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Gamification marketing in metaverse contexts

Can the employment of immersive gamification experiences that leverage customer's creativity and sociality be a useful tool to influence customer engagement in metaverse applications?

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Alla mia famiglia, in particolare a mia nonna Valentina, per essermi stata accanto tra alti e tanti bassi.

Alle mie care amiche, nuove, vecchie, e ritrovate, che hanno mosso mari e monti per supportarmi.

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2 Introduction

In the last decades, public interest toward the innovation and newfound opportunities "the metaverse" could provide has consistently grown all around the planet. However, only in recent years, powered by the physical limitations people had to endure during the outbreak of Covid-19, the hype on the subject of parallel virtual experiences has reached unprecedented levels, putting the spotlight on the evolution made up to now. Complicit to this rediscovery by public opinion have been the substantial investments and the unprecedented change of business direction that *Meta Inc.* has made towards the enhancement of metaverse experiences.

Nonetheless, research and developments in this area of study have been ongoing since the early 2000s, with the launch of innovative applications such as *Second Life*, which was the first embryotic instance of metaverse presented to the public. In fact, it perfectly aligned to the definition of the metaverse now in use: "an enhanced experience of reality" (Golf-Papez et al., 2022), built as an ecosystem of interconnected, shared (mainly 3D) virtual worlds, with unlimited number of users creating and exploring it (Bosworth and Clegg, 2021; Hollensen et al., 2022).

From that point after, the evolution, especially in terms of technology has been consistent, to the point of reaching technologies such as the ones grouped under extended reality technologies.

The use of Extended Reality (XR) technologies as tools to create immersive experiences has been thoroughly explored by several domains, ranging from more academical subjects, like healthcare and education, to hedonic applications, like gaming and virtual retail. The term Extended Reality simplistically refers to any form of new reality developing in the metaverse, which include: Virtual Reality (VR), which is a simulation of 3D experiences and entities in a virtual environment (Hudson et al., 2019), that merges sensory perceptions in order to create a sense of presence; Augmented Reality (AR), which supplements reality by projecting elements inside it, combining both online and offline touchpoints (Rauschnabel et al., 2022); and their convergence, Mixed Reality (MR), which includes all the existing realities between the extremes of VR and AR (Flavián et al., 2019). Specifically, the first two forms (VR and AR) notably represent the great part of the technologies that have reached the markets of individual consumers to date. In fact, they include interface devices such as head mounted displays and powerwalls, but also common smartphones, tablets, and computers. Naturally, considering their functioning is substantially different, each technology has several diverse implications in various contexts and, thus, in this systematic review, the groupings of virtual reality and augmented reality are often addressed separately depending on their implications.

Considering extended realities are predisposed to enable creative activities, offer a dynamic experience, and give rise to the playground effect, if well managed (Jessen et

al., 2020), it does not come as a surprise to discover that the discipline observing the greatest developments is the gaming industry (Wedel et al., 2020). In fact, the current most used metaverse platforms partially belong to such field. Additionally, as mentioned, other industries have already started exploring extended realities' potential, the noteworthy are marketing, tourism, entertainment, medicine, and education (Wedel et al., 2020).

Even so, to date, most of them have not fully achieved to grasp the infinite possibilities the extended reality technologies present. Indeed, they propose mostly low-involvement solutions that prevent interaction and mirror situations already existing in reality, employing mainly the only sense of vision, statically (Cowan & Ketron, 2019)(Xi & Hamari, 2021).

Hence, they have not yet harnessed the power extended reality technologies hold in not being subject to the same space-time restrictions of the real world (Alcañiz et al., 2019). Such approaches also disregard the pillars of the Situated Cognition Theory, for which customer experiences are more realistic when product information is embedded, users can have physical interactions with the products, and there are opportunities for communication with others (Hilken et al., 2017).

Nonetheless, such reluctancy to innovate also concerns the marketing and communication field, inasmuch the literature reviewed outlined the felt hesitancy of brands before embedding innovative technologies to their routines. It was the cases of both Web 1.0, when firms hesitated to digitalise their businesses because wary of online sale, and Web 2.0, when companies lingered before creating their own channels on social networks (Cowan & Ketron, 2019). Manifestly, these instances are further proof that disregarding change always proves to be harmful, since the companies avoiding risks with such drive end up either changing business model when competitors are already achieving success,or changing it too late and consequently fail.

Unfortunately, in accordance, in marketing and shopping fields, most companies limit the use of virtual reality to the visual reproduction of brick-and-mortar shopping environments (Xi & Hamari, 2021). Such approaches remove physical environments' incumbencies (e.g., having to move, bystanders, expenses), but do not add anything to the existent experience, in fact, they cannot even wholly reproduce the same multisensory experience. The same goes for augmented reality, as most of the proposals consist in the mere visual projection of an existing product in a consumer's personal environment, often on a static picture, without allowing further interaction.

These approaches are restrictive and evidently do not take advantage of the true value adding features of metaverse applications. Among other approaches, they overlook the strong potential held by the application of game designed elements' motivational power (gamification)(Yang et al., 2017) to achieve immersion and, consequently, customer engagement in the metaverse.

Metaverse technologies are remarkably prone to gamified experiences, as they originated from the same gaming logics. In fact, gamification promotes leisure activities in which customers relax, compete, and often act more spontaneously. This approach makes it possible to understand more easily their essence and what moves them (Nobre & Ferreira, 2017). These experiences are powered by psychologically influential tools that include systems of points, rewards, storytelling, challenge, and role-playing, and accordingly can be great means to the heightening of customer engagement. However, since gamification is a relatively new concept as well, its implementation is still unclear for businesses (Yang et al., 2017), particularly in metaverse contexts.

The apparent lack of creative innovation in extended reality marketing applications and gamified experiences could be tracked back to the scarce, fragmented, and often heterogeneous nature of the research made until now (Alcañiz et al., 2019)(Yang et al., 2017). In fact, the literature selected and investigated for the constitution of this systematic literature review was characterised by studies on the metaverse that often did not sufficiently investigate pragmatic and realistic applications.

In the face of such deficiency, this body of work focuses on outlining the possible opportunities of customer engagement enhancement that can originate from the employment of gamification in metaverse contexts. Accordingly, the discourse acknowledges the weight consumer interactions with the virtual environment have on emotional investment (Hollensen et al., 2022). As in fact, manipulation of psychological dimensions is an important driver of immersion in an extended reality context (Hudson et al., 2019). In fact, being customer engagement a psychological construct of the marketing field, the main determinants of its improvements all partially belong to the psychological and emotional spheres conditioning consumer behaviour.

Specifically, the results collected and investigated brought the researcher to the definition of three determinants a company should work on, in order to achieve higher levels of customer engagement in metaverse gamified experiences. The first characterises the necessary environment in which the other two dimensions can thrive, and it is the state of immersion guaranteed by both technology and storytelling. The second is sociality, which strongly depends on the nature of human beings and is affected by competitive dynamics, that naturally involve both metaverse and gamification. The third is creativity, which instead is heavily dependent on the relationship with companies, that should provide the appropriate level of autonomy to its customers.

The choice of concentrating on the metric of customer engagement as representative of successful marketing approaches, and thus connect it to the aforementioned three drivers, is due to the resulting behaviours of engaged customers with respect to their

relationship with the company. In fact, as addressed by this body of work, engaged customers are more inherently prone to purchase the related products, take part of firm-induced referrals, talk about the firm with acquaintances and so further. Thereby, they are a reliable source of value, which derives both from their retention and their ability to bring new acquisitors.

The structure of the systematic literature review is the following, and it almost entirely adheres to the PRISMA checklist of 2020. Primarily, priority is given to the definition of the three concepts that underpin the entire literary review, namely the metaverse, gamification and customer engagement. They are addressed in terms of defining features, dimensions, technologies, and contexts of development, all based on the current literature addressing these issues. Naturally, their depiction is performed in accordance with the review's objectives of finding common grounds for the three.

Thereafter, the use of the PRISMA framework is investigated, to define in which ways this body of work fully adheres to its propositions, and the possible modifications made. The chapter dedicated to this analysis is the one of the "literature review process methodology", which in fact also deepens the eligibility criteria, methods and parameters employed in the conduction of the eleven searches performed in the course of several months.

Afterwards, the data resulting from the searches is deepen, with the aim of highlighting the strong points verified throughout the literature analysed. This chapter is the one truly defining the aforementioned three determinants of immersion, sociality, and creativity.

Finally, the whole work performed is discussed in terms of focal evidence, examples, and gaps, to define and summarise the reasonings made up until that point, justifying the hypothesis brought forward. Thereby, this discussion chapter functions as a compendium outlining propositions in the form of theoretical and functional background, managerial implications, and suggestions for future research.

3 "Laying the foundations" – definition of key concepts

The current chapter will serve as a steppingstone for further investigations, as it "lays the foundations" of this production by outlining the very meaning of its three conceptual pillars: the metaverse, gamification and customer engagement.

In point of fact, the premise for an accurate systematic literature review is that of describing the current state of the art and, most importantly, defining unambiguously the concepts that constitute the heart of the body of work. In fact, it serves as a guide for future statements, leaving little to no room for misunderstandings on the matter. Indeed, the concepts to be presented may already be subject to bias on the part of the reader, due to previous knowledge gathered over decades or over a little period, with respect to each notion. It could be either a deep and professional knowledge, deriving from personal studies or familiarity in this area, or superficial knowledge from third-party sources. Else, the reader may be completely unaware of the meaning of one or more of these three key points. Either way, these discrepancies must and are resolved in this very chapter of investigation.

For further intelligibility, the following paragraphs are arranged as follows:

- The emergence of the **metaverse** in the early 2000s, the underlying dynamics that guided its evolution throughout the years, its defining dimensions, the most distinctive ("tangible" and "intangible") metaverse technologies, and the ultimate differences between centralised and decentralised platforms.
- The context from which **gamification** originates, game design, and its true meaning it terms of application to the business context.
- The new-born interest of academics to **customer engagement**, related to customer-centric marketing, its significant role in the marketing field and the depiction of its three dimensions.

In order to paint a relevant and well-rounded picture of said tools, obviously, the definitions depicted are the result of a sound research, as they blend point of views coming from several researchers mostly working in the marketing and business management fields.

3.1 Metaverse

The investigation first depicts the metaverse's origins in the gaming industry since early 2000s and its evolution in the very same field to this day, when it has finally reached public dominion, supported by a set of the most popular and successful instances. Given the background, a more theoretical definition of the metaverse is presented as synthesis of recent research. Consequently, the depiction is deepened through the key distinction between centralised and decentralised metaverse platforms, which will serve as key for further developments. Finally, the technologies

characterising the metaverse's relationship with users are outlined, the tangible side of the Extended Reality technologies and the strictly digital side of blockchain elements.

3.1.1 History of the metaverse

Up until this point, we have mostly mentioned the existence and the key role played by extended reality, as most people, particularly those not familiar with this field of study, are famously more accustomed to the devices now on the market (e.g., VR visors, AR screens), rather than the underlying concept of virtual worlds per se. However, the true focal point goes beyond the types of technology employed. As a matter of fact, it is more coherent to change perspective and, before referring to Extended Reality technologies, their declinations, and their applications, it should be imperative to acknowledge the context in which it all develops. In fact, Extended Reality technologies represent the array of interface devices that function as a bridge between the real world and the metaverse.

Here follows the history of where the term was born and its native application, starting from an abstract concept, continuing with the first releases in the market, and finishing with current state of the art and the newfound interest coming from colossal multinationals like *Meta Inc.* (formerly *Facebook Inc.*).

It is no mystery how the metaverse's roots go deep into the (video)games universe. In fact, the majority of the first archetypes of metaverse that came out in the early 2000s belong to the gaming industry. In particular, the two most famous and pioneering instances are those of *Second Life* (released in 2003), still in use but now becoming obsolete, and *Roblox* (released in 2006), which instead is still a winning business, with more than fifty million games and an accumulated monthly usage time amounting to 3 billion hours (Park & Kim, 2022).

It all begun in 2003, when the founder Philip Rosedale paved the path for its American software house *Linden Lab Inc.* to develop *Second Life*, the first successful virtual reality. This online software was one of the most notable instances of the phenomenon of metaverse worldwide. Therefore, being so early with respect to other platforms (e.g., Roblox, Minecraft) helped it become a market leader for quite some time, achieving more than one million user visits worldwide just after a decade of functioning (Linden Lab, 2013).

Such promising numbers, mediated by the growing power of the Internet (Web 1.0), implied easy access to a generous amount of useful personal data by consumers (Alcañiz et al., 2019). Naturally, the interest for the employment of virtual worlds for ulterior motives increased, bringing further investments in the market, especially on the theme of marketing and advertising for businesses. Some of the most known instances are: the Canadian retailer *American Apparel* had its own in-world shop to sell sweatshirts and t-shirts; the Japanese automotive manufacturer *Toyota* built an

in-world Scion division's dealership, together with a driving track with the sole scope of letting residents try out their car models (Kalning K., 2007); the American cable TV network *MTV* built the "Virtual Laguna Beach", in which fans could dress as their favourite characters and hang out in the show's faux settings (Siklos R., 2006).
However, to fully appreciate its potential, we must investigate further the actual functioning of *Linden Lab Inc.*'s creation. Accessible from one's own personal computer, *Second Life* consists in an "open-ended commercial virtual environment with in-world live editing, ability to import externally created 3D objects into the virtual environment, and advanced virtual economy" (Dionisio et al., 2013). Therefore, unlike similar popular multiplayer games of the time, e.g. *The Sims*, *World of Warcraft*, in this software, *Linden Lab Inc.* does not create the content, on the contrary the users oversee building for entertainment (and economic) sake (Kalning K., 2007). Hence, the main source of income of *Linden Lab Inc* comes from leasing virtual land to tenants (Siklos R., 2006).
Keeping the ability to interact (exchange) and socialise with other users as one of the main purposes of the software, the mechanism employed to achieve said goal is that of creating one's own avatar and projecting it in several possible virtual spaces (Hollensen et al., 2022). In this environment, users can perform real life actions such as purchase, sell, run businesses, gamble, listen to music, buy property, play games, enact relationship dynamics with others and so further (Kalning K., 2007). However, residents are not bounded to real world dynamics, on the contrary, they can also go beyond real life and express their imagination, for instance owning a dragon or walking underwater, in synthesis, they can own and do anything they wish (Siklos R., 2006).

From *Second Life* forward, the idea of metaverse has been further developed, going from low immersion instances, accessible through the combination of three tools/devices (a display, a keyboard, and a mouse), to high immersion realities (i.e., VR, AR, MR), that often demand a certain level of technological improvements, for instance fifth-generation connections (Hollensen et al., 2022).
As a matter of fact, in their contribution to the 2022 opinion paper *Metaverse beyond the hype* (Dwivedi et al., 2022), Sang-Min Park and Young-Gab Kim highlighted four major evolutions occurred between 2003 and today, that undoubtedly differentiate *Second Life*'s metaverse, previously discussed, and the dynamics that characterise the metaverse now:

1) The development of deep learning provides for high recognition performance and a natural generation model, which allow greater and more natural immersion.
2) As mentioned above, the current metaverse uses mobile devices, instead of PC-based tools, which increases accessibility and continuity.

3) The application of blockchain technologies and tools, including virtual currency, assets and NFTs, allow for more economic stability and new interesting possibilities of ownership (and exchange).
4) The historical occurrence of Covid-19, and the consequent forced long periods of isolation, has had a great impact on offline social activities, urging people of all ages to find online alternatives, which in some cases caused greater interest in the virtual worlds.

The subsequent metaverse platforms were then mostly released in 2010s and 2020s, e.g., *Minecraft*, *Fortnite*, *The Sandbox* and *Decentraland*. Similar to the beginning, the platforms that are currently gaining the most success (e.g., *Roblox*, *Fortnite, The Sandbox*) are often means to online gaming. Accordingly, this field is the one experiencing the greatest developments in metaverse evolution (Wedel et al., 2020), as they have had the time to experiment throughout the years, leading to consolidated best practices and decades of experience. These platforms consist mostly of online video games, which inherently have the scopes of entertaining, challenging, allow interaction and grant purposeful experiences; making user co-creation easier because of the potential of interactive and fun experiences (Cowan & Ketron, 2019). However, these instances are mostly known by "tech-savvy" consumers and are quite unknown to the public.
A true turning point happened recently, when public opinion's attention toward the metaverse strongly increased after the decision of one of the most popular and successful companies worldwide to heavily invest and promote the metaverse. The company mentioned is of course former *Facebook Inc.*, now *Meta Inc.*
The company and its chief executive Mark Zuckerberg have often been in the limelight of media because of multiple controversies of privacy breaches, political influences, censorships, and questionable system biases. Consequently, in October 2021, when Zuckerberg announced they were changing the historical name of the company to Meta and investing billions of dollars in order to introduce the metaverse to the masses (Hill, 2022), public opinion made itself heard, especially knowing he wanted to restore his public image by making himself the face of said change (Frenkel et al., 2022),

The project launched by *Meta Inc.* in December 2021 is called *Horizon Worlds* and is a free multi-player virtual universe. It offers thousands of different experiences for users to try, including attendance of events (e.g., musical performances, comedy sketches), games, and meeting friends and/or new people. In order to connect to said metaverse, users need to own and connect to a Meta Quest headset as this virtual world is VR-based. (Meta Inc., 2022).

The New York Times's journalist Kashmir Hill defined *Horizon Worlds* as a "VR-based social network" having a number of users close to 300,000 people.
At the moment, the limits of this platform lay in the fact that users are forced to design avatars with human features (Hill, 2022) that often do not have an excellent quality, and in the limiting nature of VR headsets. In fact, *Horizon Worlds* is still subject to many bugs and is thus becoming quite unpopular. Moreover, as mentioned above, many investors are not convinced, as evidences the statement of the investor and metaverse expert Matthew Ball in which he shared concerns on the timing of this venture, considering it "farther out than he (Zuckerberg) imagined." (Frenkel et al., 2022)
From *Horizon Worlds*'s example one can deduce that large investments in the metaverse cannot bring great satisfactions unless they are targeted. However, we must recognise Zuckerberg's effort to bring the subject further from early adopters and straight to less inclined masses.

3.1.2 Metaverse definition

Considering the often-controversial history of the metaverse and having now an overview of what could and went wrong when approaching the masses with real applications, it has come the time to finally define what characteristics of the metaverse will be brought forward to be considered as key in the forthcoming investigations. Inevitably, some notions will be left behind if not congruent to the right understanding of this body of work.
"The metaverse is an enhanced experience of reality" (Golf-Papez et al., 2022). In fact, it is an ecosystem of interconnected, shared (mainly 3D) virtual spaces (virtual worlds) in which an unlimited number of users can create and explore (Bosworth and Clegg, 2021; Hollensen et al., 2022) with an individual sense of presence. Consequently, this body of work distances itself from past views directing the concept of metaverse toward a narrow single-world perspective, on the contrary, it wants to align itself to the view recently shared by Giang Barrera & Shah (2023). Thereby, the term "metaverse" refers to a range of worlds, making it a large network of interconnected worlds rather than a single world.
In particular, these virtual worlds are persistent computer-simulated spatial environments that support communication between multiple users that seek socialisation through the employment of avatars (Cowan & Ketron, 2019), nearly real time, in remote physical places, for the purpose of work or play (Dionisio et al., 2013). Thereupon, the enhanced perceived immersion is in some part produced by avatars and residents' character realness.
This depiction of the metaverse as a "world of worlds" derives from the metaverse evolving similarly to the Worldwide Web, as a multiplicity of interoperable clients

(viewers) and servers are emerging (Dionisio et al., 2013). For instance, as it is the case of social networks now coexisting and being interconnected, not without competition, so it is the case of the metaverse, now constituted by several distinct platforms characterised by different technologies, different goals and, naturally, different markets.

On the communication side, the metaverse is synchronous, persistent, and interoperable, supporting continuity of data (e.g., identity, history, entitlements, objects, communications, and payments) (Ball, 2021; Golf-Papez et al., 2022). Such strength of communication and collaboration in user-user and user-NPC (Non-Player Characters) interactions is key. Indeed, it gives the metaverse an allure of "society" and empowers users with meaningful purposes (Sang-Min Park and Young-Gab Kim; Dwivedi et al., 2022). On the other hand, a metaverse environment can be either realistic, unrealistic, or a mix of the two (Sang-Min Park and Young-Gab Kim; Dwivedi et al., 2022). Undoubtedly when there is realism, there are strong limitations, because of how much the bound with time and space is firm.

Considering such specifics, it is of essence specify that the depiction here exposed is deliberately related to a metaverse that interfaces with customers and/or users with hedonistic or utilitarian goals. In fact, the metaverse is also facing great evolutions in terms of a tool "for reality" (e.g., education, training, healthcare, office), but they do not concern this body of work.

3.1.2.1 The core defining categories

In an article taken from his own website, metaverse expert Matthew Ball tracked the emergence of the metaverse around eight core categories. Most of these building blocks will be further analysed in this body of work as they dissect the metaverse, giving better light to its developments. Here a summary of their meaning:

1- Hardware – Physical technologies and devices are fundamental. Particularly, this category includes interface devices (e.g., VR headsets, smartphones, haptic gloves) which provide customers and firms the tools to have access, interact, and have an identity in the metaverse (Giang Barrera & Shah, 2023). They improve each year, with better sensors, cameras, screens and so further, and can be wither stationary or bodily integrated (Giang Barrera & Shah, 2023). This category does not include compute-specific hardware.

2- Networking – The provisioning of persistent, real-time connection and mobile communication systems (e.g. 5G) (Giang Barrera & Shah, 2023), characterised by the following key performance indicators: "how much data can be transmitted over a unit of time" (bandwidth), the time taken for data to travel from a point to another and back (latency), and the quality of the service (reliability).

3- Compute – The main computer programs, computation instructions and algorithms constituting the metaverse architecture (Giang Barrera & Shah, 2023). It powers fundamentals like physics calculation, rendering, data reconciliation and synchronization, AI, and motion capture.
4- Virtual Platforms – Most consumers are looking forward to immersing themselves in these digital environments in order to experience and interact by means of a variety of devices. The captivating feature that differentiates the product from traditional online experiences is users playing an active role of creation, as there is a "large ecosystem of developers and content creators" that elaborate most of the content, often monetising it.
5- Interchange standards and tools – A smooth users' integration inside the metaverse requires the interconnection of the different devices and platforms constituting the tools allowing consumers to interface the environment mentioned. To ensure said interoperability, the use of proprietary standards is mandatory since they support key features, including "asset formats and their import/export from experience to experience, forward compatibility management and updating, tooling, and authoring activities, and information management".
6- Payments – Whether it is cryptocurrencies supported by blockchain or physical world currency though digital networks (e.g., PayPal), a form of payment is needed to prove and manage assets ownership, or to simply transfer money.
7- Content, services, and assets – "The design/creation, sale, re-sale, storage, secure protection and financial management of digital assets, such as virtual goods and currencies, as connected to user data and identity."
8- Consumer and business behaviours – The building block refers to the future (and current) noticeable changes in consumer and business behaviours directly associated with variations in the metaverse. They initially disguise as trends, but they often endure globally throughout time.

3.1.3 Key metaverse dimensions

As can be deduced from the depiction just shares, an experience in the metaverse reaches a user differently depending on various variables. These dimensions, here investigated, have often been described in the selection of documents analysed, and are recurring in works concerning both the technologies alone (Extended Reality) and the metaverse per se. In fact, they accurately describe the essence of the ecosystem and, most importantly, they play a strong role in the predisposition to both game design and customer engagement. They are the concepts of interactivity, immersion, and presence.

3.1.3.1 Immersion

The sense of immersion a human being can experience goes beyond the distinction between a real or a virtual experience, as it is a circumstance one could confront also in real life with no digital support, through story-telling activities like reading or table games. In fact, immersion is related to the concept of (continuous) "flow", thus to the impression of losing self-consciousness and feeling a modified sense of time (Csikszentmihalyi, 1990; Hudson et al., 2019). Therefore, whether active or passive, immersion involves both physical and mental participation (Muhanna, 2015), and since it is such an "absorbing" dynamic, it must be handled with care, because it does not necessarily presuppose positive emotions (Hudson et al., 2019).

Refocusing the attention on virtual environments and consequently the metaverse, immersivity can also be defined as the degree of realism of the computer simulation provided by several possible sensory inputs to the human brain (Slater et al., 1995; Wedel et al., 2020). Naturally, depending on the interface device chosen (e.g., head-mounted displays, computer screens, smartphone displays, CAVE) and how it is employed, the sense of embodiment and belonging can vary (Flavián et al., 2019).

What immediately comes to light when referring to the interface devices, is the hold the five human senses have on the actual sense of immersion of a person. Sensory elements tend to enhance the experiences offered (Alcañiz et al., 2019) and, consequently, the interface devices chosen play a significant role, since the level of technological embodiment of extended reality technologies influences a user's level of immersivity (Flavián et al., 2019). Accordingly, the research on sound, visual and haptic devices able to provide a "true to life" experience is currently quite substantial. However, as one could expect, the key sense for a satisfactory level of immersion is sight, and to manipulate its quality in metaverse contexts, one must work on several features, including the resolution, the field of view, the depth perception, and the head-based rendering (Wedel et al., 2020).

3.1.3.2 Presence

The metric of presence is key as it is applicable to any kind of Extended Reality experience (Alcañiz et al., 2019). It is a mental state in which the user feels they exist in some way inside the virtual environment (Sanchez-Vives & Slater, 2005; Steuer, 1992; Wedel et al., 2020), also translated in the feeling of "being there" (Hudson et al., 2019) and "being transported to an alternative place" (Flavián et al., 2019).

It is very much connected to the other two metrics, especially immersion as they their meaning are often wrongly swapped or joined as one term. However, the sense of presence is more strongly linked to the user's psychological interpretation of what they feel (Baños et al., 2004; Flavián et al., 2019), mentally and physically. Thereby, a state of presence is also highly influenced by the quality felt in sensory terms, inherently, the

level of realism offered by the platforms directly conditions the sense of presence perceived by the user (Wedel et al., 2020) since it conditions their sense of technological embodiment and their mental effort in envisioning themselves in the virtual world (Flavián et al., 2019).
Ultimately, given the nature of the parameter, the level of presence felt by one can be measured either or by subjective tools, such as questionnaire and self-reports during or after exposure, which are quite common, or objective tools, including the correlation of presence with psychophysiological signals (Alcañiz et al., 2019).

3.1.3.3 Interactivity

Interactivity indicates users' dynamic ability to communicate with either other users (avatars), non-player characters introduced by the platform, and/or the medium itself, meaning the virtual world characterising their mediated experience. Hence, interactivity cannot be reduced to a bare stimulus because it represents in fact the sharing between entities. Moreover, being a behavioural factor, interactivity also indicates users' power to control and manipulate the environment presented to them (Sohn, 2011; Flavián et al., 2019)
In the contexts considered, the possibility of interacting is a key determinant of consumers retention and acts as a solid tool for feedback collection (Alcañiz et al., 2019). In fact, interactivity in Extended Reality applications is cause for promotion of much improved user skills (and performance), greater perceived sense of challenge in users, more of a sense of concentration and focused attention, and greater sense of flow (Cheng et al., 2014). Naturally, it is achievable only by overcoming the barriers present in the physical world (Alcañiz et al., 2019).
Interactivity can be considered as either person-environment interaction or social interaction (with other users and NPC). The shift towards customer-centric value creation brought light to the importance of offering free engagement and interactive occasions to customers in the digital environment, in order to create positive service experiences (Prahalad & Ramaswamy, 2004; Hudson et al., 2019) and additionally increase the parameter of immersion via the heightened individual identification (Nagy and Koles, 2014; Hudson et al., 2019).
However, while the impact of a well-constructed interaction with an environment is universal, social interaction is biased by the individual. Although the presence of others by means of avatars helps a digital environment become more realistic and is of great use for competition and group challenges, not all individuals find social interaction as key to satisfy their experience (Andersson & Mossberg, 2004; Hudson et al., 2019). On the contrary, many interpret the occasion as useless or even frustrating at times. Furthermore, at times, it could break the "magic" of immersion, bringing real world social relations into the virtual world (Hudson et al., 2019).

3.1.4 Metaverse's tangible and intangible technologies

The full comprehension of the dynamics that will be presented are heavily linked to a pool of terminologies connected to the metaverse and its application. In fact, as any technological tool, the metaverse is governed by both a tangible side, which strongly relates to how users interface the virtual worlds, and an intangible side, which instead describes the dynamics ruling said virtual worlds. Therefore, we will first investigate the approaches with which users interface the multiverse, i.e., Virtual Reality, Augmented Reality, Mixed Reality, and their synthesis in Extended Reality. Thereafter, the crucial topics of blockchain, non-fungible tokens and cryptocurrencies will be inquired.

