actual to virtual environments (*See Figure 1*).

**Figure 1. The Reality-Virtuality Continuum (Milgram & Kishino, 1994)**
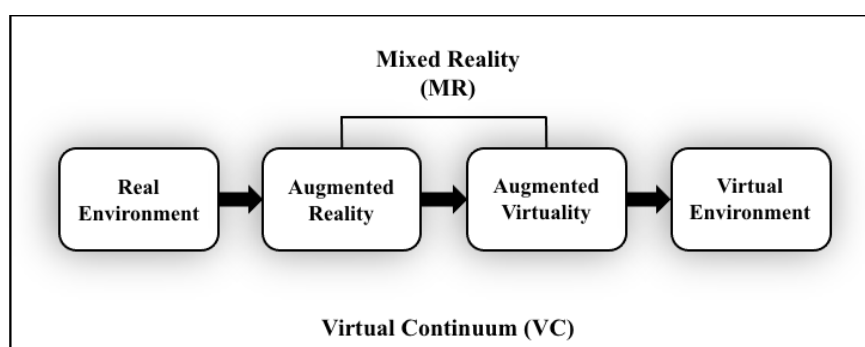
The reality itself as the physical world is described under Real environments (RE). On the other hand, Virtual environments (VE) are fully computer-generated settings in which objects that do not exist in reality are "displayed" on a device and users interact in real time via a technical interface. Within this category, Virtual Worlds (e.g., *Second Life*) are continuous virtual environments that allow users to be re-presented by avatars in order to create, play, and interact in real time with other avatars. The existing realities between these extremes were named Mixed Reality (MR) environments (Flavián *et al.,* 2019). Among those, while Augmented Reality (AR) modifies the user's actual physical surroundings by overlaying virtual elements (e.g.., images, videos, virtual items), the Augmented Virtuality (AV) is characterized by the comprehensive integration of virtual holograms with the actual world, thus overlaying real-world components on virtual settings. Accordingly, while external devices (e.g., computers, smartphones) are required to access augmented reality (AR), head-mounted visors are now indispensable to experience the virtual world. However, research is making more and more strides towards a technological embodiment, with the creation of special imputable devices that allow for a more seamless and immersive experience. Among those, there are the retinal prostheses and bionic vision processing (Durana *et al.,* 2022). Implantable sensors might detect changes in the body's physiological state and adapt the virtual environment, providing the user with a more personalized and responsive experience and further blurring the line between the actual and virtual worlds (Tang *et al.,* 2022).

To date, there are 3 different types of visors: those for PCs/consoles that require special cables to connect; standalone ones that work without any form of connection; and those for smartphones/tablets that require the device to be plugged in. Among these, can be found the HTC Vive Pro, Sony Playstation VR, Meta Quest 2, the HP Reverb G2, with the most popular being Meta's Oculus Quest which is characterized by being a lightweight standalone device (*See Figure 2*). As a result, the more virtuality in the media environment, the more the level of

technological embodiment, the more the feeling of intimacy between technology and the senses, resulting in greater immersive experiences.

Figure 2. Technological embodiment Continuum (Flavián *et al.,* 2019)
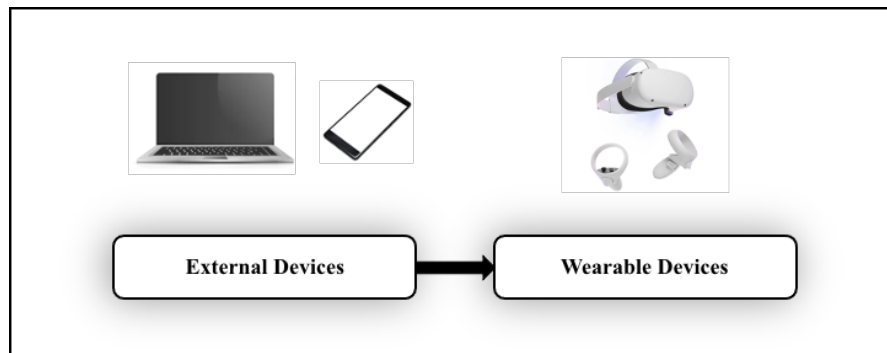
To develop the most comprehensive picture of the Metaverse and its implications, it is useful to analyze the fundamental elements that distinguish it from other digital platforms. First of all, the Metaverse includes the creation of a third-dimension environment. The 3D method has the advantage of increasing realism and thus enhancing users' immersion. On the same hand, immersion is critical for encouraging user interaction in the Metaverse and maintaining a continuous world. A stated by Dwivedi *et al.,* (2022), collaboration and communication are important values for the Metaverse. Avatars can share their experiences, thus creating a new value. Unlike in the actual world, this relationship allows time and place to be crossed. It also provides people with a common goal, allowing the Metaverse to persist as a real community and society. For instance, Metaverse provides access to users from different geographies and it enables them to meet in the same environment. Individuals can connect remotely, in a smoothly and fast way and they can communicate with others from anytime and anywhere (Hwang & Chien, 2022).

Nowadays, the Metaverse is attracting growing curiosity from both businesses and consumers. According to McKinsey (August 2022), internet searches for the term "Metaverse"

surged by 7,200% in 2021 and that over 60% of consumers are thrilled about the shift of ordinary activities like shopping, dating, and working out to the metaverse. On the other side, according to the report, companies related to the Metaverse have raised more than $10 billion, more than doubling what they did in 2020. More than $120 billion was invested in the Metaverse in 2022 and its value-generating potential will rise to $5 trillion by 2030 (Kunthara, S., 2021).

Aside from the positive contributions that the Metaverse can make to several settings (e.g., educational, tourism, entertainment, retail, fashion, luxury) there are significant drawbacks related to its security, transparency, and privacy of users' data (Wang, Y. *et al.,* 2022). More specifically, user identities can be stolen, and interoperability concerns in authenticating between applications in the Metaverse can arise (Inceoglu, M. *et al.,* 2022). When compared to real-world identity authentication, avatar authentication by facial or voice recognition can be more difficult (Tlili, A. *et al.,* 2022). Furthermore, users' privacy including location data, habit, living styles may be violated during the lifecycle of data services (Tran, N. C. *et al.,* 2023). On the other hand, an extended use of Augmented Reality may have repercussion on morality and ethics. Indeed, it could lead to addiction, social isolation and abstinence from real, physical life, often combined with body neglect and anti-social behaviors (Golf-Papez *et al.,* 2022).

The transition to a more contactless society, accelerated by the COVID-19 pandemic, increasingly manifests into activities now being possible into virtual reality. In a context of rapid expansion into numerous fields of application and research streams, the main goal of this paper is to review the extant literature on the Metaverse, framed within the marketing context, and to investigate the results of a bibliometric and co-citation analysis and a systematic literature review.

1.2 Materials and Methods

The methodology utilizes quantitative techniques (i.e., bibliometric analysis) on bibliometric data (e.g., publishing units and citations). In the past few years, bibliometric study has become increasingly prevalent in economic research (Khan *et al.,* 2021; Randhawa *et al.,* 2016) due to two primary factors: (1) the progress and availability of scientific databases such as Scopus and Web of Science, and (2) the application of bibliometric technique from information science to economic research, emphasizing on multidisciplinary approach (Donthu, N. *et al.,* 2021).

Drawing on the guidelines provided by PRISMA, the sources mainly from the Web of Science were used to analyze and study the topic of Metaverse in Marketing, the present study was conducted in three sequential phases.

In the first phase, I searched for articles on Web of Science (WoS) to prepare the dataset useful for the purpose of the research. In the second step, I conducted a bibliometric and co-citation analysis to further analyze the data regarding their relevance to the conducted study and their communalities. Lastly, I conducted a qualitative analysis and review of the papers used to investigate this topic (*See Figure 3*).

Figure 3. Main stages of the research

Data Collection

1. Area and Keywords Searching → Select articles → Extraction from WoS

Bibliometric Analysis

2. Co-citation analysis → Social Network analysis

Qualitative Analysis

3. Analysis of 148 articles
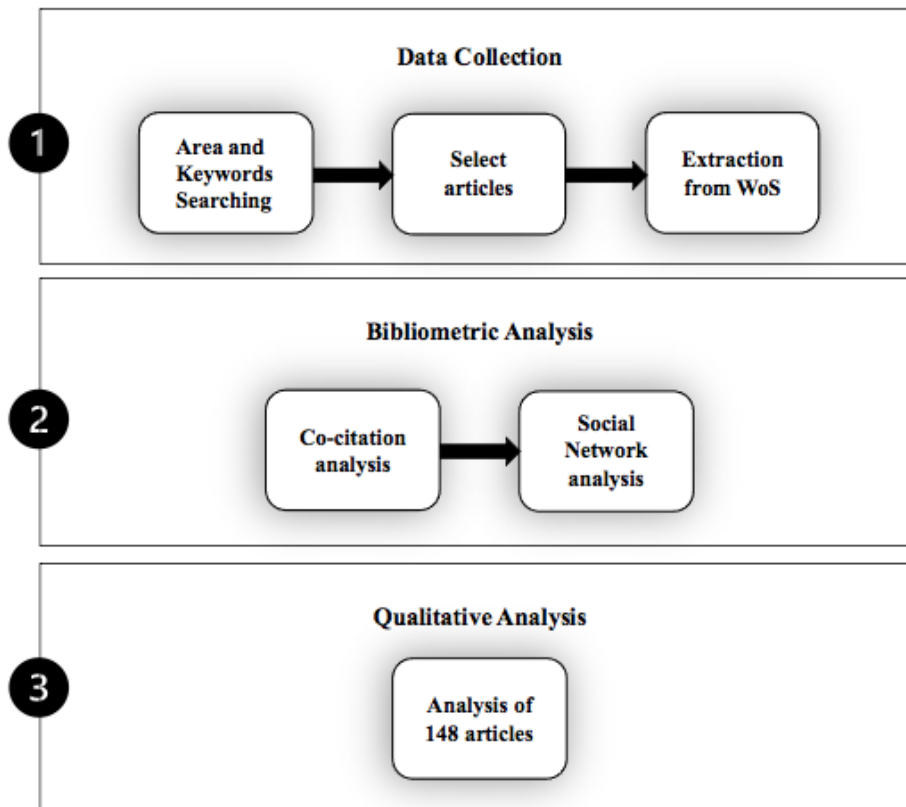
1.2.1 Data Collection

Considering the multifaced nature of the Metaverse, the relevant material has been scattered across various journals. In the present study, Metaverse articles have been initially retrieved in 9 types of journals related to the areas of: (1) Management, (2) Sustainability, (3) Behavioral sciences, (4) Psychology, (5) Marketing, (6) Communication, (7) Business, (8) Economics, (9) Computer Science and Information Systems. The selection excluded journals that only covered computer science and psychology topics. The analysis started with the reduction of the sample of articles by differentiating the area of interest, and moved forward with extensive search through the keywords "Metaverse", and "Marketing" in the title, authors and full texts. Considering the novelty of the Metaverse, the adopted timeframe went towards a 31-year research period from 1992 to 2023. Once the papers by area have been sorted, I collected a total of 1020 articles.

In this perspective, the second step involved a restriction of the initial set. Using the keywords "exact phrase" without narrowing the sources, 252 documents were reported. Among these, 240 were selected after removing those of foreign languages. Subsequently, about 92 publications were removed following a preliminary scan of the titles and abstracts because they were considered to be inconsistent with the research's goal. This phase led to the selection of 148 papers, which poses the basis of the analysis. *Figure 4* summarizes the steps of the article identification process.

Figure 4. Selection of articles
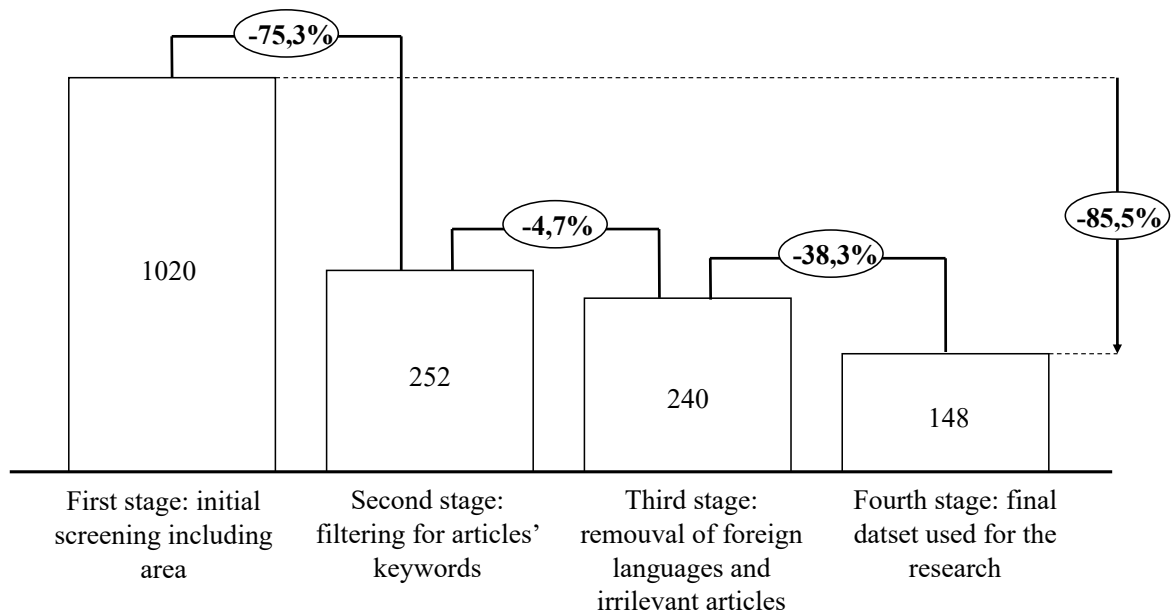
1.2.2 Data analysis

The bibliometric analysis was carried out with R (bibliometrix package). The analysis of the extant literature on Metaverse focused on: (1) year of publication; (2) names and the numbers of authors; (3) the type of study; (4) the analysis carried out; and (5) the co-citation networks.

The co-citation networks were built out using Louvain method (Blondel *et al.,* 2008) for community detection, which tries to optimize the modularity of a network's subcomponent. As

a result, the density of a subcomponent is greater than the total density of the network. In other words, compared to the degree of connections with members outside of their community and the entire network, the nodes connected in a community rely on the highest degree of connections. The membership of a certain network is determined by the ties that exist between one author and another, meaning the number of times they are mentioned. The authors that mention each other the most are from the same network component; otherwise, they are from distinct clusters. In the following sections, I will refer to each observed network as co-citation network 1, 2, 3, and 4. Following the qualitative analysis detailed above, which highlighted the primary theoretical evidence by extrapolating the most relevant subjects, the following chapter will proceed to perform a quantitative analysis of our research data.

1.3 Results

1.3.1 Quantitative Findings

The 148 papers analyzed originate from 74 different sources. Since the timeframe goes from 2008 to 2023, an increasing focus on the topic over the years has been recorded, with a recent peak of interest in 2015 and 2022, and with an average annual growth rate equal to 19.2%.

Of the above mentioned 148 papers, 114 were articles, 8 were literature reviews, 12 were proceedings papers and the rest were editorial material. In addition, the analysis involves 394 authors, with an average of 2.9 authors per paper and 33 single-authored documents. On average, each document was cited 4.97, and the overall number of references reported by all documents in the dataset equals 7274. The most-cited article was written by Papagiannidis *et al.,* 2008, followed by Bourlakis *et al.,* 2009 and Rauschnabel *et al.,* 2022 (*See Table 1*).

Table 1. Most-cited articles (Web of Science)

Paper	DOI	Total Citations	TC per Year
PAPAGIANNIDIS S, 2008, TECHNOL FORECAST SOC CHANG	10.1016/j.techfore.2007.04.007	78	4,88
BOURLAKIS M, 2009, ELECTRON COMMER RES	10.1007/s10660-009-9030-8	49	3,27
RAUSCHNABEL PA, 2022, J BUS RES	10.1016/j.jbusres.2021.12.084	34	17,00
GURSOY D, 2022, J HOSP MARKET MANAG	10.1080/19368623.2022.2072504	26	13,00
KRAUS S, 2022, INT J ENTREP BEHAV RES	10.1108/IJEBR-12-2021-0984	26	13,00
GADALLA E, 2013, J MARKET MANAG	10.1080/0267257X.2013.835742	22	2,00
LEE HJ, 2022, SUSTAINABILITY-a	10.3390/su14084786	21	10,50
HASSOUNEH D, 2015, J ELECTRON COMMER RES	NA	20	2,22
PAMUCAR D, 2022, TECHNOL FORECAST SOC CHANG	10.1016/j.techfore.2022.121778	17	8,50
ZHOU M, 2018, TECHNOVATION	10.1016/j.technovation.2018.06.002	16	2,67

The most relevant journals on the topic are Psychology and Marketing, Journal of gaming and virtual worlds, Internet Research and International Journal of Contemporary Hospitality Management (*See Figure 5*). Similarly, the most cited authors are depicted in Figure 6.