3.1.4.1 Extended Reality technologies

Extended Reality is an umbrella term that encompasses Virtual Reality, Augmented Reality and Mixed Reality (Alcañiz et al., 2019). Although there are documentations taking into consideration further specific "nuances" of the "Reality-Virtuality continuum" (Milgram & Kishino, 1994; Flavián et al., 2019), including augmented virtuality, this body of work will only investigate the three Information and Communication Technologies just mentioned. The reasoning behind this decision is the will to present a clear and simplified picture of present means, as to avoid introducing theoretical topics that do not find consistent feedback in the current market. The perspective from which the topic will be tackled can be further inspected in Figure 1.

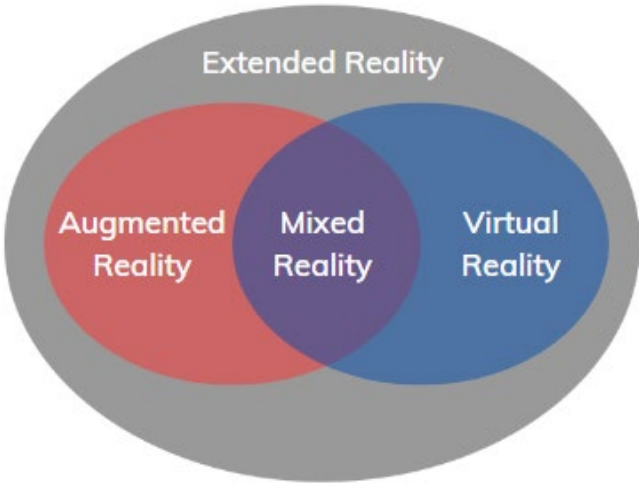

Figure 1 - Reality-Virtuality continuum

Furthermore, for each technology presented, the devices needed to make the most of these experiences, and their functioning, will be summarily described as they result

indispensable to reach technological embodiment. Such state can generate human-technology symbiosis, which improves the overall user's capacities (perceptual skills) (Flavián et al., 2019) and experience.

Virtual Reality (VR) is "the computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment, such as a helmet with a screen inside or gloves fitted with sensors" (KPMG, 2016; Hollebeek et al., 2020). Indeed, it consists in the simulation of 3D experiences and entities (people, places, objects) in a virtual environment, (Hudson et al., 2019) through various hardware components (input and output devices), which merge sensory perceptions to create a sense of presence.

Today, Virtual Reality experiences can be conveyed through a variety of hardware that regards any computer platform. The most popular and used ones are computers and related complements, common mobile devices (smartphones, tablets), head-mounted displays (HMD), cubic immersive spaces (CAVE) and large screens (powerwalls). We will briefly deepen the functioning of each to grasp each one's potential and applicability. They can be defined as follows.

- VR conveyed through a *computer* is commonly explored by means of keyboard, mouse, and other input hardware such as game joysticks, they can all be either wired-in or wireless. Taking into consideration a computer's level of embodiment and its set location, it can be defined as a stationary external device (Flavián et al., 2019). Although it is a popular choice of interface, it is worthwhile noticing how distancing oneself from this device to engage in real-world situation can diminish a virtual world's key ability to be ubiquitous and thus serve as an alternative environment for cultural, social, and creative interaction (Dionisio et al., 2013).
- *Hand-held systems* (smartphones, tablets), instead, relay on their touchscreens, thus users usually move through the reality by touching the screen, and for any kind of typing, the virtual keyboard usually appears when in need. Being mobile with respect to computers, smartphones and similar can be included in the box of portable external devices (Flavián et al., 2019).
- "*Head-mounted displays* (HMDs) are small displays or projection technology integrated into eyeglasses or mounted on a helmet or hat"(Gartner, n.d.) that provide visual and auditory inputs according to where the user is positioned and oriented (Meissner et al., 2017; Cowan & Ketron, 2019); therefore, differently from those previously presented, HMDs are wearable technologies (Flavián et al., 2019). They can either block the user's vision (e.g., smartphone visors, Meta Quest, Oculus) or superimpose the image of the virtual world onto the user's

view of the real world. The exploration and manipulation of the virtual world is usually achieved by using controllers that track the users' position.

- Invented in America in 1992, the *CAVE* is generally a 3x3x3 meters cubic room, sitting in a larger darkened room (Muhanna, 2015). Its side walls, and oftentimes its floor, are stationary display surfaces enabled through high-resolution projectors and loudspeakers surrounding the customer (Cowan & Ketron, 2019). In order to have a stereoscopic view of the content, users wear special goggles, also used to track the head of the participant. Moreover, there is a controller called "wand", which functions as a three-dimensional mouse with several coloured buttons, each one with its own functionality (Muhanna, 2015).
- A *powerwall* is a large, high-quality display made in turn of several multi-source displays that allows for both 3D and 2D content. Its considerate size makes it a shared platform optimal for group visualisation and advanced collaboration (St Engineering Antycip, n.d.)

These VR interfaces can be differentiated following the 2x2 matrix of VR archetypes developed by L. D. Hollebeek et al. (2020), which is defined by the dimensions of VR centricity and autonomy.

	Autonomous VR	Programmatic VR
VR-centric VR	The focus is on the hardware used to operate (Manis & Choi, 2019), with sole VR functionality.	They are software-based VR programs integrated in autonomous host devices (Rauschnabel et al., 2019), with sole VR functionality.
Non-VR centric VR	The focus is on the hardware used to operate (Manis & Choi, 2019), with VR functionality shared with other functions.	They are software-based VR programs integrated in autonomous host devices (Rauschnabel et al., 2019), with VR functionality shared with other functions.

Table 1 - Matrix of VR archetypes

Finally, L. D. Hollebeek et al. (2020)'s work also classified some VR formats that exist independently from the archetypes just mentioned: VR video, VR-based gamification, VR-based shopping, and VR-based events. Of the four, the latter three are the more impactful in terms of application via metaverse platforms and contact with the customer.

Augmented Reality (AR) supplements reality by projecting elements inside it, embedding virtual information in a specific context and combining both online ("reduced reality") and offline ("normal reality") touchpoints (Rauschnabel et al., 2022), and resulting in a utilitarian and hedonic experience (Scholz & Duffy, 2018). Therefore, AR is characterised by what Hilken et al. (2017) define as "environmental embedding", meaning it can integrate virtual content into a person's real-world

environment, relieving the user from the mental burden of imagining how the offer related to the context. Such characteristic is key, as it was proved to have a positive interaction effect on the utilitarian and value perception of customers in online service experiences (Hilken et al., 2017).

Scholz & Smith (2016) individuated active and passive ingredients defining an augmented reality experience. Specifically, the active ingredients are those that act as direct parts of the augmented experience, i.e., the AR content per se, the consumers participating (users) and the objects that undergo the augmentation by digital information (targets), which in many cases could be the users themselves. On the other hand, the passive ingredients are not direct part of the experience, but they influence the experiences of targets, and they include non-participant witnesses (bystanders) and nearby objects that are not experiencing the augmentation (background). The experience can take place through either a private device like a smartphone in a private space, usually characterised by autonomous activities with little to no interruptions (Bradford and Sherry, 2015; Livingstone, 2002; McCracken, 1989, Scholz & Duffy, 2018) or a publicly shared device, where the experience is strongly impacted by external influences. Moreover, its content may include a variety of formats, i.e., text, pictures, videos, and animations. In this context, bystanders have a key role, as they have a social impact that influences users, who naturally wonder whether their actions are socially appropriate (Mead, 1934; Scholz & Smith, 2016). Finally, the influence of the background varies depending on the application.

Relatively to the technologies employed, given how smart technologies (e.g., smartphones) have become an active part of modern life, "smart consumer markets" are now fast growing, and mobile AR apps are becoming the main means through which AR technologies can influence personal shopping experiences. In a business-oriented dynamic based on online applications, AR assists consumers evaluating products by allowing a consumption experience prior to purchase, since they are invited to try and check whether a product fits them (Hilken et al., 2017), either on their body (e.g., Sephora's makeup, Gap AR app) or in their personal spaces (e.g., IKEA's furniture). This dynamic is particularly effective when product-related uncertainty is high, and the customers are new to the product category and/or to the online channel (Tan et al., 2022).

In relation to this specific application of augmented reality technology in the retail field, Tan et al. (2022) identified four interesting and value adding uses of the technology: entertainment of customers through engaging experiences driving foot traffic to physical stores; education of customers on the understanding of products; help in the evaluation of product fit through the visualisation of products; enhancement of customers' post purchase consumption experience. As proved by Nikhashemi et al. (2021)'s study, these AR features, determined by quality, vividness,

and novelty, have a positive impact on customers' hedonic and, most noticeably, utilitarian benefits perceptions; and consequently, have effect on customer's engagement in the AR app.

In light of such developments on AR application in the retail field, it is clear how AR experiences can stimulate situated cognition, for which customer experiences are more realistic when information is integrated real time within the user's immediate decision context and thus can be altered to facilitate the evaluation (embedded), there is possibility to physically interact with the product/service and learn more about it (embodied), and there are opportunities for consulting other users' experiences (extended) (Robbins & Aydede, 2009; Semin & Smith, 2013; Hilken et al., 2018). In short, situated cognition implies that customer experiences are defined by said realism when they are embedded, embodied, and extended.

Consequently, consumers can effortlessly evaluate the value of the offering and decide, helped by abstract concepts fusing with their immediate physical environment, nourishing user-brand engagement (Scholz & Smith, 2016). In short, consumers are no longer forced to project and manipulate the product only through their own imagination.

As it was investigated for VR, the paradigms and devices used for AR experiences will be explored as well. Considering the topic of this body of work, the focus will lay on the tools used in the marketing filed. Therefore, following a contribution by Scholz & Smith (2016), four AR marketing paradigms will be taken into consideration:

- Active prints usually exploit already owned personal devices (smartphones, tablets), and they augment targets presented on paper (e.g., packaging, advertisements). A popular example is that of the IKEA catalogue in which the furniture can be projected into one's room.
- Geo-layers also generally exploit already owned personal devices, and they serve users by augmenting the space around them with computer-generated information often linked to the specific geolocation. They are quite popular in the touristic field, especially in museum and such. Its most popular instance is the case of the 2016 Pokémon Go app, where GPS is employed to locate, capture, train, and battle the famous cartoon creatures, which appear on the screen of players as if they were in the real-world location in which they are in.
- Magic Mirrors may make use of either public tv screen devices or already owned personal devices, depending on the objective. They augment the space, the objects, or the users themselves, so as to make the users feel part of the augmentation. Lately, several brands have landed on this paradigm, profiting by the possibility to try-on their products. An example, also deepened by Scholz & Duffy, is that of Sephora's mobile app, which can be used either to try-on a

product, to have present looks, or to check virtual tutorials. The app facilitates the user's exploration and trial.

- Bogus windows are usually made with devices such as TV screens, and they augment the space in front of the user, thus behind the device. Therefore, differently from a magic mirror, in this case, the user does not see themselves.

Mixed Reality (MR) merges VR and AR as it includes all the existing realities between said extremes, and consequently it should be investigated independently (Flavián et al., 2019). In light of the definition just outlined, mixed reality technologies may also be described as tools that create virtual objects that can interact in real-time with the actual environment (Alcañiz et al., 2019) in such a way that there is visual coherence (Collins, Regenbrecht, & Langlotz, 2017; Flavián et al., 2019): digital objects are not superimposed on the real environment, but they are rendered in a way that makes them difficult to be discerned from the actual ones. Accordingly, in said contexts, virtual entities' behaviours can also be modified by real items (Flavián et al., 2019).
Today, there are few successful instances of mixed reality devices, as its functioning is particularly complex to be implemented. Even so, there are noteworthy technological developments in holographic devices (Flavián et al., 2019). The following instances bring light to the functioning of said devices. Microsoft HoloLens 2 is a headset developed by Microsoft, which is equipped with several features allowing it to smoothly combine the two realities: it traces the user's hands to move holograms, it provides the possibility to employ vocal commands when in need of further assistance; it adapts holograms to the user's eyes position real-time and it can map the physical environment around the user (Microsoft, n.d.). Magic Leap 2 is as head-mounted virtual retinal display that, much similarly to the previous instance, allows users to invest their own senses to interact with digital information through their digital twin, while the environment around them can be translated into valuable digital information (Magic Leap, n.d.).

3.1.4.2 Blockchain technologies

The ability to exchange digital assets and currencies online and in the metaverse is made possible by the technology called **blockchain**. It is a distributed record ledger of transactions (often referred to as blocks) (Hughes et al., 2019), different accounts and the related balances. It is not held by a single trusted entity, such as a bank, and thus it does not need intermediaries. As a matter of fact, blockchains are organised in a peer-to-peer network, in which any participant of the system has a copy of the ledger. In short, it is a method "for decentralized record keeping of transactional and data sharing across multiple servers, countries, or institutions" (Aste et al., 2017). Accordingly, participants can see the transactions made and the balances of all the

accounts, keeping the blockchain transparent and visible by everyone (Valeonti et al., 2021). However, to guarantee a certain level of privacy, the transactions are highly encrypted and anonymised, indeed the participant's accounts do not display their real names, instead there are alphanumeric codes impossible to link to the owner's identity; the only thing made public is the block's header (Hughes et al., 2019).

Furthermore, to verify a transaction between parties, blockchains achieve a secure consensus over its decentralized system by asking participating computers (also known as miners) to solve complex math problems (Malik et al., 2022). This way, the first validator finding the solution has the possibility to spread its version to the rest of the network. This system avoids the possibility of scammers modifying the ledger and guarantees the authenticity and the accuracy of the transaction and update their copy of the register. Accordingly, blockchains are to be considered "tamper resistant" because earlier transactions in the chain validate the following transactions, obtaining quite a robust system (Hughes et al., 2019)

The digital assets exchanged in the blockchain are either NFTs or cryptocurrencies.

The anagram **NFT** indicates a "non-fungible token," and being a token, it is a digital asset that can be exchanged on a blockchain without the need of employing intermediaries. Differently from interchangeable fungible tokens, NFTs are characterised by a unique identifier, and they cannot be divided, thus they are indivisible, unique, and unchangeable.

Today, over 80% of all NFTs are coined and distributed via the Ethereum Blockchain network (Robertson, 2022; Malik et al., 2022), although there are also other blockchain networks facilitating the trade of NFTs (Wilson et al., 2022). They were first introduced in 2017, as we know them now, as a means for game players to trade virtual goods (Valeonti et al., 2021); in fact, *Cryptopunks* art collection and the *Cryptokitties* video game were among the first and most successful NFTs launched on Ethereum at the time (Malik et al., 2022).

NFTs can be either digital representations of physical items, thus digital records of ownership (e.g., in online shops), or they could be actual digital objects accessible in the metaverse (e.g.., images, videos, audio, text, graphics, metadata, text messages, event tickets, sports cards).

Their functioning is based on a highly secure system. Indeed, a NFT encodes unique content in smart contracts, which define and guarantee pre-specified rules (Valeonti et al., 2021), instructions and fundamental properties visible to all, such as who is allowed to transfer the tokens, for secure verification of provenance. Moreover, their security is further ensured using mathematical cryptography and verification processes that prove the identity of the creator, to minimise fraud. Their identity and ownership are registered in a distributed ledger technology, the blockchain. (Wilson et al., 2022). On the other hand, their management (not their storage) is simplified by crypto wallets,

which enable sending and receiving cryptocurrencies and tokens, and are accessible through the owner's cryptographic key, without which access to its content can be lost (Pollock, 2021; Valeonti et al., 2021).

In the context of the metaverse, such technology is key to easily exchange, sell, and collect digital instances, including digital art, sporting collectibles, recorded moments and more. In fact, transactions do not need any mediator as smart contracts rules ensure no delay from both parties (Malik et al., 2022). Therefore, NFTs offer stakeholders a new tool to "create, commoditize, authenticate, exchange, and store digital content that can benefit many parts of the ecosystem" (Malhotra et al., 2022, Wilson et al., 2022).

With this newfound ability to trade digitally as well, NFTs have moved beyond the gaming industry and have now caught the attention of several customer-end industries, ranging from fashion and music to sports and automotive. Therefore, businesses are now beginning to understand the power of NFTs, as they let users "make the brand their own by transferring an interactive ownership with the brand" (Hollensen et al., 2022). This way, experience can be enhanced beyond imagination. In fact, tokens' sale has experienced a great period of improvement in 2021 (Johnston, 2021; Hollensen et al., 2022). In fact, the same year, the British auction house *Christie'*s held their very first sale for a NFT, in that case American graphic designer Beeple's "5000 Everydays" digital image, which was sold for the unprecedented amount of $69 million (Valeonti et al., 2021). Such prices are justified by the concept of scarcity, which did not exist in the metaverse before the introduction of NFTs into the market.

Non-fungible tokens' payments are mostly made in cryptocurrencies, making them strongly intertwined in blockchain dynamics. In fact, cryptocurrencies are one of the most recognised use cases of blockchain (Hughes et al., 2019). A **cryptocurrency** is an encrypted digital currency obtained through the employment of cryptography technique, and it cannot be materialised (Hassani et al., 2018).

Its conceptualisation cannot be discernible from the one of the blockchain, as its first ever instance (*Bitcoin*) was introduced by Satoshi Nakamoto with the rise to popularity of blockchain technology during the 2008's financial crisis (Nakamoto, 2008; Aste et al., 2017). To be precise, *Bitcoin*'s blockchain was developed with the aim of resolving the heavy issue of trust in a decentralised self-sovereign monetary system (Aste et al., 2017). Although its future survival is still uncertain, as of lately, said functioning has been successful, since the 2008 digital currency has experienced an exponentially growing trend in total supply. Accordingly, the cryptocurrency market is now experiencing a period of newfound interest and attention coming from both businesses and privates, in fact, it now includes a consistent number of different cryptocurrencies, reaching an amount of more than 2000 cryptocurrencies. (Hassani et al., 2018)

Taking into consideration the blockchains' processes of validation, the employment of cryptocurrencies in transactions carried out in the metaverse is highly recommendable as they are subject to continuous scrutiny that guarantees security and transparency. However, considering such promising premises, it is also worth mentioning cryptocurrencies flaws, for which digitalisation and anonymity serve quite well also the goals of cybercriminals, and, at the same time, limit the reach of such great innovation to a good part people lacking advanced technological skills (Hassani et al., 2018).

3.1.5 The two sides of metaverse platforms

It is imperative to further investigate metaverse's practical application in the real markets now at disposal. As a matter of fact, metaverse platforms can be distinguished in centralised platforms and decentralised platforms, and their difference lays in the level of control and ownership guaranteed to the user:

- Centralised platforms allow the free creation of content to users though keeping the property of it (Cela A., 2022). They are far more penchant for gaming and, inherently, they are seeing the most success and are now consolidating their numbers. For future reference, they include the following two successful platforms. *Fortnite* (released in 2017) is a metaverse platform, mainly devoted to gaming, in which the user can take part of the experience via four different main modalities: "Battle Royale" is a player-versus-player game in which the user can either play alone or in groups and the goal is that of being the last one standing; "Zero Build" is similar to the previous mode but it does not provide for building; "Creative" is devoted to inventiveness, as players are given complete freedom to create entirely new games on their personal island, using items from "Battle Royale"; "Save The World" is a vast world one can explore with friends while fighting hordes of monsters and, one again, users are given the power to become stronger by "finding loot, crafting weapons and taming wildlife" (The Fortnite Team, 2020). On the other hand, *Roblox* (released 2006), whose main users are young (9-12 years old) (Park & Kim, 2022), is more associated to physical reality, as it provides users with the (low complexity) means to program their own games (and virtual items) and play games created by others, but it also hosts over 30 million immersive experiences, including social hangouts, concerts (e.g. Lil Nas X, Twenty One Pilots), sports events, fashion shows, and other sources of entertainment very much related to the "real world" (The Roblox Team, n.d.).
- Decentralised platforms, instead, acknowledge the work of users and recognise the property of content to the legitimate creators, allowing them to monetize it (Cela A., 2022). They are still developing and have not yet reached the same level of maturity, but present great opportunities for business, even beyond the

gaming industry. For future reference, they include the following two successful platforms. *The Sandbox* (released in 2011) is a "community-driven platform" in which users are given the means to create and monetise assets and gaming experiences in a virtual marketplace by exploiting blockchain technologies. Moreover, players can buy their own pieces of land and built their games and items in there, developing their own experience for themselves and for others; in fact, several firms have already invested and bought a space (e.g., Warner Music, Playboy, Ubi Soft) (The Sandbox Team, n.d.). Similarly, *Decentraland* (released in 2020) is a 3D virtual world browser-based platform in which users can built their own creations and monetise it. Also in this case, there is a "Land" made of parcels that can be owned and personalised (Decentraland, 2023). Further details will be shared in the subsequent deepening on metaverse platforms.

Such possibilities of freely expressing themselves and personalising what surrounds them stimulates users'/customers' anticipated satisfaction and indicates the presence of the "playground effect", for which consumers are allowed to be creative thanks to safe exploration and playful activities (Jessen et al., 2020).

3.1.6 Gaming vs. metaverse platforms

In light of the wealth of knowledge acquired with respect to the metaverse's origins in the gaming field and the logics behind its functioning, it is imperative to unambiguously distinguish metaverse platforms from gaming platforms. The purpose would be that of overcoming their ambiguous similarities and comprehend the respective strong and pain points. As a matter of fact, even though they have similar grounds, they are characterised by two fundamentally different natures.

In the gaming industry, the platforms are single-goal oriented, meaning their storytelling is set to give the user an ultimate goal, which governs the experience as a whole. Although characterised by a consistent series of middle-ground and/or facultative objectives, the purpose of the game remains one and must be taken to completion. We can take as instances of functioning two popular videogames: *The Las Of Us* and *Game Theft Auto (GTA)*.

The Last Of Us is famously focused on a precise narration, and accordingly it has a definite main goal, without which the experience cannot come to a completion. In *The Last Of Us part* 1, for example, the purpose is that of guiding the two main characters (Joel and Ellie) through a post-apocalyptic scenario and finally reach a certain place (Salt Lake City) in the game. The only liberty one can take lays in the side-missions proposed.

Differently, open-world videogames such as *Grand Theft Auto (GTA)* are less linear and allow much more freedom in terms of side missions and activities. In fact, the

actual objective is that of improving one's own experience by obtaining the rewards from completing single missions. However different, also in this case the game is one and the possibilities of personalisation and arbitrarily do not go far beyond the characterisation of one's own character.
On the other hand, as it could be inferred by the few examples (e.g., *Second Life*, *Meta*), metaverse platforms are multi-goal oriented. Users are allowed to act in accordance with one or multiple objectives, or even operate arbitrarily. Indeed, metaverse platforms' users can entertain themselves with a multiplicity of options: in-platform games of all extensiveness, events of various nature (e.g., music, comic, fashion, art), social communication, creation, and trading of digital assets, and more. This leaves the participants the power of choosing their own purpose in the platform. In order to also understand in practice this type of platforms, two instances are to be described in this case as well: *Fortnite* for centralised platforms and *Decentraland* for decentralised platforms.
One of the most successful metaverse platform is *Fortnite* (released in 2017), which defines itself as "a world of many experiences". As a matter of fact, it allows participants to create their own virtual islands, employing the "creative" mode, and equip it with personal rules of choice, bringing into action the person's skills and imagination with no limitations. Having the ability to share said personal world, users can also share their creations and frequent other participants on their islands. Consequently, *Fortnite* is provided with thousands of games, developed either by Epic Games or community creators themselves, to which several participants can play together simultaneously from separate locations. (The Fortnite Team, 2020) Therefore, there are no limitations as to how users want to live the several experiences at their disposal, and what set of objectives and rules they want to follow.
Another recent instance is *Decentraland* (released 2020), which is a platform in which users can create, experience, and monetise their own content. It consists in a finite 3D virtual space dominated "Land", which is divided into parcels univocally identifiable by their cartesian coordinates. These pieces of virtual land can be purchased by the members of the community, who automatically become owners of said parcels. This dynamic of ownership provides participants full liberty and authority over what they create, which can range from static virtual items to interactive applications, and how they want to manage it. (Decentraland, 2023)

3.2 Gamification

Following the above-mentioned flow of thought, the following paragraphs will investigate the concept of gamification. Firstly, there will be an overview of its origins, naturally based on game design and its tools of narration. Thereafter, the actual

meaning of the terms will be outlined, supported by some historically well-known applications.

3.2.1 Game design logics

As the term might suggest, the practice of gamification finds its roots in the field of games, following the same rules and creation-process. Accordingly, the starting point of the discourse, in this case, is the technical underpinning of what a game actually is.
A game is an activity characterised by defined rules that people follow and perform for sole hedonic and/or challenging purposes (Kim, 2008; Huotari & Hamari, 2012). It is an experience co-produced by game developers and players themselves. At one end, game developers establish a storyline, define the bounding rules, and depict the game design. On the other end, the players are active part of a process of creation, which renews and evolves each time they play the game; the circumstance stresses the key role served by the player's drive to voluntary commit and participate (Huotari & Hamari, 2012).
In the face of these circumstances, it is important to clarify how gamification does not represent the application of actual games, instead the concept is conceptually closer to the idea of "game design" than it is to "games" per se (Landers et al., 2018). In fact, one prominent research area in gamification science is gameful design and it studies the conditioning of an experience from the simple addition of interaction-related design components (e.g., badges, levels) to the implementation of play-centric designs (Landers et al., 2018). The choice of approach depends on the context and on the targets, as gamified systems may not involve play at all or might have play as an explicit part of the design depending on the users targeted. As a matter of fact, with respect to game, gamification's nature is more easily affected by bias, thus there is more subjectivity, which manifestly depends on the specific context of application, user's actual purpose, and user's personal perception (Nobre & Ferreira, 2017).
In accordance with the partial fit to game logics, the practice of gamification is usually orchestrated as to employ limited portions of a game's rationale, rather than full-fledged game technologies (Nobre & Ferreira, 2017). To be precise, gamification involves and focuses notably on the storytelling and the narration of the experience onto which it is implemented. The goal is to guarantee the consumer an improved, memorable, and subjective immersive experience. (Nobre & Ferreira, 2017).
In particular, such experiences are mediated by the presence of four distinct parties: players, designers, spectators, and observers. Following the reasoning of Robson et al. (2015), one can define the four roles one should identify before trying to gamify an experience. First, players are the users, those who compete in the gamified experience; how they live it is defined by their actual contribution and involvement to the experience, and the type of environmental relationship they have with it, which can be

either of absorption (the experience occupies the person's mind) or of immersion (the person is part of the experience itself). Moreover, according to Robson et al. (2016), choosing the correct type of player before designing the gamified experience is key to have success, and the types of players they propose are: those playing to be better than others (*slayers*); those playing to engage in personal development (*strivers*); those playing to be part of a network (*socialites*); and those playing to learn about the game *scholars*). Second, designers are naturally those who design and maintain the gamified experience, and they usually play a passive role when players' experience starts. Third, spectators are part of the gamified environment and contribute to the atmosphere, but although their presence influences the gamified experience, they do not directly compete. Finally, observers are outside individuals that do not directly impact on the gamified experience, but whose presence influences the popularity of the experience; their importance is also determined by their possibility of becoming either spectators or players.

Following the depiction of the key roles people can play in a gamified experience, it is crucial to outline the backbone supporting such layout. Referring to the work of Hofacker et al. (2016) on the application of game design (gamified) elements to mobile applications for marketing purposes, which in turn refers to Schell (2008)'s Elemental Game Tetrad Model, four design elements can be considered as pillars for the creation of a "cognitive and affective ecosystem around the theme of a game": story, mechanics, aesthetic, and technology. First, as mentioned before, storytelling is key to provide context and a sense of meaning to the user, as they are forced to focus attention on the story and bring into action the elements of mental imagery and empathy, which help achieve an optimal level of "narrative transportation" through "suspension of belief". Second, the element of mechanics indicates the rules and structure of a game, which will be soon proven to be core to game design, as they constitute the backbone of storytelling and provide the feedback making the gamified experience intelligible. As a matter of fact, they typically include elements like (symbolic or monetary) incentives, (uncertain or clear) rewards, and (basic or elaborate) game levels, which are going to be the protagonists of most of the future instances presented. Third, aesthetics are manifestly relevant in the creation of an engaging experience because aesthetic features and character quirks reinforce the storytelling, attributing it more depth of information and purpose. Finally, technology is the medium through which the story is brough to life and without which the gamified experience cannot take place. This element is developed also through the understanding of the cognitive resources possessed by target users and the available data about users, which naturally is now very consistent.

Another useful framework to define game design and gamification is the MDE (Mechanics, Dynamics, Emotions) framework (Hunicke et al., 2004; Robson et al.,

2015). First, mechanics, similarly to Schell's view, indicate the ruling structure developed by designers in terms of setup, rule, and progression mechanics, and consequently they are known before the experience. Second, dynamics describe the naturally unpredictable types of player behaviour emerging during the experience and can be influenced by spectators and observers. Third, emotions are the mental affective states and reactions of players during the experience.

3.2.2 Gamification's rise

Considering such background, we can proceed with a more comprehensible definition of what gamification is. In fact, gamification is an entertainment system that applies lessons learned from the gaming domain (Robson et al., 2015)and design elements – fun, play, transparency and challenge (Palmer et al., 2012; Hwang & Choi, 2020) – to non-game contexts, in order to change people's behaviour (Bunchball, 2010; Yang et al., 2017), especially in terms of consumption, and support their overall value creation (Huotari & Hamari, 2012) in everyday interactions. Like games, gamification usually provides consumers with challenges and tasks (either for individuals or groups), and attaches them point systems, consequent levels, badges of progress (Hwang & Choi, 2020) and possibilities of related social interactions. In short, consumers are rewarded. However, the rewards chosen and the path (difficulty level) to achieve them must be balanced, as to avoid acts of surrender and abandonment given by the two extremes of either boredom, in case of low levels of difficulty, or frustration, in case of high levels of difficulty; thus, there must be harmony between challenge and skills required, so as to guarantee "flow" (Csikszentmihalyi, 1990; Cheng et al., 2014). This logic serves the idea for which people gaining benefits from the usage of a certain media will decide to use it more frequently (Weibull, 1985; Jang et al., 2018) and often decide to engage in unexpected purchases (Hoffman & Novak, 2009; Hofacker et al., 2016). Logically, this system is leveraged to serve the business purposes already defined (Zichermann & Linder, 2010; Yang et al., 2017).

Given businesses' found interest in customer-centric approaches, the aforementioned dynamics would prove to be quite beneficial if correctly applied, since they would improve customer loyalty, motivation, and, most importantly, customer engagement (Blohm & Leimeister, 2013). Nowadays, gamification has in fact a wide array of potential application domains and it is the primary driver for the criterion choice (Landers et al., 2018). For instance, the use of gamification in the marketing area has recently become quite popular for branding, as companies are given the ability to engage users, encourage them to join the community and drive active participation (Yang et al., 2017)

However, manifestly, game logics and their subsequent implementation through the practice of gamifying experiences are not of recent discovery. Focusing on "offline" instances concerning the marketing domain, loyalty programs represent a common tool to exploit, since the public is quite familiar with its employment, especially in the universe of retail and large-scale distribution. According to this body of work's point of reference for the instrument, Hwang & Choi, (2020), loyalty programs can be either gamified or not, although the former are those capturing more positive impacts in terms of customers loyalty toward the initiative. In fact, with respect to conventional loyalty programs, gamified loyalty programs did not reinvent the dynamics but certainly provide further social and motivational benefits (Blohm & Leimeister, 2013), and are more experiential and effective loyalty wise, thanks to playfulness and attitude toward the loyalty program's roles of mediators (Hwang & Choi, 2020).

In particular, a loyalty program is a marketing strategy that follows the simple principle of rewarding loyal customers, who participate voluntarily to the initiative, in presence of frequent purchases and acts of engagement with the brand. The idea is that of encouraging customers to stay active, leveraging future benefits like discounts and rewards of different natures, which do not necessarily involve monetary advantages. The tool indeed serves as a springboard to pass from loyalty toward the loyalty program to loyalty toward the firm (Hwang & Choi, 2020). In accordance, they are usually of simple application as they do not require membership fees, since it was found that it reduces customers' intention to join the loyalty program (Hwang & Choi, 2020). However, they do involve a form of cost, as they ask consumers to provide their personal information, which can be of different nature depending on the type of firm and loyalty program chosen.

Gamified loyalty programs have however surpassed the boundaries of physical retail experiences and have also landed into the digital world of mobile apps. The success story that will be referred to in this case as an example of gamified loyalty program is *My Starbuck Reward*. The American multinational chain of coffeehouses *Starbucks* introduced in 2009 a loyalty card program, now landed on their application, providing members personalised rewards based on purchases (Starbucks, 2013). In fact, for each purchase made indistinctively with either cash, debit card or the app itself, users earn and collect Stars. This process is often accelerated by the institution of special days where customers earn twice the Stars on most products. As the number of Stars collected increases, also rewards improve, going from free refills and free food/beverages to pieces of merchandise (e.g., signature cup, drink tumbler). (Starbucks, n.d.). Moreover, the experience is further gamified by member-only games on the app, in which users can play for a chance to win particular prizes. Two of these games are the "Bonus Star bingo", according to which the users fills one spot on a card of tasks (e.g., "coffee with friends," "weekender") after each purchase and has a chance

achieving up to 300 additional points when a line is completed, and “Starbucks for Life”, a program for which each purchase provides a chance to win benefits such as a week of free drinks (Hwang & Choi, 2020).

However, given the unprecedented success of Web 2.0 worldwide and its ability to connect and create communities, promising digital gamification applications have also been proposed in recent years, and they go beyond loyalty programs. The grounds for firms' found willingness to approach and bring into play gamification are many. As Yang and his colleagues explained in an article published in 2017 in the journal *Computers in Human Behavior*, companies have started heavily exploiting the power of gamification only in the last few years, due to customers becoming more selective in what catches their attention and what keeps them engaged. As a matter of fact, gamification is a powerful tool that can be used, for instance, for branding (points, badges, free rewarding products) and for the creation of strong communities that usually grow independently and promote participation and sharing (Meloni & Gruener, 2012; Yang et al., 2017).
Moreover, according to Robson et al. (2015), such positive developments are to be attributed as well to three further circumstances that took place in the last couple of decades. First, the growing success of the computer game industry, which forced game designers to regularly outdo themselves to improve their understanding of the engaging features of computer games. Second, as already mentioned, social media (Web 2.0) have altered the times and modes of communication, in addition to the generation of users’ big data on anything, including opinions, feelings and, most importantly, behaviours. Third, consumer-centric logics have prompted firms to continually seek impactful connections with consumers.

Most successful Web 2.0 application of gamification involve rewarding systems and the establishment of competitive dynamics between users as fuel for further involvement. An emblematic example of exploitation of both gamification and Web 2.0 logics is that of training mobile apps, which are recurringly cited in most research. There are many instances on the market, ranging from technical mobile apps to more entertaining ones. For instance, *Zombie, Run!* is one of the latter, as it motivates users to move (run, walk, jog) by delivering a surviving apocalyptic story: the more you run, the more you collect supplies for your base, the more you survive (Jang et al., 2018).
However, the most successful training mobile applications manifestly belong to sportwear multinationals, such as *Adidas* (*Runtastic*), *ASICS* (*ASICS Runkeeper)*, *Nike* (*Nike Run Club*) and *Puma* (*PUMATRAC*). Since their functioning is quite similar, it is sufficient to approach the logic of a single application as representative of all to understand the dynamics behind them. The application will be shortly analysed

via a classification of non-monetary customer benefits that can be generated in this type of experience, and it is a categorisation also employed by the Journal of Business Research's article by Jang et al. (2018): (a) epistemic benefits (understanding of information); (b) social integrative benefits; (c) personal integrative benefits (credibility, social status). In particular, the instance to be addressed is *Adidas*'s *Runastic*, whose information is taken from the application itself.
Theoretically *Runastic* is used for workouts tracking and related stats's analytics, however it goes far beyond these simple premises, since in fact it can serve as a "social network" for its own members. In order to have access to the main functionalities of this freemium application, the user must log in and create their own profile, add personal information including age, height, and weight, and facultatively they can also connect their own smartwatch for finer tracking. Thereafter, the first gamified function comes into play: the user is encouraged to set their personal training objectives (type of workout, time period, objective of repetitions, distance, calories, and others), which leverages personal integrative benefits as the user can strengthen their capabilities. Afterward, one could decide to challenge themselves with the objectives set, but this is not the type of experience promoted. As a matter of fact, *Runastic* fosters social integrative benefits of appreciation and reciprocal exchange (Nambisan & Baron, 2009; Hofacker et al., 2016) by promoting several occasions of interaction between its members, as it allows them to follow each other on the app, to find acquaintances who are part of the community via their telephone number or their Facebook page, to share their activities with followers and either comment or add a like on them. Moreover, the application offers the possibility to apply and participate to challenges and events shared worldwide, allowing for users to be part of organised groups of training everywhere. These social network-like features allow for continuous participation and sense of challenge. However, the ultimate touches for a true gamified experiences are rewards, and the application is not lacking, the more one interacts with the app, the more they are rewarded: for each event, objective, workout, and challenge completed, *Runastic* rewards members with points (expired within a year) redeemable in advantages, including early access to exclusive products, discounts and more. Finally, the application offers training plans and lessons, and shares insights on sporting matters through articles shared via notifications; these final features are cause for epistemic benefits as they create value via information and learning experiences that allow for skills development (Nambisan & Baron, 2009; Hofacker et al., 2016).

As was the case with *My Starbucks*, the implementation of gamification just displayed emphasises again how much rewards are cause for customers' senses of motivation (Jang et al., 2018) and involvement. In particular, game-specific rewards (points, badges, leader boards, social interaction) work as visual identifiers of users' merits

achieved ("symbolic capital") (Hofacker et al., 2016), and consequently they often preserve the effects of both intrinsic and extrinsic motivations over time, because their collection is proof of user's performance and documents the progress toward the goals set; moreover, they facilitate interaction and social recognition (Blohm & Leimeister, 2013).

In fact, gamification gives consumers a purpose to stay active and participate in a brand's initiative. Moreover, the display of *Runastic*'s case proved gamification's ability to increase the levels of all epistemic, social integrative and personal integrative benefits. Such finding is significant since Jang et al. (2018) proved the three dimensions have strong positive influence on a consumer's behavioural engagement, whilst only epistemic and social integrative benefits positively affect purchase intentions.

3.2.3 Gamification's stall

Despite such promising instances of implementation, the sources analysed indicate a gap in gamification's implementation in terms of lack of research and applicability, since most literature is limiting the study to gamification as a context (Bitrián et al., 2021). As of today, gamification's massive employment is not yet a valid option. In fact, many industries still struggle comprehending its usefulness and applications, thereby they deem such practices to facultative and resource-wasteful decisions. Besides, even companies who are willing to invest still endure hardship employing gamification, since increasing engagement and rewarding desired behaviour in such ways has proven to be hard at scale (Robson et al., 2015).

Accordingly, although several disciplines would benefit from further investigations, dedicated academic research on gamification and its vast range of suitable applications is still lacking, particularly in terms of leverage for specific purposes. As a result, several businesses find themselves implementing the instrument quite poorly, just for the sake of homologate to the trends. Doing so, they profoundly underestimate the significance of designing a gamified experience in full accordance with business objectives and they naturally fail. (Yang et al., 2017)

Implementing shallow loyalty programs to Web 2.0 logics is not enough to catch and retain customers' attention, especially if one considers the forthcoming opportunities of Web 3.0, which notably require greater narrative efforts.

3.3 Customer engagement

The third and final pillar onto which this systematic literature review finds its support is the marketing-related concept of customer engagement. Indeed, it embodies the link interconnecting the technological means and practices just investigated to marketing dynamics, which constitute the core subject of this body of work. Thus, the focus

strongly shifts toward the true targets of the analysis, customers, and what characterises their (possibly retained) relationship with the brand.
The investigation of term will follow the structure here presented. First, there will be a brief deepening of the subject of customer-centric marketing and its relationship with customer engagement. Second, there the actual definition of term will be presented as this body of work wants to intend it. Third, the multidimensionality of the term and the consequent psychological features characterising it will be deepened.

3.3.1 Customer-centric marketing

The marketing field has undergone great changes in the last 80 years. In fact, the opportunity of affording the purchase of certain products has evolved throughout time, moving far from past conditions of widespread poverty and small portion of the population being able to satisfy needs beyond the primary ones (physiological and safety).
Only a few decades ago, after the perils of World War II, people developed a desire for retaliation, and started expressing several unmet needs. However, given the companies and products to refer to were few and defined according to the possibilities of most, consumers were easily satisfied by standardized products at reasonable prices. This reasoning inevitably led to the delineation of a newfound mass consumption society, powered by mass production technology, where companies' focus laid on products (product-centric marketing) (Sloan, 1963; Sheth et al., 2000).
In the subsequent decades, as the number of firms operating grew and the markets became saturated, the necessity to stand out from competition arose, thereby mass-market techniques became less performing. A change in customer approach techniques was in order. Accordingly, in mid 1950s, the perspective shifted to a market-centric perspective (Sheth et al., 2000): companies started carefully studying what demand they were serving and what types of related consumers best suited their offerings, foreshadowing the segmentation concept.
As a matter of fact, segmentation indicates the act of dividing the market into groups of potential customers ("segments") according to parameters of preference (demography, behaviour, benefits), with the aim of obtaining sets characterised by similar needs. Naturally, the process of selection results in a target market and the goal of serving only that.
In the 1990s, companies were still focused on customer transactions, measuring their impact through the firm's profitability (past customer value, share of-wallet, and recency, frequency, and monetary value) (Pansari & Kumar, 2017), hence avoiding the topic of firm-customer non-transactional relationship. However, as the number of firms available continued growing, and products and services became increasingly differentiated and specific, the segments grew smaller and smaller. Such dynamics,

supported by evolutions in (low) marketing productivity, (high) market diversity and (high) technology applicability (Sheth et al., 2000), were cause for a consisting shift toward (partial or total) customisation. The latter term indicates the willingness to provide individual customers products or services suiting their wishes as much as feasible. This mind-set suits a customer-centric perspective, which saw its first instances and research date back to the late 1990s and the early 2000s. At the time, firms started offering improved products and services with the aim of earning customers' trust via the instauration of positive relations, and the achievement of satisfaction and loyalty (Pansari & Kumar, 2017).

Manifestly, customer-centric marketing serves the purpose of "understanding and satisfying the needs, wants, and resources of individual consumers and customers" (Sheth et al., 2000), as to create value for them and build a long-term relationship.

In order to achieve such personal knowledge on the target, the interactions between brand and customers must be continuous, significant and bearer of valuable consumer information. Fortunately, contrary to the past, the gathering and management of such rich data is now facilitated by current technologies.

Therefore, a system of value co-creation must be established to collect intel on matters of design, production, and consumption of the product or service (Sheth et al., 2000). However, said kind of relationship with customers does not establish overnight, organizations must put in strong marketing efforts in order to retain consumers' attention and interest. As a matter of fact, momentary satisfaction and loyalty only guarantee a short-termed state of interest. Thus, in order to reach a higher level of "desired differentiation and of sustainable competitive advantage," organizations must commit at their fullest to create an emotional bond and therefore engage customers (Pansari & Kumar, 2017).

In fact, regardless of the valuable dynamic just elaborated, customer engagement is now an inevitable practice, as social networks and similar media have empowered easy interactions, and thus have given more importance to non-transactional customer behaviour (e.g., reviews, blogging) with respect to previous years.

Ultimately, given the current state of evolution, marketing is now concentrating its efforts on maintaining a customer-centric perspective. The power tool to achieve this vision is understanding how to incentivise customer engagement, because it nurtures an ideal profitable relationship with consumers. Said status is key for the co-creation of interactive experiences, and thus is generator of value (Brodie et al., 2011). Furthermore, experts believe that low customer engagement should be interpreted as a threatening sign of unsuccess, because disengaged customers are sources of negative word of mouth, among other things. (EIU survey 2007; Kumar et al., 2010)

3.3.2 Customer engagement definition

In view of what has been stated, the concept of customer engagement emerges as key to determine what customer-related aspects of the marketing field could be influenced by the combination of gamification and metaverse. Moreover, since customer value is not to be limited to novel interactions, customer engagement's definition here to be presented wants to be referred to both new and retained customers.

As anticipated, the concept of customer engagement is preamble for a durable and long-term oriented relationship with the brand, because it provides for customer's voluntary resource contribution (Harmeling et al., 2017), and thus it cannot be confined to the success of a mere transaction (van Doorn et al., 2010). As a matter of fact, customer engagement goes beyond purchase and involves long-lasting occurrences of emotional bonding and utter satisfaction (Pansari & Kumar, 2017).

In light of these premises, this body of work defines customer engagement as a psychological process (Bowden, 2009; Brodie et al., 2011) describing the manifested commitment and loyalty of a customer to a firm (van Doorn et al., 2010). As such, it is characterised by multiple dimensions equally impacting the customer: cognitive, emotional and behavioural (L. Hollebeek, 2011).

Therefore, linking what just outlined to the previous contextualisation, customer engagement is the result of interactive and co-creative experiences (Brodie et al., 2011), and motivational drivers (e.g., word-of-mouth (WOM), ratings, recommendations, blogging and reviews), which can originate from either the brand or customers themselves (van Doorn et al., 2010) and play a key role in viral marketing activity (Brodie et al., 2011).

Accordingly, the mission marketing practices need to absolve is that of establishing a meaningful and dynamic relationship, personifying the firm via entities specifically designed to communicate brand value (Mollen & Wilson, 2010). For instance, in the last decade, such spokesperson role has often been assigned to social media influencers, as they can often establish friendly dynamics able to capture consumers' attention and trust. Manifestly, these dynamics have only significant positive effects when well-studied and based on the social media usage of the targeted individual (Pansari & Kumar, 2017). Indeed, organizations must interpret the customer as a person, in all their nuances, ranging from needs and desires to fears and challenges.

Thus, as it is the case of products and services, interactions must also guarantee high quality and be personalised to have a good understanding of customers. The goal is that of knowing them to a point in which the company can alleviate their preoccupations and improve their lives, within the limits of what concerns the firm (Pansari & Kumar, 2017). In order to give form to this latter concept of emotional bonding, we will take into consideration one of the examples shared by Pansari & Kumar (2017), *Dove*'s "Real Beauty" campaign. In 2013, the British personal care

company produced a short film called “Dove Real Beauty Sketches” as part of their decade-long campaign verting on building self-confidence, particularly in women. The video documented an experiment: women were asked to describe themselves to a forensic artist from behind a curtain, afterward a random stranger was asked to describe the same woman, resulting in two completely different portraits (Dove, 2013). This simple depiction of women’s insecurity in their image rapidly knew success, as more than 50 million people viewed the video within 12 days of its release (Dove, 2013). The virality of such content is to be pinned to the clever work of understating of the target demographic (women) put in place by *Dove*’s team, as the campaign conveyed the exact feelings of warmth and understating they wanted to express to debunk the message of unrealistic beauty standards often associated to their beauty brand.

Finally, the value of customer engagement can also be expressed through the power of feedbacks and reviews. On one hand, when customers are well informed, empowered, and, often, passionate about the subject, they can add value to the company and its products or services. As brand community members, they can engage in related discussions and cooperate to propose novel solutions, improvements, and eventually whole new product ideas (Hoppe, 2008; Kumar et al., 2010).

On the other hand, engaged (or disengaged) customers also have the power to add (or detract) value to the organizations and/or its products. Meaning they may hold the power to either damage the firm’s customer base or convert prospects into actual customers, since sharing opinions with others can affect both the transmitters and the receivers (Kumar et al., 2010). Additionally, it is noteworthy mentioning the resonance public impressions have gained since the diffusion of the Internet and social networks. As a matter of fact, as with previous analogic media, companies must once again avoid passiveness, and should instead engage customers through online media, exploiting its advantages. For instance, these tools allow them to communicate with customers, encourage their feedbacks (e.g., online brand communities), mobilise the creation of a community network, seek participation from consumers, and employ firm-incentivised referral programs, incentivising existing customers to introduce the brand to their acquaintances.

3.3.3 The multidimensionality of customer engagement

As briefly mentioned, customer engagement is not to be framed into a unidimensional structure, on the contrary, it is characterised by a substructure of distinct meaning tiers. Indeed, customer engagement indicates a psychological state induced by how customers experience their individual interaction with the focal engagement object, which could be either a product, a service, or a brand (Brodie et al., 2011). Additionally, in compliance with the reviewed conceptualisations, said psychological and subjective nature implies the existence of a multidimensionality, mainly tri partite. Therefore,

customer engagement's nature and components must be addressed to have a full picture of the value that can be brought forward.

However, the nature of said multidimensionality is interpreted differently throughout research. In fact, analysing recent (2010s and on) documentation on the matter, it is possible to observe discrepancies between what to consider as dimension of customer engagement, ranging from levels of participation to types of relationships and behavioural manifestations. In particular, the literature review will focus on the psychological aspects. Nevertheless, even in this specific subgroup where the instances demonstrate greater concordance, there are still variants. In fact, some recognise cognitive, emotional, and social dimensions (Xi & Hamari, 2020), some behavioural, attitudinal and network dimensions (Kumar et al., 2010), whilst Brodie et al. (2011) and L. Hollebeek, (2011) suggest cognitive, emotional, and behavioural dimensions. In order to maintain a justly inclusive and exhaustive perspective of the real implications of customer engagement, this body of work will focus of the dimensions indicated by Brodie et al. (2011) and L. Hollebeek, (2011) (cognitive, emotional, behavioural), as they accurately describe the nature of customer engagement and are in fact the point of reference for several research.

The first dimension to be detailed is cognitive customer engagement. It refers to the awareness and the actual concentration of a customer with regards to the specific focal engagement object (Patterson, et al., 2006; Brodie et al., 2011). In other words, this dimension can be compared to the state of "immersion", as it represents the feeling of being fully concentrated and engrossed in the experience proposed (Patterson et al., 2006; L. Hollebeek, 2011).

The emotional customer engagement, instead, involves the sense of belonging of a customer (Patterson, et al., 2006; Brodie et al., 2011), their emotional investment and their feeling of pride with respect to the focal engagement object (Kuvykaitė & Tarutė, 2015). L. Hollebeek (2011) associates this dimension to the concept of "passion", since it indicates how much of a positive brand-related affection there is between the customer and the brand.

Lastly, behavioural customer engagement is the conduct of a customer when they interact with a focal engagement object, their willingness to invest effort into interactions (L. Hollebeek, 2011). It takes into consideration the energy (Kuvykaitė & Tarutė, 2015) and mental resilience of the two-way communications between customer and object (Patterson, et al., 2006; Brodie et al., 2011). L. Hollebeek (2011) associates this dimension to the concept of "activation", meaning customers' energy and time in reciprocating their perceived brand-related benefits. Therefore, a satisfying level behavioural customer engagement is cause for practices that include positive word of mouth (van Doorn et al., 2010), constructive feedback for improvement, enthusiastic participations to referral programs and active involvement in the firm's community.

Being the manifested reaction of customers' willingness to participate and interact with the focal engagement object, it is worth to rapidly mention the antecedents of the latter dimension according to van Doorn et al. (2010)'s proposal. As a matter of fact, the state of the behavioural customer engagement in an individual depends on several factors that can involve the attitude of customers themselves, organizations' doings, or external factors. Therefore, the paper defined the following factors, which very high or very low levels can lead to engagement: customer-based factors (i.e., satisfaction, trust/commitment, identity, consumption goals, resources, and perceived costs/benefits), firm-based factors (i.e., brand characteristics, firm reputation, firm size/diversification, firm information usage and processes, industry), and context-based factors (i.e., competitive factors and P.E.S.T. factors).
Furthermore, this body of works will also consider the analyses performed by Jaakkola & Alexander (2014) on customer engagement behaviour, since they have formulated four typologies of behavioural customer engagement based on the purposes to which customers may answer when employing their resources (e.g., knowledge, experience, relationships, skills, labour, time):

- The augmenting behaviour has the goal of enhancing firm's offering "beyond that which is fundamental to the transaction."
- The codeveloping behaviour wants to facilitate the actual development and process of creation of the offering.
- The influencing behaviour's purpose is to affect other people's perceptions, preferences, or knowledge on the organization.
- The mobilising behaviour meets the objective of mobilising other stakeholders' actions toward the company.

4 Literature Review Process methodology

4.1 Designated framework adopted.

This body of work originates from the need of collecting and analysing useful findings, in the marketing field, related to the enhancement of customer engagement in the very controversial and contemporary context of the metaverse. In particular, the actual focus of the research is on the possibilities provided by the employment of gamification actions in such environments, which often employ blockchain technologies as sources of rewards (NFTs) and exchange (cryptocurrency).

The linkage between the three topics of gamification, metaverse and customer engagement (marketing) is becoming quite of interest to researchers as the hype around the metaverse grows. In fact, the events that inspired the research question of this body of work are marketing seminars held between 2022 and 2023, attended by the researcher. In particular, this reasoning can be captured in an online seminar held by researchers Khilare & Resnick in 2023 for *Gartner*, where the topics of gamification and web 3.0 are addressed.

In order to collect relevant information of the topics just presented, it was followed the framework of a systematic literature review. This typology of review is structured to examine data and findings addressed in other authors' literature, relative the specific research question.

The main database on which the searches were performed is *Elsevier*'s *Scopus*, often supported by snowballing resulting either from *Elsevier*'s *Science Direct* database or from the results' bibliographies. Thus, the main strand of literature employed is associated to verified scientific papers and articles, focusing on the great part on qualitative documentations in the fields of Computer Science, Business, Management and Accounting, Engineering, Economics and Econometrics and Finance; and occasionally enquiring documentations related to Social Sciences, Decision Sciences and Psychology.

The framework employed for the conduction of this systematic literature review is that of the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) statement. It consists in rigorous standardised guidelines for authors writing a systematic review, and it has been outlined by Moher et al. in 2009 as a revision and expansion of the previous QUOROM checklist and flow diagram.

The PRISMA statement is a realistic and trustworthy framework to follow, as differently from proposals presented in the past, it has further detailed the process to be followed in the drafting and, most importantly, it acknowledges the iterative nature of the process of research, including the possibility to modify the review protocol during its conduct (Moher et al., 2009).

The PRISMA Statement consists of two driving tools to exploit in the execution of the systematic review: a 27-item checklist and a four-phase flow diagram. The checklist

defines the macro sections onto which the author should divide its work (i.e., title, abstract, introduction, methods, results, discussion, funding), the 27 sections that are part of the latter and the items to be investigated in each of them. The diagram, on the other hand, represents a visual schema of what defined in the "methods" section, as it filters the number of records involved in the process, starting from the number of records identified during the searching and ending with the number of studies used as product of several filters (Figure 2).

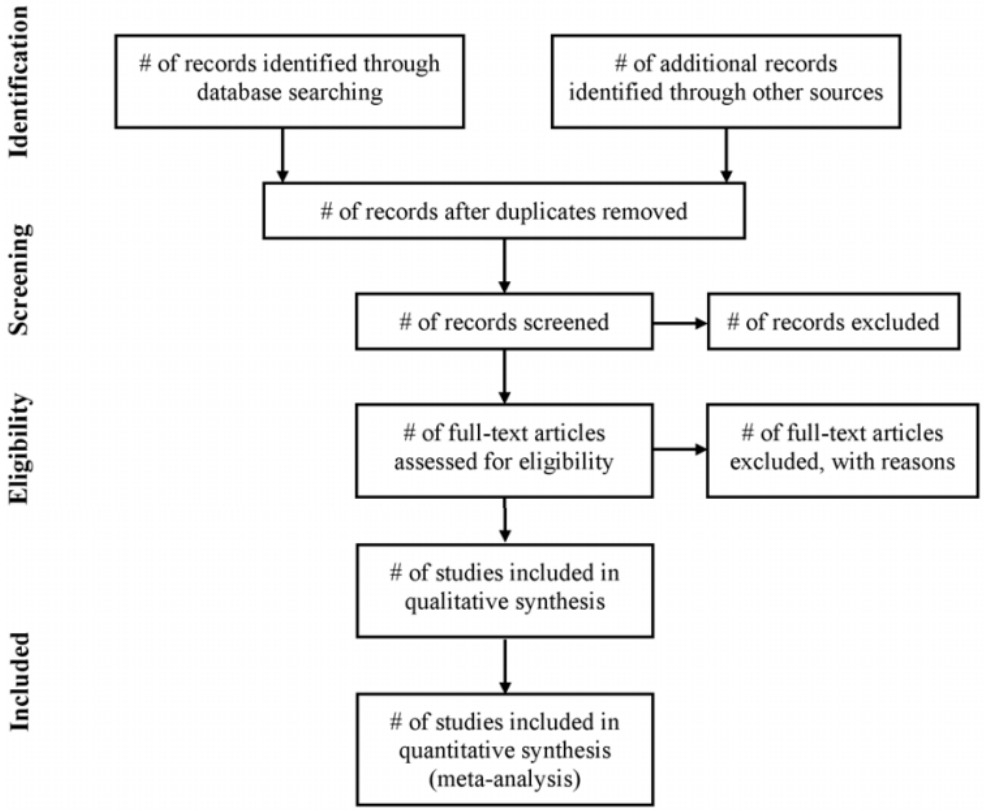

Figure 2 - Four-phase flow diagram (Moher et al., 2009)

4.1.1 Variations to the framework

This body of work follows the PRISMA's schemas just presented, according to the PRISMA 2020 checklist, implementing however some variations.