Figure 5. The most-cited sources, 2008-2023
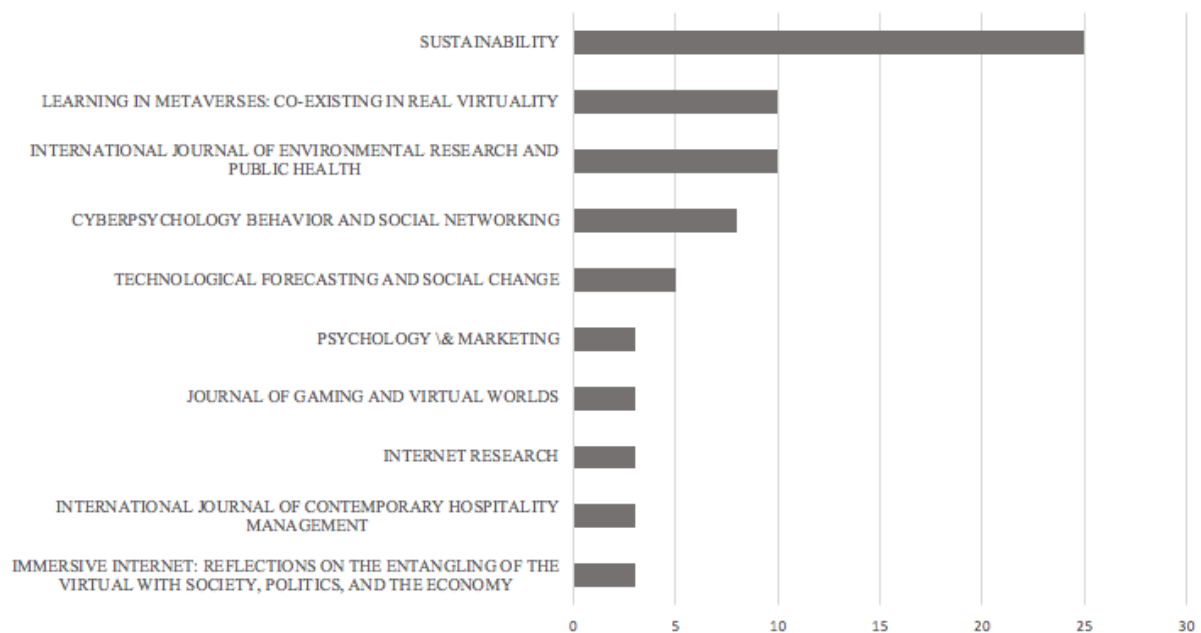
Figure 6. The most-cited authors, 2008-2023
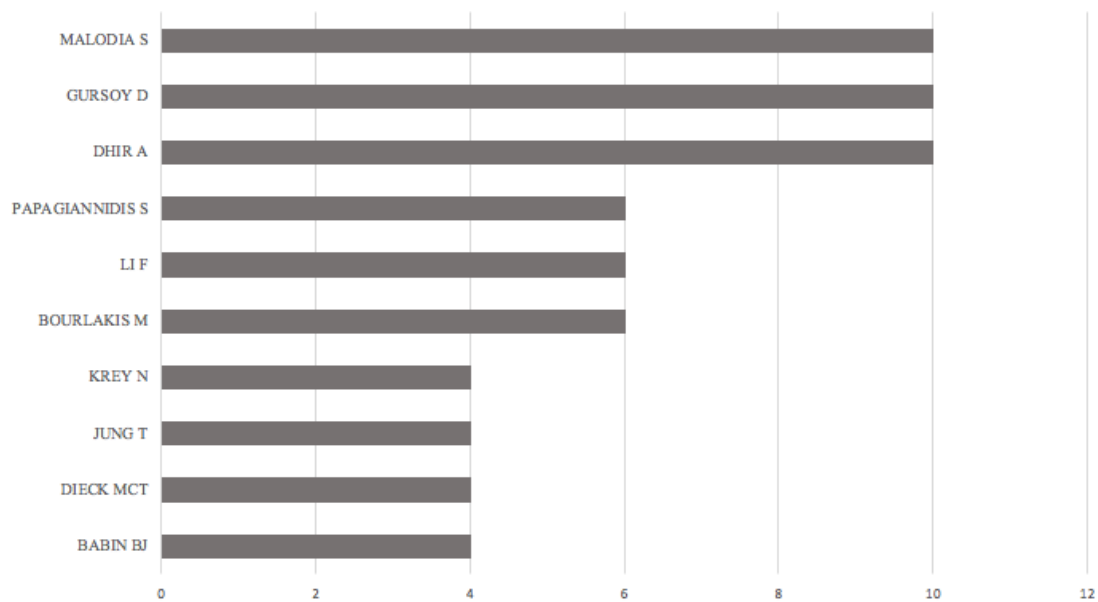
The most prolific countries are the UK, with 40 documents and 173 citations, USA with 61 documents and 93 citations, and South Korea, with 72 documents and 78 citations. Similarly, the most collaborative countries are UK, USA and South Korea (*See Table 2*).

Table 2. Most prolific countries and the number of citations, 2008-2023

Country	Frequency	Total Citation
UNITED KINGDOM	40	173
USA	61	93
SOUTH KOREA	72	78
GERMANY	22	51
ITALY	27	38
FINLAND	17	31
CHINA	69	29
NORWAY	7	26
AUSTRALIA	19	25
ISRAEL	9	20

CANADA	9	15
NETHERLANDS	5	11
INDIA	13	8
FRANCE	11	4
POLAND	2	4
THAILAND	5	3
SWEDEN	5	1
BRAZIL	38	0
DENMARK	3	0
IRELAND	5	0

1.3.2 Co-Citation Analysis and Qualitative Findings

Subsequently, a co-citation analysis was conducted to further investigate whether relevant correlations exist among authors. A total of 4 co-citation networks emerged. Each cluster focuses on a specific topic with implications on the business area. According to the analysis carried out, clusters can be grouped into the following categories: Augmented and Virtual reality, Metaverse, Customer Experience, Marketing Technology using Metaverse. The dataset was framed into the various clusters through the analysis of betweenness, closeness and PageRank values.

Co-Citation Network 1

The emergence of Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) technologies is leading to the creation of a new environment that blends physical and virtual objects (Flavián, C. *et al.,* 2019). Indeed, both VR and AR technologies are key components in the development of the Metaverse (Mystakidis, 2022). While VR provides a fully immersive environment, AR can be used to overlay digital content into the real world, thus creating the basis for an immersive and mixed reality experiences.

For instance, according to this first clustering of authors, it emerged that works focused on exploring the multifaced nature of virtual and augmented reality and their implications on the consumer experience (*Table 3 and 4*). This network encompasses many areas of management and psychology, with possible solutions and improvements for company management procedures as customers' interactions and decision-making processes. As a result, also demonstrated by Heller, J. *et al.,* (2019), advances in technology, including the use of virtual and augmented reality, are rapidly transforming the ways in which retailers connect with their customers. Indeed, Virtual Reality provides a digitally enhanced vision of reality, combining it with information and images to aid decision-making. At the very beginning of this stream of studies, Steuer, J *et al.,* (1992) and Lombard, M. *et al.,* (1997) highlighted the capability of these emerging technologies to provide consumers with a mediated experience that has never been possible before by using traditional media such as radio, television, film (Lombard & Ditton, 1997). More specifically, they recognized the necessity to explore the effects of the sense of telepresence and interactivity infused by Virtual and Augmented Reality. The term *telepresence* refers to experience of presence in an environment by means of a communication medium (Steuer *et al.,* 1992). Accordingly, given the combination of multisensory stimuli conveyed in the mediated environment, this influences the ways in which customers communicate with each other and with the environment, thus enhancing their interactivity (Hilken *et al.,* 2017). Indeed, VR and AR technologies hold special potential through their engrossing immersiveness that may promote not just the transfer of information but also feelings and experiences (Heller *et al.,* 2019). As stated by Steuer *et al.,* 1992, the virtual space provides a more immersive and interactive experience through a high degree of media richness and visual vividness that allows it to transmit a great amount of information and thus enhances engagement and enjoyment. As a result, when a state of telepresence is created in a persuasive communication strategy, marketers may expect consumers to develop more intense attitudes

and beliefs towards products and their functional and emotional attributes (Lombard & Ditton, 1997). In this regard, a parallel stream of research became relevant in the Virtual and Augmented Reality literature, showing that particularly physical interaction with an offering evokes affective reactions in form of pleasure and improves the customer's ability to evaluate the offering. Driving on this, Hilken, T. *et al.,* (2017) confirmed that many firms pursued strategies of service augmentation to enhance customers' online service experiences. Within the marketing discipline, these reality-virtuality technologies have the potential to significantly impact customer experience, which is defined as "the customer's cognitive, emotional, behavioral, sensorial, and social responses to a firm's offerings throughout the customer's entire purchase journey" (Lemon & Verhoef, 2016). This is another reason why much research has focused on this background (Flavián, C. *et al.,* 2019).

Consumers interact with companies at many stages of their decision-making (before, during, and after purchase), and these sensory, emotive, behavioral, and intellectual sub-experiences create the fundamental customer purchase experience. Technology integration in companies' brand value telling journey is especially significant because firms may provide their customers with new value propositions to build ideal customer experiences by combining virtual and physical touchpoints. As a result, the combination of reality-virtual reality technology allows customers to play a more dynamic and autonomous part in their experiences, resulting in a higher perception of value. This technology's persuasive effectiveness stems from its ability to overcome its intangibility and enhance buyers' confidence prior to actually seeing the products. Furthermore, Virtual Reality technologies are fictitious experiences that cannot elicit the same emotions that a physical setting does; hence, they should not be viewed as a replacement for the real experience, but rather as a valuable complement to the consumer experience.

Table 3. Composition of co-citation network 1 in terms of authors, articles, year and citation

Id	Authors	Articles	Years	Citation
1	Steuer, J., Biocca, F., & Levy, M. R.	Defining virtual reality: Dimensions determining telepresence. Communication in the age of virtual reality	1992	8197
2	Lombard, M., & Ditton, T	At the heart of it all: The concept of presence. Journal of computer-mediated communication	1997	5517
3	Lemon, K. N., & Verhoef, P. C.	Understanding customer experience throughout the customer journey.	2016	4802
4	Hilken, T., de Ruyter, K., Chylinski, M., Mahr, D., & Keeling, D. I.	Augmenting the eye of the beholder: exploring the strategic potential of augmented reality to enhance online service experiences	2017	405
5	Heller, J., Chylinski, M., de Ruyter, K., Mahr, D., & Keeling, D. I.	Let me imagine that for you: Transforming the retail frontline through augmenting customer mental imagery ability.	2019	166
6	Flavián, C., Ibáñez-Sánchez, S., & Orús, C.	The impact of virtual, augmented and mixed reality technologies on the customer experience	2019	814

Table 4. The relative strength of nodes within the co-citation network

Node	Co-Citation Network	Betweenness	Closeness	PageRank
heller j 2019	1	25,2790	0,0045	0,0293
lombard m. 1997	1	66,0000	0,0048	0,0093
steuer j 1992	1	47,0000	0,0025	0,0275
flavian c 2019	1	13,2738	0,0025	0,0150
hilken t 2017	1	21,2971	0,0045	0,0270
lemon kn 2016	1	5,0000	0,0024	0,0122

Co-Citation Network 2

In co-citation network 2, the authors focused primarily on the Metaverse, a specific use of virtual reality, framing the main characteristics of the 3D environment in which interaction takes place, the types of relationships in the 3D media environment, and the data protection methods used in the Metaverse (*Table 5 and 6*). Differently from the co-citation network 1, these authors belong to the last stage of the literature on virtual and augmented reality, in the timeframe that goes from 2019 to 2022. For this reason, these authors focus on explaining the relevance of this already well-known topic, exploring some of its possible practical applications in specific industries as tourism and hospitality management.

Across the multiple definitions, the common features of the Metaverse appear to be the continuity (or persistence) of identity and objects, a shared environment, the use of avatars (or embodied self), synchronization, being three-dimensional (or virtual), interoperability, and an interactive, immersive, and social user experience (Kim *et al.,* 2021). In addition, prior research has argued that the Metaverse definitions should be categorized into four types: environment, interface, interaction and social value (Dwivedi, Y. K. *et al.,* 2022). The Metaverse environment is a fused environment which encompasses elements of both realistic and unrealistic settings (Dwivedi, Y. K. *et al.,* 2021) allowing for the sharing of a 3D virtual world that, in turn, leads to an increased immersion (Narin *et al.,* 2021), interaction and participation of the final customers (Ball *et al.,* 2021). Furthermore, as stated by Kraus *et al.,* (2022), the metaverse context exists in both the present and the future as an accumulation of various technologies that will be created during the next decade. As a result, Meta envisions the metaverse as the mobile Internet's successor, with a sizable market and strong adoption potential in various fields of application (Dwivedi, Y. K. *et al.,* 2022).

Accordingly, Gursoy, D. *et al.,* (2022) posited that humanity's collective experiences with COVID-19-related lockdowns and social distancing regulations, as well as the resulting feelings of detachment and loneliness, have accelerated the collective imagination around the development of an alternate reality. For instance, the opportunity for organizations to adapt their business models and operational capability to operate in the Metaverse has increased over the past few years, with revolutionary implications for marketing, advertising, tourism, leisure and hospitality, citizen-government interaction, health, education, and social networks.

With a focus on tourism and hospitality management, Gursoy, D. *et al.,* (2022) and Buhalis, D. *et al.,* (2019) added that, before monetizing the Metaverse, hospitality and tourism companies should design immersive experiences that people perceive to be valuable and for which they are willing to pay. In other words, instead of engaging audiences with current fashionable technological trends, travel companies should envision their brands as technology-driven platforms for improving customer experience and value co-creation. For instance, it has been proved that, through the Metaverse, people are allowed to virtually experience flights, hotel rooms, cooking and food preparation in restaurants, tours, conferences, meetings, and conventions in advance (Buhalis, D. *et al.,* (2019). Consequently, companies should make an effort to provide clients with a "try before you buy" feature that allows them to explore hotel and restaurant interiors, tourist sites, flights, and other services of interest from the comfort of their own homes. Drawing on this, the Metaverse experience journey must be a "stream of engagement" in which users may interact with the Metaverse-scape and have unique experiences, enriching, at the same time, the brand value telling journey of organizations. Indeed, the creation of virtual interactions is able to shape feelings and experiences, as well as fulfill needs that frequently overlap or replace real ones (Giorgino & Mazzù, 2018). For example, focusing on the promotion side, companies should work with the Metaverse to create

digital twinning of destinations and resorts and to enhance the augmented physical experience (Gursoy, D. *et al.,* 2022).

However, significant areas of concern have been highlighted in studies relating to ethics, data security, legislation, and safety, as well as the possible negative psychological impact on vulnerable people of society (Golf-Papez, M. *et al.,* 2022). Users in established sections of the Metaverse are claiming an increase in offensive and undesired behavior, including as user harassment, sexualization of avatar interactions, data exploitation, and unregulated gambling. Metaverse systems have access to all biometric information of participants, including eye movement, hand gestures, and other stored information, posing security and data manipulation issues (Dwivedi, Y. K. *et al.,* 2022). Moreover, since the metaverse is an open platform, there have been instances of cyberbullying of users (Frenkel & Browning, 2021).