First, it was decided to add a further chapter to the scheme, *"Laying the foundations" – definition of key concepts*, dedicated to the definition of the three contexts (metaverse, gamification, customer engagement) in which the heart of this systematic literature review unfolds. This decision was made in the face of the paucity of consolidated research addressing the link between the three topics. Taking into consideration metaverse and gamification are concepts of recent birth and understanding, undergoing research developments with constancy, such investigations were essential. These premises function as the backbone of the bridge

this body of work intends to build between the three topics, and they guarantee the reader's full understanding of concepts that to many are unfamiliar with.
Moreover, the 27 points indicated in the PRISMA 2020 checklist were not blindly followed, on the contrary, they were applied to the systematic literature review based on the actual lever of research conducted and on the quality of detail expected. In short, the checklist was simplified in light of the review's qualitative approach chosen. In particular, these modifications took place in three specific sections of the framework: methods, results, and other information. The following paragraphs are dedicated to accurate rearrangement of each section.
In the "methods" section, the points included as described in the checklist provided by the authors of the PRISMA framework were n. 5, n. 6, n. 7, n. 8, n. 9 and n. 15. On the other hand, points n. 11 and n. 12 were not addressed because the required a level of quantitative analysis the review conducted could not guarantee. Following a similar reasoning, point n. 13 was "resized" by ignoring all quantitative specifications and describing qualitatively the processes followed for the selection of data. Finally, point n. 14 was not included as biases of all kinds were to be deepen in the following section.
In the "results" section, instead, the points included as described were n. 17, n. 18, and n. 21. On the other hand, point n. 16 was fully addressed but instead of outlining the reasoning behind the inclusion of each paper, it was decided to implement the point's logic to the four macro-areas of investigation (depicted in 3.2) as wholes, with the aim to provide a more fluid and sounder argumentation. Points n. 19 and n. 22, instead, was not included because it required statistical analysis that were not envisaged in the review. Finally, point n. 20 was only addressed for the heterogeneity investigation (c).
The "other information" section was not address in toto. The decision derives from the absence of review's information on the matter because they were not part of the schema envisioned.

4.2 Search and selection processes

The search process consisted in a group of 11 searches performed between October 2022 and March 2023, and have been numbered based on their chronological occurrence. They were all conducted on *Elsevier*'s abstracts and citations database *Scopus*; thus, all the exclusion and inclusion criteria is to be applied to this database only. However, there has been a collection of further documentation via the snowballing technique, which originated either in the consultation of the bibliography of key elements or in the suggested articles proposed by *Elsevier*'s bibliographic database *Science Direct* during the reading of results from Scopus. Moreover, the review is not short of grey literature, originating from reliable websites of newspapers, scientific blogs, or companies (e.g., *Fortnite*, *Decentraland*, etc.), selected with the

purpose of enriching the search with updated data that often times is not available in bibliographic databases due to prolonged publication time.
The 11 searches performed shared a good part of eligibility criteria selected beforehand, however they were also individually characterised by specific exclusion/inclusion criteria, depending on the topic investigated and the documentation's availability. The shared eligibility criteria were:

- PUBYEAR > 2013: this limitation considered documentation published only from 2014 on. This decision arises from the proved instance that recent publications are more attainable because they take into consideration recent evolution and changes undergone by the topics analysed. This is particularly true for the metaverse and gamification applications since they are currently evolving at a fast pace. Note: searches n. 8 and n. 11 are not subject to this limitation because both related to the sole conceptualisations of customer engagement and customer-centric marketing. The reasoning behind this choice is the more consolidated nature of both topics, which have developed since the late 1990s; the alternative date limitations chosen for each of the two will be deepen in their dedicated paragraphs.
- Number of citations above 30: this limitation allowed for the consideration of documentations who had been cited by other authors in a considerate number of at least 30 other works. The reasoning comes from the idea that the more the number of articles interested in the same study, the higher the probability of reliability. This imposition does not include the documentation collected via snowballing.
  Note: search n. 9 is not subject to this limitation, as it has the limit of citations set at 27; he decision is to be justified by the lack of findings over the limit of 30 (just one). The same goes for search n. 8, which on the contrary set a limit of 200 citations justified by the (high) average number of citations of the search.

For what concerns the selection process, on the other hand, it is key to anticipate the criterion of quartile ranking. In fact, journals are ranked based on their impact factor or impact index and based on their positioning, they are divided into quartiles by both Journal Citation Reports (JCR) and SCImago Journal & Country Rank (SJR). Since they are famously a reliable source for proving the credibility of a journal and thus of its articles, quartiles were also employed as a metric to select the documentation worth analysing. In particular, the public portal employed for the collection of information related to such rankings was www.scimagojr.com. The choice is legitimated because the website is conveniently developed from information contained in the Scopus database, this review's main source of documentation, and because it ranges until 1996 journals, which is once again convenient considering the sources analysed date from

2000 onwards. The criterion was that of excluding all articles set in quartiles Q3 and Q4 as not sufficiently reliable. Consequently, Q1 and Q2 articles were selected, prioritising Q1 articles as more robust.
Furthermore, there was a selection criterion imposed by circumstances, and it corresponded to the one of accessibility. As a matter of fact, all the documentation employed in this body of work was either *Open Access* or was made accessible by the student's Politecnico di Milano credentials of the researcher. Thereby, non-accessible content was naturally excluded a priori.
Finally, the selection process, with its own variances from search to search, provides for further limitations in terms of subjects accepted. As a matter of fact, a recurring explanation for the missing selection of papers is the one of the incompatibilities of topic addressed with the objectives of the review. In particular, the most common reason for exclusion at this point of the review was that of papers belonging to the groups of documents addressing either economic matters or touristic/hospitality issues. In some instances, these happenings were bypassed by excluding certain journals from the search process, otherwise they had to be excluded one by one.
Ultimately, the steps followed for the selection of the resources was the same for all searches. The first step was that of reading the titles of all the results with a citation count above 30, excluding those which title anticipated the non-conformity to the review's purpose. Afterward, the remaining document's abstracts were to be read, once again excluding the non-related ones. The next stage consisted in accessing the material, which is the point in which few documents were inaccessible. Finally, there was the careful reading of the documents selected, highlighting sentences connected to research gaps, the purpose of the paper, the research questions posed, the hypothesis verified and, naturally, the reasoning connected to this review's purpose. After all these investigations, the understanding of whether the source was promising enough to be included came more easily. As of further details on the selection process, they will be provided in the paragraphs dedicated to each individual search for a complete appreciation of the methods adopted.

In the following paragraphs, all the 11 searches will be detailed in terms of:

- the first and last consultation dates;
- further inclusion and exclusion criteria;
- the reasoning behind such choices;
- the search strategy followed;
- the records analysed and how;
- the selection process and its criteria for each source;
- the supporting grey literature employed and why.

However, since the xx searches were conducted by macro-areas, they will be reviewed according to such groupings as they were performed with the same search objectives. In doing so, the aim is that of elaborating a readable, smooth, and punctual review, avoiding getting lost in constructions and specifications that could easily tire the reader and mislead the discourse from the question itself.
In particular, the four macro-areas/objectives individuated were the following:

- The investigation of the link between the metaverse, and its most notorious technologies (XR), and marketing opportunities: searches n. 1, 3, 4, 5, 7.
- The investigation of the link between gamification applications and marketing opportunities: searches n. 2, 6.
- The investigation of blockchain technology's functioning, with a focus on NFTs and cryptocurrency: searches n. 9, 10.
- The investigation of the definition of customer engagement, its core dimensions, its employment in marketing and its roots in the customer-centric perspective: searches n. 8, 11.

The decision to conduct different searches based on the different links of the topics to the marketing field is rooted in the current great literature gap concerning the connection of the three main topics and the potential behind their combination. Such gap will be further deepened, as the goal of this systematic literature review is to work as a bridge between the three and highlight their possibilities.

Finally, in order for the reader to understand the tables to be presented, here follows a brief explanation of the different columns:

- "Source" indicates whether the document was finally employed for the review's analysis (Yes) or not (no)
- "#cit" indicates the number of other author's sources that have cited the document and said number is updated to the last consultation date.
- "Snowball origin" distinguishes the sources derived from the actual search and those originated from either one of the sources or Science Direct recommendations by specifying the source of the snowballing.
- "Analysis" indicates whether the source was fully read ("reading"), not available ("NA"), excluded based on the title ("title") or excluded based on the abstract ("abstract").

4.2.1 Macro-area n. 1: metaverse, XR and marketing opportunities

This series of searches, that took place in different dates, were conducted according to two specific objectives:

- Collecting information on the metaverse and its defining technologies per se;
- Collecting information on the linkage between the metaverse and marketing, via studies and best practices.

4.2.1.1 Search n. 1

First consulted 10/2022 - Last consulted: 3/03/2023

Result: 65 documents

Final query: *(TITLE (virtual AND reality) OR TITLE (augmented AND reality)) AND (TITLE-ABS-KEY (marketing) OR TITLE-ABS-KEY (advertising)) AND (TITLE-ABS-KEY (experience)) AND PUBYEAR > 2013 AND PUBYEAR < 2023 AND (LIMIT-TO (EXACTKEYWORD , "Virtual Reality") OR LIMIT-TO (EXACTKEYWORD , "Augmented Reality") OR LIMIT-TO (EXACTKEYWORD , "Marketing") OR LIMIT-TO (EXACTKEYWORD , "Advertising") OR LIMIT-TO (EXACTKEYWORD , "Consumer Behavior") OR LIMIT-TO (EXACTKEYWORD , "Consumer Experience") OR LIMIT-TO (EXACTKEYWORD , "Immersion") OR LIMIT-TO (EXACTKEYWORD , "Engagement")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ENGI")) AND (EXCLUDE (EXACTSRCTITLE , "Psychology And Marketing") OR EXCLUDE (EXACTSRCTITLE , "Journal Of Hospitality And Tourism Technology") OR EXCLUDE (EXACTSRCTITLE , "Sustainability Switzerland") OR EXCLUDE (EXACTSRCTITLE , "Tourism Management") OR EXCLUDE (EXACTSRCTITLE , "Current Issues In Tourism") OR EXCLUDE (EXACTSRCTITLE , "Information Technology And Tourism") OR EXCLUDE (EXACTSRCTITLE , "Academica Turistica") OR EXCLUDE (EXACTSRCTITLE , "Engineering Construction And Architectural Management") OR EXCLUDE (EXACTSRCTITLE , "International Journal Of Contemporary Hospitality Management") OR EXCLUDE (EXACTSRCTITLE , "International Journal Of Hospitality Management") OR EXCLUDE (EXACTSRCTITLE , "International Journal Of Tourism Research") OR EXCLUDE (EXACTSRCTITLE , "Journal Of Global Sport Management") OR EXCLUDE (EXACTSRCTITLE , "Journal Of Hospitality And Tourism Research") OR EXCLUDE (EXACTSRCTITLE , "Journal Of The Korean Society Of Clothing And Textiles") OR EXCLUDE (EXACTSRCTITLE , "Journal Of Tourism And Development") OR EXCLUDE (EXACTSRCTITLE , "Journal Of Tourism Futures") OR EXCLUDE (EXACTSRCTITLE , "Journal Of Travel And Tourism Marketing") OR EXCLUDE (EXACTSRCTITLE , "Medical Education Online") OR EXCLUDE (EXACTSRCTITLE , "Studies In Documentary Film") OR EXCLUDE (EXACTSRCTITLE , "Tourism And Hospitality Management") OR EXCLUDE (EXACTSRCTITLE , "Tourism Management Perspectives") OR EXCLUDE (EXACTSRCTITLE , "Tourism Recreation Research"))*

This first search was performed with the purpose of prefiguring the context in which the search would have developed, hence the interweaving of “OR” operators at the beginning of the query. The initial query was:

(TITLE(virtual reality) OR TITLE(augmented reality)) AND (TITLE-ABS-KEY(marketing) OR TITLE-ABS-KEY(advertising)) AND (TITLE-ABS-KEY(experience)) AND PUBYEAR > 2013 AND PUBYEAR < 2023

As a matter of fact, based on the initial knowledge on the topic, the goal was that of collecting sources addressing either one of the most popular XR technologies (AR, VR) and have them linked to the general topic of marketing, often reduced to the sole application in the advertising field, and to the concept of experience, which is what drives users toward the metaverse. Finally, the upper date limitation set to records published before 2023 is to be linked to the date in which this search was performed (October 2022).
Considering the abundance of results from the initial query, which were often distant from what hoped, it was decided to narrow down the search via the application of filters. The purpose of the inclusion filters was to focus on academic articles (from journals), so to gain an academic overview of the state of the art, specifically related to the influences of AR and VR technologies in the consumer sphere. Given the inclusion criteria still let through too many non-related documents, it was decided to reinforce the query with exclusion filters on the source type to eliminate a large part of the unrelated resources, too often linked to the tourism field, which is not the focus of our work. Said filters are here presented.

Inclusion criteria:

- Exact keyword: virtual reality, augmented reality, marketing, advertising, consumer behaviour, consumer experience, immersion, engagement.
- Source type: Journal.
- Subject Area: Business, Management and Accounting, Social Sciences, Engineering.

Exclusion criteria:

- Source title: Psychology And Marketing, Journal Of Hospitality And Tourism Technology, Sustainability Switzerland, Tourism Management, Current Issues In Tourism, Information Technology And Tourism, Academica Turistica, Engineering Construction And Architectural Management, International Journal Of Contemporary Hospitality Management, International Journal Of Hospitality Management, International Journal Of Tourism Research, Journal Of Global Sport Management, Journal Of Hospitality And Tourism Research, Journal Of The Korean Society Of Clothing And Textiles, Journal Of Tourism And Development, Journal Of Tourism Futures, Journal Of Travel And Tourism Marketing, Medical Education Online, Studies In Documentary Film, Tourism

And Hospitality Management, Tourism Management Perspectives, Tourism Recreation Research.

The selection process was performed by one researcher, and it followed the general steps previously defined. However, the criteria of selection for search n. 1 during the reading phase followed the purpose of gathering information so to build an overview of the current state of the art in both VR and AR applications, addressing the defining dimensions of presence, interactivity and immersivity.
The documents reviewed in search n. 1 were 19:

- 12 selected: 5 on AR alone, 3 on VR alone, 2 on XR
- 7 rejected: 7 on AR alone, 2 on VR alone

Table 2 - Overview search n. 1

Source	Title	#cit	Q	Journal	Year	Snowball origin	Analysis
Yes	The impact of virtual, augmented and mixed reality technologies on the customer experience	374	Q1	Journal of Business Research	2019	Virtual and augmented reality: Advancing research in consumer marketing	Reading
Yes	Augmenting the eye of the beholder: exploring the strategic potential of augmented reality to enhance online service experiences	216	Q1	Journal of the Academy of Marketing Science	2017		Reading
Yes	Augmented reality: Designing immersive experiences that maximize consumer engagement	215	Q1	Business Horizons	2016		Reading
Yes	Virtual reality and the CAVE: Taxonomy, interaction challenges and research directions	144	Q1	Journal of King Saud University - Computer and Information Sciences	2015	The impact of virtual, augmented and mixed reality technologies on the customer experience	Reading
Yes	We ARe at home: How augmented reality reshapes mobile marketing and consumer-brand relationships	142	Q1	Journal of Retailing and Consumer Services	2018		Reading
Yes	With or without you: Interaction and immersion in a virtual reality experience	140	Q1	Journal of Business Research	2019	Virtual and augmented reality: Advancing research in consumer marketing	Reading

Yes	Virtual and augmented reality: Advancing research in consumer marketing	102	Q1	International Journal of Research in Marketing	2020		Reading
Yes	A dual model of product involvement for effective virtual reality: The roles of imagination, co-creation, telepresence, and interactivity	85	Q1	Journal of Business Research	2019		Reading
Yes	Augmented reality in smart retailing: A (n) (A) Symmetric Approach to continuous intention to use retail brands' mobile AR apps	52	Q1	Journal of Retailing and Consumer Services	2021		Reading
Yes	A virtual market in your pocket: How does mobile augmented reality (MAR) influence consumer decision making?	47	Q1	Journal of Retailing and Consumer Services	2021		Reading
Yes	How augmented reality affects advertising effectiveness: The mediating effects of curiosity and attention toward the ad	39	Q1	Journal of Retailing and Consumer Services	2020		Reading
Yes	Augmented Reality in Retail and Its Impact on Sales	30	Q1	Journal of Marketing	2022		Reading
No	'It's an illusion, but it looks real!' Consumer affective, cognitive and behavioural responses to augmented reality applications	164	Q1	Journal of Marketing Management	2016		NA
No	Augmented reality marketing: A technology-enabled approach to situated customer experience	65	Q1	Australasian Marketing Journal	2020		NA
No	Blending the real world and the virtual world: Exploring the role of flow in augmented reality experiences	50	Q1	Journal of Business Research	2021		NA
No	What's Mine Is a Hologram? How Shared Augmented	45	Q1	Journal of Interactive Marketing	2019		Reading

	Reality Augments Psychological Ownership						
No	Experiential exposure to texting and walking in virtual reality: A randomized trial to reduce distracted pedestrian behavior	38	Q1	Accident Analysis and Prevention	2017		Title
No	Augmented or admented reality? The influence of marketing on augmented reality technologies	37	Q1	Information Communication and Society	2015		NA
No	Consumer experiences of virtual reality: Insights from VR luxury brand fashion shows	37	Q1	Journal of Business Research	2021		Reading

4.2.1.2 Search n. 3

First consulted 12/2022 - Last consulted: 4/03/2023

Result: 78

Final query: *(TITLE-ABS-KEY (vr) AND TITLE-ABS-KEY (ar) AND TITLE-ABS-KEY (marketing)) AND PUBYEAR > 2013 AND OUB YEAR < 2023*

Once again, the upper date limitation is set to records published before 2023 is to be linked to the date in which this search was performed (December 2022).
This search was performed with the aim of collecting further knowledge concerning the possible connections between the two most diffused form of extended reality, augmented reality (AR) and virtual reality (VR), and the marketing field. However, given the previous search on matter provided many results focused solely on augmented reality, the "AND" operator was preferred to narrow the research to documentations hopefully addressing both technologies. Given the manageable number of results, it was decided not to add further limitations to the search.

The selection process was performed by one researcher, and it followed the general steps previously defined. However, the criteria of selection for search n. 3 during the reading phase followed the purposes of: finding possible link between VR and/or AR technologies employment and marketing dimensions, collecting further information on interface devices, and understand the related literature gaps. Most of the papers not selected addressed tourism subjects.

The documents reviewed in search n. 3 were 9:

- 3 selected: 1 on XR, 2 on VR alone
- 5 rejected: 1 on XR, 4 irrelevant subjects
- 1 repetition from search n. 1

Table 3 - Overview search n. 3

Source	Title	#cit	Q	Journal	Year	Snowball origin	Analysis
Yes	Virtual reality in marketing: A framework, review, and research agenda	57	Q1	Frontiers in Psychology	2019		Reading
Yes	Shopping in virtual reality: A literature review and future agenda	43	Q1	Journal of Business Research	2021		Reading
Yes	How to design a virtual reality experience that impacts the consumer engagement: the case of the virtual supermarket	26	Q2	International Journal on Interactive Design and Manufacturing	2019	Shopping in virtual reality: A literature review and future agenda	Reading
rep-Yes	Virtual and augmented reality: Advancing research in consumer marketing	103	Q1	International Journal of Research in Marketing	2020		Reading
No	New realities: a systematic literature review on virtual reality and augmented reality in tourism research	319	Q1	Current Issues in Tourism	2019		Title
No	Transforming the Customer Experience Through New Technologies	167	Q1	Journal of Interactive Marketing	2020		Reading
No	Virtual Reality (VR) & Augmented Reality (AR) technologies for tourism and hospitality industry	77	Q4	International Journal of Engineering and Technology(UAE)	2018		Title
No	Research progress on virtual reality (VR) and augmented reality (AR) in tourism and hospitality: A critical review of publications from 2000 to 2018	73	Q1	Journal of Hospitality and Tourism Technology	2019		Title
No	The role of elaboration likelihood model in consumer behaviour research and its extension to new technologies: A review and future research agenda	30	Q2	International Journal of Consumer Studies	2021		Abstract

4.2.1.3 Search n. 4

First consulted 12/2022 - Last consulted: 5/03/2023
Result: 27 documents
Final query: *(TITLE-ABS-KEY (customer AND journey) AND TITLE-ABS-KEY (ar) OR TITLE-ABS-KEY (vr)) AND PUBYEAR > 2013 AND PUBYEAR < 2023*

Like the previous research, the goal was that of linking AR and/or VR technologies to marketing concepts and, in this particular instance, the focus was solely on the customer journey. The focal point of interest, in this case, was that of understanding where the technologies might be (and often are already) located in the customer journey, as it strongly determines the processes of interaction with the company and the engagement occasions.
Given the number of sources above the threshold of 30 citations was satisfying, no further limitations were employed. However, also for this search, the upper date limitation is set to records published before 2023, in accordance with the date in which this search was performed (December 2022).

The selection process was performed by one researcher, and it followed the general steps previously defined. However, the criteria of selection for search n. 4 during the reading phase followed the purpose of choosing documents that clearly defined the promise constituted by AR and/or VR technologies in interfacing customers.
The documents reviewed in search n. 4 were 7:

- 4 selected: 3 on AR alone, 1 on VR
- 1 rejected: tourism field
- 2 repetitions from searches n. 1 and n. 3

Table 4 - Overview search n. 4

Source	Title	#cit	Q	Journal	Year	Snowball origin	Analysis
Yes	Making omnichannel an augmented reality: the current and future state of the art	112	Q1	Journal of Research in Interactive Marketing	2018		Reading
Yes	The playground effect: How augmented reality drives creative customer engagement	58	Q1	Journal of Business Research	2020		Reading
Yes	Virtual reality through the customer journey: Framework and propositions	53	Q1	Journal of Retailing and Consumer Services	2020		Reading
Yes	What is augmented reality marketing? Its definition, complexity, and future	40	Q1	Journal of Business Research	2022		Reading

rep-Yes	Virtual and augmented reality: Advancing research in consumer marketing	102	Q1	International Journal of Research in Marketing	2020		Reading
rep-No	Transforming the Customer Experience Through New Technologies	167	Q1	Journal of Interactive Marketing	2020		Reading
No	The impact of representation media on customer engagement in tourism marketing among millennials	39	Q1	European Journal of Marketing	2019		Title

4.2.1.4 Search n. 5

First consulted 12/2022 - Last consulted: 5/03/2023

Result: 235 documents

Final query: *(TITLE-ABS-KEY (metaverse) AND TITLE-ABS-KEY (platform) OR TITLE-ABS-KEY (marketing)) AND PUBYEAR > 2013 AND PUBYEAR < 2023 AND PUBYEAR > 2013 AND PUBYEAR < 2023*

Given previous searches justly provided only papers with focus on extended reality technologies, it was pointed out a lack of literature collected with respect to the general conceptualisation of the interoperable metaverse as virtual worlds, independent from device-specific applications. Therefore, this search had the purpose of individuating documents concerning link between the metaverse topic and its current employment as platforms and/or the marketing field. Given the number of sources above the threshold of 30 citations was satisfying, no further limits were added. Once again, the upper date limitation is set to records published before 2023 and is to be related to the date in which this search was performed (December 2022).

The selection process was performed by one researcher, and it followed the general steps previously defined. However, the criteria of selection for search n. 5 during the reading phase followed the purpose of fully understanding the dynamics behind the metaverse context, both in terms of taxonomy and application to the marketing field, individuating gaps on related literature.

The documents reviewed in search n. 5 were 8:

- 5 selected
- 2 rejected: tourism field.
- 1 repetition from research n. 1

Table 5 - Overview search n. 5

Source	Title	#cit	Q	Journal	Year	Snowball origin	Analysis
Yes	3D virtual worlds and the metaverse: Current status and future possibilities	192	Q1	ACM Computing Surveys	2013	A Metaverse: Taxonomy, Components, Applications, and Open Challenges	Reading
Yes	A Metaverse: Taxonomy, Components, Applications, and Open Challenges	158	Q1	IEEE Access	2022		Reading
Yes	Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy	77	Q1	International Journal of Information Management	2022		Reading
Yes	Metaverse – the new marketing universe	47	Q2	Journal of Business Strategy	2022		Reading
Yes	Embracing falsity through the metaverse: The case of synthetic customer experiences	12	Q1	Business Horizons	2022	Science Direct recommendations	Reading
rep-Yes	What is augmented reality marketing? Its definition, complexity, and future	40	Q1	Journal of Business Research	2022		Reading
No	The metaverse in the hospitality and tourism industry: An overview of current trends and future research directions	43	Q1	Journal of Hospitality Marketing and Management	2022		Title
No	Educational applications of metaverse: Possibilities and limitations	82	Q2	Journal of Educational Evaluation for Health Professions	2021		Title

4.2.1.5 Search n. 7

First consulted 12/2022 - Last consulted: 7/03/2023
Result: 149 documents
Final query: *(TITLE-ABS-KEY (vr) AND TITLE-ABS-KEY (experience) AND TITLE-ABS-KEY (customer)) AND PUBYEAR > 2013 AND PUBYEAR < 2023*

The final search pertaining this macro-area had the purpose of collecting further information on virtual reality as a tool to engage in experiences. In fact, sources previously collected proved virtual reality technologies' promise in offering particularly immersive experiences. Moreover, the technology is highly utilised in the gaming and could more easily serve as a bond between the two topics of metaverse and marketing, and the third topic of gamification.
The choice of investigating further the term "virtual reality"/ "vr" was also partially forced, because employing the term "metaverse" now rarely provided any useful result, as the documentation linked to it is few and often unrelated to the topic of the review. On the contrary, the single technologies of AR and VR experience more success in terms of numbers and contents. Thereby, since we believed the information gathered on augmented reality technologies was sufficient, we decided to proceed with a search specifically dedicated to virtual reality.
Therefore, the goal was that of understanding the features of VR and its influences over customers' experiences, thus possible sources of engagement, thus promises in marketing employment.
Since the number of documents overcoming the threshold of 30 citations was proportionate, no further filters were added. Again, the upper date limitation set to records published before 2023 is to be related to the date in which this search was performed (December 2022).

The selection process was performed by one researcher, and it followed the general steps previously defined. However, the criteria of selection for search n. 7, during the reading phase, followed the purpose of collecting as much data as possible on promising VR features to influence customer experiences, the mediators.
The documents reviewed in search n. 7 were 10:

- 1 selected
- 5 rejected
- 2 repetitions from searches n. 2 and n. 3

Table 6 - Overview search n. 7

Source	Title	#cit	Q	Journal	Year	Snowball origin	Analysis
Yes	Measuring virtual experience in a three-dimensional virtual reality interactive simulator environment: A structural equation modeling approach	48	Q1	Virtual Reality	2014		Reading
rep-Yes	Virtual and augmented reality: Advancing research in consumer marketing	103	Q1	International Journal of Research in Marketing	2020		Reading
rep-No	Transforming the Customer Experience Through New Technologies	167	Q1	Journal of Interactive Marketing	2020		Reading
No	Quality of virtual reality and its impacts on behavioral intention	55	Q1	International Journal of Hospitality Management	2020		Abstract
No	VR is on the edge: How to deliver 360-videos in mobile networks	114	-	VR/AR Network 2017 - Proceedings of the 2017 Workshop on Virtual Reality and Augmented Reality Network, Part of SIGCOMM 2017	2017		Abstract
No	Integrating virtual reality devices into the body: effects of technological embodiment on customer engagement and behavioral intentions toward the destination	51	Q1	Journal of Travel and Tourism Marketing	2019		Abstract
No	Video Coding Optimization for Virtual Reality 360-Degree Source	99	Q1	IEEE Journal on Selected Topics in Signal Processing	2020		Abstract
No	Non-immersive virtual reality technologies in real estate: How customer experience drives attitudes toward properties and the service provider	43	Q1	Journal of Retailing and Consumer Services	2020		Title

4.2.1.6 Supporting grey literature

This macro-area searches were supported by several contributions of grey literature. Such additions functioned as sources of present-day information and recent real-case examples, which add body to data collected in order to understand the mechanics governing current metaverse applications.