Table 5. Composition of co-citation network 2 in terms of authors, articles, year and citation

Id	Authors	Articles	Years	Citation
1	Buhalis, D., Harwood, T., Bogicevic, V., Viglia, G., Beldona, S., & Hofacker, C.	Technological disruptions in services: lessons from tourism and hospitality	2019	518
2	Ball, M.	The Metaverse: What It Is. Where to Find It, Who Will Build It, and Fortnite	2020	89
3	Kim, J.	Advertising in the metaverse: Research agenda.	2021	197
4	Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... & Williams, M. D.	Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy.	2021	964
5	Narin, N. G.	A content analysis of the metaverse articles.	2021	88
6	Golf-Papez, M., Heller, J., Hilken, T., Chylinski, M., de Ruyter, K., Keeling, D. I., & Mahr, D.	Embracing falsity through the metaverse: The case of synthetic customer experiences.	2022	32

7	Kraus, S., Kanbach, D. K., Krysta, P. M., Steinhoff, M. M., & Tomini, N.	Facebook and the creation of the metaverse: radical business model innovation or incremental transformation?	2022	152
8	Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M., ... & Wamba, S. F.	Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy.	2022	201
9	Gursoy, D., Malodia, S., & Dhir, A.	The metaverse in the hospitality and tourism industry: An overview of current trends and future research directions	2022	89

Table 6. The relative strength of nodes within the co-citation network

Node	Co-Citation Network	Betweenness	Closeness	PageRank
gursoy d 2022	2	247,3191	0,0056	0,0347
kim j. 2021	2	237,6348	0,0053	0,0223
buhalis d. 2022	2	1,2449	0,0040	0,0254
ball m. 2021	2	0,0000	0,0047	0,0074
buhalis d 2019	2	19,9066	0,0027	0,0198
kanbach dominik 2022	2	0,0000	0,0025	0,0074
dwivedi yk 2021	2	12,4578	0,0027	0,0161
hilken t 2022	2	0,0000	0,0025	0,0079
narin n.g.a. 2021	2	6,3534	0,0049	0,0151

Co-Citation Network 3

The third network represents the largest group in our dataset as it refers to the topic of Metaverse and its related technologies as tool in business management. More specifically, the works and studies included in this cluster mainly focus on framing the use of Metaverse and Virtual and Augmented reality in educational and organizational settings. For instance, a set of articles that compared the effectiveness of Metaverse in terms of learning tool emerged in this network (*Tables 7 and 8*).

The first contribution comes from the study conducted by Daft and Lengel *et al.,* (1986), which established the basis of organizational information processing and the role of media richness in the transmission of data. In particular, they argued that communication media vary the capacity to process rich information. The reason for richness differences lie in the medium's capacity of immediate feedback, the number of cues, personalization and language variety (Daft & Lengel, 1986). As a result, it has been found that face-to-face media provides multiple cues via body language and tone of voice, thus providing individuals' capacity to process complex and subjective messages. Drawing on this, extant research (Mystakidis, S. *et al.,* 2022; Kye, B. *et al.,* 2021) also showed the positive influence of the Metaverse and Virtual and Augmented reality on individuals' task comprehension and achievements. Indeed, high tech tools quality leads to meaningful learning and in depth understanding of the exposed topic. In other words, the use of Metaverse in individuals' education has the potential to improve not only their conceptual understanding and knowledge but, also, important skills, such as problem-solving, collaboration, and communication. Similarly, from an industry point of view, Hwang, G. J. *et al.,* (2022) demonstrated that employing the Metaverse as an educational environment implies the potential to perceive learning designs from new perspectives. According to his research, the Metaverse is today recognized as being the next generation of a skill practicing environment. For instance, in the Metaverse realm people can engage in social activities such as sharing subjective knowledge, discussing an issue, cooperating on a project, playing games, and learning through experiencing or solving various problems (Kye *et al.,* 2021). Accordingly, Ning, H. *et al.,* (2021) also stated that the Metaverse has several possible applications in education, including medical, nursing, and healthcare education, science education, military training, manufacturing training, and language learning. Moreover, the Metaverse provides greater viable alternatives for learners to experience, explore, learn, and teach in a new world, as well as work and communicate with others (Hwang & Chien, 2022).

Dionisio, J. D. N. *et al.,* (2013) revealed that the Metaverse, with its various features, tool and information processing capacity, is empowering marketers and brands to deliver offerings that are impossible in the real world. As the laws of nature do not apply to the virtual world, marketers can be highly imaginative and creative and provide unique products beyond the real world.

Dwivedi, Y. K. *et al.,* (2023) argued that the Metaverse offers unique opportunities and experiences for consumers that are allowed to directly interact with brands and to experience shopping as a grand adventure through a hyper-personalized experience in the comfort of their personal space. In line with this, marketers must also be careful about specific issues about branding and communication. In this context, the advertising process in the Metaverse is modeled as an experiential, interactive, and triadic relationship between the consumer (i.e., personal), media (i.e., environment), and engagement (i.e., behavior) (Kim, J. *et al.,* 2022). Therefore, when communicating a message with an educational purpose (i.e., sustainable consumptions) in the Metaverse, brands have to focus their efforts on sharing the same message and brand personality they have in the real world to be always aligned between the two worlds, thus avoiding alteration of values and reputation and losses of loyal customers. Accordingly, the Metaverse, with its educational potential and strategic tools, can also help in effectively measuring and evaluating the performance of brand campaigns and provide insights for further improvements.

Table 7. Composition of co-citation network 3 in terms of authors, articles, year and citation

Id	Authors	Articles	Years	Citation
1	Daft, R. L., & Lengel, R. H.	Organizational information requirements, media richness and structural design	1986	14143
2	Jaynes, C., Seales, W. B., Calvert, K., Fei, Z., & Griffioen, J.	The Metaverse: a networked collection of inexpensive, self-configuring, immersive environments	2003	115

3	Davis, A., Murphy, J., Owens, D., Khazanchi, D., & Zigurs, I.	Avatars, people, and virtual worlds: Foundations for research in metaverses	2009	477
4	Dionisio, J. D. N., III, W. G. B., & Gilbert, R	3D virtual worlds and the metaverse: Current status and future possibilities	2013	547
5	Kye, B., Han, N., Kim, E., Park, Y., & Jo, S.	Educational applications of metaverse: possibilities and limitations	2021	251
6	Duan, H., Li, J., Fan, S., Lin, Z., Wu, X., & Cai, W.	Metaverse for social good: A university campus prototype	2021	381
7	Ning, H., Wang, H., Lin, Y., Wang, W., Dhelim, S., Farha, F., ... & Daneshmand, M.	A Survey on Metaverse: the State-of-the-art, Technologies, Applications, and Challenges	2021	203
8	Lee, L. H., Braud, T., Zhou, P., Wang, L., Xu, D., Lin, Z., ... & Hui, P.	All one needs to know about metaverse: A complete survey on technological singularity, virtual ecosystem, and research agenda	2021	552
9	Mystakidis, S., Christopoulos, A., & Pellas, N.	A systematic mapping review of augmented reality applications to support STEM learning in higher education	2022	87
10	Tlili, A., Huang, R., Shehata, B., Liu, D., Zhao, J., Metwally, A. H. S., ... & Burgos, D.	Is Metaverse in education a blessing or a curse: a combined content and bibliometric analysis	2022	76
11	Lee, J., Lee, T. S., Lee, S., Jang, J., Yoo, S., Choi, Y., & Park, Y. R.	Development and application of a metaverse-based social skills training program for children with autism spectrum disorder to improve social interaction: protocol for a randomized controlled trial	2022	14
12	Hwang, G. J., & Chien, S. Y.	Definition, roles, and potential research issues of the metaverse in education: An artificial intelligence perspective	2022	129
13	Allam, Z., Sharifi, A., Bibri, S. E., Jones, D. S., & Krogstie, J.	The metaverse as a virtual form of smart cities: Opportunities and challenges for environmental, economic, and social sustainability in urban futures	2022	55

14	Bibri, S. E., Allam, Z., & Krogstie, J.	The Metaverse as a virtual form of data-driven smart urbanism: platformization and its underlying processes, institutional dimensions, and disruptive impacts	2022	27
15	Zhou, K., Yang, J., Loy, C. C., & Liu, Z.	Learning to prompt for vision-language models	2022	300

Table 8. The relative strength of nodes within the co-citation network

Node	Co-Citation Network	Betweenness	Closeness	PageRank
mystakidis s. 2022	3	745,1044	0,0050	0,0490
dionisio jdn 2013	3	170,2822	0,0048	0,0406
kye b 2021	3	0,2727	0,0027	0,0265
shehata boulus 2022	3	429,2720	0,0047	0,0257
duan h. 2021	3	399,4506	0,0044	0,0210
lee j 2022	3	0,1333	0,0027	0,0128
davis a 2009	3	0,2000	0,0027	0,0189
jaynes c. 2003	3	0,0000	0,0026	0,0223
ning h. 2021	3	24,0000	0,0026	0,0127
allam z 2022	3	0,0000	0,0045	0,0108
bibri se 2022	3	0,5634	0,0045	0,0103
daft rl 1986	3	0,0000	0,0025	0,0098
hevner ar 2004	3	0,0000	0,0023	0,0047
lee l.-h. 2021	3	0,8500	0,0028	0,0253
liu z 2022	3	0,1818	0,0027	0,0161

Co-Citation Network 4

In the last co-citation network, studies are mostly related to the evolution of retail platforms. The most frequent topics analyzed are related to the managerial and marketing implementation and shortcomings of the Metaverse retailing (MR), as customers' confusion and implementation's adversity (*Tables 9 and 10*).

The study conducted by Bourlakis, M. *et al.,* (2009) highlighted that the nature of the economy has shifted from an industrial-based to an information-oriented economy, as evidenced by the considerable and quickly rising informational (intangible) components of our products, services, and manufacturing processes. This intangible part of the economy, often known as information, knowledge, or intelligence, has become the most significant resource on which the efficiency and competitiveness of all organizations rely. As a result, organizations should, and must do things differently in order to survive and succeed in this new economy.

Gadalla, E. *et al.,* (2013) evidenced the shift between brick-and-mortar stores, e-retailing and Metaverse retailing by outlining the main changes that our economy has faced over the years. Among these, retail in the Metaverse differs from the more typical 2D world (i.e., e-retailing) for specific features and for its purpose. The 2D context is a website that provides an aesthetic and easily accessible 2D experience to the user by utilizing a collection of 2D web pages comprising texts, photographs, and various forms of multi-media assets. Retailing in the Collaborative Virtual Environment is referred to as Metaverse Retailing by Bourlakis *et al.,* (2009), and it entails selling virtual goods and services to ultimate consumers for personal or business usage. Accordingly, few years later Dwivedi, Y. K. *et al.,* (2023) confirmed that, as the Metaverse evolves and potentially shifts into a fully immersive mixed and augmented reality ecosystem, it may provide a potential evolution for brands and marketers to strengthen their relationships with consumers by delivering new levels of customer interaction and engagement.

The new multi-space retail environment necessitates an omnipresent approach to retail, forcing businesses to employ a variety of promotional strategies and technologies to reach consumers at any time and from any location (both online and offline). Handling each space independently may not be a practical choice, since the connectivity of spaces gives the most appealing opportunities. This was already proved when the first two places, physical and

online, came together, allowing retailers opportunities to explore synergies (Bourlakis *et al.,* 2009).

Moreover, Metaverse retailing products range from virtual digital (e.g., avatar accessories, skin color, hair) to digital for offline (e.g., music) to purchasing actual items for use in real life (e.g., books and clothing). Drawing on Popescu, G. H. *et al.,* (2022) it has been defined some marketing strategies to implement the Metaverse retailing within extant organizations. Among those, conversational artificial intelligence, visual imagery, and customer experience analytics should be harnessed in livestreaming e-commerce across 3D immersive environments during digital shopping journeys. More specifically, Dawson, A. *et al.,* (2022) confirmed that digital shopping paths in experiential shops promote virtual assets and lead to personalized user experiences, increasing brand awareness and optimizing customer relationship management (CRM). In turn, the customer relationship management and engagement tools should optimize multi-person virtual experiences through data mining techniques, modelling customer behaviors during immersive shopping experiences, which characterize Metaverse engagement. On the other hand, virtual worlds, on the other hand, have a variety of constraints. Second Life, for example, adds an additional layer of technological sophistication that, although it may improve the experience of many customers, may confuse others. Another issue lies in the design of three-dimensional representations of often thousands of products that would be very time-consuming and costly.

Table 9. Composition of co-citation network 4 in terms of authors, articles, year and citation

Id	Authors	Articles	Years	Citation
1	Bourlakis, M., Papagiannidis, S., & Li, F.	Retail spatial evolution: paving the way from traditional to metaverse retailing	2009	153

2	Dawson, A.	Data-driven consumer engagement, virtual immersive shopping experiences, and blockchain-based digital assets in the retail metaverse	2022	21
3	Popescu, G. H., Valaskova, K., & Horak, J.	Augmented reality shopping experiences, retail business analytics, and machine vision algorithms in the virtual economy of the metaverse	2022	20
4	Gadalla, E., Keeling, K., & Abosag, I.	Metaverse-retail service quality: A future framework for retail service quality in the 3D internet	2013	81
5	Park, S. M., & Kim, Y. G.	A metaverse: taxonomy, components, applications, and open challenges	2022	462
6	Dwivedi, Y. K., Hughes, L., Wang, Y., Alalwan, A. A., Ahn, S. J., Balakrishnan, J., ... & Wirtz, J.	Metaverse marketing: How the metaverse will shape the future of consumer research and practice	2023	16

Table 10. The relative strength of nodes within the co-citation network

Node	Co-Citation Network	Betweenness	Closeness	PageRank
bourlakis m 2009	4	173,1765	0,0047	0,0085
buhalis d 2023	4	588,6649	0,0048	0,0207
gadalla e 2013	4	0,6580	0,0044	0,0163
dawson a 2022	4	0,8744	0,0045	0,0132
popescu gh 2022	4	1,1224	0,0028	0,0270
park s.-m. 2022	4	126,9136	0,0055	0,0583

1.3.3 Network analysis

As mentioned above, I utilized R software (bibliometrix and biblioshiny) and Web of Science to carry the analysis of the co-citation networks. The 3 variables taken into account to construct the different clusters were: (1) Betweenness, (2) Closeness, and (3) PageRank. Betweenness centrality measures the extent to which a particular node (e.g., a paper, author, or journal) lies on the shortest paths between other nodes in a network of citations. Closeness

centrality measures the average distance between a node and all other nodes in a network (Hirsch, J. E., 2005). PageRank, which was originally developed by Google to rank websites, is a measure of the relative importance of a node based on the number and importance of other nodes that link to it (Van Raan, A. F., 2005).

Table 11. Correlation analysis with network measures

Variable	Betweenness Centrality	Closeness Centrality	Page Rank
Betweenness Centrality			
Closeness Centrality	.031*		
PageRank	.006**	<.001**	
H Index	.006**	.008**	.007**

Correlation is significant at the 0.05 level (2-tailed).
*Correlation is significant at the 0.01 level (2-tailed).***

As shown in *Table 11*, the correlation analysis highlights positive relation between the betweenness centrality, closeness centrality, PageRank and H-index, indicating that those more central in the network have a higher likelihood of influencing other authors. More specifically, the positive relationship between the H-index and the closeness centrality metric shows that users who have a lower average distance to all other vertices in the network (i.e., are close to other nodes) are more influential and impactful. Similarly, authors who are connected to the shortest paths between two vertices are more likely to control communication since multiple linkages connect through those paths.

Figure 7. Co-occurrence network (Web of Science)
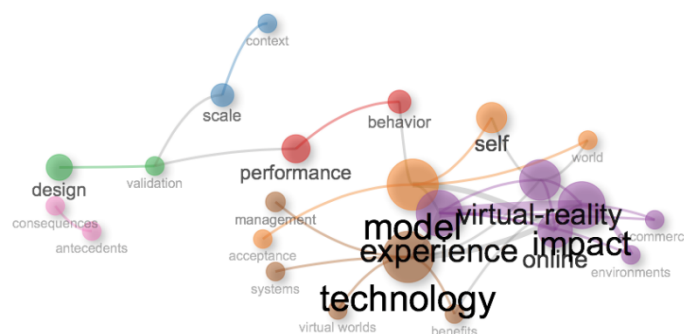
Furthermore, in line with the co-occurrence network, the main topics that were divided into the various networks are those illustrated in *Figure 7*. In particular, the most important and discussed were: (1) the use of high technology (2) the advent of virtual reality (3) performance and managerial implications of using this type of technology.

The goal of this further research was to analyze, categorize, and refine what had been the scientific evidence of the publications that had built up our starting dataset thus far in terms of themes, areas of belonging, and probable practical applications in the field of marketing and management. In fact, the second phase of the co-citation analysis focused on the potential application of the theoretical evidence discovered throughout our research, in order to lay the groundwork for future research or possible implementation.

1.4 General Discussion

Over the past years, technological advancement has significantly altered and modified people's perceptions of the physical world, human contact, and the enjoyment of experiences and consumer products in recent years. Prior research also identified the social environment as one of the major aspects impacting consumer experience and decision journeys (Verhoef *et al.,* 2009). Accordingly, the 3D interactive environment provided by the Metaverse can impact an individual customer's decision-making process at various phases, and, reciprocally, influence the way business in different industries are conducted (Hamilton *et al.,* 2021)

The role of the technology in supporting fluid interaction between customers and brands is becoming crucial and related to a virtual dimension, which can create new touchpoints and opportunities for stakeholders. For instance, technology tools enable a more sophisticated utilization of products and services inside sensorial, and immersive realities, capable of enhancing the perceptual impact of goods and enriching the user-experience.