- *Linden Lab*'s legitimate website was source of data related to Second Life's features and validated success figures (Linden Lab, 2013).
- *NBC news*'s official website was source of real-case examples of firms which already started exploring metaverse applications via Second Life (Kalning K., 2007).
- *CNBC*'s official website was the source employed to collect information on the functioning of "Nikeland" (*Nike* x *Roblox*) (Golden, 2021).
- *The New Tork Time*'s official website (3 sources) was source of data for: the functioning of *Meta*'s developments in Horizon Worlds (Hill, 2022)(Frenkel et al., 2022), examples of firms' presence in metaverse platforms (Siklos R., 2006).
- *Meta.com* was also source of information on the company's new direction and the features of Horizon Worlds (Meta Inc., 2022).
- *Microsoft.com* and *magicleap.com* served as sources of data on the technological logics and features now characterising the mixed reality tools, describing HoloLens 2 (Microsoft, n.d.) and Magic Leap 2 (Magic Leap, n.d.).
- *Fortnite.com, roblox.com, sandbox.game* and *decentraland.com* are the official website of the corresponding firms and have been employed as sources of information for the functioning of each platform. Such examples were also exploited to understand the core differences between centralised and decentralised metaverse platforms. (The Fortnite Team, 2020)(The Roblox Team, n.d.)(The Sandbox Team, n.d.)(Decentraland, 2023)
- Matthew Ball's blog (*matthewball.vc*) was source for the definition of metaverse's building blocks (Ball, 2022).
- *techstar.it* was employed as source of information on the differences between decentralised and centralised platforms.
- *Gartner's* official website was employed to construct a complete definition of Head-Mounted Displays (HMDs). (Gartner, n.d.)
- Company *St. Engineering Antycip's* official website was source for the understanding of the functioning of powerwalls. (St Engineering Antycip, n.d.)
- *Wired.com* was employed as source of information on the 2022 collaboration between *Ralph Lauren* and *Fortnite* (Dall'Ava, 2022).

4.2.2 Macro-area n. 2: gamification and marketing opportunities

This series of searches, that took place in different dates, were conducted according to two specific objectives:

- Collecting information on gamification and its origins per se;
- Collecting information on the linkage between gamification applications and marketing, via studies and best practices

4.2.2.1 Search n. 2

First consulted /12/2022 - Last consulted: 3/03/2023

Result: 68 documents

Final query: *(TITLE (gamification) AND TITLE-ABS-KEY (game) AND TITLE-ABS-KEY (experience)) AND PUBYEAR > 2013 AND PUBYEAR < 2023 AND (LIMIT-TO (SRCTYPE , "j")) AND (EXCLUDE (SUBJAREA , "MEDI") OR EXCLUDE (SUBJAREA , "ARTS") OR EXCLUDE (SUBJAREA , "HEAL") OR EXCLUDE (SUBJAREA , "ENVI") OR EXCLUDE (SUBJAREA , "ENER") OR EXCLUDE (SUBJAREA , "MATE") OR EXCLUDE (SUBJAREA , "MATH") OR EXCLUDE (SUBJAREA , "CENG") OR EXCLUDE (SUBJAREA , "PHYS") OR EXCLUDE (SUBJAREA , "NURS") OR EXCLUDE (SUBJAREA , "CHEM") OR EXCLUDE (SUBJAREA , "BIOC") OR EXCLUDE (SUBJAREA , "NEUR") OR EXCLUDE (SUBJAREA , "AGRI") OR EXCLUDE (SUBJAREA , "DENT") OR EXCLUDE (SUBJAREA , "EART") OR EXCLUDE (SUBJAREA , "SOCI")) AND (EXCLUDE (EXACTSRCTITLE , "European Journal Of Investigation In Health Psychology And Education") OR EXCLUDE (EXACTSRCTITLE , "Frontiers In Psychology") OR EXCLUDE (EXACTSRCTITLE , "International Journal Of Online And Biomedical Engineering") OR EXCLUDE (EXACTSRCTITLE , "Journal Of Hospitality And Tourism Insights") OR EXCLUDE (EXACTSRCTITLE , "Journal Of Travel And Tourism Marketing")) AND (EXCLUDE (LANGUAGE , "Spanish") OR EXCLUDE (LANGUAGE , "Portuguese") OR EXCLUDE (LANGUAGE , "Korean") OR EXCLUDE (LANGUAGE , "Chinese") OR EXCLUDE (LANGUAGE , "German") OR EXCLUDE (LANGUAGE , "Russian"))*

This search was inspired by the attendance of the researcher to seminars investigating metaverse's current state of the art. Understanding the great adding value of gamification dynamics deriving from the metaverse's compatibility to game design, the search was then conducted. The purpose was gaining information of the origins and dynamics of gamification, with a particular interest in its relation to the gaming sphere and the enhancement of experiences, as point of connection with customers possible engagement and marketing subjects. The initial query was:

(TITLE (gamification) AND TITLE-ABS-KEY (game) AND TITLE-ABS-KEY (experience)) AND PUBYEAR > 2013 AND PUBYEAR < 2023

Once again, the "experience" factor is justified by the desire of viewing documentations revolving around the topic of experiential contexts. The upper date limitation set to

records published before 2023 is pertained to the date in which this search was performed (December 2022).
In the face of a disproportionate number of results from the initial query, it was decided to narrow down the search via the application of filters. The goal was to reduce the number of results, by removing both linguistically inaccessible documents and academically distant documents, thus least related to an application of gamification to marketing and technology environments (see metaverse). In fact, contrarily to the previous search, the subject areas were defined in terms of exclusion because of the researcher was less familiar with the subject of gamification, thus it was preferred to exclude subjects that were certainly unrelated to the context of analysis. On the other hand, the source titles were once again defined in terms of exclusion, to remove documentations belonging to topics such as psychology and tourism. Said filters are here presented.

Inclusion criteria:

- Source Type: Journal.

Exclusion criteria:

- Subject Area: Medicine, Arts and Humanities, Health Professions, Environmental Science, Energy, Materials Science, Mathematics, Chemical Engineering, Physics and Astronomy, Nursing, Chemistry, Biochemistry, Genetics and Molecular Biology, Neuroscience, Agricultural and Biological Sciences, Dentistry, Earth and Planetary Science, Social Sciences.
- Source Title: European Journal Of Investigation In Health Psychology And Education, Frontiers In Psychology, International Journal Of Online And Biomedical Engineering, Journal Of Hospitality And Tourism Insights, Journal Of Travel And Tourism Marketing.
- Language: Spanish, Portuguese, Korean, Chinese, German, Russian.

The selection process was performed by one researcher, and it followed the general steps previously defined. However, the criteria of selection for search n. 2 during the reading phase followed the purpose of understanding the dynamics and roles played by game design in defining the application of gamification to marketing experiences. As a matter of fact, particular attention was paid to the documentation that presented concrete and recent instances of real applications, already in digitized contexts so to facilitate the future transition from digital to metaverse.
The documents reviewed in search n. 2 were 22:

- 9 selected
- 13 rejected

Table 7 - Overview search n. 2

Source	Title	#cit	Q	Journal	Year	Snowball origin	Analysis
Yes	Defining gamification - A service marketing perspective	760	Q1	Proceedings of the 16th International Academic MindTrek Conference 2012: "Envisioning Future Media Environments", MindTrek 2012	2012	Gamification and Mobile Marketing Effectiveness	Reading
Yes	Is it all a game? Understanding the principles of gamification	394	Q1	Business Horizons	2015		Reading
Yes	Gamification: Design of IT-based enhancing services for motivational support and behavioral change	244	Q1	Business and Information Systems Engineering	2014	Gamification and Mobile Marketing Effectiveness	Reading
Yes	Gamification and Mobile Marketing Effectiveness	214	Q1	Journal of Interactive Marketing	2016		Reading
Yes	Game on: Engaging customers and employees through gamification	154	Q1	Business Horizons	2016		Reading
Yes	Having fun while receiving rewards? Exploration of gamification in loyalty programs for consumer loyalty	85	Q1	Journal of Business Research	2020	Science Direct recommendations	Reading
Yes	The effects of gamified customer benefits and characteristics on behavioral engagement and purchase: Evidence from mobile exercise application uses	52	Q1	Journal of Business Research	2018		Reading
Yes	Experiences that matter? The motivational experiences and business outcomes of gamified services	52	Q1	Journal of Business Research	2020		Reading
Yes	How does gamification improve user experience? An empirical investigation on the antecedences and consequences of user experience and its mediating role	48	Q1	Technological Forecasting and Social Change	2018		Reading

No	Motivational effects and age differences of gamification in product advertising	123	Q1	Journal of Consumer Marketing	2014		Abstract
No	The application and impact of gamification funware on trip planning and experiences: the case of TripAdvisor's funware	108	Q1	Electronic Markets	2015		Title
No	Gameful Experience in Gamification: Construction and Validation of a Gameful Experience Scale [GAMEX]	103	Q1	Journal of Interactive Marketing	2018		Reading
No	Gamification and the online retail experience	89	Q1	International Journal of Retail and Distribution Management	2014		Reading
No	The use of gamification mechanics to increase employee and user engagement in participative healthcare services: A study of two cases	68	Q1	Journal of Service Management	2017		Title
No	Gamification in e-learning: Introducing gamified design elements into e-learning systems	62	Q4	Journal of Computer Science	2015		Title
No	Governments Should Play Games: Towards a Framework for the Gamification of Civic Engagement Platforms	54	Q2	Simulation and Gaming	2017		Title
No	Gamification of Creativity: Exploring the Usefulness of Serious Games for Ideation	51	Q1	Creativity and Innovation Management	2015		Abstract
No	Applying basic gamification techniques to it compliance training: Evidence from the lab and field	47	Q1	Journal of Information Systems	2016		Title
No	Gamification in Management: Between Choice Architecture and Humanistic Design	39	Q1	Journal of Management Inquiry	2019		Abstract
No	Gamification and serious game approaches for adult literacy tablet software	38	Q3	Entertainment Computing	2014		Title
No	When gamification backfires: the impact of perceived justice on online community contributions	32	Q1	Journal of Marketing Management	2020		Title

No	A qualitative investigation of gamification: Motivational factors in online gamified services and applications	31	Q3	International Journal of Technology and Human Interaction	2015		Q3

4.2.2.2 Search n. 6

First consulted /12/2022 - Last consulted: 5/03/2023

Result: 63 documents

Final query: *(TITLE (gamification) AND TITLE-ABS-KEY (marketing)) AND PUBYEAR > 2013 AND PUBYEAR > 2023 AND (LIMIT-TO (EXACTKEYWORD , "Gamification")) AND (EXCLUDE (SUBJAREA , "SOCI") OR EXCLUDE (SUBJAREA , "ENGI") OR EXCLUDE (SUBJAREA , "MATH") OR EXCLUDE (SUBJAREA , "ECON") OR EXCLUDE (SUBJAREA , "ARTS") OR EXCLUDE (SUBJAREA , "PSYC") OR EXCLUDE (SUBJAREA , "MEDI") OR EXCLUDE (SUBJAREA , "ENER") OR EXCLUDE (SUBJAREA , "ENVI") OR EXCLUDE (SUBJAREA , "MULT") OR EXCLUDE (SUBJAREA , "NEUR") OR EXCLUDE (SUBJAREA , "HEAL") OR EXCLUDE (SUBJAREA , "PHYS"))*

The search was performed with the purpose of gaining further information of the possible links between gamification experiences and the marketing field. In fact, in order to guarantee the retrieval of documentation strictly centred around the concept of gamification, it was decided to "limit" the search to the papers capturing the concept in their own title. In fact, the initial query was:

(TITLE (gamification) AND TITLE-ABS-KEY (marketing)) AND PUBYEAR > 2013 AND PUBYEAR > 2023

Again, the upper date limitation set to records published before 2023 pertains to the date in which this search was performed (December 2022).

As was the case of the previous search, the number of results was disproportionate and oftentimes the titles were related to subject areas totally distant from the scope of this review, therefore it was decided to narrow down the search via the application of filters. The goal was to reduce the number of results, by removing the misleading subject areas not inherent to the purpose, such as the field of economy, which is not compliant to the possible advantages gamification applications could bring to the metaverse, and by ensuring the topic of "gamification" as core. Said filters are here presented.

Inclusion criteria:

- Exact Keyword: Gamification.

Exclusion criteria:

- Subject Area: Economics, Econometrics and Finance, Engineering, Medicine, Arts and Humanities, Health Professions, Environmental Science, Energy, Mathematics, Physics and Astronomy, Neuroscience, Social Sciences.

The selection process was performed by one researcher, and it followed the general steps previously defined. However, the criteria of selection for search n. 6 during the reading phase followed the purpose of collecting useful data regarding the possible application of gamification to marketing experiences to influence marketing-related dimensions, in particular customer engagement. The objective was also that of understanding the dynamics making gamification suitable for marketing applications and eventually the confrontation via best practice instances.
The documents reviewed in search n. 6 were 11:

- 6 selected
- 3 rejected
- 2 repetitions from search n. 2

Table 8 - Overview search n. 6

Source	Title	#cit	Q	Journal	Year	Snowball origin	Analysis
Yes	Examining the impact of gamification on intention of engagement and brand attitude in the marketing context	191	Q1	Computers in Human Behavior	2017	Does gamification affect brand engagement and equity? A study in online brand communities	Reading
Yes	Gamification as a platform for brand co-creation experiences	52	Q1	Journal of Brand Management	2017		Reading
Yes	Gamification Science, Its History and Future: Definitions and a Research Agenda	130	Q2	Simulation and Gaming	2018		Reading
Yes	Does gamification affect brand engagement and equity? A study in online brand communities	104	Q1	Journal of Business Research	2020		Reading
Yes	Hook vs. hope: How to enhance customer engagement through gamification	80	Q1	International Journal of Research in Marketing	2019	Enhancing user engagement: The role of gamification in mobile apps	Reading

Yes	Enhancing user engagement: The role of gamification in mobile apps	47	Q1	Journal of Business Research	2021		Reading
rep-Yes	Gamification and Mobile Marketing Effectiveness	214	Q1	Journal of Interactive Marketing	2016		Reading
rep-No	Gameful Experience in Gamification: Construction and Validation of a Gameful Experience Scale [GAMEX]	104	Q1	Journal of Interactive Marketing	2018		Reading
No	Design approaches for the gamification of production environments. A study focusing on acceptance	42	-	8th ACM International Conference on PErvasive Technologies Related to Assistive Environments, PETRA 2015 - Proceedings a6	2015		No clear source quartile
No	Tourists as Mobile Gamers: Gamification for Tourism Marketing	131	Q1	Journal of Travel and Tourism Marketing	2016		Title
No	The impact of gamification adoption intention on brand awareness and loyalty in tourism: The mediating effect of customer engagement	40	Q1	Journal of Destination Marketing and Management	2021		Title

4.2.2.3 Supporting grey literature

This macro-area searches were supported by few contributions of grey literature. These additions functioned as sources of present-day information and recent real-case examples, which add body to data collected in order to understand the mechanics governing current applications.

- *starbucks.com*'s (2) contributions were core for the understanding of loyalty programs dynamics via a real-case example of recent success. (Starbucks, n.d.)(Starbucks, 2013)
- *Adidas Runastic* mobile application was consulted and used by the researcher to gather information on the functioning of gamification and loyalty program instances in mobile implementations.
- *Zombie, run!* mobile application was consulted and used by the researcher to gather information on the mechanisms governing gamification implementations strongly related to storytelling and playfulness.

4.2.3 Macro-area n. 3: blockchain useful tools (NFT, cryptocurrency)

The decision to further investigate the functioning of blockchain technologies arose after the viewing of the online seminar The Gartner Top Strategic Technology Trends for 2023: Metaverse. In fact, researchers Khilare and Resnick addressed the blockchain topic by explaining the possible uses of Web 3.0 dynamics in the metaverse. Although they are not the same concept and are not necessarily intertwined, in fact blockchain technologies can notoriously exist and be employed for digital exchanges outside the boundaries of virtual worlds, the same tools can be successfully implemented to power the metaverse. Moreover, unique digital assets like the ones guaranteed by NFTs can also serve as rewards in a gamification dynamic, and in fact there have been few instances of this behaviour.

In light of such strong connections with both metaverse and gamification subjects, it was decided to dedicate a couple of searches to the sole tool of blockchain, with the objective of collecting information on its functioning and current employments.

4.2.3.1 Search n. 9

First consulted 02/2023 - Last consulted: 6/03/2023

Result: 31 documents

Final query: *(TITLE-ABS-KEY (blockchain) AND TITLE-ABS-KEY (nft) AND TITLE-ABS-KEY (crypto)) AND PUBYEAR > 2013*

Given the searches addressing the metaverse, performed up until this point, evidenced the core role played by blockchain technologies, particularly in decentralised platforms, as sources for the management of digital assets (whether items or currency), it was decided to deepen their understanding. In fact, the query addresses both the terms “blockchain” and its applications showing more coherence with the metaverse, namely “nft” and “crypto” (currency). Because the number of results was satisfying, no further filters were added.

The selection process was performed by one researcher, and it followed the general steps previously defined, except for the citation count, which in this case was set at 27 citing sources. The decision is justifiable by the scarcity of meaningful results. The criteria of selection for search n. 9 during the reading phase followed the purpose of collecting useful insights on the functioning of blockchain technologies. Firstly, the information collected concerned the dynamics of privacy, decentralisation, and transparency of blockchains. Afterward, as inferable from the query, the core information gathered was that related to non-fungible tokens and their employment as collectibles. Finally, the functioning of cryptocurrencies as currency to exchange assets digitally was investigated.

The documents reviewed in search n. 9 were 4:

- 3 selected
- 1 rejected

Table 9 - Overview search n. 9

Source	Title	#cit	Q	Journal	Year	Snowball origin	Analysis
Yes	Crypto collectibles, museum funding and openGLAM: Challenges, opportunities and the potential of non-fungible tokens (NFTs)	30	Q2	Applied Sciences	2021		Reading
Yes	Prospecting non-fungible tokens in the digital economy: Stakeholders and ecosystem, risk and opportunity	27	Q1	Business Horizons	2022		Reading
Yes	Blockchain technology for creative industries: Current state and research opportunities	3	Q1	International Journal of Research in Marketing	2022	Science Direct recommendations	Reading
No	Construction payment automation using blockchain-enabled smart contracts and robotic reality capture technologies	39	Q1	Automation in Construction	2021		Reading

4.2.3.2 Search n. 10

First consulted 15/02/2023 - Last consulted: 6/03/2023

Result: 70 documents

Final query: *(TITLE-ABS-KEY(cryptocurrency) AND TITLE-ABS-KEY(blockchain)) AND (EXCLUDE (LANGUAGE,"Chinese") OR EXCLUDE (LANGUAGE,"Spanish") OR EXCLUDE (LANGUAGE,"Russian") OR EXCLUDE (LANGUAGE,"Portuguese") OR EXCLUDE (LANGUAGE,"German") OR EXCLUDE (LANGUAGE,"French") OR EXCLUDE (LANGUAGE,"Japanese") OR EXCLUDE (LANGUAGE,"Korean")) AND (LIMIT-TO (SUBJAREA,"COMP") OR LIMIT-TO (SUBJAREA,"ENGI") OR LIMIT-TO (SUBJAREA,"BUSI") OR LIMIT-TO (SUBJAREA,"ECON")) AND (LIMIT-TO (DOCTYPE,"ar") OR LIMIT-TO (DOCTYPE,"ch")) AND (LIMIT-TO (EXACTKEYWORD,"Cryptocurrency")) AND (LIMIT-TO (OA,"all")) AND (EXCLUDE (SUBJAREA,"MATE") OR EXCLUDE (SUBJAREA,"PHYS") OR EXCLUDE (SUBJAREA,"BIOC") OR EXCLUDE (SUBJAREA,"CHEM") OR EXCLUDE (SUBJAREA,"ENVI") OR EXCLUDE (SUBJAREA,"ENER") OR EXCLUDE (SUBJAREA,"HEAL") OR EXCLUDE (SUBJAREA,"MEDI") OR EXCLUDE (SUBJAREA,"ARTS") OR EXCLUDE (SUBJAREA,"CENG")) AND (LIMIT-TO (EXACTKEYWORD,"Bitcoin"))*

In light of the results of the previous search on the same subject of blockchain, the tenth search was conducted for further exploration. Given the previous search did not result in useful documentation on the functioning of cryptocurrencies, but mainly focused on non-fungible tokens. In fact, the initial query was:

(TITLE-ABS-KEY (cryptocurrency) AND TITLE-ABS-KEY (blockchain)) AND PUBYEAR > 2013

Differently from the previous search, a set filters had to be put in place in order to downsize the results obtained. In particular, the misleading results were addressed via limitations regarding the language read by the researcher, the subject areas concerning the possible objective of the review, the document type, and the exact keyword to surely address the core topic. Moreover, it was added a limitation in terms of access, choosing the All-Open Access filter to ensure the collection of all accessible sources. This series of strict limitations is justified by the objective of achieving just a smattering of the topic via few targeted sources.

Inclusion criteria:

- Document type: Article, Book Chapter.
- Exact Keyword: Cryptocurrency, Bitcoin.
- Subject Area: Engineering, Economics, Econometrics and Finance, Business, Management and Accounting.

Exclusion criteria:

- Subject Area: Mathematics, Physics and Astronomy, Biochemistry, Genetics and Molecular Biology, Chemistry, Environmental Science, Energy, Health Professions, Medicine Arts and Humanities, Chemical Engineering
- Language: Spanish, Chinese, Russian, Portuguese, German, French, Japanese, Korean.

The selection process was performed by one researcher, and it followed the general steps previously defined. The criteria of selection for search n. 10 during the reading phase followed the purpose of collecting insights on the functioning of cryptocurrency as to define its uses in metaverse contexts. Moreover, information on the dynamics of blockchain technologies were also collected.
The documents reviewed in search n. 10 were 11:

- 3 selected
- 8 rejected

Table 10 - Overview search n. 10

Source	Title	#cit	Q	Journal	Year	Snowball origin	Analysis
Yes	Blockchain Technologies: The Foreseeable Impact on Society and Industry	359	Q1	Computer	2017		Reading
Yes	Big-crypto: Big data, blockchain and cryptocurrency	42	Q2	Big Data and Cognitive Computing	2018		Reading
Yes	Beyond Bitcoin: What blockchain and distributed ledger technologies mean for firms	139	Q1	Business Horizons	2019		Reading
No	Applications of blockchain technology beyond cryptocurrency	108	Q2	Annals of Emerging Technologies in Computing	2018		Reading
No	Socialism and the blockchain	53	Q2	Future Internet	2016		Abstract
No	Toward Fairness of Cryptocurrency Payments	39	Q1	IEEE Security and Privacy	2018		Abstract
No	A petri nets model for blockchain analysis	37	Q2	Computer Journal	2018		NA
No	A comparative study of bitcoin price prediction using deep learning	78	Q1	Mathematics	2019		Title

No	Understanding the motivations, challenges and needs of Blockchain software developers: a survey	40	Q1	Empirical Software Engineering	2019		Abstract
No	Bitcoin and Blockchain: Security and Privacy	48	Q1	IEEE Internet of Things Journal	2020		Title
No	Policy uncertainty and Bitcoin returns	30	Q2	Borsa Istanbul Review	2020		Title

4.2.3.3 Supporting grey literature

This macro-area searches were supported by few contributions of grey literature. In particular, these additions functioned as sources of present-day information and recent real-case examples on non-fungible tokens. Since the academic sources collected were not particularly focused on the link between the technology and the metaverse, these grey sources add body to the understanding of the potential of such technology in the metaverse.

- *The New York Times*'s official website was source for information on *Nike*'s collaboration with *RTFKT* as example of successful ventures via collectible non-fungible tokens. This instance was specifically searched as it was often mentioned both in literature and seminars as ultimate example of success. (Williams, 2022)
- *Forbes*'s official website was source for information on the current employment of non-fungible tokens in metaverse contexts, thus served as further proof of NFTs' usefulness in the marketing field. (Fonarov, 2022)
- *NBC news*'s official website was employed as source of information on the functioning of non-fungible tokens in metaverse contexts such as the one present in the platform *Decentraland*. (Marquez, 2021)

4.2.4 Macro-area n. 4: customer engagement and customer-centric perspective

The last "bridge to build" is the one connecting the marketing subject of interest to its actual expression. As a matter of fact, the review is employing the construct of customer engagement as the core marketing dimension on which gamification logics and metaverse applications could have greatest influence.

The following searches' objectives concern the understanding of the customer-centric perspective now characterising the marketing subject and the consequence importance of customer engagement as metric to measure the success of the relationship with a customer. Naturally, the dimension found can be then related to those of the other two main topics.

4.2.4.1 Search n. 8

First consulted 12/2022 - Last consulted: 6/03/2023

Result: 111 documents

Final query: *(TITLE (engagement) AND TITLE (customer)) AND PUBYEAR > 2009 AND PUBYEAR < 2022 AND TITLE-ABS-KEY (marketing) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (SUBJAREA , "BUSI") OR EXCLUDE (SUBJAREA , "AGRI") OR EXCLUDE (SUBJAREA , "ENVI") OR EXCLUDE (SUBJAREA , "MATH") OR EXCLUDE (SUBJAREA , "MEDI") OR EXCLUDE (SUBJAREA , "DECI") OR EXCLUDE (SUBJAREA , "PSYC")) AND (EXCLUDE (LANGUAGE , "Spanish") OR EXCLUDE (LANGUAGE , "Chinese") OR EXCLUDE (LANGUAGE , "German")) AND (EXCLUDE (EXACTKEYWORD , "Tourism") OR EXCLUDE (EXACTKEYWORD , "Banking") OR EXCLUDE (EXACTKEYWORD , "China") OR EXCLUDE (EXACTKEYWORD , "Europe") OR EXCLUDE (EXACTKEYWORD , "Facebook Brand Page") OR EXCLUDE (EXACTKEYWORD , "FsQCA") OR EXCLUDE (EXACTKEYWORD , "India") OR EXCLUDE (EXACTKEYWORD , "LinkedIn") OR EXCLUDE (EXACTKEYWORD , "Mobile Instant Messaging") OR EXCLUDE (EXACTKEYWORD , "Netnography") OR EXCLUDE (EXACTKEYWORD , "Retail Banking") OR EXCLUDE (EXACTKEYWORD , "Tourism Market") OR EXCLUDE (EXACTKEYWORD , "AI Preference") OR EXCLUDE (EXACTKEYWORD , "AI Satisfaction") OR EXCLUDE (EXACTKEYWORD , "Active Tourism") OR EXCLUDE (EXACTKEYWORD , "Age") OR EXCLUDE (EXACTKEYWORD , "Airlines") OR EXCLUDE (EXACTKEYWORD , "Anti-haul Video") OR EXCLUDE (EXACTKEYWORD , "Artificial Intelligence") OR EXCLUDE (EXACTKEYWORD , "Australia") OR EXCLUDE (EXACTKEYWORD , "Automobile") OR EXCLUDE (EXACTKEYWORD , "Automobile Brands In Pakistan") OR EXCLUDE (EXACTKEYWORD , "Automobile Market Of Pakistan") OR EXCLUDE (EXACTKEYWORD , "Biblioshiny") OR EXCLUDE (EXACTKEYWORD , "Big Data") OR EXCLUDE (EXACTKEYWORD , "Biotechnology Industry") OR EXCLUDE (EXACTKEYWORD , "Blog") OR EXCLUDE (EXACTKEYWORD , "Bluetooth Low Energy"))*

The search was conducted with the aim of exploring the theme of customer engagement, with the hope of individuating dynamics interrelating the topics of gamification and metaverse to the actual customer and the marketing subject. Since the subject is not of recent discovery, but belongs to research involving the last two decades, it was decided to amplify the time of search and include results from 2010 to

2022. The aim was that of collecting information originating from recent developments and identifying customer engagement's characteristics already consolidated in the marketing area. In fact, the initial query was:

(TITLE (engagement) AND TITLE (customer)) AND PUBYEAR > 2009 AND PUBYEAR < 2022 AND TITLE-ABS-KEY (marketing)

Like previous searches, also in this occasion, a series of limitations had to be put in place, because the range of results from the first query was too vast, and oftentimes unrelated to subject areas. The goal was to reduce the number of results, by removing the misleading subject areas, and keywords not inherent to the purpose, and adding further limitations of form (e.g., language, publication stage, document type) derived from previous search experience.

Inclusion criteria:

- Publication Stage: Final.
- Document type: Article.
- Subject Area: Business, Management and Accounting.

Exclusion criteria:

- Subject Area: Medicine, Environmental Science, Mathematics, Agricultural and Biological Sciences, Decision Sciences, Psychology.
- Language: Spanish, Chinese, German
- Exact Keyword: Tourism, Banking, China, Europe, Facebook Brand Page, FsQCA, India, LinkedIn, Mobile Instant Messaging, Netnography, Retail Banking, Tourism Market, AI Preference, AI Satisfaction, Active Tourism, Age, Airlines, Anti-haul Video, Artificial Intelligence, Australia, Automobile, Automobile Brands In Pakistan, Automobile Market Of Pakistan, Biblioshiny, Big Data, Biotechnology Industry, Blog, Bluetooth Low Energy.