Today, immersive experiences serve as a link between supply (on the business side) and demand (on the consumer side). Technologies are essential means of bridging the gap between parties and increasing the value and impact of the experiences themselves. Furthermore, experiential marketing has become a necessary and often mandatory business orientation for brands seeking to create value for consumers in the digital age, and the Metaverse is the means of action.

This research contributes to the current research stream in marketing on the Metaverse by structuring and refining the existing literature in the perspective of both researchers and managers, providing practical insights in multiple domains, and proposing a tentative research agenda for future contributions in this field. The networks described in the preceding paragraphs demonstrates that the Metaverse is an unusual example of a universe that provides a strong sensation of possibly totalizing immersion that can be applied in several diverse domains. Moreover, its pace of development, the players involved, the huge investments, and some forecast analyses all contribute to significant and positive prospects for the future of a phenomenon that has received little attention in the literature and is sometimes only superficially understood. For instance, even though the concept of the Metaverse has gone through several years of research, few contributions from the experiential literature arose. It is no accident, then, that the majority of available research on the macro-concept concern an examination of a theoretical type, beneficial for the construction of a definitional framework, as well as a collection of reflections on the phenomenon's evolution over time.

Overall, this research identifies four different co-citation networks, framed in a marketing perspective, that present a relevant potential in terms of research on Metaverse and differ in terms of potential impact on sectors and individual companies practices in advertising, retail, tourism and hospitality and education sectors emerged. While some networks appear to be more consolidated in the literature, such as co-citation networks 1 and 2, which have focused

on the origins and theoretical explanations of Virtual, Augmented reality and the Metaverse, other more fragmented clusters concern the use of marketing technologies (MarTech) in supporting the Metaverse's diffusion in diverse fields such as education, advertising, retail, hospitality luxury, and fashion. More in detail, while from the first co-citation network revealed possible ideas and enhancements for firm management procedures such as customer interactions and decision-making processes, the second cluster focused on the exploration of the Metaverse's experiential journey as a "stream of engagement" in which users can interact with the Metaverse-scape and enjoy unique experiences, while at the same time enriching the organizations' brand value telling journey. Accordingly, with a focus on hospitality management, it has been proved that travel companies should envision their brands as technology-driven platforms for improving customer experience and value co-creation (Gursoy, D. *et al.,* 2022; Buhalis, D. *et al.,* 2019).

Other investigations, as for the co-citation networks 3 and 4, mainly focused on understanding the factors that drive the comprehension of the Metaverse and its applicability in other settings such as education, advertising and retailing. Similarly, other contributions dared to explore untrodden paths, creating the basis for alternative viewpoints, developing complementary conceptual frameworks to enhance consumer decision-making pathways towards the use and integration of the Metaverse, which support informed decisions towards sustainable choices (Kim, J. *et al.,* 2022; Laukkanen *et al.,* 2022).

1.4.1 Directions for Future Research

As a whole, the Metaverse is a fascinating and significant advancement in the evolution of digital technologies; it has the ability to transform our knowledge of reality, enhance our social and cultural experiences, and give new opportunities for innovation and creativity with sustained research, development, and appropriate use. Moreover, the advancement of this

modern technology and sophisticated devices has consistently revolutionized how marketing operations are carried out, and it will continue to do as well in the future. As a result, marketers must be proactive in learning and adopting new technologies for advertising, customer engagement, and customer service in multiple industries. These industries are particularly relevant as they are closely tied to human experiences, social interactions, and consumer behavior. As such, the Metaverse holds enormous potential for transforming how people interact with brands, products, services, and each other in these domains.

This research analyses the applicability of the Metaverse in four different sectors starting with advertising, proceeding to hospitality and education, and finalizing with retailing. These industries are especially important because they are inevitably linked to human experiences, social connections, and consumer behavior. As a result, the Metaverse has immense potential to change how people interact with businesses, products, services, and each other in these sectors. However, many questions remain unanswered in these contexts.

First, potential areas for examining advertising in the metaverse include, but are not limited to investigating the effectiveness of the Metaverse compared to traditional advertising channels, such as television and print media; examining the potential of virtual product placement in the Metaverse and its impact on brand awareness and purchasing behavior; exploring the use of immersive advertising formats in the Metaverse and their influence on consumer engagement and brand loyalty.

Second, researchers can identify the various forms of interactive marketing communication that can be applied in the metaverse, particularly in the hospitality and tourism industries. These activities will help to advance the literature and practice of hospitality and tourism. In addition, technology enthusiasts can propose both conceptual and methodological frameworks to assess how customers perceive and value virtual events, exhibitions, destinations in the Metaverse, or the extent to which virtual hotel tours and immersive dining experiences impact tourism.

Third, there are many possible avenues for future research on exploring the applications of metaverse-based education practices. Some of these include the development of metaverse-based educational models or execution frameworks; the examination of the effects of metaverse-based educational settings on learners' learning performances and perceptions; and the comparison of the performance of students using the meta-verse and those using the conventional learning approach.

Fourth, opportunities for further research in the retailing area should assess the potential of the Metaverse for virtual shopping experiences and its impact on online and offline consumer behavior; compare the effectiveness and the service quality in the offline, 2D and 3D contexts; explore the potential of personalized and adaptive shopping experiences in the Metaverse and their impact on consumer satisfaction and loyalty.

Finally, the findings of this study suggest four different cluster of interests related to the broad concept of the Metaverse. Therefore, our work paves the way for future research directions that may still focus on identifying different clusters and sectors.

The work is not exempt from limitations. First, the database assigns a unit to each magazine, author, university, or nation mentioned in the article. Some research, however, may have only one author, while others may have three or four. A second constraint is that the value of journals differs, because publication in a big journal is not equivalent to publication in a lower-status journal. Finally, because the sort of research receives more citations and other connected elements, many works may receive a better bibliometric grade.

1.5 Conclusions

The research highlights the presence of four major research networks connected to how the world of the Metaverse is significantly shifting the way we utilize technology to interact with

brands, companies and with each other. This new media of communication has the potential to transform a wide range of industries and domains, including advertising, tourism and hospitality, education and retail. Indeed, the Metaverse promises to create new opportunities for researcher in understanding the fundamental underlying elements of interaction of consumes with this technology in their relations with brands and companies, and to managers with a potential roadmap of actions to engage with consumers, deliver engaging and personalised experiences and unlock new sources of value and revenue. Accordingly, there are still many under-studied areas, such as those that behaviorally and perceptually assess the acceptance and use of the Metaverse in spheres such as Luxury and high-end Fashion.

Furthermore, given the emergent relevance of sustainability and corporate social responsibility (CSR) activities by companies, some interesting avenues for further investigation may emerge.

In this perspective, through the creation and development of two experiential studies, the following articles aim to analyze the benefits and implications of the Metaverse with a focus on the high-end Fashion and Sustainability industry. More in detail, the second chapter will focus on investigating the differential effect in sustainability perception that consumers have when exposed, in a context of para-social interaction, to sustainable products of a high-end Fashion company, confronting the results in the 2D dimension against the 3D dimension. Once having identified the potential of the Metaverse in enhancing customers' perceptions of sustainable practices and, thus, directing them towards sustainable choices, the research focuses on investigating individuals' emotional responses to sustainable high-end fashion products when exposed in the Metaverse environment in the third chapter.

1.6 References

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CHAPTER 2

Sustainability perceptions of high-end fashion products in the Metaverse: a comparative investigation on different media settings

Abstract

Over the past years, fashion customers and stakeholders have become more concerned to how sustainability goals are being implemented. Despite the increasing relevance of 3D virtual reality, limited attention has been devoted to exploring its effects on consumer sustainability perception. This study investigates how consumers rank a set of objective and visible practices and of subjective responses and emotions when exposed to Metaverse comparing the outcomes with 2D environments. Findings suggest the presence of significant relationships between the environment in which the discussion is conducted, and the way consumers perceive specific practices and emotions connected to sustainable high-end fashion products.

2.1 Introduction

Relevant trends, affecting industry structure, conduct and performance, are currently shaping the fast-evolving High-end Fashion sector. Among others, sustainability, and Corporate Social Responsibility (CSR) activities, are now becoming an industry-standard (Colucci, M., Tuan, A., & Visentin, M., 2020) affecting both the supply side - and how company design, source, produce and distribute their products (Perry & Towers, 2009; Bubicz, Barbosa-Póvoa, & Carvalho, 2021; Zorzini et *al,.* 2015) -, and the demand-side of the market, and how consumers engage (Kucukusta, Perelygina, & Lam, 2019; Cho, Furey, & Mohr, 2017), interact (Hur, Moon & Kim et *al,.* 2020; Pomering & Dolnicar, 2009), select (Ellen et *al,.* 2006;

Kim, Yin, & Lee *et al,.* 2020), and bond (Thompson *et al,.* 2017; Cha & Bagozzi et al,. 2016; Martínez & Del Bosque, 2013) with brands.

Consumers expect brands to play a greater role towards sustainability and companies, in order to meet those priority needs (Papahristou, E., & Bilalis, N., 2017), and are increasingly embracing trajectories of sustainable development and corporate social responsibility (Ethical Fashion Forum 2016). Therefore, market success is affected, among others, by the full alignment between customers' expectations on sustainability and tangible actions of companies, that are not perceived as woke-washing (Vredenburg, J., Kapitan, S., Spry, A., & Kemper, J. A., 2020). High-end fashion companies are then contributing to a sustainable ecosystem (Arribas, M., Nylund, P. A., & Brem, A. *et al.,* 2022), by creating a solid footprint in sustainability (Jung, S., & Jin, B., 2014), modifying their current global supply chain design (Vachon & Klassen, 2007), aligning their product development processes (Armstrong & LeHew, 2011; Albino, Balice & Dangelico, 2009), their activities for stakeholders (Ki, C. W., Chong, S. M., & Ha-Brookshire, J. E., 2020). Moreover, it has been discovered that communication between fashion companies and consumers is crucial (Hur, E., & Cassidy, T., 2019). According to Fisher *et al.* (2008), when participants are provided with information regarding environmental consequences, they tend to reflect on their behaviours and are willing to change it. Fisher *et al.* (2008) also found that employing the appropriate form of media for sustainability information would be beneficial to consumers.

Consumers are more attracted by global CSR initiatives that are noticeable and recognisable (Amatulli *et al,.* 2018), clearly linked to the brand (Sung, K. S. K., & Lee, S., 2023), rooted in their supply chain and production processes (Kong, Ko, Chae & Mattila *et al,.* 2016), and that are immersive (Lee, S. Y., Kim, Y., & Kim, Y., 2021) or are designed with a full involvement of customers (Edinger-Schons, L. M. *et al,.* 2020). These initiatives connected to the

philanthropic dimension of CSR, are also more effective in boosting consumers' Willingness To Buy (WTB) (De Angelis *et al,*. 2018).

Extant research dedicated specific attention to the role of MarTech in supporting sustainability positioning of high-end fashion companies (Pereira, A. M. et al,. 2022; Ahmad, S. et al,. 2020), showing the importance of social media (Sivarajah, U. et al,. 2020), recommendation systems (Chung, M. *et al,*. 2020) - in the communication of the brand (Kumar, P., 2014) and products (Brooksworth, F. et al,. 2022), the role of supply chain in this respect (Guo *et al,*. 2020), and the impact on consumer perceptions (Kontu, H., & Vecchi, A., 2014), emotions (Chae, H., & Ko, E., 2016) and decision-making (Kim, K. H. *et al,*. 2020).

Limited attention has been dedicated to the impact of new media on consumers' perception of sustainability and, specifically, when communication is delivered through the Metaverse, and when opinions are formed through the interaction of customers in a meta-space.

In this perspective, para-social interactions can take place between users and digital characters or avatars in virtual environments (Chung *et al,*. 2007) thus letting customers experiencing a feeling of intimacy with a media personality or avatar, without any actual reciprocal communication or personal contact (Zhang *et al,*. 2022).

As a result, para-social interactions in 3D virtual reality have the potential to be more intense and emotionally charged compared to those in other forms of media (Yuan *et al,*. 2022).

This research then investigates the differential effect in sustainability perception that consumers have when exposed, in a context of para-social interaction, to sustainable products of a well-known high-end fashion company, confronting the results in the 2D dimension, through the Webex platform vs. the 3D dimension, using Horizon Workrooms app which provides access to Meta's Metaverse.

Through a controlled experimental design, based on the *wait-list control group model* approach (Elliot, 2002), I assessed whether the media setting influences *objective* and

subjective elements of consumer's perception of sustainable products, in contexts of para-social interaction.

The following paper is divided as follows: after an overview of the extant literature, the research methodology and analysis will be discussed, together with the main implications of our studies.

2.2 Theoretical Background and Research Hypothesis

In high-end fashion, consumers form their opinion about how much brands and products are truly sustainable from their understanding of the respondence of the company to a set of *objective* and visible practices (Dwivedi *et al,.* 2018; Japutra, A., & Molinillo, S., 2019). This is, however, affected by the interchange of their opinions with other relevant stakeholders (Kozinets *et al.,* 2010; Karadayi-Usta, S., 2022) and by the setting where the discussion is taking place (Kong *et al,.* 2021), and might elicit *subjective* responses and emotions (Byrum, K., 2019).

In this respect, over the past years, business front-runners have become more conscious and attentive to how sustainability goals are being implemented. Several companies (i.e. Stella McCartney) applied the green supply chain method (GSCM) (Vachon & Klassen, 2007), that integrates the relevant *objective elements* of sustainability perception. Those elements show company's commitment towards the environment, and include items as product design, material selection and sourcing, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life (Puspita, H., & Chae, H., 2021) and waste management.

These functional factors, affect other intrinsic factors such as customers' attitude towards the brand, attitude towards sustainable products (Kim & Hall, 2015), Willingness-To-Buy (Amatulli *et al,.* 2021), and brand credibility (Abu Zayyad, H. M. *et al,.* 2021).

For the scope of this research, most relevant functional drivers, as identified by extant literature (Dyllick & Rost, 2017) and confirmed by a panel of sector experts, can be outlined in i) components ii) responsible supply chain iii) global commitment vi) circularity v) strategic sustainability plan *(see Table 1)*.

Table 1. Functional items that support customers' the perception that a high-end fashion product is sustainable

Item	Description	Reference
Components	The company utilize **low impact materials** (e.g., recycled, biobased, organic, etc.)	Dyllick, T., & Rost, Z. (2017)
Responsible supply chain	The Company has a **responsible management** of the supply chain (e.g., respect for human rights and health and safety)	Dyllick, T., & Rost, Z. (2017)
Circularity	The Company is able to **design products** according to the circularity criteria (e.g., eco-design, ability to disassemble, disposal, sustainable inputs, etc.)	Dyllick, T., & Rost, Z. (2017)
Global commitment	The Company **participate** in global commitments (e.g., Just Transition, joining The Fashion Pact initiative, submission of UNGC, etc.)	Dyllick, T., & Rost, Z. (2017)
Strategic Sustainability Plan	The Company has a public Strategic Sustainability Plan with a **public, quantitative and challenging** commitment and targets	Dyllick, T., & Rost, Z. (2017)

Objective elements (ILFI, 2015a) are complemented by emotional and *subjective* factors (Dyllick *et al.*, 2017) to form sustainability perceptions. Thus, it is crucial for businesses to elicit an emotional response from customers regarding sustainability, so that they will ultimately make an informed - but emotionally charged - purchase that will have a beneficial impact on their perception (Fuxman *et al.*, 2022). Main relevant *subjective* factors, identified by extant literature (Laros & Steenkamp, 2005; Algoe & Haidt, 2009) to measure the elicited emotions associated to the exposure to sustainable high-end fashion products are: i) pride ii) contentment iii) happiness iv) gratitude v) inspiration vi) elevation *(see Table 2)*.

Table 2. Emotional factors related to consumers' sustainability perception

Item	Description	Reference
Pride	Occurs when a consumer feels **superior** compared to another person because of the product	Laros, F. J., & Steenkamp, J. B. E. (2005)
Contentment	Is a feeling of **quiet satisfaction** generated by the product	Laros, F. J., & Steenkamp, J. B. E. (2005)
Happiness	An emotional state characterized by feelings of **joy** and **fulfilment** generated by the product	Laros, F. J., & Steenkamp, J. B. E. (2005)
Gratitude	Involves being **thankful** and **appreciative** towards the company behind the product	Algoe, S. B., & Haidt, J. (2009)
Inspiration	Being mentally stimulated by the company behind the product to **do** or **feel** something	Algoe, S. B., & Haidt, J. (2009)
Elevation	Is a response to acts of **moral beauty** of the company behind the product in which individuals feel as though they have become less selfish, and they want to act accordingly	Algoe, S. B., & Haidt, J. (2009)

Furthermore, many studies found that exposure to *subjective* and *objective* factors is affected by both the media (traditional vs. new) and the context (individual vs. interactive) where the stimuli is received (Hamilton *et al,.* 2021)

Consumers, in fact, tend to rely more on *objective* factors when they are in social contexts/ group discussion (Mesmer-Magnus & DeChurch, 2009). Furthermore, when interacting in the 2D/3D environment, the shaping of para-social relationships have an impact on the *functional* elements of the user's perception and the understanding of the transmitted information (Dwivedi *et al,.* 2022).

Different media setting also significantly influences the consumer's perception of the message both on traditional (Wright, 1974; Stafford & Day, 1995) and new and interactive two-dimensional (2D) media (Pezzuti *et al.,* 2021).

Nowadays, a new type of technology is increasingly emerging and changing the way individuals can interact: the Metaverse. Metaverse is a 3D online virtual world that allows people to be virtually connected and interact with each other, the environment, 3D objects, and businesses (Daşdemir *et al,.* 2022). Hence, as stated by Wu *et al.* (2021), "compared to two-dimensional (2D) online platforms, the 3D virtual space provides a more immersive and interactive experience that allows it to transmit a great amount of information and thus enhances customers' emotions, attitudes, and behaviors toward the product". The Metaverse marketing literature is in its infancy, but it is growing rapidly in several domains, including the area of retailing and of the high-end goods (Joy et *al.,* 2022).

To the best of our knowledge, the effect of the 3D environment on customers' sustainability perception – deployed in a para-social context of a group of individuals - is currently been overlooked, as prior studies mostly focused on the impact of different medias (i.e. 2D technology, radio, television). The research then tests and compares the differential influence

of the media (Metaverse vs. Webex) on customers' priority association of *subjective* and *objective* factors elicited by the visual display of high-end sustainable fashion products.

As the Metaverse provides consumers with a multi-sensory experience as opposed to the conventional 2D environment's single-sensory stimulus (Laukkanen *et al,.* 2022), it can impact customers' perception providing a more realistic representation of products and services, allowing customers to experience them in a more tangible way and thus enhancing the *objective/functional* factors of customers' perception (van Herpen *et al,.* 2016). Furthermore, the use of the VR techonology enables the creation of a more interactive and immersive experience that can be effective in eliciting emotions and affective responses (Martínez-Navarro *et al,.* 2019).

In line with this focus, this research argues that the use of 3D virtual reality rather than 2D technology will have a greater impact on certain critical intrinsic/functional (i.e. components, responsible supply chain, circularity, global commitment, strategic sustainability plan) and emotional/subjective (i.e. pride, contentment, happiness, gratitude, inspiration, elevation) factors of consumer perception. This reaction may be rooted in the fact that, as shown by previous studies (van Herpen *et al,.* 2016; Wu & Whang *et al,.* 2021) the use of a different media condition the transmission of the stimulus to the consumer. In detail, the main focus of our research refers to assessing how much customer's perception derives from the exposure to a high-end sustainable item, is affected by the different usage of media.

Therefore, it is hypothesized that:

H1: The Metaverse has a greater impact towards **Components**' perception if compared to 2D environment

H2: The Metaverse has a greater impact towards **Responsible supply chain**'s perception if compared to 2D environment

H3: The Metaverse has a greater impact towards **Circularity**'s perception if compared to 2D environment

H4: The Metaverse has a greater impact towards **Global commitment'**s perception if compared to 2D environment

H5: The Metaverse has a greater impact towards towards **Strategic Sustainability Plan**'s perception if compared to 2D environment

H6: The feeling of **Pride** towards sustainable products is enhanced during product exposure in the Metaverse (vs. 2D platforms)

H7: The feeling of **Contentment** towards sustainable products is enhanced during product exposure in the Metaverse (vs. 2D platforms)

H8: The feeling of **Happiness** towards sustainable products is enhanced during product exposure in the Metaverse (vs. 2D platforms)

H9: The feeling of **Gratitude** towards sustainable products is enhanced during product exposure in the Metaverse (vs. 2D platforms)

H10: The feeling of **Inspiration** towards sustainable products is enhanced during product exposure in the Metaverse (vs. 2D platforms)

H11: The feeling of **Elevation** towards sustainable products is enhanced during product exposure in the Metaverse (vs. 2D platforms)

2.3 Methods

2.3.1. Data collection and sample

Data was collected at the end of each experiment from 137 students belonging to the Master of Science in Management at Luiss University in Rome. Preliminary information was collected about respondents' demographic, involvement with technology and personality traits was gathered.

The sample was divided into 2 main groups: Group A and B, formed respectively of 15 teams and 16 teams of students. The number of students per team varied in a range of four to six. The reward for participating in the project was extra points in their final course grade. Thirty-one per cent of the participants were female (n = 42) and sixty-nine per cent male (n = 94), their average age being twenty-two years (SD = 1.35).

2.3.2 Procedure

All participants were exposed in advance to a training stage necessary to become familiar with the use of Meta's Metaverse platforms and the Oculus, the VR headset tool provided by Meta to handle the Metaverse world. Individuals were already familiar with the use of Webex platform, as part of other online activities. Pre-tests were run to evaluate participants' attitude and usage motivation for technology.

The experiment was conducted in two different rounds, following the *wait-list control group model* approach (Elliot, 2002), where participants used sequentially the two different technologies (3D Metaverse and 2D Webex App). Specifically, in round one, each group ofGroup A performed a prioritization task to reach group-consensus on the ranking of the relevance of *objective factors* ("experimental group"), while Group B was exposed to the same task on the Webex platform ("control group"). In round two, the two groups were reversed and focused on ranking *subjective factors*. As a result, each group meeting ended when the group's leader exposed the answers agreed upon during the 30-minute meeting. Respondents knew that every groupwork has been evaluated by the teaching team. The structure of the experiment had the aim to avoid bias in the students' responses, given the novelty of the Metaverse platform, and to allow participants to work with the same technologies.

In each round, drawing on Elliott et al. (2002), the first intervention group was exhibited to the stimulus prior to the second one functioning as a control group. This method allows us to

include students from both classes in the project while keeping technological constraints in mind.

To ensure that the variance of the process was minimized and to guarantee equality of information between the students, a structured protocol for both the training and intervention phases was prepared.

2.3.3 Stimuli and measurement scales

To establish the adherence to a real managerial situation, the business case and the associated stimuli were developed with the support of the management of a leading, well-known international high-end fashion company *(see Appendix 1)*.

Stimuli were visual display of the product, related details and of sustainability practices of the company. Objective and functional factors were based on Dyllick, & Rost (2017) work on the drivers of product sustainability, and Laros & Steenkamp (2005) and Algoe & Haidt (2009) on consumer behaviour and emotional response.

2.3.4. Data Analysis and Measures

After registering the ranking run from each focus group, the frequency of occurrence was calculated. Referencing Thurstone's Law of Comparative Judgment and the scaling tools he elaborated for forced-choice scales (2017), the frequency of occurrence was put into a matrix in order to be turned into interval scale data.

With regard to quantitative data analysis, a chi-squared test of independence was carried out using the SPSS software by retrieving data from all the Qualtrics questionnaires separating those of round 1 from round 2, to check whether the media impacted the relative relevance, as mirrored by the ranking, of the *subjective* and *objective* factors.

2.4 Results

The results of the two pre-tests highlighted the proper participants' involvement towards the use of a new technology (M= 4.3; SD= 1.46) and the related usage motivation (M= 4.34; SD= 1,55).

The analysis of the occurrences of the ranking of individual items showed that different priorities in both the first (i.e., *objective/ functional elements*) and second (i.e., su*bjective/ emotional elements*) round *(Table 3)* were manifested in discussion held in Metaverse vs. Webex.

Table 3.a. Occurrence of ranking of *objective/functional* factors related to consumers' sustainability perception

Item	Media	Position				
		1	*2*	*3*	*4*	*5*
Components	3D App	4	4	2	2	2
	2D App	7	5	1	1	0
Responsible supply chain	3D App	4	2	3	3	2
	2D App	1	4	6	3	0
Circularity	3D App	1	5	2	2	4
	2D App	1	4	5	2	2
Global commitment	3D App	2	1	2	4	5
	2D App	1	0	1	2	10
Strategic Plan	3D App	3	2	5	3	1
	2D App	4	2	0	7	1

Specifically, students who held meetings in the Metaverse rated the "Components" (mean position=3,4) most highly than the other factors, with a (-0,9) points deviation from Webex (mean position=4,3). On the other hand, students who held meetings on Webex gave less importance to "Global commitment" (mean position=1,6) which resulted with a 0.8 point deviation from Metaverse (mean position=2,4). As a result, students in the Metaverse structured a deductive discussion focusing on the l-t view of the company and how to achieve

a sustainable goal in the near future. In contrast, students in Webex focused more on the pre-reading material delivered with descriptions of the sustainable campaign and the product offered, thus relying on explicit documents.

Results from Chi-square test showed a non-significant correlation between the selected round (e.g., 1,2) and, respectively, "Circularity" (χ^2 (3) = .000, p =1.000) (H3 not supported); "Responsible supply chain" (χ^2(5) = 5.333, p = .377) (H2 not supported); "Global commitment" (χ^2 (5) = 4.667, p = .458) (H4 not supported); "Strategic plan" (χ^2 (6) = 6.000, p = .423) (H5 not supported). On the other hand, this study evidenced a quasi-significant relationship regarding "Components" (χ^2(5) = 10.000, p = .075). On this basis, the chi-square test indicated an acceptable fit of Components within the hypothesized construct (H3 partly supported)

Table 3.b. Occurrence of ranking of *subjective/emotional* factors related to consumers' sustainability perception

Item	Media	Position 1	2	3	4	5	6
Pride	3D App	4	3	5	2	0	2
	2D App	3	3	2	2	0	5
Contentment	3D App	3	3	0	6	1	3
	2D App	1	3	5	2	3	1
Happiness	3D App	3	2	2	2	6	1
	2D App	1	3	4	2	4	1
Gratitude	3D App	0	0	4	4	2	6
	2D App	1	1	1	3	3	6
Inspiration	3D App	4	2	3	1	4	2
	2D App	6	0	1	5	2	1
Elevation	3D App	2	7	2	0	3	2
	2D App	3	4	3	1	3	1

In the second round (i.e. the ranking of emotions/ subjective factors), the Metaverse students appeared more proud regarding the sustainable product (mean position= 4.2) than the students

in Webex (mean position=3.5) with a difference of 0.7 points. The item "Inspiration", on the other hand, was rated less highly (mean position=3.7) than the respondents' in 2D technology (mean position=4.0). The chi-square test results indicated that the correlation's assumption between the variable "Gratitude" and Round (i.e., 1,2) was not violated ($\chi^2(5) = 10.000$, p = .075) (H9 partly supported). On the other hand, the test showed a non-significant association with the other variables among which "Pride": ($\chi^2(4) = 1.333$), p =.856) (H6 not supported); "Contentment": ($\chi^2(5) = 4.533$, p = .475) (H7 not supported); "Happiness": ($\chi^2(4) = 4.333$, p = .363) (H8 not supported); "Inspiration": ($\chi^2(6) = 6.667$, p = .353) (H10 not supported); "Elevation": ($\chi^2(5) = 9.000$, p = .109) (H11 not supported).

2.5 Conclusions

2.5.1. General Discussion

In the current context of fast evolving emerging MarTech tools to support marketers in the development of effective actions, the Metaverse and virtual reality might play a significant key role in facilitating customers' social communication (Laukkanen *et al,.* 2022). Accordingly, the use of this new interactive setting enables the transmission of a greater deal of information, thus enhancing customers' emotions, attitudes and behaviors towards the product (Wu & Whang et *al,.* 2021; Fisher et *al,.* 2008). As the adoption of true sustainability practices is today central in affecting individual perception (Amtulli *et al,.* 2018; Lee & Lin, 2022), the paper highlights the presence of a differential effect when customers interact in a Metaverse/ 3D virtual reality environment against when they engage in group discussion in a 2D environments. Evidences suggest that individuals form different priorities when they rank the relevance of *objective* and visible practices and of *subjective* responses and emotions.

Managers can derive relevant implications as, depending on the area that should be strengthened in their brand development planning (subjective/emotional vs.

objective/functional), they can develop appropriate settings to engage customers and stimulate discussions on the perceived sustainability of the brand and its products.

Our results emphasized a significant influence of the Metaverse on respondents' perceptions of "Components" and "Gratitude" (i.e., the objective and emotional factor of the perception of sustainability, respectively) with respect to the 2D platform. The above suggests that those two elements might be a central element of a potential engagement plan in 3D media setting; as an example, they might be connected to develop effective marketing actions in the Metaverse; as **Gratitude** is the "capability of being thankful and appreciative towards the company and behind the product", this can be deployed to stimulate the perception of "Components", i.e., the perception that a Company is truly able to design products according to sustainable criteria (e.g. recycled, biobased, organic materials), thus limiting potential woke-washing perceptions. We thus expanded the extant literature highlighting the efficacy of virtual reality on both the *objective* and the *subjective* factors of customers' perception. Furthermore, our research contributes to enriching the theoretical background of the fashion and sustainability industry by investigating the impact of the Metaverse in customers perceptions towards the brand and sustainability when developed during group discussion.

2.5.2. Limitations and Future Research

This study is not exempt from limitations that could also serve as recommendations for future research. The sample was composed by students, and the validity of the outcomes might be increased by enlarging the sample and the expanding to other socio-demo groups. Secondly, the technology involvement and the related usage motivation were high for respondent; consequently the study didn't consider cases with low technology experiences. Another issue that warrants further research is to collect information of other relevant items of attitudes and behavior in high end fashion, as Personal traits (Rammstedt *et al.*, 2007), Attitude

toward high-end Fashion products (McNeill et al., 2015), attitude toward the brand (Sengupta & Johar, 2002), attitude toward sustainable products (Wei *et al.*, 2017), Brand Credibility (Ohanian, 1990) that could serve to understand potential mediating and moderating relationships and, accordingly, develop new theoretical model that can advance research and support business leaders decision making in high-end fashion.

Finally, the validity of the results might be explored also in other industries to understand whether a common differential pattern exists on subjective/emotional and on objective/functional factors in different contexts, when customers interact to form their opinion in the Metaverse vs. other touchpoints.

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CHAPTER 3

Beyond the Virtual Realm: an introductory investigation on Inward and Outward Emotional Responses to Sustainable Fashion Products in the Metaverse[1]

Abstract

Relevant trends, affecting the development of the Metaverse together with other technological innovations, are currently shaping the way through which individuals' emotions are elicited, when exposed, in a context of para-social interaction, to brands and products. In this context, limited attention has been devoted to exploring the effects of this new touchpoint on consumers' specific inward and outward emotions. Therefore, the aim of the present work is to analyse the differential effect on forming individual emotions in the Metaverse – a 3D virtual reality – comparing the outcomes with the conventional 2D environment (Webex platform) in the context of sustainable high-end fashion products. Findings suggest the presence of significant relationships between the environment in which the discussion is conducted, and the way through which some specific emotions are evoked during individuals' exposition to sustainability's stimuli, in turn affecting the perceived financial value of the goods.

3.1 Introduction

Over the recent years, businesses have focused their efforts on being part of the Metaverse, a fast-evolving 3D virtual environment (Dincelli et al., 2022; Joy et al., 2022). The Metaverse is defined as a fully developed digital world existing in parallel to the one in which we live (Kim, J., 2021), with the potential to shape the way through which people work (Pantano &

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Viassone, 2015), do business (Papagiannidis et al., 2017), socialize (Laukkanen et al., 2022) and entertain (Dwivedi et al., 2022). Indeed, the use of the 3D technology allows people to visually simulate complex physical environments and communicate using avatars - digital versions of themselves (Bainbridge, 2007; Jin et al., 2009). Both professionals (such as IBM) and academics have acknowledged the ability of such a rich medium also for virtual collaboration (Wilson, 2009; Van der Land et al., 2011). In this perspective, para-social interactions can take place between users and digital characters or avatars in virtual environments (Chung et al., 2007), thus letting customers experiencing a feeling of intimacy with a media personality or avatar, without any actual reciprocal communication or personal contact (Zhang et al., 2022). Para-social interaction within the 3D virtual world offers a higher level of interactivity thus enabling an increasing engagement and enjoyment of individuals (Niedenthal et al., 2005). As a result, these technologies can be applied by companies to engage groups of consumers during all stages of the customer journey (Flavián et al., 2019a) and thus offering a valuable and holistic experience (Petit et al., 2019).