The selection process was performed by one researcher, and it followed the general steps previously defined, except for the citation count, which in this case was set at 200 citing sources. The decision is supported by the conspicuous number of results with a considerate average count, and by the necessity to collect a contained number of documents on the topic of customer engagement as to deepen the subject to a good grade, without incurring in misleading information.
The criteria of selection for search n. 8 during the reading phase followed the purpose of collecting useful insights on the nature of customer engagement, its multidimensionality, and its defining characteristics, in order to decline said features

in such a way that can enhance the power of experience and thus the employment of gamification and metaverse contexts.
The documents reviewed in search n. 8 were 15:

- 9 selected
- 6 rejected

Table 11 - Overview search n. 8

Source	Title	#cit	Q	Journal	Year	Snowball origin	Analysis
Yes	Customer engagement behavior: Theoretical foundations and research directions	1986	Q1	Journal of Service Research	2010		Reading
Yes	Undervalued or overvalued customers: Capturing total customer engagement value	789	Q1	Journal of Service Research	2010		Reading
Yes	Engagement, telepresence and interactivity in online consumer experience: Reconciling scholastic and managerial perspectives	785	Q1	Journal of Business Research	2010	Customer engagement: Conceptual domain, fundamental propositions, and implications for research	Reading
Yes	Customer engagement: Conceptual domain, fundamental propositions, and implications for research	1946	Q1	Journal of Service Research	2011		Reading
Yes	Exploring customer brand engagement: definition and themes	708	Q2	Journal of Strategic Marketing	2011	A Critical Analysis of Consumer Engagement Dimensionality	Reading
Yes	The Role of Customer Engagement Behavior in Value Co-Creation: A Service System Perspective	706	Q1	Journal of Service Research	2014		Reading
Yes	A Critical Analysis of Consumer Engagement Dimensionality	3	-	Procedia - Social and Behavioral Sciences	2015	Science Direct recommendations	Reading

Yes	Customer engagement: the construct, antecedents, and consequences	757	Q1	Journal of the Academy of Marketing Science	2017		Reading
Yes	Toward a theory of customer engagement marketing	465	Q1	Journal of the Academy of Marketing Science	2017		Reading
No	Customer engagement and the relationship between involvement, engagement, self-brand connection and brand usage intent	232	Q1	Journal of Business Research	2018		Reading
No	Customer Engagement as a New Perspective in Customer Management	622	Q1	Journal of Service Research	2010		Reading
No	Demystifying customer brand engagement: Exploring the loyalty nexus	784	Q1	Journal of Marketing Management	2011	A Critical Analysis of Consumer Engagement Dimensionality	NA
No	Customer engagement: Exploring customer relationships beyond purchase	1137	Q1	Journal of Marketing Theory and Practice	2012		NA
No	Corporate social responsibility in business-to-business markets: How organizational customers account for supplier corporate social responsibility engagement	221	Q1	Journal of Marketing	2013		Title
No	Co-creation and higher order customer engagement in hospitality and tourism services: A critical review	236	Q1	International Journal of Contemporary Hospitality Management	2016		Title

4.2.4.2 Search n. 11

First consulted 20/02/2023 - Last consulted: 6/03/2023
Result: 31 documents
Final query: *TITLE (customer AND centric AND marketing) AND PUBYEAR > 1999 AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "ECON"))*

Considering the results of the previous search about customer engagement and of researcher's previous knowledge, it was decided to investigate the origins of the newfound interest in customer engagement, exploring information regarding the customer centric prospective. In accordance, the date limit was broadened, including sources from the year 2000. It is a significant year, as the first instances of customer-centric marketing theories date back to the late nineties. In fact, the first query was:

TITLE (customer AND centric AND marketing) AND PUBYEAR > 1999

In order to avoid misleading results, it was decided to apply a modest number of filters, limiting the restrictions to the sole topic of subject area. The two subjects chosen are the two most suitable to the topic of customer-centric marketing.

Inclusion criteria:

- Subject Area: Economics, Econometrics and Finance; Business, Management and Accounting.

The selection process was performed by one researcher, and it followed the general steps previously defined. The criteria of selection for search n. 11 during the reading phase followed the purpose of defining the origins of customer-centric marketing and its evolution throughout time to truly grasp the current state of the art and the newfound interest in concentrating a firm's effort on customers and their engagement, as it is a core topic of the review.
The documents reviewed in search n. 11 were 5:

- 1 selected
- 4 rejected

Table 12 - Overview search n. 11

Source	Title	#cit	Q	Journal	Year	Snowball origin	Analysis
Yes	The Antecedents and Consequences of Customer-Centric Marketing	520	Q1	Journal of the Academy of Marketing Science	2000		Reading
No	Customer empowerment in tourism through consumer centric marketing (CCM)	80	Q2	Qualitative Market Research	2007		Title
No	Customer-centric marketing with Internet coupons	36	Q1	Decision Support Systems	2008		Abstract
No	Entrepreneurial marketing: Acknowledging the entrepreneur and customer-centric interrelationship	110	Q2	Journal of Strategic Marketing	2010		Title
No	Integrated marketing communication – from an instrumental to a customer-centric perspective	43	Q1	European Journal of Marketing	2017		Reading

4.2.4.3 Supporting grey literature

This macro-area searches were supported by only one contribution of grey literature, which happening is due to the searches' strong theoretical nature and to the researcher's personal academic knowledge. These conditions naturally led to a lack of need for examples or further clarifications.

The addition was information gathered from *Dove*'s official website on their Real Beauty Sketches campaign video, and its use was in the depiction of an emotional driven campaign with successful numbers in customer engagement. (Dove, 2013)

4.3 Data collection and synthesis

Based on the results obtained for each of the four macro-areas, it is fundamental to specify the methods employed in order to collect useful data from each document selected, the processes followed to confirm the validity of such data, what were the information and variables actually gathered in each macro-area and, finally, what was actually relevant from such collection. Such analysis will be presented for each macro-area searched.

4.3.1 Macro-area n. 1: metaverse, XR and marketing opportunities

Given the collection purposes of this macro-area were vast, ranging from metaverse's technologies to the marketing opportunities related, the first step of data collection consisted in a summary reading of the papers. In particular, to fully understand which could be the possible key useful points of a document, the researcher read and highlighted the main topics shared in both introductions and conclusions.

After such premise, the following step was to collect data on the hypothesis and research questions the works wanted to verify. In fact, often, the documents analysed presented a series of propositions and hypothesis then addressed and partially consolidated with either literature reviews or qualitative statistical analyses by means of tools such as surveys and field experiments. Thus, in order to fully grasp the direction taken by these results, the researcher paid particular attention to each prediction made, checked their verification in the "results" sections dedicated, and finally analysed the premises of each verified hypothesis/proposition.

At this point, the focus of the documents was clear and distinguished between: papers investigating the sole dynamics of metaverse technologies and the related interface devices now conditioning the market; and papers investigating the link between metaverse and customers influences via more theoretical perspectives.

Given this strong distinction, the next process to address was that of the investigation on origins and meaning of the terms "metaverse," "virtual reality," "augmented reality" and "mixed reality." Manifestly, the more theoretical documents provided more in-depth overviews of the current state of the art, often specifying the nuances characterising the "reality-virtuality continuum" and served as the backbone for the understanding of this environment. This type of works offered the key definitions of metaverse's dimensions involving customers' perceptions: immersion, presence, interactivity. Since they have often been defined as predictors of satisfaction, loyalty, and engagement, the three dimensions will be core points in the reasoning behind the relation between metaverse, customer engagement and gamification, and thus they were at the very basis of this macro-area search. In fact, they were searched in each document, including those heavily focused on interface devices, in order to collect data

on their functioning in both logics of theory and real application instances, independently from the devices employed.
As expected, not all documents addressed the same dimensions here selected. In fact, some papers investigated only one or two of them, some added further dimensions, and some even merged some of the dimensions together as one (e.g., immersion and presence). However, it was decided to only collect information related to the three as distinct and defining entities, for instance uniting the concepts of interactivity and interaction under one definition. Naturally, particular attention was paid with respect to the influences of such dimensions on customer's perceptions and engagement.
Afterward, the focus of the data collection shifted towards the understanding of the effects of each component of the so-called "reality-virtuality continuum." Thereby, the concepts of extended reality, and thus virtual reality, augmented reality, and mixed reality, were addressed by thoroughly analysing their functioning. This session of data collection was performed mainly employing the documentation focusing of the dynamics of metaverse technologies.
In fact, the process focused on devices and real-case applications, which are now common knowledge thanks to newfound hype around the theme of metaverse that firms are sharing with market targets, going beyond the sole early adopters. At first, the data collected indicated great developments in terms of augmented reality employment, and consequently, the process initially verted on gathering information on current popular applications (e.g., magic mirrors, active prints), which proved the widespread interest of consumers in engaging with such innovative technologies. Thereafter, the same dynamic of data collection was reserved to virtual reality employment, concentrating the analysis efforts on the distinctive characteristic of devices based on their immersivity abilities and stationary /or not features. Such focus and richness of data on more materialistic aspects of the technology allowed for investigations of the influence that each feature has on consumers, also with respect to each metaverse dimension. Moreover, considering most current applications, as mentioned before, find their roots in the game field, the specifics and examples noted may also play a crucial point in the link with game design and gamification logics.
Furthermore, considering the shared interest of some papers on specific theories and concepts, it was decided to collect data on further specifications as well. First, it was paid particular attention to the power held by creativity, which proved to be one of the main metaverse' features offered to consumers to enhance their participation and engagement. Second, concerning the topic of the exploitation of creativity, there was the "playground effect" (main reference: Jessen et al., (2020)), which was noted as it describes the consumers' ability to freely explore and experiment via playful activities in the metaverse, and consequently can be easily related to game design as well. Third, "situated cognition" (main reference: Hilken et al. (2017)) was another theory that

frequently reoccurred, especially in documentations addressing augmented reality. Fourth, the "flow" theory (main reference Cheng et al. (2014)) was also frequently addressed by the analysed documents, and it was paid particular attention to this theory because it concerns the psychological state of total absorption of a consumer when engaged in experiences, thus it perfectly adheres to the dimensions previously stated, especially immersion, and it can play an important role in the link with customer engagement.
Finally, the validity of all the information just indicated was verified by consulting grey literature and, most importantly, by a process of cross-reading documentation addressing the sae concepts.

4.3.2 Macro-area n. 2: gamification and marketing opportunities

This macro-area's two searches were performed with the purposes of collecting information on both gamification's bond with the gaming industry logics and the linkage between gamification applications and marketing. For the collection of data related to such objectives, firstly the researcher read and highlighted the main topics shared in both introductions and conclusions.
Similar to the previous macro-area, the following step was to collect data on the hypothesis and research questions the works wanted to verify. In fact, also in this case, many of the documents analysed presented a series of propositions and hypothesis, addressed and partially consolidated. Thus, it was paid particular attention to the hypotheses proposed, their validity was checked in the "results" sections dedicated, and finally the premises of each verified hypothesis/proposition were addressed.
Pinpointing such conceptions allowed for the definition of the goal pursued by each paper. In particular, the different results often addressed, either one, two, or all, the following three issues: game design logics ruling gamification, gamification instances of recent past and their functioning, and the influence gamification holds on customer.
Given the acknowledgement of these three topics as key, the following steps consisted in the investigation of each of them, validating data collected via cross-reading, as in the previous case.
The first topic was that of gamification's relation with game design logics and playfulness. The data collected verted on the explanation of how game design works and the core figures defining their dynamics. First, it was decided to search and collect data concerning the actual functioning of game design and the components defining the development of its structure, the objective was that of acknowledging the process of the building of a playful/gamified experience. In this case, the two partially superimposable framework annotated were those of the Game Tetrad Model and the MDE framework, both outlined in the second chapter. Second, almost the entirety of the documentation highlighted a distinction between games and gamified experiences

in terms of business objectives pursued, and given the importance of such breaking points, they were recorded for further investigation. Third, a recurring definition was that of the parties involved throughout the whole life of a game/gamified experience (i.e., players, designers, spectator, observers), from its conception and design to its actual usage. Moreover, roles such as the one of players were further analysed, specifying distinct types, and such information was noted as players constitute the actual consumers of a gamified experience. Fourth, similarly to the previous macro-area, the papers scrutinised often referred to creativity as a key variable for the definition of both games and truly gamified experiences; therefore, reasonings and data pertaining to this dimension were collected especially in view of future developments in the link between metaverse and gamification.

The second topic was the analysis of recent applications of game design logics to non-game related experiences. In fact, as mentioned in the second chapter, the employment of gamification is not of recent discovery; however, since the focus of the review verts on its possible use in a metaverse context, it was decided to analyse only recent applications. Thereby, most of the instances scrutinised were online campaigns, mobile applications, and online retail, as their logics and customer commitment required functioned as proxies for digital experiences. In particular, loyalty programs were identified as the most common forms of gamification, and thus most of the data collected relates to such implementations. Finally, these real-case examples were also supported by grey literature specifically dedicated to these applications.

The third topic is that of customer's approach and relation toward gamified experiences. As the link between game design applications and marketing dynamics is fundamental in view of this review, it was also crucial to understand in which ways the instances that took place so far have influenced consumers in their approach toward a product/brand. The variables and dimensions for which it was paid particular attention in the collection of data were word-of-mouth, brand experience, brand engagement, benefits, behavioural dimensions, and willingness to pay. In fact, such topics have often proven to be mediators or antecedents of customer engagement.

4.3.3 Macro-area n. 3: blockchain useful tools (NFT, cryptocurrency)

The two searches dedicated to this macro-area of analysis verted on the collection of data in relation to blockchain technology, with a particular focus on the tools of non-fungible tokens and cryptocurrencies. Accordingly, these were the topics researched in the first part of the process, when the researcher read and highlighted the main topics shared in both introductions and conclusions.

Differently from the instances analysed in the previous acro-areas, the results of this group of searches did not provide clear hypothesis and/or propositions to validate. Consequently, the following step consisted in a simple summary reading of the

documents, highlighting characteristics more easily linkable to the topic of the review. In particular, the collection of data on this macro-area followed three streams of enquiry: the mechanics of blockchain technologies, the employment of nun-fungible tokens, and the payment via cryptocurrencies. Given the acknowledgement of these three topics as key for dynamics pertaining the metaverse context, the following steps consisted in the investigation of each of them, validating data collected via cross-reading, as in the previous cases.

The first issue was that of functioning of blockchains. After gathering information on the history of blockchain and its recent success after the mining of Bitcoin, the data collection shifted towards the actual logics governing such technology. Specifically, it was paid particular attention to its decentralised nature and independence from any third party. In fact, given metaverse platforms now tend to create networks, it was important to collect data specifically on how much blockchain technology depends on peer-to-peer dynamics and trust in order to guarantee transparency.

The following key point was that of non-fungible tokens, in fact, they were investigated because of their importance in terms of unrepeatable digital assets in the metaverse. First, it was decided to gather information on real-case applications situated either in metaverse platform contexts (e.g., *Nike*'s skins) or in Web 3.0 (e.g., art auctions), taking into consideration the fact that happenings such as the exchange of collectibles can take place in either scenario. Second, it was explored the role of non-fungible tokens as the creative tool of blockchain technology and its vast potential. Third, it was decided to gather information on the functioning of NFTs, particularly referring to the usage of smart contracts as guarantee. In addition to the scientific documentation analysed, such knowledge on NFTs, particularly on current instances, was retrieved by means of grey literature and field seminars as well.

Finally, it was decided to explore the most notorious technology powered by blockchain logics: cryptocurrencies. In particular, the data collection verted on the understanding of the mechanics governing an exchange and the value of cryptocurrencies, on their transparency and, finally, on both importance and risk of adopting this type of online currency to discipline online transactions, including those taking place in the metaverse.

4.3.4 Macro-area n. 4: customer engagement and customer-centric perspective

The data collection purpose of this macro-area is to gain knowledge on the current perspective of customer centric marketing, and its expression via the dimension of customer engagement.

Again, to fully understand which could be the possible key useful points of a document, the process started with a summary reading of the main topics shared in both introductions and conclusions. Afterward, for those documents providing hypotheses

and/or propositions, it was once again decided to concentrate on each of them, before verifying their validations in the "results" sections dedicated and finally analysing the premises of each verified hypothesis/proposition.
Considering the overview of the context obtained via such expedients, some crucial variables, definition, and theories were highlighted and thus further searched by means of cross-reading.
Firstly, it was decided to investigate customer engagement and its dimensions. This data collection proved to be quite complex, as the depiction of such dimensions was different when cross-reading. Finally, as mentioned in the second chapter, it was decided to focus on the representation of customer engagement shared by Brodie et al. (2011) and L. Hollebeek, (2011). Thereby, we proceeded with cross-reading documents with the aim of adding (data) corpus to the three suggested dimensions: cognitive, emotional, and behavioural dimensions. In particular, the branch on which the search focused more, since it was the most investigated in the field, was the behavioural factor. Such behavioural dimension served as a link to achieve knowledge on another noteworthy aspect: co-creation. As a matter of fact, it was often proven a satisfactory level of success (especially in behavioural engagement) in marketing campaigns inviting customers to participate, give feedback and employ their creativity. Moreover, since the ability to express creativity was becoming a common thread in the review, it was decided to collect further data on the topic. Manifestly, with the purpose of proving such assumptions, it was decided to collect data on real-case instances of marketing campaigns and decisions that successfully achieved optimal levels of customer engagement; and to do so, grey literature was consulted as well.
Another topic that reoccurred and thus was studies was the Stimuli-Organism-response (SOR) model, which served as a useful framework for the understanding of the mechanism behind the functioning of customer engagement.
Finally, data collection and searches verted on understanding the marketing context in which the newfound interest for engaging customer arose. Therefore, via a specific search and by cross reading the findings with papers more focused on customer engagement alone, it was decided to gather data on the centricity of customers in current marketing perspectives. In fact, it explains the reasoning behind the necessity to give up partial control of the processes of creation, in order to involve the consumers more and allow them to express their creativity for the benefit of the firm itself.

5 Emerged evidence and research question

In light of the definition of the research conditions and the main objectives faithfully pursued throughout the entire process of this systematic literature review, this chapter has the aim of continuing the storytelling defined by PRISMA 2020's guidelines. First, the paragraphs will outline the filtering process followed to obtain the final 83 sources at the very basis of the review. Second, the discourse will shift its focus toward the main results obtained when addressing the various sources, in terms of theories and frameworks, and the consequent reasoning that led to the recognition of interesting common trends in the four macro-areas defined. In fact, the ultimate objective is to finally reveal the research question and the rationale behind such propositions.
Finally, the chapter will also address the topic of biases, by outlining a qualitative assessment of risks of bias, specifying the research and study terms that inevitably conditioned the work and its results.

5.1 Documentation selection and filtering process

The research process and methods followed when performing the investigations have been repeatedly outlined throughout this body of work, however their results are yet to be explored. Accordingly, the first disclosure concerning the outcomes of this systematic literature review is associated to the consultation and filtering process performed by the researcher on the consistent number of input documentation (147 sources). In order to paint a complete and intelligible picture of the procedure followed, what specified in the following paragraphs can also be monitored by consulting the visual representation provided in Figure 3, which was inspired by the framework recommended by the PRISMA method (Figure 2).
As was specified in different instances, we have divided the documentation based on their original retrieval point. This led to the definition of different input categories:

- The (103) records analysed as immediate results of database searching in *Scopus*.
- The (16) records strongly connected to such searches but not directly deriving from the immediate results presented in *Scopus*, meaning the papers that originated from processes of snowballing.
- One academic record of recent publication which retrieval is to be attributed to the contribution of the consulted co-advisor.
- Grey literature distinguished by their format (27): web pages, mobile applications personally downloaded by the researcher, and online seminar attended.

After their collection, these sources were reported in a database manufactured on Microsoft Excel, and the tools provided by such application allowed for the

individuation of 8 duplicates, later removed. Afterward, as already mentioned in previous chapters, the different titles were read to proceed to a further process of elimination of papers unrelated to the cause. Finally, abstracts and, when suitable, whole studies were addressed for eligibility, resulting in further records not being included with reason.

Figure 3 – Documentation filtering framework

5.2 Results

This section is fully dedicated to the reasonings that have resulted from the thorough analysis preformed on the 84 sources selected. In particular, the research trends and possible gaps highlighted in such documentation will be highlighted and deepen, in the attempt to summarise the current state of the art of the four macro-areas investigated. Therefore, the examination will concentrate on the four macro-areas in dedicated sections, exploring the theories and dimensions individuated in the data collection phase. Afterward, however, the four subjects will be addressed and compared together, to delineate the premises of the research question individuated in the following section.

The noteworthy results of the examinations performed are of qualitative nature, as quantitative considerations did not interest the review and, most importantly, would not add considerable data to support the research question.

5.2.1 Macro-area n. 1: metaverse, XR and marketing opportunities

The results about to be presented relate to the searches performed on metaverse practices influencing customers. They have widely proven how much study still has to be performed with respect to the topic. In fact, the need to deepen the potential of the combination of metaverse and marketing employments is striking and will be outlined throughout this dedicated section.

The first insight deriving from the analyses made is connected to the structure followed by the documents. As a matter of fact, most of the sources included in this study addressed the topic of metaverse experiences starting from thorough overviews of the current state of the art. Such initial paragraphs, that could involve several sections, presented argumentations ranging from the definition of metaverse's dimensions, interface devices, and history in the marketing field. Therefore, in most cases the definition of the metaverse and its components confirmed the current heterogeneous knowledge on the matter.

The seemingly impelling need to re-define the origins and dynamics derived from the literature and research gaps stressed in every study. As a matter of fact, there is lack of academic investigation on metaverse's uses as a tool to condition customer's experiences and engagement with respect to a certain product or brand. Such shortage of reliable data can be justified by the novelty of the subject, and by the consequent lack of field-experiments performed, often limited to lab research.

Thereby, the concept of metaverse known until now is still in its initial stages and waits for further proof and experimentation before evolving. Accordingly, firms and consumers have started taking an interest in the technology and its implementations only recently. By extension, multiple studies analysed still addressed the metaverse via point of views that can be considered too theoretical, and often too much focused on technicalities that are far from current applications. These detached and heterogenous approaches to the subject have generated confusion on the actual points of interest of the technology, as it was widely mentioned throughout the documentation.

As a matter of fact, part of the literature available often projects in futuristic perspectives. For instance, one of the matters on which some have profoundly focused on is the feasibility of creating "one" interoperable and interconnected metaverse, which takes distance from the current state of the art, where the metaverse consists of several different privatised platforms with different goals and different standards governing them. Another controversial issue addressed is the attribution of fixed-entity characteristics to avatars, which is also a utopistic conceptualisation.

Concerning the topic of marketing in the metaverse, another trend in academic research is the focus on particular interface devices, such as VR wearables, which are still not easily accessible to great part of the public, and thus cannot be considered ultimate tools to connect with a greater base of consumers. In fact, as already briefly mentioned, it was deemed quite complex retrieving papers baring information exploring the metaverse as virtual worlds per se, acting independently from the device employed.

Nonetheless, via cross-reading and specific search filters, it was possible to collect the insights of interest, investigating what is now intrinsically connected to a customer experience in the metaverse. Namely, the psychologically compelling experiences that metaverse can provide, as they have been recognised as major contributions to a successful approach to customer engagement.

Accordingly, as already partially addressed in previous chapters, the documentation examined proved the key role played by psychological involvement, introducing and describing the dimension of immersion. Unsurprisingly, the latter proved to be the most discussed and analysed dimension of the three defined in the academic literature addressed.

A theory that often came up as descriptive of such state of immersion is the "flow" theory, which was deemed worthy of further study since it was the protagonist of arguments belonging to sources of other macro-areas as well. In fact, first conceptualised by the Hungarian American psychologist Mihály Csíkszentmihályi in the 1970s, the theory defines "flow" as the mental state of full immersion and enjoyment felt when performing a specific activity. This approach is considered as key throughout the review because it describes a mental state that perfectly adapts to a metaverse experience. As a matter of fact, Cheng et al. (2014) verified how this state of immersion can be determined by metaverse's dimensions of interactivity and skill. Furthermore, in turn, "flow" can positively affect customers, finally driving the discourse of the metaverse in the direction of concrete effects on the consumers.

The dimension of interactivity, just mentioned as possible antecedent of "flow", was also recognised as an important determinant of consumers involvement in the metaverse. As a matter of fact, the dimension was often quoted and investigated in the literature analysed, focusing particularly on its sociality component.

The weight this social component has on experience, and therefore on the possible engagement of a consumer in such moments is not surprising. Indeed, oftentimes, the results collected compared the current rise of the metaverse to the past rise of Internet, and subsequently of Web 2.0. The possibility to socialise and share experiences with others beyond physicality is, in fact, the fuel guaranteeing the past and current success of social networks and their consequent successful monetisation of such advantage.

Therefore, as already partially implied when outlining the dynamics governing the metaverse platforms now in use, a great part of current users was proven to be taking part in metaverse experiences because driven by the desire to socialize and engage in interactions with fellow users. Accordingly, Hudson et al. (2019) proved that increased social interaction positively influences satisfaction in these experiences, correlating once again metaverse applications to marketing dynamics.

Although various studies analysed proved that the predisposition for sociality does not concern every user, the consequent interest one can develop toward competition is another core aspect to investigate. In fact, the drive one derives from feelings of (positive) competition pushes toward exploration of the environment and interest in improving their skills. Moreover, competition often generates the need to differentiate oneself from others, bringing to the table the need for free expression of one's creativity via the generation of content or the collection of defining assets.
As discussed by Hollensen et al. (2022), the possibility to generate content, for oneself, for others, or for a brand, is cause of emotional investment for the consumer. Accordingly, the tool individuated in the literature providing the ability to generate content in metaverse platforms is that of the non-fungible tokens, proofs of ownership and uniqueness. These digital assets can be created by users themselves or firms, they can be sold and bought, and finally they can be collected because of a reward or as results of purchase. Such power is deemed particularly important in metaverse contexts to introduce the concept of ownership, and it has inspired the content of macro-area n. 3, which results will be further explored in the dedicated section.
In relation to this, it was studied the "playground effect" presented by Jessen et al. (2020), for which exploration allows for playful creativity and consequently customer engagement.

The nature of possible risks a consumer could incur to is another characteristic the metaverse and the internet have in common. As a matter of fact, the metaverse's newfound freedom of expression via avatars, social interactions and feelings of immersion allows users to have access to infinite possibilities. However, unfortunately, it comes with a particular cost: data. Accordingly, various papers have highlighted the access to rich data as a key advantage for firms deciding to work in virtual universes. Besides data coming from consumers themselves via voluntary data entry and the monitoring of their interactions, extended reality technologies (XR) allow for further access to data on the environment surrounding the consumer (augmented reality via personal devices) and psychophysical data (virtual reality vi wearables).

Consequently, although consumers' interest in participating is manifest, several researchers have shared concerns with respect to possible risks that preoccupy a good part of the customer base.
Manifestly, the risks the papers refer to are mainly privacy issues and cybersickness. The first grouping is naturally connected to the unknown use a company makes of the rich data collected throughout one's experience, and such risk has become increasingly felt because the questionable and infamous instances of data trading between companies, involving *Meta Inc.* among others. Moreover, said unguaranteed privacy particularly concerns parents, who are also often worried about the risks of dual identities and the nature of the fellow users interacting with their children. Such issues are quite important, considering older generations (of parents) are the decision makers and buyers of the means of access of younger generations (children) to metaverse contexts. On the other hand, the other concern is related to the possible feelings of dizziness and consequent sickness derived from the use of VR technologies, such as Head-Mounted Displays.
Ultimately, all the researchers addressing such issues have stressed the need to reassure consumers by working on privacy regulations, real identity identification, and more sophisticated technologies to avoid sickness. In fact, since it was confirmed that these technologies achieve greater results in involving younger generations, the resolution of these concerns is key to guarantee their safe access to the platforms in use.

Finally, the last core insight that must be investigated in this result section is the one related to the greater impact of augmented reality technologies with respect to others. As briefly mentioned in other paragraphs, the main topics addressed by the results of this macro-area proved to be strongly unbalanced towards developments in augmented reality technologies. As a matter of fact, aided by their earlier introduction and its simpler application, augmented reality's implementations have experienced greater success with respect to virtual reality's.
Augmented reality technologies have in fact gradually reached consumers in their ordinary customer journeys with a company, to such an extent that their usage is quite known and accepted by most consumers. In fact, this easier accessibility to augmented reality solutions is to be attributed to the widespread use of mobile devices, especially smartphones.
Their strong suit lays in the ability of enhancing pre-purchase dynamics, allowing consumers to try products either on themselves or in their personal environments, without actually having to move or sense the products' physicality. For instance, applications of great and known success are those developed by IKEA, which projects furniture in one's own house avoiding the burned of having to drive to the nearest IKEA

shop to visually understand their physicality, and by Sephora, which was investigated by few papers as it allows consumers to "try on" makeup via their smartphone screens. As one could infer from the examples just shared, nowadays, these applications are relegated to retail experiences, which in fact are those that allowed for greater collection of information in this review. Consequently, documentation analysis led to the conclusion that companies going beyond pre-purchase or purchase assistance in online retail contexts are few. Moreover, manifestly, this approach holds back firms and the metaverse's potential to engage customers beyond what has been done before, limiting the great possibilities given by effects such as the one of situated cognition.