While the Metaverse marketing literature is in its infancy, it is growing rapidly in several domains, including high-end goods (Joy et al., 2022). Such industries are embracing disruptive technologies (Xue et al., 2020) and new channels of communication (Arribas et al., 2022; Blázquez et al., 2014) to better understand emerging needs (Trabelsi-Zoghlami & Touzani, 2019) and meet consumers' growing demands for more immersive experiences (Buhalis et al., 2022). While implementing these strategies - and given the relevance of the Metaverse in today's technological environment (Martínez-Navarro et al., 2019) -, it is imperative for these companies to design integrated online platforms (Blázquez et al., 2014) in order to elicit an emotional response (Hartmann et al., 2006), Dwivedi et al., 2022; Martínez-Navarro et al., 2019) that could lead to purchase (Fuxman et al., 2022). Compared to two-dimensional (2D) online platforms, in fact, the 3D virtual space provides a more immersive and interactive

experience that enhances customers' emotions, attitudes, and behaviors toward the products (Wu et al., 2021). Moreover, through a high level of media richness and visual vividness, the 3D virtual space promotes engagement and enjoyment (Wu et al. 2021).

As limited attention has been dedicated to the impact of the Metaverse in eliciting consumers' emotions, this introductory research investigates the differential impact on forming individual emotions in the 3D dimension (Horizon Workrooms app with access to Metaverse) vs. the 2D dimension (Webex platform), during para-social interaction, applying it to group of individuals when exposed to products and brands. For this investigation, I then selected the case of the high-end fashion industry, where consumers form their emotions also in expecting well-known brands to play, through their products, an increasing role towards sustainability (Kim & Hall, 2015; Gimenez et al., 2012; Akrout & Guercini, 2022).

The remainder of the paper is organized as follows. After an overview of the extant literature, the methodological approach, results, and main findings will be presented. I close the work highlighting the theoretical and managerial implications, the limitations of the study and further research trajectories.

3.2 Theoretical Background and Research Hypothesis

Emotions have been defined as "states of feelings that arise as reactions to experiences" (Mehrabian & Russell, 1974). As the technology evolves, the arrival of new devices (Tussyadiah et al., 2018) has altered the way through which individuals perceive (Flavián et al., 2019), interpret (Laukkanen et al., 2022), and interact with their immediate environment (Tussyadiah et al., 2018), and between each other (Fox et al., 2009). As the virtual experience has both cognitive and emotional aspects (Lin et al., 2012; Trabelsi-Zoghlami et al., 2019), it has been postulated that the multi-sensory stimuli provided by the Metaverse hold special potential by improving immersiveness and promoting not just the transfer of information (Lee

et al., 2021), but also feelings and emotional reactions (Kim et al., 2020; Laukkanen et al., 2022). Furthermore, in comparison to the traditional 2D environment, 3D virtual reality can influence customers' perception by offering them a more accurate representation of products and services, enabling customers to experience them in a more meaningful way, and thereby enhancing the emotional aspects of customers' perception (van Herpen et al., 2016). As stated by Yim et al., (2017), "interactive technologies that present more vivid product visualizations are linked to a more positive affective emotional experience", enabling customers to enjoy the thrill of discovering realistic products. This, in turn, produces varying degrees of positive emotional evaluations (i.e. enjoyment) that are felt as happiness, contentment and joy (Yim et al., 2017; Jin et al., 2009).

As far as the high-end sustainable fashion industry is concerned, companies have the opportunity to exploit the capabilities of this new and richer communication medium, which can arouse positive emotions towards the products (Flavián et al., 2019). Experiencing positive emotions is then of paramount importance for generating satisfactory experiences and attitudes towards brands (Khan et al., 2017). Specifically, through the use of the Metaverse, users can experience a sense of psychological involvement (Mollen & Wilson, 2010), and thus feeling intense emotions (Mayer et al., 2020) that lead to a high degree of engagement (Bilro et a.l. 2019).

I then hypothesize that using the Metaverse will produce more positive emotions compared to the conventional 2D environment.

Moreover, emotions can be classified into two main categories (Laros & Steenkamp, 2005), where inward emotions are complemented by outward emotions to form individuals' emotional reactions towards specific situations or products (Algoe & Haidt, 2009). On the one side, inward emotions refer to feelings that individuals perceived when exposed to situation, such as

the display of a sustainable high-end fashion item, and can be outlined in: a) Pride b) Contentment c) Happiness d) Admiration e) Love (Table 1).

Table 1. Inward emotions related to sustainability's stimuli – Tested scales.

Construct	Description	Reference
Pride	Feeling that occurs when a consumer feels superior compared to another person because of the product	Laros, F. J., & Steenkamp, J. B. E. (2005)
Contentment	It is a feeling of quiet satisfaction generated by the product	Laros, F. J., & Steenkamp, J. B. E. (2005)
Happiness	It is an emotional state characterized by feelings of joy and fulfillment generated by the product	Laros, F. J., & Steenkamp, J. B. E. (2005)
Admiration	Feeling of surprise associated with some pleasure and a sense of approval towards the product	Algoe, S. B., & Haidt, J. (2009)
Love	Feeling of passion and love generated by the product	Algoe, S. B., & Haidt, J. (2009)

On the other side, outward emotions relate to the emotional connection with particular products or with the relative company. As stated by Algoe & Haidt (2009), the elicited outward emotions associated to the exposure of a sustainable high-end fashion product/service are: a) Gratitude b) Inspiration c) Elevation d) Awe (Table 2).

Table 2. Outward emotions related to sustainability's stimuli – Tested scales.

Construct	Description	Reference
Gratitude	It involves being thankful and appreciative towards the company behind the product	Algoe, S. B., & Haidt, J. (2009)
Inspiration	Being mentally stimulated by the company behind the product to do or feel something	Algoe, S. B., & Haidt, J. (2009)
Elevation	It is a response to acts of moral beauty of the company behind the product in which individuals feel as though they have become less selfish, and they want to act accordingly	Algoe, S. B., & Haidt, J. (2009)

Awe	Feeling of appreciation, respect and esteem generated by the product	Algoe, S. B., & Haidt, J. (2009)

Therefore, I expect that:

H1: Inward emotions are enhanced during exposure in the Metaverse (vs. 2D platforms) to sustainable high-end fashion products

H2: Outward emotions are enhanced during exposure in the Metaverse (vs. 2D platforms) to sustainable high-end fashion products

Moreover, financial value plays a key role in high-end fashion (Henninger et al., 2016), and it is considered one of the main drivers of consumption choice when compared to the other values (Sheth et al., 1991); a study carried out by Khan et al., (2017) demonstrated that personal emotions have a great impact on financial value, when exposed to a sustainable products/services. This research attempts then to highlight how, in the high-end fashion, the use of different media impacts customers' emotions (Chae & Ko, 2016; Wu et al., 2021; Pezzuti et al., 2021), when dealing with sustainability's stimuli (DiRusso & Myrick, 2021), that in turn affect perceived financial value (Khan et al., 2017).

Therefore, as the use of 3D virtual reality platforms is supposed to stimulate consumers' emotions (Yim et al., 2017; Jin et al., 2009), I expect specific inward and outward emotions to mediate the impact of 3D technologies (vs. 2D platforms) on the financial value of sustainable items, and specifically:

H3: Emotions mediate the interaction effect of the type of media (2D vs. 3D platforms) on the financial value of sustainable high-end fashion products

3.3 Methods

3.3.1. Data collection and Sample

Data was collected at the end of each experiment from 133 Master students (Mage= 23, SDage= 1.8) at Luiss University in Rome, rewarded for participating in the project with extra points in their final course grade. The sample was divided into 2 main groups (Group A and B), and students were randomly assigned to teams with a size range of four to six individuals. A total of 15 teams for Group A and 16 teams for Group B resulted from such aggregation process.

3.3.2 Procedure

All participants were exposed in advance to a training stage necessary to become familiar with the use of Metaverse platforms and the Oculus, the VR headset tool provided by Meta to handle the Metaverse world. Individuals were already familiar with the use of Webex platform, as part of other online learning activities. Pre-tests were run to evaluate participants' attitude and usage motivation for technology.

The experiment was conducted in two different rounds, following the wait-list control group model (Elliot, 2002), where participants used sequentially the two different technologies (3D Metaverse and 2D Webex App. Specifically, part of the team of Group A performed a prioritization task to reach group-consensus on the ranking of specific factors ("experimental group") of a sustainable high-end fashion item, while part of the team Group B was exposed to the same task on the Webex platform ("control group"). The opposite for another subset of each group. As a result, each group meeting ended when the group's leader exposed the answers agreed upon during the 30-minute meeting. Respondents knew that every groupwork has been evaluated by the teaching team. The structure of the experiment had the aim to avoid

bias in the students' responses, given the novelty of the Metaverse platform, and to allow participants to work with the same technologies.

In each round, drawing on Elliott et al. (2002), the first intervention group was exhibited to the stimulus prior to the second one functioning as a control group. This method allows us to include students from both Groups in the project while keeping technological constraints in mind. To ensure that the variance of the process was minimized and to guarantee equality of information between the students, a structured protocol for both the training and intervention phases was prepared.

3.3.3 Stimuli and measurement scales

To establish the adherence to a real managerial situation, the business case and the associated stimuli were developed with the support of the management of a leading, well-known international high-end fashion company *(see Appendix 1)*.

Stimuli were visual display of the product, related details and sustainable initiatives of the company. Inward and outward emotions were based on Laros & Steenkamp (2005) and Algoe & Haidt (2009) work on consumers behaviors and emotional responses, and the consumption driver (i.e., financial value) on Hennigs et al., (2012) study on consumption values in luxury.

3.3.4. Statistical Analysis

Quantitative data analysis has been performed, through which a t-test was carried out using IBM SPSS Statistics 28 by retrieving data from the Qualtrics questionnaires. In particular, in Study 1, I aim at observing (H1 and H2) which of the investigated emotion is affected by the use of 2D vs. 3D media, evaluating the main direct effect between the use of 2D/3D technology and each inward and outward emotions. Taking into account the results of Study 1, in Study 2 I analyze the mediating effects of emotions retained from the previous hypotheses, in the

relationship between technological platform's type (2D/3D) and the financial value of the sustainable product (H3). To this end, I utilized the PROCESS macro for SPSS (Model 4).

3.4 Results

3.4.1 Study 1

All tested constructs were reliable (Table 3), as the Cronbach's alpha of each variable was higher than the cutoff value of 0.7 proposed by Kaynak (2003). Moreover, results from the t-test underline few significant relationships between medium and emotions. As regard to Inward emotions, the 2D platform received higher scores than the 3D environment both for happiness (M2D=5.36; M3D= 4.7; t(135)= 2.96, p<.01), and contentment, which measures the feeling of a quite satisfaction generated by the product (M2D=5.19 vs. M3D=4.78, t(135)=1.96, p<.05). With regards to outward emotions, significant difference is exhibited for the variable inspiration (M2D=5.41 vs. M3D= 4.90, t(135)=2.00, p=<.05) and elevation (M2D=4.63 vs. M3D= 4.18, t(135)=1.90, p=.05).

Table 3. Inward and Outward emotions elicited by 2D/3D environment: means and standard deviations.

	2D condition (n= 64)	3D condition (n=73)	*t*-Test statistics	*p* value	α
Inward Emotions					
Pride	4.76 (1.3)	4.63 (1.5)	t(135)=.52	p=.60	.916
Contentment[1]	5.19 (1.1)	4.78 (1.3)	t(135)=1.96	p=.04	
Happiness	5.36 (1.1)	4.7 (1.4)	t(135)=2.96	p<.01	.916
Admiration	5.01 (1.2)	4.8 (1.4)	t(135)=1.33	p=.19	.940
Love	4.68 (1.3)	4.33 (1.4)	t(135)=1.50	p=.14	.928
Outward Emotions					
Gratitude	5.02 (1.3)	4.60 (1.5)	t(135)=1.64	p=.10	.945
Inspiration[2]	5.41 (1.3)	4.90 (1.6)	t(135)=2.00	p=.04	

Elevation	4.63 (1.4)	4.18 (1.4)	t(135)=1.90	p=.05	.982
Awe	4.82 (1.5)	4.48 (1.5)	t(135)=1.33	p=.18	.953

(1) Measured as a single-item scale: "I feel contented"
(2) Scale composed of a single item: "I feel inspired"

3.4.2 Study 2a

For Study 2, I took into consideration only the variables which displayed a significant difference in Study 1. To test the hypothesized model (H3), I first assessed the conditions of mediation of the variable happiness (Figure 1). I coded the 2D as 0, and the 3D as 1. The results of the regression analyses showed that the type of media (X) significantly predicted happiness (M) (β = -.61, SE = 0.23, p < 0.01), and M significantly predicted financial value (Y) (β = 0.18, SE = 0.06, p < 0.01). The total effect of X on Y was not significant (β = -.27, SE = 0.18, p =.13), indicating that type of media has not a direct effect on happiness. On the other hand, the indirect effect through the emotion was significant (β = -.11, SE = 0.06, LLCI=-.23, ULCI=-.01), indicating that happiness mediates the relationship between the media and the financial value. These results suggest that the type of media has an indirect effect on product's financial value through the feeling of happiness, however in the opposite direction vs. what expected. Specifically, our results showed a full mediation.

**Figure 1.** Estimated path coefficients of the hypothesized model – 2D/3D, Happiness, Financial Value
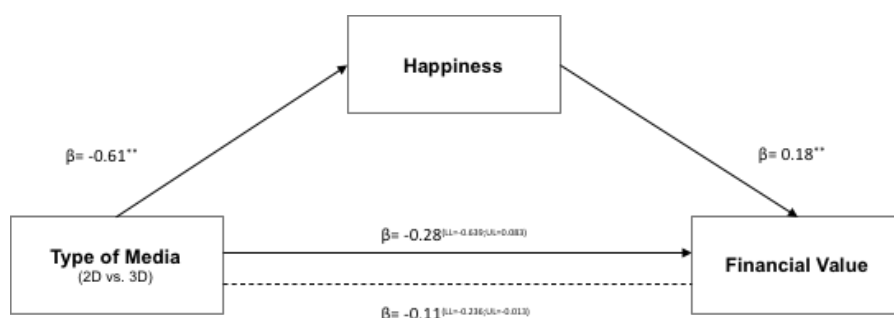
*p<.05; **p<.01; ***p<.001

3.4.3 Study 2b

To test the hypothesized model (H3), I first assessed the conditions of mediation of the variable contentment (Figure 2). I coded the 2D as 0, and the 3D as 1. The results of the regression analyses showed that the type of media (X) significantly predicted contentment (M) (β = -.42, SE = 0.22, p = 0.05), and contentment significantly predicted financial value (Y) (β = 0.19, SE = 0.07, p < 0.01). The total effect of media on financial value was quasi-significant (β = -.31, SE = 0.18, p =.08), indicating that X has a direct effect on Y. The indirect effect of media on financial value through contentment was significant (β = -.08, SE = 0.05, LLCI=-.21, ULCI=-.000), indicating that this variable mediates the relationship between media and financial value. These results suggest that the type of media has an indirect effect on product's financial value through the feeling of contentment, again in the opposite direction vs. what expected. More in detail, our results demonstrated the mediated role of contentment between our independent and dependent variables.