5.2.2 Macro-area n. 2: gamification and marketing opportunities

The results here investigated concern the searches conducted on the implementation of game logics to marketing practices, and the influence of such gamified experiences on customers. Differently from the previous macro-section, these results have proven an already diffused use of gamified logics in different environments, going from education to retail. However, the area of research is not free from literature gaps, as in fact various documents have outlined the lack specific branches of gamification applications, on the relation between gamification and customer engagement, and on the psychological effects of gamification on consumers and their subsequent behaviours.

The first key observation with respect to this area of research is related to the key role played by rewards implemented throughout a gamified experience. Indeed, to this day, they constitute the main tool to achieve an optimal application of gamification, as proven by the real-case instances investigated in the literature. Rewards are a form of recorded progress tracking, that a consumer can consult to acknowledge their growing competences and their achievements with respect to specific (personal or shared) objectives. This was naturally proven to evoke a sense of achievement, gratifying the user in their endeavours, and increasing their motivation to continue their experience. Thereby, said yearning for a goal-congruent outcome has been exploited to further capture a person's attention. I fact, rewarding systems were actually the protagonists of most documents analysed, particularly in dynamics regarding loyalty programs instances, to be investigated in following paragraphs.
In light of such results and their strong correlation to game industry logics, the literature collected also highlighted the importance of distinguishing the two universes of gaming and gamification. As proven, the two share most of the structure, but they are characterised by quite different objectives. In fact, the gaming industry interfaces only markets with hedonic scopes, and thus has the goal of entertaining users as much as possible and provide them with a construct that better adheres to the targeted users.

On the other hand, gamification can interface, by definition, different application fields concurring for different purposes of use. So that the goals pursued by a gamified experience in the health sector cannot be compatible with the ones of the marketing field. Therefore, in the case of gaming, the specific goal on entertainment can be declined according to the storytelling the target expects. Whilst, in the case of gamification, the goals can be several depending on the field of application, and further vary depending on the single instance, such in the case of marketing purposes depending on the business objectives of the firm.

However, despite the different goals pursued, as mentioned in several occasions, the characteristics defining the gaming industry per se are the backbone logics of the functioning of a gamified experience. As a matter of fact, the literature analysed always started their discourse by addressing gaming logics first.

Consequently, various sources have proposed different approaches to the definition of game design functioning, often limiting to the mere examination of a limited set of game elements. However, the observation of all these different schemas led to the decision of employing the Elemental Game Tetrad model and the Mechanics Dynamics Emotions model. The two frameworks are considered key for the description of the topic, as they share the dimensions of mechanics, as indicator of the ruling structure of a game, and aesthetic/emotions which indicate the same responses. The Elemental Game Tetrad model is more focused on actual game design and logics that interest developers, as they condition the quality of the final product: mechanics, aesthetic, storytelling, and technology. Thus, it depicts the functioning without further investigating the effects that the four dimensions have on consumers and their experience. On the other hand, the Mechanics Dynamics Emotions model adapts more to a customer point of view, taking into consideration mechanics, dynamics, and emotions. This last dimension is key to understand the effects of games on consumers. Therefore, the union of the two frameworks presented helps the depiction of what should be built and how such components can influence customers.

Furthermore, another framework was partially taken into consideration for the confirmation of hypothesis related to the relation between gamification and psychological effects on the customer. It is the one of Koivisto and Hamari, proposed by Bitrián et al. (2021) as basis of their work.

As expected, all the schemas observed in the analysis attribute foremost importance to the roles of player and designer. In particular, the first indicates the user, or even better the consumer, of the gamified experience, the one undergoing the storytelling and following the mechanics governing the playful experience, and thus the one to be engaged. As mentioned previously, such role has been widely defined throughout the literature investigated, also via categorisations that help understand the type of customer, their approach, and reactions to specific stimuli (e.g., informative,

competitive), and their strong points. Such classifications help in view of the design process.
As a matter of fact, gamified experiences, like gaming instances, must be designed in terms of storytelling, aesthetics, rules, and rewards with the purpose of guaranteeing an enjoyable experience to the target consumer. Therefore, the literature individuated the role of designers, who are those in charge of setting the dynamics just mentioned. Although it is a crucial process to implement, various papers read highlighted current firms' difficulties in setting the true goals of a gamified experience. As a consequence, the role of designers is clearly often undervalued.
Other key roles were defined by Robson et al. (2015), attributing importance to spectators and observers. Spectators are those that are immersed in the experience but do not compete, whereas observers are outside individuals that passively influence the experience. Such definitions observed are key because they perfectly pertain to dynamics identified also in the metaverse applications.

The study of the literature allowed for the discovery of yet another similarity linking metaverse and gamification. In fact, as one could imply from first-hand experiences, it was proven that gamified experiences, originating from game design, are also sources of states of immersion. As a matter of fact, whether they are implemented in digital solutions or in physical ones, when well-constructed, they allow for the users to "get lost" in the storytelling provided, facilitating the process of engagement. In particular, the immersion-related features observed primarily include game-like mechanics such as avatars, storytelling, narrative structures, and roleplay mechanics, which are dynamics that gamified experiences share with some metaverse applications.

The gamification instances encountered more in the literature search dedicate to the macro-are n. 2 are those functioning according to the logics of loyalty programs. In fact, the application of rewards and challenges in non-entertainment context, with the aim of gaining loyalty, was the major technique observed throughout the documentation. Due to their ease of applicability, starting from little supermarket initiatives, loyalty programs have now been used throughout fields, to increase the participation and the intention of consumers.
The reason for such success was to be found in people's interest in activities that combine utilitarian and hedonic purposes. Accordingly, Hwang & Choi (2020) proved the mediated role played by playfulness in the positive impact of loyalty programs on customers, and again Yang et al. (2017) assessed the positive effect perceived enjoyment has on one's intention to engage in gamification.
However, convenient rewards in playful environments are not the only reasons for the proven success of gamification implementations, and loyalty programs in particular.

On the other hand, a significant role is played by the competitive factor. In fact, similarly to the metaverse logics, the literature searched repeatedly implied competition can drive the interest of consumers toward the experience. Therefore, it was proved that challenges and possibilities to win rewards function more strongly when users have the possibility of challenging each other and confronting one's achievements with their fellow users.
This aspect is strongly socially related, and in fact, most of the papers investigated indicated the social component as key in a well-though and well-designed gamified experience to motivate consumers. Accordingly, one among many, Jang et al. (2018) verified the predisposition toward said dimension, and proved increased levels of social integrative benefits lead to increased behavioural engagement and attitude toward purchase. Said reasonings highlighted again how satisfying individuals' basic psychological needs is key to promote engagement.
This link with consumers' enjoyability and involvement is an incredibly important result, as it undoubtedly relates the application of game-like logics to marketing tools, which are mainly employed for retention and attraction.

Given the similarities with part of the pinpoints highlighted in macro-area n. 1, the results related on sociality naturally lead to the collection of results concerning creativity. In fact, there was proof of the relevance of the dimension of "autonomy" throughout the literature analysed, whether pertaining to co-creation initiatives or the need for possibilities of customisation. As a matter of fact, via studies such as the one of Nobre & Ferreira (2017), it was demonstrated the natural predisposition of gamification instances as platforms for brand experiences, such as the ones of co-creation, which ask for emotional involvement. Allowing the presence of customers in said processes of creation and development can be a significant tool in view of retention and attraction marketing It empowers the users by "listening" to their inputs and making them feel part of the cause. However, the possibility of contributing to the value of a gamified experience is not the only option a consumer could chose to express their creativity. On the contrary, documentation proved users' demand for the ability to personalise and have customised experiences in the gamified experience. Again, demonstrating their need for spontaneity and possibilities of self-expression via creative practices.
Accordingly, the correlation between such "expressive freedom" in gamified experiences and its positive effects on customers have been verified by Wolf et al. (2020), highlighting its effects on customer commitment and willingness to pay.

Another insight that is relevant to share concerns the most common applications of gamification nowadays. In fact, since most of the sources investigated proposed real-

case instances based on mobile applications, research proved how much logics such as the one of loyalty programs have now finally landed in digital environments. Most of the gamified experiences now provided to customer, in fact, are of digital matrix and often reach the consumer in the form of mobile applications. Therefore, it was once again proven the importance played by digitalisation in efficiently reaching customers, and its support of customisation via online interactions. Furthermore, the propension of current consumers toward the use of such tools establishes an optimal environment for the application of similar gamification logics to metaverse contexts.

Ultimately, the papers analysed provide consistent evidence on the possible correlation between the application of game design to non-game dynamics and consumers' positive responses. It was indeed demonstrated the relation between gamification and enhancements in marketing effectiveness, since the participation to gamified experiences can influence users' behaviour in terms of commitment, willingness to pay, perception of brand equity, customer referrals and, most importantly, can be source of word-of-mouth behaviours. Moreover, in this result section it is noteworthy the contribution of Xi & Hamari (2020), which investigated the actual relationship between gamification features and their defining dimensions of brand engagement (emotional, cognitive, and social). As expected, the study demonstrated the positive association of achievement and social interaction related logics, respectively, to the cognitive and social dimensions of brand engagement. Thereby, the results of the macro-area confirm the investigated correlation of the two topics.

5.2.3 Macro-area n. 3: blockchain useful tools (NFT, cryptocurrency)

The results about to be deepened relate to the searches conducted on the technologies enabled by blockchain logics. Particularly, non-fungible tokens as instruments to create and exchange assets in metaverse platforms, and cryptocurrencies as the means to trade them efficiently. As already specified, differently from the previous macro-sections, the objective pursued in this case was the collection of information on the functioning of the technologies, as their actual connection to metaverse dynamics had already been demonstrated by sources of macro-area n. 1.

The results are more cohesive and homogeneous with respect to the previous two macro-areas, because the functioning and employment of blockchain technologies has been at the centre of deep research and application in the last fifteen years. Therefore, given the data provided is the result of solid established studies, mostly well-known by academic and non-academic public, most of the information is addressed more briefly than in previous results analyses.

The first insight that seized an interest is related to the nature and functioning of blockchain technologies in general terms. In fact, as the researcher expected, the great part of the documentation selected emphasised the network logics underlying the features promoted by blockchain technologies.
The well-known framework employed by said technologies is in fact strongly dependent on peer-to-peer collaboration. The detection of such manifest observation is however relevant in view of what addressed in previous macro-areas, that is the strong role played by social constructs. Indeed, also in the case of blockchain technologies, the democratic collaboration and confrontation between peers is fundamental. Moreover, such dynamics also showed to be characterized by competitive instances, which pertain to the processes followed by miners (special peers) to validate a transaction in the ledger. In this case, competition is governed by the miners' individual computational power with respect to the total computational power of all the miners present in the network.
Thereby, the literature consulted recognised blockchain technologies as able to guarantee the necessary level of trust between parties that do not know each other and have anonymity, allowing for trade without intermediaries.
The advantage just depicted anticipated an important result verified in many of the papers investigated, that is the strong features of transparency and security characterising blockchain technologies. In fact, the ledger at the very basis of the tools was constructed in order to guarantee its tamper-proof, immutable, and irreversible nature. The escamotages employed are cryptographic hash functions, private and public keys, and decentralised ledgers, which by nature guarantee security and allow for the avoidance of third-party agents. In turn, this freedom eliminates imbalances of information and enable a shared and transparent management of the ledger. Naturally, being a system developed by humans and powered by the collaboration of humans, the technology cannot be free from ill-intention and indeed there has been evidence of blockchains being hacked. However, the bigger the number of peers involved, the lower the possibilities of malicious attacks.
Another important feature characterising a blockchain, and thus anticipating the following investigations of two specific technologies, is its versatility. As a matter of fact, the analysis of the literature made evident the possibility of recording any type of data on a blockchain, ranging from ownership of (digital and physical) assets to contractual obligations and digital identities. Again, the observation is relevant in view of the possibility of applying the technology to metaverse platforms, which consequently would gain new-found expressive liberties.

Regarding ownership, the focus now shifts toward the relevance of non-fungible tokens as representatives of unique digital assets. It was observed that this specific application

of blockchain technology, like others, is not necessarily bound to metaverse contexts, on the contrary, it was developed outside the boundaries of virtual worlds, and constitutes a terrific opportunity for digital exchange in general.
This newfound method for indicting ownership in digital contexts originates from the need of finding uncomplicated ways to sell and exchange digital ownership and/or digital assets, without incurring in risks, such as digital piracy and illegal reproduction. In fact, before its application, brands, artists, and organisations lacked tools to sell digital assets like art and collectibles. Hence, non-fungible tokens also served as promoters of new markets in which to sell art, music, tickets, in-game items other assets form, answering the need for digital collection and trade. Consequently, non-fungible tokens were indicated as possible generators of creativity because they allow creators to interface with a broader market and guarantee their copyright. Furthermore, users of channels such as metaverse platforms can collect digital assets, or create them, with the aim of customising their stay in the virtual world.
The discourse on non-fungible tokens just outlined is evidently centred around the employment of non-fungible tokens in digital contexts in general, particularly transactions taking place on websites. However, such generic description is not intentional, but forced by the identified consistent lack of reliable academic study on the recent implementation of the instrument in virtual worlds. Therefore, as mentioned before, considering the relevant adding value further insights on the matter could have brought, the researcher decided to deepen the topic via grey literature, and the following paragraph condenses the resulting findings.
The main noteworthy insights observed are naturally pertaining to the possible uses of non-fungible tokens in the metaverse. The most notorious, as widely addressed in the review, is the virtual marketplace, where firms and individuals can sell their creations, allowing for eventual negotiation. A popular example is the collaboration between *Nike* and *RTFKT*, via which the firms launched thousands of skins as digital sneakers to be collected online and shared on social media.
Another cited modality of use is the creation of art galleries in the virtual world, with the aim of displaying art compositions for viewing. As it could be inferred from the functioning and goals of the platform, this practice is quite consolidated in *Decentraland*.
Finally, as anticipated when addressing decentralised platforms, non-fungible tokens can be employed for digital real estate as well, indicating digital assets such as digital land sold for further development.

To come full circle, the relevant insights collected on cryptocurrencies must be addressed. In fact, it was observed their functioning is strongly related to the one of non-fungible tokens, since the latter are purchased with cryptocurrency and thus their

value can rise depending on the increasing cryptocurrency values. Therefore, such the certificates of ownership we refer to are generated via cryptocurrency, and according to the investigations made, it is usually Ethereum. This dependency explains the possible uncertainty regarding the value of non-fungible tokens, concerning speculation bubbles.
The investigation of the literature dedicated to the topic of cryptocurrencies lead to the observation of an important gap in common knowledge. In fact, almost the entirety of the papers selected highlighted the lack of understanding of the functioning and advantages of cryptocurrencies in society. Thereby, in view of a predicted future massive adoption of the technology, the experts should work to simplify and demystify the concepts. Such results highlight the necessity to fully inform consumers on the logics behind cryptocurrency and alert them on the risks and precautions to consider, to guarantee a wider employment of technology and allow for greater opportunities of trade in the digital field, especially in metaverse environments.

5.2.4 Macro-area n. 4: customer engagement and customer-centric perspective

The results about to be presented concern the searches conducted on the marketing perspective adopted in the conduction of the review (customer-centric), and the related dynamic of customer engagement as measure of a firm's success.
This set of results distances itself from the previous instances because it does not present particular individuated gaps in the documentation selected. In fact, as stressed on several occasions, the topics of customer-centric marketing and customer engagement are not of recent discovery, on the contrary, their understanding and use is mostly consolidated throughout literature. Therefore, the observations here shared have the purpose of examining the current situation and developments and unveil the reasoning behind some choices.

The fist observations to be investigated pertain the current marketing perspective, adopted by a good part of firms to investigate the market and interface customers. In fact, it is the customer-centric perspective, which was individuated by the researcher as the lenses through which a firm should approach its target, according to both the information collected in the sources consulted and the academic knowledge developed by the researcher.
The literature explored indicated customer-centric marketing as the last step of a protracted process of development, which started from homogeneous mass marketing approaches mostly focused on products and have now landed on methods concentrating efforts on the actual need expressed by the single customer. Such observations are key when put in the perspective of the importance we have attributed to the possibilities that personalisation and creativity provide to customers. In fact,

when responding to the actual demand of a customer, a firm is factually adapting their offering, where possible, via processes of customisation.
In light of this approach, the connection between a customer-centric approach and the measure of customer engagement is self-evident and proven by literature.

The first noteworthy result to outline pertains the already widely addressed theme of customer engagement's multidimensionality. Indeed, the conceptualisations examined in the literature almost unanimously shared a multidimensional perspective that excludes at priori a unidimensional definition of customer engagement. In fact, the possible descriptive dimensions presented throughout the documentation were various, although they often indicated similar conceptions, all expressed differently depending on customer expression and their context. The observed common factor, however, was the psychological process defining customer engagement with a specific engagement object.
Nonetheless, as stated in previous chapters, the dominant perspective individuated in the literature was the one investigated by Brodie et al. (2011) among others. Such result is the product of a process of cross-reading and analysis of the already proposed comparisons from other authors. Thereby, the dimensions we decided to employ in the definition of customer engagement are cognitive, behavioural, and emotional. Nonetheless, the investigations performed on each dimension lead to the identification of the behavioural component as the most significant one in the literature, since it is the most in-depth one in the documentation read, with some results addressing it exclusively.
Moreover, an interesting insight on such classification was collected in the study of L. Hollebeek (2011), which recognised three themes defining the degree to which a customer decides to exploit cognitive, emotional, and behavioural resources, namely immersion, passion, and activation. While the other two indicated the levels of affection and energy spent for the cause of brand interaction, and thus did not particularly concern the analysis performed until this point, the topic of immersion emerged once again as key. In fact, in this instance, it was linked to the cognitive dimension in part of the literature, and it indicated the customer's level of concentration during brand interactions. Moreover, in relation to the link between immersion and engagement, Mollen & Wilson (2010) demonstrated that immersion (indicated as "telepresence" in the study) was an antecedent of engagement; and that in turn interactivity was an antecedent of immersion.

In conformity to the results just outlined, it is relevant to address the observations made with respect to the topic of sociality, which we consider part of the greater conceptualisation of interactivity. In fact, also in this case, the literature proved to hold

a consistent amount of data and propositions on the highly interactive nature of engagement.

In particular, sociality was often presented as means to reach a wider range of consumers via customer-to-customer communication, achieving customer acquisition, expansion, and eventually retention. Therefore, the behaviour the literature suggested to incentivise is the one expressing via instruments such as (digital or "physical") word-of-mouth, recommendations, blogging, ratings, and/or referrals. These tolls are crucial because they can potentially reduce firms' acquisition costs. As a matter of fact, such customer influencer behaviour proved to be optimal in influencing the success of firms and brands, as it is particularly effective in situations characterised by low or moderate initial levels of awareness. Naturally, as was the case of previous investigations of the issue of sociality, the specific level of interactivity provided by engagement initiatives proved to be dependent on the well-known factors of personal characteristics and attitude, and contextual contingencies.

The main source of reference for sociality advantages, in a perspective of customer engagement enhancement was the work of Harmeling et al. (2017). The study identified a combination, of four valuable resources customers possess and which should be identified in order to be leveraged by a firm. What the researcher deemed noteworthy about said classification is the fact that three out of the four pertained to the dimension of sociality. Here follows a brief depiction of the grouping.

First, "customer network assets" were the resources most evidently linked to the topic, since they were defined as "the number, diversity, and structure of a customer's interpersonal ties within his or her social network." Therefore, it indicated the possibility of exploiting a customer's affiliation with other communities in order to reach broader and more diverse audiences with respect with the ones already achieved.

Second, "customer persuasion capital" was on the other hand related to the power held by customers in potentially reaching said known social circle and influencing it. Thus, it outlined the greater impact and naturalness of receiving information from other peers.

Third, "customer knowledge stores" simply indicated a customer's "accumulation of knowledge about the product, brand, firm, and other customers," and thus the quality of information that could be reached by other peers.

Finally, the dimension that does not pertain the sociality theme, but that still resulted relevant for the discourse, was "customer creativity." Manifestly, the dimension perfectly adheres to the reasoning brought forward until this point, as it indicated "a customer's production, conceptualization, or development of novel, useful ideas, processes, or solutions to problems."

In light of such remark on the core conceptions of customer creativity and involvement of a customer in co-creational processes with the firm, it is imperative to further investigate the results deriving from the analysis of this macro-area.
Indeed, the great part of the literature addressed the topic of creativity, through the lenses of co-creational initiatives, which are employed by firms to stimulate voluntary and, most importantly, autonomous customer contributions. It was demonstrated that allowing customers to participate in processes of creation enhances their feeling of psychological ownership and enables opportunities of self-transformation, with relevant positive impacts on customer engagement.
The contribution by Jaakkola & Alexander (2014) was specifically relevant or this issue since it investigated the role of the specific dimension of behavioural customer engagement in value co-cocreation. Specifically, the study outlined the importance for firms to cede control, to a certain degree, in favour of customers by proving them with resources enhancing codeveloping and augmenting behaviours. Thereby, such observation sheds light on the active role companies can (and should) play in directing creativity toward their own advantage.
Moreover, Pansari & Kumar (2017) were employed as further source to empower the positive outputs given by these customer's direct contribution. As a matter of fact, it was proven that customer satisfaction has a positive relationship with these contributions, which demonstrated to have greater impact on low involvement products and firms with low brand value.
The advantages brought forward by harnessing customers' networking and creative abilities were interestingly studied by Harmeling et al. (2017). Specifically, what we want to capture and report from this study is the detection of two primary forms of engagement marketing initiatives, task-based and experiential. Indeed, the two address the core topics of sociality and creativity by distinguishing between two types of firm's initiatives beyond the core economic transaction. Thereby, on one side, task-based engagement initiatives are more firm-defined structured tasks guides (e.g., produce a review, refer a customer, support other customers); whilst, on the other side, experiential engagement initiatives indicate a playful instance of shared interactive experiences.
Task-based engagement initiatives drive customers toward structured tasks, such as referral to other peers, and reward them with entities such as discounts, points, badges, and other forms of direct compensation. Naturally, this rewarding system shows enormous potential with respect to the information collected, as it perfectly mimics the logics brought forward by gamification. Nonetheless, this approach functions best when the contributions empower the social network built by customers, and in the face of a voluntary and personalised approach.

On the other end, it was observed that experiential engagement initiatives adhere even more powerfully to the logics of gamification, as they were indicated to "resemble play more than work." In this instance, the key is motivation, that is they enhance psychological and emotional attachment to the firm via well-written experiences that can allow for the generation of content from the consumer. Said content can be extracted by the firm in order to construct a more authentic marketing communication and is often reason for long-term customer engagement.
Manifestly, the initiatives that emerged as more fitting for the purpose of the review are the experiential ones. In fact, it was demonstrated their ability to enhance cognitive bonds, by means of their intrinsic association with multisensory, emotional, and social information, which perfectly adapt to the objective of finding linkages between customer engagement instances and metaverse applications.

Ultimately, the literature investigated demonstrated how an engaged customer can become a major source of value for a company, when well-directed and well-instructed by the firm itself. In fact, Pansari & Kumar (2017) proved that prominent levels of customers' engagement are reason for a higher probability of them actively participating to marketing programs, providing the firm access to personal information, and enabling marketing communication.
Consequently, the more the effort expended to reach the customer, understand them, and engage them, the greater the results in terms of marketing effectiveness.

5.3 Association process

In light of the depiction of three topics of metaverse, gamification and marketing performed until this point, their connection is evident: metaverse applications originate in the gaming industry, the gaming industry follows the same logics of game design and gamification, and the employment of gamification in marketing campaigns have the clear goal of engaging the customer. However, the link we want to build between the three is not naïve, on the contrary it is based on common and recurring logics that characterise them, which have not yet been widely addressed in literature as linked concepts.
The punctual depiction of the most interesting and targeted results of the four macro-areas' documentation has highlighted the presence of three concepts, which could unequivocally relate the three core pillars of the review. In fact, they have reoccurred throughout the investigation of the results, as enhancements of the three subjects of metaverse, gamification and marketing (via customer engagement). Said three linking concepts are those of creativity, sociality, and immersion.
The following paragraphs recapitulate the findings collected for the three linking concepts. Thereby, first, each concept (creativity, sociality, immersion) is depicted as

function of gamification and metaverse, following what outlined in the results section; then, each concept is briefly described as influencer of customer engagement. Manifestly, the objective is that of developing a reasoning behind the proposed research question, to be found at the end of the argumentation.
The framework just outlined can be consulted in Figure 4, which exemplifies the rationale.

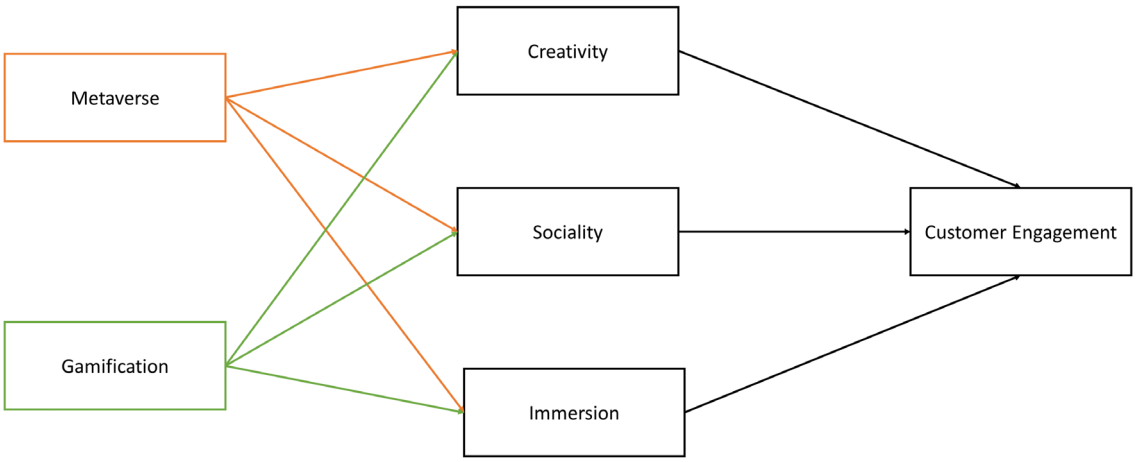

Figure 4 – Association framework

5.3.1 Creativity

The concept of creativity intended by this body of work indicates the ability of a customer to voluntary generate content, either for themselves or for a firm. In the latter case, we refer to it as co-creational process.
The core reasoning driving forward the relevance of such dimension is consumers' need for autonomy and self-expression when exploring an environment. The necessity to achieve "expressive freedom" was deemed intrinsic in logics concerning both metaverse applications and gamification instances. In fact, in the case of gamification, it was proven how embracing the involvement of consumers in processes of creation is significantly relevant for retention and attraction. Whereas, as demonstrated by the documentation collected, in the context of a metaverse, the link to creativity is individuated in the main tool allowing customer exertion of their expression, namely non-fungible tokens. Their employment allows for co-creation with firms and actual digital ownership.
Therefore, with respect to customer's expression of creativity in the metaverse it was decided to mainly investigate the employment of non-fungible tokens, consequently giving more attention to virtual reality instances.

The relation between non-fungible tokens and gamification was demonstrated as well, via the use of said tools as possible customisable rewards. As a matter of fact, non-fungible tokens can be used in a metaverse as prizes in challenging gamified experiences. To support this eventuality, we propose the real-case instance of ASICS, which created one thousand NFT sneakers in collaboration with a fitness application, which allows users to virtually wear them, and participate to challenges rewarding them with sneaker levelling, shoe-minting and NFT customization (Williams, 2022).
Finally, in light of the results collected on the issue, customer engagement can be considered as a result of the possibility to create. In fact, the psychological ownership and self-transformation opportunities promoted by this practice were proven to have an impact on customer satisfaction and customer relation with the firm. Moreover, with respect to eventual gamified applications, the results highlighted the profound influence exerted by experiential engagement initiatives "resembling play." They enhance psychological and emotional attachment to the firm by means of content generation and they can manifestly be established in metaverse contexts.