Figure 2. Estimated path coefficients of the hypothesized model – 2D/3D, Contentment, Financial Value
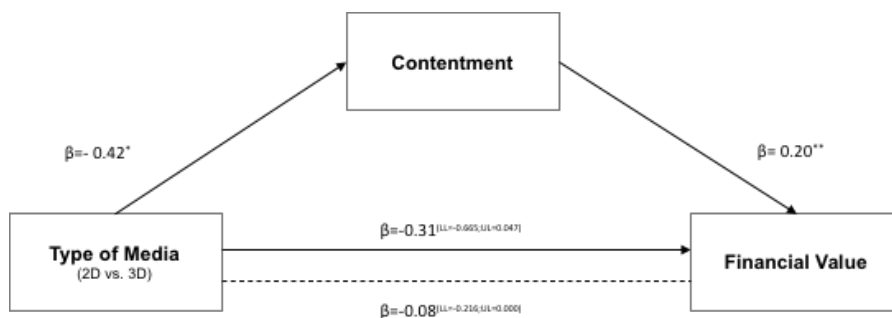
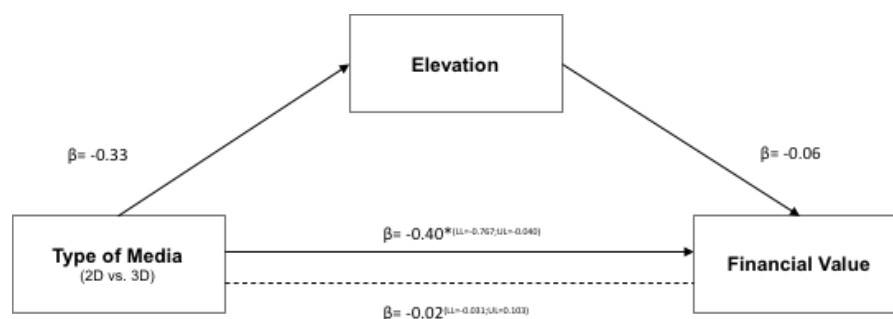*p<.05; **p<.01; ***p<.001

3.4.4 Study 2c

To test the hypothesized model (H3), I first assessed the conditions of mediation of the variable inspiration (See Figure 3). I coded the 2D as 0, and the 3D as 1. The results of the

regression analyses showed that the type of media (X) doesn't significantly predict inspiration (M) (β = -.31, SE = 0.27, p = 0.25), and M doesn't significantly predict financial value (Y) (β = 0.08, SE = 0.06, p= 0.14). The total effect of X on Y was significant (β = -.36, SE = 0.18, p<.05), indicating that X has a direct effect on Y. On the other hand, the indirect effect of X on Y through M was non-significant (β = -.02, SE = 0.04, LLCI=-.13, ULCI=.03), indicating that M does not mediates the relationship between X and Y. These results suggest that the type of media has only a direct effect on product's financial value, excluding the interaction with inspiration. More in detail, our results didn't demonstrate the mediated role of inspiration between our independent and dependent variables.

Figure 3. Estimated path coefficients of the hypothesized model – 2D/3D, Inspiration, Financial Value
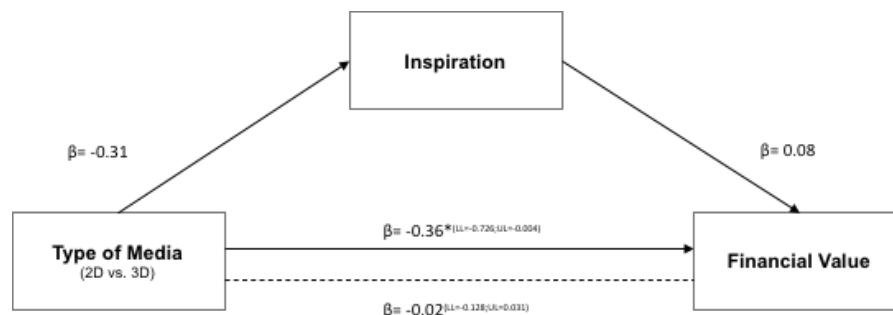
*p<.05; **p<.01; ***p<.001

3.4.5 Study 2d

To test the hypothesized model (H3), I first assessed the conditions of mediation of the variable elevation (Figure 4). I coded the 2D as 0, and the 3D as 1. The results of the regression analyses showed that the type of media (X) doesn't significantly predict elevation (M) (β = -.33, SE = 0.25, p = 0.18), and M doesn't significantly predict financial value (Y) (β = -0.06, SE = 0.06, p= 0.30). The total effect of X on Y was significant (β = -.40, SE = 0.18, p<.05), indicating that X has a direct effect on Y. On the other hand, the indirect effect of X on Y

through M was non-significant (β = 0.02, SE = 0.03, LLCI=-.03, ULCI=.10), indicating that M does not mediates the relationship between X and Y. These results suggest that the type of media has only a direct effect on product's financial value, excluding the interaction with elevation. More in detail, our results didn't demonstrate the mediated role of elevation between our independent and dependent variables.

Figure 4. Estimated path coefficients of the hypothesized model – 2D/3D, Elevation, Financial Value

*p<.05; **p<.01; ***p<.001

3.5 Conclusions

3.5.1 General Discussion and Managerial Implications

In the current context of fast evolving emerging technological, multiple devices are enabling VR experiences, through which consumers communicate and interact. Accordingly, the use of this new interactive setting might impact customers' emotions, attitudes and behaviors towards the product (Wu & Whang et al., 2021; Fisher et al., 2008). With regards to the adoption of true sustainability practices, affecting individual feelings and emotions (Kyu Kim et al., 2021; Fuxman et al., 2022), the paper highlights the presence of a differential effect when customers, engaged in group discussion, interact in a Metaverse/ 3D virtual reality environment vs. when they do the same in a 2D environments.

In this scenario, our findings reveal that only a limited set of inward (Laros & Steenkamp, 2005) and outward emotions (Algoe et al., 2009) are affected by the type of media setting in which the discussion takes place. More specifically, this introductory research showed a direct effect between the use of different media and specific inward emotions such as Happiness, Contentment, Inspiration and Elevation. Differently from what expected, 2D settings still have a better influence on such emotions when dealing with sustainable high-end fashion products. The above suggests that those emotions need to be carefully stimulated, as they might be a central element in a potential engagement plan in 3D media setting. Thus, future effective marketing strategies in the Metaverse should focus on improving Happiness – as the "emotional state characterized by feelings of joy and fulfillment generated by the product" - and Contentment – as the "feeling of quiet satisfaction generated by the product". The impact of these emotions would then be translated in a differential perceived financial value of the sustainable products: results from our path analysis indicated, indeed, that the emotional reaction (i.e. happiness and contentment), obtained from the display of the sustainable high-end Fashion items, mediates the effect of the type of media (2D vs. 3D platforms) on the product's financial value.

In order to boost users' feelings and behavioral intentions towards high-end sustainable fashion products, especially with embodied technologies, Choi et al. (2018) suggest that users may need to be enjoyed and engaged in the virtual experience, and thus managers should carefully reflect on how to develop appropriate communication plans in a multi touch-point environment.

As a result, experiences with highly embodied and virtual devices (i.e. Oculus) can generate a higher level of emotional display which, in turn, might influence the individual perception of the product's sustainable qualities and the reasons for its associated value. In their quest to discover fresh emotional approaches for promoting products, marketers ought to consider the

influence of the Metaverse and how to set-up proper immersive experiences. In order to be effective in the market, accordingly, a profound and careful investigation should be run to understand the impact of the setting of the Metaverse; managers might then explore how to enrich their VR tools, its sensory inputs and interactivity (i.e. working on Avatars) to enhance positive emotional reactions (i.e. enjoyment and engagement) and attitudes towards sustainable products.

3.5.2 Limitations and Future Research

This study has several limitations that could generate future research avenues. First, the sample size of our research is relatively small with limitations on a specific age group, already more prone to the use of innovative technologies; thus the validity of the outcomes might be increased by enlarging the sample and the expanding to other socio-demo groups. Second, the stimulus analyzed was the display of one sustainable high-end Fashion product of an international well-known Fashion company. It would be interesting to use different stimuli (i.e. different types of products) and different Fashion brands to compare the effectiveness of the different media (i.e. 2D vs. 3D platforms). Third, all variables, including inward and outward emotions and financial value, were measured self-reportedly (i.e., Likert scales), and there was a limited exploration of more behavioural variables. Future research can go beyond these limitations and extend our findings by conducting qualitative data analysis based on coding semi-structured interviews on respondents' emotional states and attitudes. Finally, the validity of the results might be explored also in other industries to understand whether a common differential pattern exists on emotional responses and on other consumption drivers in different contexts, when customers interact to form their opinion in the Metaverse vs. other touchpoints.

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FINAL DISCUSSION

The Metaverse represents a paradigm shift in how we perceive and interact with digital spaces. It goes beyond the world of virtual reality and augmented reality, offering a seamless convergence of physical and digital worlds. As a highly immersive and interactive environment, the Metaverse holds immense potential for transforming industries such as entertainment, gaming, education, social networking, and commerce. Accordingly, as highlighted by the first chapter of this paper, the applications of the Metaverse are vast and multifaceted. In the tourism and hospitality industry, for example, the Metaverse has the power to revolutionize storytelling, creating dynamic and immersive narratives that engage users on unprecedented levels. Educational institutions can leverage the Metaverse to provide immersive and collaborative learning experiences, fostering creativity and engagement among students. The Metaverse also offers unique opportunities for social interaction, enabling users to connect, communicate, and collaborate in virtual spaces.

In addition, in order to contribute to the existing literature on the Metaverse, the article aimed to analyze and explore behavioral variables such as customer experience and para-social interactions. With a sharp focus on the emotional sphere of individuals, in fact, the paper focused on highly emerging issues such as sustainability, individuals' perceptions and emotions. Specifically, from the investigations carried out in Chapters 2 and 3, respectively, it was found (a) a differential effect when customers interact in a Metaverse/ 3D virtual reality environment against when they engage in group discussion in a 2D environments, and consequently, the formation of different priorities in the ranking of the relevance of *objective* and visible sustainable practices and of *subjective* responses and emotions depending on the media settings, and (b) that a limited set of inward (Laros & Steenkamp, 2005) and outward emotions (Algoe et al., 2009) are affected by the type of media setting in which the discussion takes place.

However, several challenges and considerations need to be addressed for the successful implementation and adoption of the Metaverse. Privacy and security concerns, ethical considerations, interoperability standards, and accessibility are crucial aspects that must be carefully navigated to ensure the inclusivity, safety, and integrity of the Metaverse ecosystem.

Furthermore, to unlock novel emotional strategies for product promotion, marketers should explore the potential of the Metaverse and its ability to create immersive experiences. To achieve success in the market, it is crucial to conduct thorough and comprehensive research on the impact of the Metaverse environment. Managers then should focus on enhancing their virtual reality tools, sensory inputs, and interactivity (such as refining Avatars) to generate positive emotional responses (such as enjoyment and engagement) and foster favorable attitudes towards sustainable products.

As the Metaverse continues to evolve, further studies and development are essential. Indeed, this manuscript is not exempt from limitations.

The limited sample, the restricted socio-demo and behavioral analyzed variables, the focus on sustainability and high-end fashion industry opened up to further research's avenues. Among those, novel studies should explore technological advancements, user experience design, governance models, and the social and cultural implications of the Metaverse. In particular, with a focus on the high-end fashion and sustainability industry, additional insights can be obtained by conducting qualitative analysis and interviewing field experts or consumers who have used the Metaverse to shop or sell products and brands. Further studies should also focus on investigating new and additional types of emotional responses to sustainable products in the Metaverse and analyze the impact of the Metaverse and other attitudinal variables on the development of sustainable products and green choices.

In conclusion, the Metaverse represents a transformative and exciting concept with vast potential for innovation and disruption. Its applications span across various domains, promising

to redefine how we interact, learn, work, and entertain ourselves. By addressing the challenges and embracing the opportunities, society and organizations can harness the power of the Metaverse to create a more immersive, interconnected, and inclusive digital future.

Appendix

Appendix 1a – Pre-reading documents

Sustainability in High-end Fashion Products

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Case introduction

- You will be asked to:
  - **Read** slides 3,4,5 and the linked documents
  - Have a group-discussion and reach a **consensus** in the group on which factors, among those listed in slide 7, are the most relevant to support the perception that a high-end fashion product is sustainable

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1. Analysing the Born to Protect (BTP) Collection

Procedure

A Please, go to:
https://www.moncler.com/en-it/monclernow/born-to-protect.html

B Read **carefully all the information** reported on the website

C **Link them** to the next documents
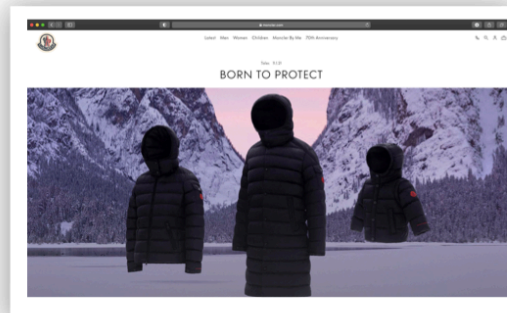
BORN TO PROTECT

2. Understanding the Components of BTP products

Procedure

A Please, go to:
https://www.monclergroup.com/en/sustain
ability/think-circular-bold/born-to-protect-
collection

B Read **carefully the technical
components** of the products

C **Link them** to the previous document
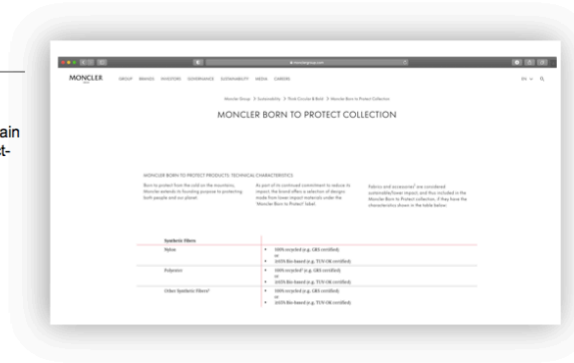
**Observing the products of the Monlcer Born-To-Protect (BTP) collection and consider
them in relation to the previous document**

Appendix 1b – Task 1

Sustainability in High-end Fashion Products

Consider the following list of factors, and rank them, according to the consensus you reach in your group, that most support the perception that a high-end fashion product is sustainable?

- **Components**: The company utilize low impact materials (e.g., recycled, biobased, organic, etc.)
- **Responsible supply chain**: The Company has a responsible management of the supply chain (e.g., respect for human rights and health and safety)
- **Circularity:** The Company is able to design products according to the circularity criteria (e.g., eco-design, ability to disassemble, disposal, sustainable inputs, etc.)
- **Global commitment**: The Company participate in global commitments (e.g., Just Transition, joining The Fashion Pact initiative, submission of UNGC, etc.)
- **Strategic Sustainability Plan:** The Company has a public Strategic Sustainability Plan with a public, quantitative and challenging commitment and targets

1 Please **discuss** in your group, reach an **internal agreement**, and **rank** in order of **importance** the factors that most **support** the **perception** that a high-end fashion **product** is **sustainable**

2 **Deliver the ranking** at the end of your group discussion

Further, you will be presenting in class, over the next weeks, the rationale beyond your decision

3 Your team leader is responsible of **clearly stating in sentences - with her/his voice - the chosen ranking** and the reasons of team's choices (i) at the end of the discussion, **(ii) inside the Metaverse and (iii) before exiting the session**

Appendix 1c – Task 2

Sustainability in High-end Fashion Products

Consider the following list of emotions, and rank them, according to the consensus you reach in your group, that most describe the elicited emotions associated to a sustainable high-end fashion product

- **Pride:** occurs when a consumer feels superior compared to another person because of the product
- **Contentment:** is a feeling of quiet satisfaction generated by the product
- **Happiness:** an emotional state characterized by feelings of joy and fulfillment generated by the product
- **Gratitude:** involves being thankful and appreciative towards the company behind the product
- **Inspiration:** being mentally stimulated by the company behind the product to do or feel something
- **Elevation:** is a response to acts of moral beauty of the company behind the product in which individuals feel as though they have become less selfish, and they want to act accordingly

1 Please **discuss** in your group, reach an **internal agreement**, and **rank** in order of **importance** the emotions that most **describe** the elicited **emotions** associated to a **sustainable** high-end fashion **product**

2 **Deliver the ranking** at the end of your group discussion

Further, you will be presenting in class, over the next weeks, the rationale beyond your decision

3 Your team leader is responsible of **clearly stating in sentences - with her/his voice - the chosen ranking** and the reasons of team's choices (i) at the end of the discussion, **(ii) inside the Metaverse and (iii) before exiting the session**

SUMMARY CHAPTER 1

The Metaverse concept, despite its 30-year history, is still in its early stages of development and offers various immersive experiences within an interconnected digital space. With its potential to reshape social, economic, and cultural landscapes, the Metaverse has gained significant attention and speculation. The concept emerged from science fiction and has been explored in various forms, such as the virtual world Second Life and more recent platforms like Roblox and Fortnite. However, it was the launch of Horizon Worlds by Meta Platforms in 2021 that sparked widespread interest and debate about the potential impact of the Metaverse on work and socialization. The use of the Metaverse presents opportunities for companies to engage with consumers and create interactive experiences, while users can be influenced by new marketing technologies that shape their behaviours, perception, and interactions.

Collaboration and communication are key elements in the Metaverse, allowing users to share experiences and connect with others from different locations and time zones. This virtual world is attracting increasing interest from both businesses and consumers. Internet searches for the term "Metaverse" have surged, and consumers are excited about the potential of shifting various activities to the Metaverse. Companies in the Metaverse industry have raised significant investments, and its value-generating potential is projected to reach trillions of dollars by 2030. The Metaverse represents a promising and rapidly growing sector with vast opportunities for various stakeholders.

Analysis and Methods

This study utilizes bibliometric analysis, a quantitative technique, to analyze the topic of the Metaverse with a focus in marketing. The analysis is conducted in three phases: data collection, bibliometric and co-citation analysis, and qualitative analysis of the papers. The

data is collected from various journals related to management, sustainability, behavioral sciences, psychology, marketing, communication, business, economics, and computer science. A total of 1020 articles are initially collected, which are then narrowed down to 148 based on area of interest, keywords, language. The bibliometric analysis focuses on the year of publication, authors, type of study, analysis conducted, and co-citation networks. Four co-citation networks, which are created using the Louvain method for community detection, emerged from the analysis. The study combines qualitative and quantitative analysis to gain insights into the research data on the Metaverse in marketing.

Results

Co-Citation Network 1

From the first co-citation Network emerged that Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) technologies are currently shaping the development of the Metaverse. VR provides a fully immersive environment, while AR overlays digital content onto the real world, enabling mixed reality experiences. These technologies have significant implications for the consumer experience, as they enhance interactivity, engagement, and the transfer of information. They create a sense of telepresence, allowing users to feel present in a mediated environment. VR and AR technologies have been explored in the context of marketing and customer experience, where they have the potential to influence attitudes, beliefs, and evaluations of products and offerings. They can evoke affective reactions, enhance sensory experiences, and improve the ability to evaluate products. The integration of reality-virtuality technologies in companies' brand value journey enables the creation of dynamic and autonomous customer experiences, enhancing perceived value. However, it's important to note that VR technologies are not meant to replace real experiences but rather complement them by providing unique and immersive interactions.

Co-Citation Network 2

The authors in co-citation network 2 focused on the Metaverse, specifically exploring its 3D environment, types of relationships, and data protection methods. They discussed practical applications of the Metaverse in industries such as tourism and hospitality management. The common features of the Metaverse include continuity of identity and objects, a shared environment, the use of avatars, synchronization, three-dimensionality, interoperability, and an interactive, immersive, and social user experience.

Since COVID-19 pandemic has accelerated the imagination around the development of the Metaverse, organizations have now the opportunity to adapt their business models to operate in this new reality. In tourism and hospitality, for example, companies should design immersive experiences that customers perceive as valuable and for which they are willing to pay. The Metaverse offers the possibility of virtually experiencing flights, hotel rooms, dining, tours, and other services in advance. However, concerns have been raised regarding ethics, data security, legislation, safety, and the potential negative psychological impact on vulnerable individuals in the Metaverse. Offensive behavior, harassment, data exploitation, and cyberbullying are among the challenges that need to be addressed in the development of the Metaverse.

Co-Citation Network 3

The third network in the dataset focuses on the use of the Metaverse and virtual and augmented reality in educational and organizational settings. The studies in this cluster compare the effectiveness of the Metaverse as a learning tool and explore its potential for improving task comprehension and achievements. The concept of media richness, which refers

to the capacity of communication media to process rich information, is highlighted, with face-to-face communication considered to provide multiple cues for processing complex messages.

In this cluster of authors, the Metaverse is seen as a next-generation skill practicing environment, offering opportunities for social activities, problem-solving, collaboration, and communication. Its applications in various fields, including education, healthcare, training, and language learning, are discussed. Marketers and brands are empowered by the Metaverse's capacity for imagination and creativity, allowing them to deliver unique offerings beyond the real world. The Metaverse also offers unique opportunities for consumers to directly interact with brands and have hyper-personalized shopping experiences. Brands must ensure alignment between their messages and brand personalities in the real world and the Metaverse to maintain their reputation and customer loyalty. The Metaverse's strategic tools can also aid in measuring and evaluating brand campaign performance and providing insights for improvement.

Co-Citation Network 4

The studies in the last co-citation network primarily focus on the evolution of retail platforms, particularly Metaverse retailing (MR). Metaverse retailing is differentiated from traditional 2D e-retailing by its specific features and purpose, involving the sale of virtual goods and services in collaborative virtual environments.

The multi-space retail environment requires an integrated approach, with businesses utilizing various promotional strategies and technologies to reach consumers across physical and online spaces. Metaverse retailing encompasses a range of products, from virtual digital items to offline digital products and even real-life purchases.

Marketing strategies for implementing Metaverse retailing include conversational artificial intelligence, visual imagery, and customer experience analytics, particularly in livestreaming e-commerce within 3D immersive environments. Digital shopping paths in experiential shops

are found to enhance brand awareness and optimize customer relationship management through personalized user experiences. However, challenges exist in terms of technological sophistication and the design of three-dimensional representations of numerous products.

Conclusions

The Metaverse holds immense potential in transforming various industries, including advertising, hospitality and tourism, education, and retailing. These industries are closely tied to human experiences, social interactions, and consumer behavior, making the Metaverse a powerful tool for reshaping how people interact with businesses and each other. However, there are still many unanswered questions and opportunities for future research in these domains.In the field of advertising, for example, potential research areas include comparing the effectiveness of the Metaverse with traditional advertising channels, exploring virtual product placement and immersive advertising formats, and studying their impact on consumer engagement and brand loyalty. In the hospitality and tourism industries, researchers can focus on interactive marketing communication and customer perceptions of virtual events and destinations in the Metaverse. For education, future studies can develop metaverse-based educational models, examine the effects of metaverse-based settings on learning outcomes, and compare performance between metaverse and conventional learning approaches. Finally, in retailing, research can assess the potential of the Metaverse for virtual shopping experiences, compare offline and online consumer behavior, and explore personalized shopping experiences and their impact on satisfaction and loyalty.

The study also acknowledges its limitations, such as the database's limitations in assigning values to journals and the variation in authorship. It suggests that future research should continue to identify different clusters and sectors related to the concept of the Metaverse.

SUMMARY CHAPTER 2

The high-end fashion sector is experiencing significant changes due to trends like sustainability and corporate social responsibility (CSR). These trends are influencing both the supply and demand sides of the market, affecting how companies design, source, produce, and distribute their products, as well as how consumers engage, interact, select, and bond with brands. Consumers now expect brands to prioritize sustainability and CSR, and market success is determined by the alignment between customer expectations and tangible actions taken by companies.

High-end fashion companies are actively contributing to a sustainable ecosystem by incorporating sustainability into their supply chain design, product development processes, and activities for stakeholders. Global CSR initiatives that are recognizable, linked to the brand, rooted in the supply chain, and immersive or involving customers are more attractive to consumers and increase their willingness to buy.

Moreover, the research highlights that consumers form their opinion about the sustainability of brands and products based on objective and visible practices, as well as the opinions of other stakeholders and the discussion context. Objective elements, such as low impact materials, responsible supply chain management, circularity, global commitments, and strategic sustainability plans, contribute to consumers' perception of a product's sustainability.

Additionally, emotional and subjective factors, including pride, contentment, happiness, gratitude, inspiration, and elevation, play a role in shaping consumers' sustainability perception. These factors are influenced by the media setting and context in which consumers are exposed to information, whether traditional or new media.

The study, thus suggests that the Metaverse, as a 3D virtual reality environment, can provide a more immersive and interactive experience compared to 2D environments, enhancing

consumers' perception of objective/functional factors and eliciting emotional responses. The use of virtual reality technology can create a realistic representation of products, enabling customers to experience them in a more tangible way.

On that basis, the research proposes several hypotheses to test the differential influence of the media (Metaverse vs. 2D) on consumers' perception of both objective and subjective factors. These hypotheses suggest that the Metaverse will have a greater impact on components, responsible supply chain, circularity, global commitment, strategic sustainability plan, as well as emotions of pride, contentment, happiness, gratitude, inspiration, and elevation compared to 2D environments.

Analysis and Methods

This research study involved 137 students from Luiss University in Rome, who were enrolled in the Master of Science in Management program. The participants were divided into two groups,Group A and Group B, each consisting of multiple teams. The average age of the participants was 22 years, with 31% being female and 69% male.

The experiment was conducted in two rounds using a wait-list control group model. In the first round,Group A used the Metaverse platform for a prioritization task on objective factors, while Group B used the Webex platform as the control group. In the second round, the groups were reversed, and the focus shifted to ranking subjective factors. The experiment structure aimed to minimize bias in the participants' responses and provide equal opportunities for working with both technologies.

The stimuli for the experiment included visual displays of high-end fashion products and sustainability practices of a real fashion company. The objective and functional factors were based on previous research on product sustainability and consumer behavior and emotional response.

Data analysis involved calculating the frequency of occurrence for each ranking obtained from the focus groups. The frequency data were transformed into interval scale data using Thurstone's Law of Comparative Judgment and scaling tools. Chi-squared tests of independence were performed to examine the impact of media (Metaverse vs. Webex) on the relative relevance of subjective and objective factors, as reflected in the rankings.

Results

In the first round of the experiment, students who held meetings in the Metaverse platform rated "Components" as the most important factor, with a deviation of -0.9 points compared to the Webex platform. On the other hand, students using Webex gave less importance to "Global commitment" with a deviation of 0.8 points from the Metaverse. This suggests that students in the Metaverse focused on the long-term view of the company and achieving sustainability goals, while students in Webex relied more on explicit documents and pre-reading materials. The results of the chi-square tests indicated a non-significant correlation between the selected round (1 or 2) and factors such as "Circularity," "Responsible supply chain," "Global commitment," and "Strategic plan." However, there was a quasi-significant relationship regarding "Components," indicating an acceptable fit within the hypothesized construct.

In the second round, which focused on emotions and subjective factors, students in the Metaverse platform appeared more proud of the sustainable product compared to students in Webex. However, the item "Inspiration" was rated less highly by the Metaverse students. The chi-square test results showed that there was a partly supported relationship between the variable "Gratitude" and the round, but non-significant associations were found for variables such as "Pride," "Contentment," "Happiness," "Inspiration," and "Elevation."

Overall, the study provided insights into the differences in students' perception and emphasis on various factors and emotions when using different platforms (Metaverse vs. Webex) for sustainability-related discussions.

Conclusions

The paper argues that there is a differential effect on customers' perceptions when they interact in a 3D virtual reality environment (Metaverse) compared to group discussions in 2D environments. The findings suggest that individuals prioritize and rank the relevance of objective and visible practices differently from subjective responses and emotions.

Managers can derive implications from these results for their brand development planning. Depending on the area they want to strengthen (subjective/emotional or objective/functional), they can create appropriate settings to engage customers and stimulate discussions on the perceived sustainability of the brand and its products.

The study highlights the significant influence of the Metaverse on respondents' perceptions of "Components" (objective factor) and "Gratitude" (emotional factor) compared to the 2D platform. This suggests that these elements could be central to an effective engagement plan in a 3D media setting. For example, marketing actions in the Metaverse could be designed to stimulate gratitude and enhance the perception of components, which represents the company's ability to design sustainable products using environmentally friendly materials.

This study is not exempt from limitations. The sample was composed by students, and the validity of the outcomes might be increased by enlarging the sample and the expanding to other socio-demo groups. The technology involvement and the related usage motivation were high for respondent; consequently the study didn't consider cases with low technology experiences.

SUMMARY CHAPTER 3

This article discussed the role of emotions and the impact of different media platforms on customers' perceptions and experiences in the context of sustainable high-end fashion. It highlights the potential of the Metaverse, a 3D virtual reality environment, to evoke positive emotions and enhance customers' engagement and satisfaction compared to traditional 2D platforms.

Emotions are defined as states of feelings that arise as reactions to experiences. The use of multi-sensory stimuli in the Metaverse is believed to improve immersiveness and elicit not only the transfer of information but also emotional reactions. 3D virtual reality can provide a more accurate representation of products and services, allowing customers to experience them in a more meaningful way and enhancing the emotional aspects of perception.Specifically, through the use of the Metaverse, users can experience a sense of psychological involvement (Mollen & Wilson, 2010), and thus feeling intense emotions (Mayer et al., 2020) that lead to a high degree of engagement.

The paper, thus hypothesizes that using the Metaverse will generate more positive emotions compared to 2D environments. Emotions are categorized into inward emotions (such as pride, contentment, happiness, admiration, and love) and outward emotions (such as gratitude, inspiration, elevation, and awe) in response to sustainable high-end fashion products.

Furthermore, the study examines the mediating role of emotions in the impact of different media platforms (2D vs. 3D) on the perceived financial value of sustainable high-end fashion products. It suggests that specific inward and outward emotions may mediate the relationship between the type of media platform and customers' perception of financial value.

In summary, the study introduces the concept of emotions, discusses the potential of the Metaverse to evoke positive emotions in the context of sustainable high-end fashion, and

proposes hypotheses regarding the role of emotions in mediating the impact of different media platforms on the perceived financial value of sustainable products.

Analysis and Methods

Data was collected from 133 Master students at Luiss University in Rome, who were divided into two main groups (Group A and B) and assigned to teams of four to six individuals. A total of 15 teams for Group A and 16 teams for Group B were formed.

Quantitative data analysis have been performed using IBM SPSS Statistics 28. An independent t-test was conducted to compare the data collected from the Qualtrics questionnaires.

In Study 1, the aim was to observe the effects of using 2D vs. 3D media on the investigated emotions (H1 and H2). The t-test evaluated the direct effects between the use of 2D/3D technology and each inward and outward emotion.

Based on the results of Study 1, the researchers conducted Study 2 to analyze the mediating effects of the emotions identified in the previous hypotheses. They examined the relationship between the type of technological platform (2D/3D) and the financial value of the sustainable product (H3). To analyze these mediating effects, the researchers utilized the PROCESS macro for SPSS (Model 4).

The experiment was conducted in two rounds using a wait-list control group model. In the first round, Group A used the Metaverse platform for a prioritization task on objective factors, while Group B used the Webex platform as the control group. In the second round, the groups were reversed, and the focus shifted to ranking subjective factors. The experiment structure aimed to minimize bias in the participants' responses and provide equal opportunities for working with both technologies.

The stimuli for the experiment included visual displays of high-end fashion products and sustainability practices of a real fashion company. The objective and functional factors were based on previous research on product sustainability and consumer behavior and emotional response.

Results

In Study 1, the reliability of the tested constructs has been assessed and t-tests to examine the relationships between the medium (2D vs. 3D) and emotions have been conducted. Regarding inward emotions, the 2D platform received higher scores than the 3D environment for happiness and contentment. For outward emotions, significant differences were observed in the variables of inspiration and elevation.

In Study 2, the researchers focused on the variables that showed significant differences in Study 1. Regression analyses have been conducted to test the hypothesized model (H3) and assessed the conditions of mediation for each variable. The results for happiness indicated that the type of media had an indirect effect on financial value through the mediation of happiness. However, the direction of the effect was opposite to what was expected, suggesting a full mediation. Similar results were observed for the variable of contentment, indicating an indirect effect on financial value through contentment. Again, the direction of the effect was opposite to expectations, and contentment served as a mediator. However, for the variables of inspiration and elevation, no significant mediation effects were found.

Overall, the findings suggest that the type of media (2D vs. 3D) has indirect effects on the financial value of the product through the mediation of emotions, specifically happiness and contentment. However, the direction of these effects is contrary to what was anticipated. The variables of inspiration and elevation did not mediate the relationship between the type of media and financial value.

Conclusions

This article discusses the impact of different media settings (2D vs. 3D) on consumers' emotions, attitudes, and behaviors towards sustainable high-end fashion products in the context of emerging virtual reality (VR) technologies. It was found that certain inward emotions (such as happiness, contentment, inspiration, and elevation) and outward emotions are affected by the type of media setting used during group discussions. Surprisingly, 2D settings had a stronger influence on these emotions compared to 3D settings.

The study suggests that stimulating and enhancing specific emotions, such as happiness and contentment, can be a central element in effective marketing strategies within the Metaverse (virtual reality environment). Moreover, evidences also suggest that the emotional reactions evoked by sustainable fashion products mediate the effect of the media type on the perceived financial value of the products. To encourage positive emotional reactions and behavioral intentions towards sustainable fashion products, marketers should focus on creating enjoyable and engaging virtual experiences, taking into account the sensory inputs and interactivity of the VR tools.

All in all, the research highlights the importance of understanding the impact of the Metaverse setting and suggests that marketers should invest in immersive experiences and explore ways to enhance positive emotional reactions and attitudes towards sustainable products.

This study has several limitations that could generate future research avenues. First, the sample size of our research is relatively small with limitations on a specific age group; thus the validity of the outcomes might be increased by enlarging the sample and the expanding to other socio-demo groups. Finally, all variables, were measured self-reportedly (i.e., Likert scales), and there was a limited exploration of more behavioural variables.

ACKNOWLEDGEMENTS