5.3.2 Sociality

Sociality, as addressed by this body of work, generically indicates a dimension that can be expressed either aimlessly, with the only purpose of interacting, and/or with the specific goal of sharing information on the firm and its products. The two identified forms of sociality expression are fully interrelated. As a matter of fact, a community cannot be formed and be considered authentic when it does not provide "aimless" forms of interactions, and at the same time, a community born within a specific context (i.e., the firms' customer base) cannot avoid sharing information on the context itself. Either way, all the macro-areas investigated proved to be tightly bound to and somewhat governed by social networking dynamics.
Firstly, metaverse platforms strongly rely on interaction for the delivery of an involving experience. It was demonstrated how much metaverse consumers deem fundamental the desire to socialise and interact with fellow users, inevitably impacting the possible outcomes of marketing campaigns.
Furthermore, the main variable impacting on this factor is the one of positive competition, which often drives exploration and the need for creativity. Manifestly, the strong relation with competition also characterises gamified experiences, which depend on competition and challenge to bring forward an engaging storytelling for the customer. In fact, literature proved the positive impact of socialisation on behavioural customer engagement.
Sociality and networking have a strong impact on blockchain technologies as well, because governed by peer-to-peer dynamics. Consequently, a successful functioning of a transaction in the metaverse, including NFTs, must be sustained by a well-

constructed and trusted network of people. Moreover, the presence of consumers interacting with each other in a metaverse platforms is deemed fundamental to allow for exchanges and possibilities of collection.
Finally, the advantages brought forward by sociality in terms of marketing effects are to be majorly attributed to the possibility of reaching a wider range of customers, achieving a wider market. Said customer-to-customer communication is expressed via motivational drivers (e.g., word-of mouth, referrals). Naturally, to accomplish good performances, a firm must encourage the generation of a felt community of consumers. It allows to enhance the emotional and psychological state of belonging to a certain brand and support customer engagement. However, as specified, the exploitation of a customer's affiliation with other audiences is also key to achieve greater success.
Therefore, in the case of gamified experiences in metaverse context, we deem important to leverage customers' enjoyment of competition and sociality in order to pursue the creation of a strong community, able to empower itself and eventually interface other audiences. Eventually, such result could be fostered by the employment of rewarding tools as motivation to perform, for instance, acts of referrals and similar.

5.3.3 Immersion

The dimension of immersion notoriously characterises metaverse's environments and technologies, as demonstrated by the literature analysed. In particular, the theory we have individuated as relevant in the description of this state of being is the psychological "flow" theory, which was proven to be influent in affecting the experiences of consumers. Indeed, it involves physical and mental participation and, accordingly, it partially depends on the interface device chosen and how it is employed in terms of sensory experience provided. Therefore, in this case, it was deemed important to leverage the interface devices proposed by extended reality technologies. However, the positive influence fostered by states of immersion can be influenced by other practices as well. Naturally, we refer to gamification applications, which originate from game design and thus are also sources of states of immersion. In fact, they allow users to "get lost" in the storytelling and roleplay mechanics, which are dynamics that metaverse applications already implement.
Finally, feelings of immersion also influence the cognitive dimension of customer engagement, since in fact it indicates the customer's level of concentration during brand interactions. As a matter of fact, the positive relation between immersion and customer engagement was demonstrated in the literature selected.
Ultimately, states of immersion can be fostered by harnessing both interface devices and gamification dynamics of storytelling and challenge, to further enhance the impact of the metaverse experience over customer engagement.

5.3.4 Research question

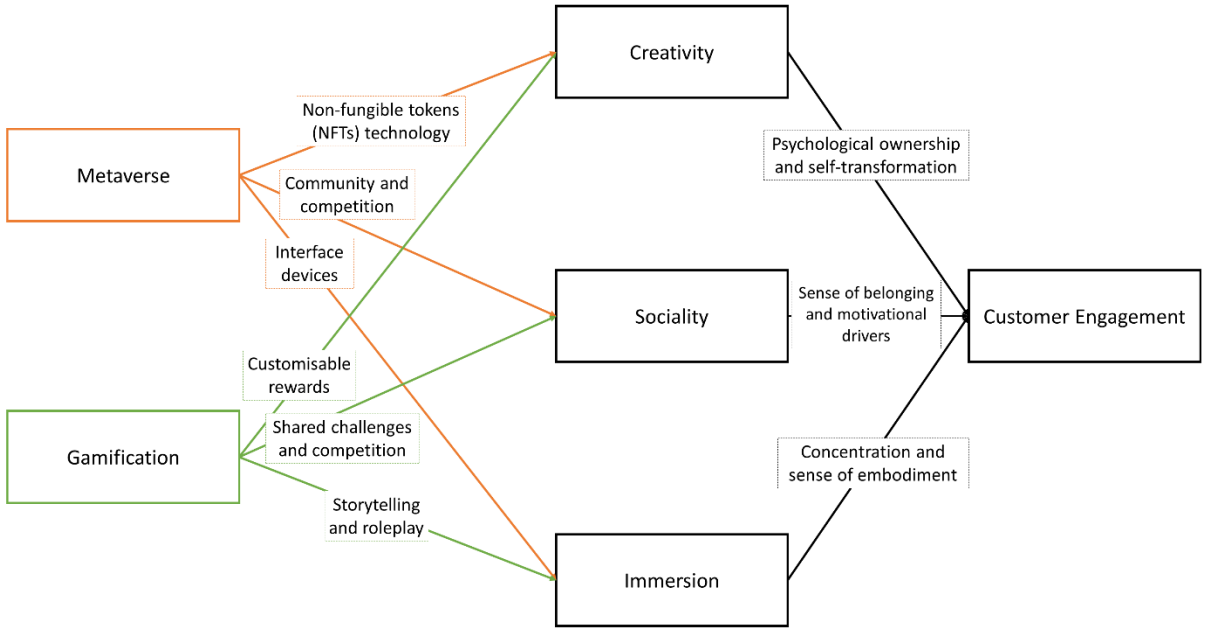

Figure 5 – Association framework for research question

In light of the reasoning just expressed, it was decided to bring forward a well-supported proposition for the enhancement of customer engagement in metaverse contexts:

> *Can the employment of immersive gamification experiences that leverage customer's creativity and sociality be a useful tool to influence customer engagement in metaverse applications?*

Specifically, the metaverse technologies that we deem more compliant are non-fungible tokens (blockchain technologies) and extended reality technologies providing clear access to virtual worlds.

5.4 Risk of bias assessment

Bias are factors that can affect the observations made in a study, misleading it from absolute truth and causing inevitable inaccuracies. Addressing such risks of misleading results is crucial, since it provides the readers with further context with respect to the methodologies followed and the possible calculated "errors". Thereby, since some biases are inevitable and difficult to eliminate, the only way to overcome the hurdle is

to “state” them clearly, because risk of bias assessment helps establishing a certain level of transparency.
All works are characterized by this risk, as no method can guarantee perfection when performed by a human being. Consequently, this systematic literature review is not free from risks of bias, which affect the reasoning followed throughout both the search and the drafting phases. Given the review was performed by one researcher only, the probability of having made choices that could have limited the efficacy of results is quite high. In fact, the single researcher’s previous academic knowledge and experiences could have played a significant role in such form of “sabotage.”
Differently from what proposed by the PRISMA method, it was decided to address the risk of bias assessment qualitatively. Thereby, the following paragraphs will not present statistical argumentation defining a precise numeric risk, on the contrary they will deepen the reasoning and motifs behind each possible bias incurred. In particular, the biases that have been taken into consideration are what we define “bias of concept”, “bias of definition” and “bias of missing studies.”

5.4.1 “Bias of concept”

First, as already mentioned in other occasions, the review is affected by possible “bias of concept”, meaning bias related to the variables, theories and dimensions that were identified by the researcher as core defining topics during data collection. In fact, the decision to concentrate the search efforts on specific points, excluding others, is heavily dependent on the interpretation of the single researcher.
For the three macro-areas, such topics were:

- Macro-area n. 1: reality-virtuality continuum, (immersion, presence, interactivity) as defining dimensions, creativity, playground effect, situated cognition theory, “flow” model.
- Macro-area n. 2: game design, Game Tetrad Model, MDE framework, loyalty programs.
- Macro-area n. 3: network dynamics, creativity, cryptocurrency, NFTs.
- Macro-area n. 4: (cognitive, emotional, behavioural) as defining dimensions, co-creation instances, OR model, customer-centricity.

For instance, great risks of bias derive from the decision to apply a certain group of defining dimensions to the review instead of another, as is the case in most of these macro-areas. In fact, changing them would alter the meaning put forward for each topic. Another defining decision is that of the theories to employ. In fact, the papers addressed presented quite a rich spectrum of theories to follow, but only a restricted number of them was considered to support the research question. Furthermore, the examples deemed more adapt to the reinforcement such concepts are affected by risks of bias as well.

5.4.2 "Bias of definition"

Second, as one could infer from the methodologies chosen to perform the eleven searches, this systematic literature review is also affected by "bias of definition" that conditioned the inclusion and exclusion criteria applied to each search. Indeed, each search was performed almost independently, starting from simple queries and finishing with queries using specific filters. As clarified before, such decision derived from the heterogeneous nature of the different topics addressed. However, although it guarantees a punctual analysis of each research and allows for the selection of incredibly useful sources, such approach to research can lead to bias powered by either too lose or extremely strict criteria.

5.4.3 "Bias of missing studies"

Third, a researcher's preconceptions inevitably influence their approach to research and data collection, and thus the scope of documents that can be accessed inevitably narrows. In this case, we refer to "bias of missing studies".

As the first possible source of gaps and limitations in terms of (data reach), in retrospect, we indicate the decision to exclude studies under 30 citations from the research. As a matter of fact, the decision guaranteed optimal levels of confidence and reliability with respect to the results at our disposition, however it also partially limited the search for more up-to-date information. Consequently, given the subjects of gamification and metaverse are both of recent research and in continuous evolution, the collection of recent data was made more challenging in some instances. Nonetheless, this missing data was then recouped. On one end, consulting grey literature, which was naturally a thorough source of recent-case examples and developments. On the other end, by referring to specific papers reached via snowballing, which results were not subject to the same limitations of database research, because they were consulted with the aim of investigating specific topics.

Regarding snowballing, the practice was also inevitably subject to risks of bias. As a matter of fact, the decision to consult a specific paper, via either other paper's bibliography or *Science Direct* recommendations, manifestly had to arise from an intention of the researcher. Thereby, as was the case of the limitations due to the variables searched, such intention is also indicative of a specific research direction followed over another. Besides, the collection of documents deriving from other sources can also be affected by the state and the attention paid by the researcher when deep reading a paper and consulting research databases.

6 Discussion

This systematic literature review was performed with the aim of recognising relevant opportunities of research with respect to the context of metaverse applications, via a marketing-related perspective. The urgency of finding new possible feasible approaches arises from the newfound success of extended reality technologies, which are being employed throughout markets, bringing innovation in most applications.

The appeal of the metaverse lies in the infinite possibilities offered by the network of shared virtual worlds, allowing its exploration to a potentially infinite number of consumers connecting from remote physical places.

This definition of "world of worlds" allowed for a comparison with Worldwide Web, which is now starting to lack from particularly innovative marketing opportunities. The maximum potential fostered by marketing approaches in Web 2.0 and social networking services can be considered almost completely reached, as most markets are now starting to get saturated with companies and their offerings. Therefore, since competition and costs in said channels are growing, companies are now taking into consideration the possibility of moving part of their marketing investments to the newfound channels provided by metaverse applications.

Naturally, although the investments in the technology are growing every day, and several leading companies have already decided to come forward, many are still hesitant. Like companies, the literature as well is still lacking rich research on the practical opportunities provided by the metaverse and the instruments to achieve enhancements in customer engagement.

In order to grasp the possibilities offered by the metaverse, this body of work has proposed the employment of practices of gamification. The proposition arises from the detection of a propensity for its application by different expressive modalities of metaverse. Moreover, the implementation of game design logics to experiences that do not intrinsically require playful dynamics is now trending, throughout markets and technologies. Its adding value lies in its ability to intrinsically influence consumers' behaviours in terms of consumption and value creation. The logics employed can range from simple gamified loyalty programs to more narrative challenges, all usually characterised by dynamics of challenge, point systems and recognition of progress as sources of consumer benefit.

The two universes of game design and metaverse already notoriously share background logics pertaining their origins in the gaming industry. Namely, the metaverse (VR) platforms that have first reached interested audiences are gaming platforms, now evolving. Specifically, this bias is especially true for centralized platforms, such as *Fortnite* and *Roblox*, that accordingly have garnered much of their acclaim from early adopters with gaming backgrounds and younger generations. On the other hand, the implementation of gamification logics to decentralized platforms (e.g., *The Sandbox*,

Decentraland) must be more subtle and needs to be designed exploiting the desires of a more adult audience. As in fact, the latter are of recent developments (2020s)
Accordingly, in light of the evident connection between the two topics, the purpose this body of work wanted to achieve was that of identifying possible linkages empowering the bond already existing between gamification and metaverse, relating them to positive influences on customer engagement. The decision to commit to this marketing metric was justified by a series of concrete implications on a company's success, willingness to purchase, among others. In fact, this psychological process is an important metric to understand the commitment and loyalty customers manifest to a firm, as it is the result of co-creative experiences and motivational divers.
Finally, the cited linkages connecting all topics are:

- (Customers') creativity, intended as the ability of a customer to voluntary generate content either for themselves or for the brand (co-creation).
- Sociality, described as the process of interaction and communication between peers. In this body of work, it is considered as expressible either with the only purpose of interacting, fostering the possibility of creating a community, or with the specific goal of sharing information on the firm and its products.
- Immersion, as one of the founding dimensions of a metaverse experience, indicates a physical and mental participation on the part of a consumer.

Moreover, the implementation of operations empowering the efficiency of these nexuses is to be supported by the two founding technologies of the metaverse: extended reality technology and blockchain technology. Specifically, the first is thought to improve states of immersion by means of interface devices, concentrating mainly on the senses of sight and secondarily of hearing. Whilst the second is thought to improve customers' accesso to creativity by means of non-fungible tokens. Finally, the dimension of sociality is not necessarily dependent of technologies, since it is mainly conditioned by the underlaying logics of interaction of metaverse platforms per se.

In light of this premise, the following paragraphs address what just briefly defined, outlining the logics in support of the research question stated, here repeated:

Can the employment of immersive gamification experiences that leverage customer's creativity and sociality be a useful tool to influence customer engagement in metaverse applications?

The sections in which the paragraphs are separated are three: the first focuses on all the theoretical background collected in favour of the proposition brought forward by this body of work; the second offers more pragmatic suggestions on how the evidences sustained can be employed to enhance customer engagement and in what significative

ways such improvements can bring gains to a company, in a managerial perspective; the third is constructed so as to leave cues for possible future research developments on the topics presented.

6.1 Theoretical and factual contributions

In light of the coherent definitions of creativity, sociality and immersion provided in function of the research question we want to address, this section has the scope of further investigating their relationship with the founding pillars of metaverse, gamification and marketing. Specifically, the objective is the formulation of a discourse able to cohesively relate all parts.
The reasoning commences from the topic of immersive experiences, in order explicitly set the metaverse experience conditions to consider. Afterward, the linkages of sociality and creativity are addressed in this order, to foster a reasoned leitmotif.

The definition of immersive experience the review refers to is the one expressed by the theory of "flow," conceptualised by the Hungarian American psychologist Mihály Csíkszentmihályi in the 1970s. The theory is noticeably accepted throughout literature, as it wholly captures the psychological factors determining the states of full immersion and enjoyment a person can experience. In fact, it outlines how immersion goes beyond the distinction between a real or a virtual experience, as it can be experienced also in real life situations. Therefore, contrary to some beliefs, to condition such states of embodiment, it is not advisable to solely implement approaches that influence the physical status of a subject, namely manipulating the senses, but cognitive tools should also be taken into consideration.
Accordingly, this body of work investigates both the physical and mental sides of immersion in a metaverse context, in a way that promotes positive absorbing emotions. Specifically, the physical determinants are deemed to be mainly influenced by interface devices and the quality of experience they offer. Whilst the mental components (e.g., losing self-consciousness, feeling a modified sense of time) are deemed to be strongly affected by dynamics of challenge, storytelling and role-play that manifestly characterise gamification logics.
Extended reality technologies can offer, depending on the device utilised, distinct levels of immersion to a consumer. Both in virtual worlds powered by virtual reality technologies and in augmented reality experiences, realism can be a strong determinant of success. Presently, said degree of sensorial quality, however, can only be offered by enhancing sight and hearing interfaces, since the technology offering the possibility to manipulate the other three senses is either in the prototyping stage (haptic devices), or potentially controversial as strongly affected by personal biases (smell and taste technology).

Specifically, in order to unambiguously define the perceptual issues that directly affect the visual and hearing quality of a virtual experience, we refer to the work of Wedel et al. (2020). In fact, they were partially described throughout literature, but the only documented selected that fully disclosed the topic was the one we refer to.
The researchers investigated the dimension of immersion intended as its physical and technology-driven representation and indicated the following perceptual issues as impacting on immersion. First, the field of view was a widely deepen topic throughout the documentation and it referred to the actual angles via which a virtual environment can be seen. Second, unsurprisingly, there is the resolution of the virtual environment, determined by depth perception and colour resolution. Naturally, this dimension particularly affects the possible realism of the virtual environment present. Although realism is not necessarily a determinant of immersion, the resolution could also affect a more crucial sentiment, the one of believability. In fact, consumers must believe the accuracy of the virtual world in order to immerse themselves into the experience. Third, they indicated head-based rendering, which naturally only concerns head mounted displays. This limited (in application) metric indicates the level of congruency between the head movements and the rendering of the virtual world, and its possible lack of quality is a strong determinant of experience issues such as cybersickness. Finally, the sense of sound was reported to be provided in superior quality via CAVE, HDMs and smartphones' headphones.
Considering the need of designing a metaverse experience capable of guaranteeing immersion as customer engagement determinant, the depiction of these metrics is fundamental to understand what dynamics are influencing, either positively or negatively, the sense of embodiment felt.
Given the in-depth investigation of the possible expedients employable to enhance the physical determinants of an immersive experience, we must now address the true value adding properties of gamification, able to enhance the mental determinants of immersion.
As mentioned throughout this body of work, the logics that better attain to the topic of mental immersion via gamification are those linked to storytelling, challenge, and role-playing. Accordingly, all these game design features perfectly adapt to metaverse applications, which provide for potentially limitless opportunities of exploration and narrative escamotages (storytelling, challenge). Moreover, they allow users to fully embody their digital persona, if wanted, via expedients like avatars and related skins (role-playing).
In particular, the narrative component enhanced by the development of a story in support of an experience is crucial for immersion, as it provides consumers with further purpose to further engage in the experience. In fact, gamification storytelling adding value consists in the playful and challenging background it can assign to a

particular instance. Said constructs can be empowered by means of systems of points, badges, and rewards, which have proven to be useful tools when one of the objectives of the storytelling is driving the user toward a precise path. Moreover, as already mentioned, rewarding systems allow for positive emotions related to the achievement of personal goals, and compel users to focus greatly on their virtual surroundings in terms of senses and game logics. Therefore, the more the narrative expedients that involve the consumer in active contributions, the more impactful is the sense of immersion in the digital environment. Naturally, this mental state can be enhanced by role-playing as well, which adds credibility to the whole experience and enhance the sense of embodiment. It is particularly meaningful in narratives that distance themselves from the real-life events characterising the lives of a user.

Ultimately, the union of these two perspectives of physical and mental immersion, and consequently their related sets of "tools" just outlined, can condition a heighten state of immersion, that would not otherwise take place when focusing on just one of the angles. Naturally, in light of the work performed, such improvements play a determinant role in the possible influence of metaverse experiences over customer engagement. As in fact, positive feelings of immersion strengthen, specifically, the cognitive dimension of customer engagement, by virtue of higher senses of concentration and focus, and the now notorious sense of embodiment.

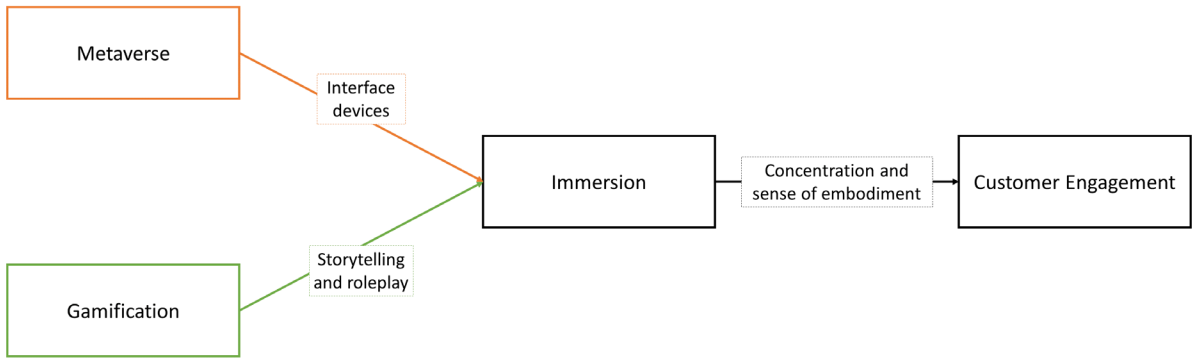

Figure 6 –Association framework: immersion

Considering the depiction of the ideal conditions of immersion a metaverse experience should guarantee in order to operate within a favourable environment for the heightening of customer engagement, the discourse proceeds further with the characterisation of the social determinant.

Quoting Aristotele, "man is a social animal," therefore, above all, sociality notably represents one of the founding characteristics of a person's life. Its relevance emerged throughout the literature consulted. In fact, sociality responds to the need of confrontation as source of debate and new knowledge. It is an integral part of almost

all experiences as it allows further discovery, together with other forms of interactivity related to the environment surrounding a person. Moreover, it builds the "social identity" of a person in a specific community, as one can portray its being through the interactions sustained with other peers.

Naturally, this intrinsic need to interact with others does not necessarily include all people in all possible contexts. Indeed, there are certain experiences in which the possibility of socialising with others could be interpreted as unpleasant by some subjects (Andersson & Mossberg, 2004; Hudson et al., 2019). For instance, it can be deemed as source of distraction or annoyance, or it can be simply considered pointless for the occasion. Thereby, considering the documentation collected often outlined this eventuality in metaverse and gamified experiences, although it is often isolated instances, it is relevant to take into consideration the possibility. Indeed, it allows to take note of the fact that each experience must be constructed depending on the actual (social) needs of the targeted group.

Given such premises, the portrayal of sociality, here outlined, is intended as part of the greater dimension of interactivity that also characterises the metaverse as a concept.

Indeed, as mentioned various times, sociality is a key determinant of engaging experiences in metaverse contexts, as well as one of the driving reasons influencing new consumers' participation. Interaction allows for the sharing of information between two participants, contributing to the promotion of motivational drivers, especially word-of-mouth dynamics. In fact, it was demonstrated how interactions between consumers, and peers in general, are perceived by people as more authentic. Thus, in these occasions, information concerning a firm and its products flows more naturally and is received more willingly, enhancing the possible effects on a consumer purchasing behaviour.

The possibility of freely interacting and discussing on certain shared experiences, that concern all the peers involved, allows for the natural creation of a related community. The power uphold by communities of consumers is promising, and it should be monitored and conditioned by brands themselves, in order to guarantee positive effects and avoid negative backslashes. Thus, consumers should be able to interact in a metaverse environment generated by a company, to empower knowledge on its proposals.

The opportunities provided by costumers' communities have also been widely demonstrated by the never-ending instances that characterise social networks. In fact, this approach toward confrontation, reviews and referrals is consolidated in modern society, and constitutes a must-have in the customer experience of large part of younger generations, namely generation Y and generation Z.

The habit of these younger generations to a digital social life derives from the familiarity with digital tools and the routinary employment of social networks.

However, their potential compliance with more immersive forms of interactions, like the ones offered by metaverse experiences, stems from their familiarity with experimentation in gaming environments. Indeed, most of the most popular metaverse platforms to date belong to the gaming industry. Consequently, the current potential consumers of metaverse implementations are accustomed to different forms of game design logics, which now characterise several smartphone applications, loyalty programs and campaigns. Accordingly, it was verified how the implementation of gamified customer experiences and marketing campaigns is growing, and how the social component is often preponderant in said cases.

Furthermore, as addressed in previous chapters, sociality in metaverse contexts also serves as a catalyst for competition, as it promotes a greater perceived sense of challenge. Manifestly, the competitive approach towards interaction between peers also characterises gamification and game design in general. Hence, it is safe to assume a further connection between gamification and metaverse, based on social and competitive backgrounds.

Accordingly, the literature searched deemed competition a driver in the interest of consumers toward the experience. Thereby, in gamified metaverse experiences, proposed challenges and rewards can be assumed to perform better in terms of motivation when mediated by social possibilities. These tools can include challenging each other and confronting one's achievements with their fellow users as sources of customer satisfaction, often resulting from being able to outdo fellow users' achievements.

Furthermore, it was proven how the drive arisen from feelings of (positive) competition encourages the exploration of both the surrounding virtual environment and one's own skills, including creativity. Hence the application of gamification in metaverse context can give consumers purposes to stay active and participate in brand's initiatives in order to confront peers on their achieved goals and badges. As in fact, Jang et al. (2018) proved the social integrative benefits of gamification have strong positive influence on a consumer's behavioural engagement and purchase intention.

A virtual reality instance exploring said advantages is the case of *Nike*, which embarked in a community engagement proposal by launching its own virtual space ("Nikeland") on *Roblox*, which naturally interfaces with users that either belong to or are interested in the brand's community. This successful virtual space, indeed, proposes several occasions for competition via mini games, while allowing consumers to wear the virtual prototypes of future launches (Golden, 2021). Naturally, the provision of engaging and playful activities, that put different consumers in relation with each other, serves as a testing environment for the collection of data on consumers' actual interests, and the promotion of future products.

Ultimately, research and real-case examples clearly supported the hypothesis of a strong correlation between sociality and heighten engagement experiences in gamified metaverse contexts. Manifestly, also in the case of this dimension, the major influence over engagement is played by basic psychological needs, confirming Jang et al. (2018)'s study that verified how increased levels of social integrative benefits lead to increased behavioural engagement and attitude toward purchase. In particular, the sociality drivers affecting (positively) customer engagement are the sense of belonging widely addressed in community dynamics, and the motivational drivers, often encouraged by the companies themselves.
Finally, interaction is to be considered a necessary dimension of gamified metaverse experiences pursuing customer engagement, also considering its further prompting of immersion. As in fact Cheng et al. (2014) highlighted how challenging and competitive aspects can be sources of concentration and focused attention towards others and the virtual environment, naturally anticipating the sense of "flow". Thus, sociality is both direct and indirect cause of customer engagement.

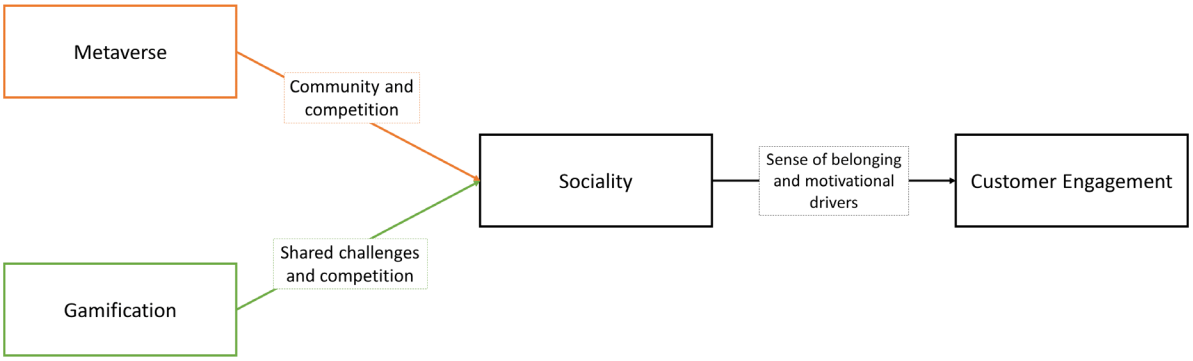

Figure 7 - Association framework: sociality

In view of the mentioned sociality and competition's ability to promote the exploration of virtual environments and the curiosity of mastering possible skills and evolutions, it is appropriate to conclude the reasoning with the investigation on creativity.
The documentation selected addressed the issue of customer creativity in conformity with two of its possible expressions. They are both included in the subsequent depiction, as they entail slightly different approaches and technologies to possible gamified metaverse experiences. The two prospectives are: co-creation of value with and for the brand, and creation or acquisition of content for the sake of the creator's expression of personality.
The expedient of involving customers in projects encouraging creativity-wise participation is neither new nor necessarily confined in metaverse applications. In fact, the practice of co-creation is a notable catalyst of customer engagement, as well an optimal indicator of customer loyalty. In fact, consumers' enjoyment of these activities

stems from the possibility of having control over the environment and the assets that constitute it, which is particularly true for metaverse applications. The consumer is "thrown" is a novel virtual space, and they can only gain confidence when in charge of some control, perfectly enhanced by co-creation.
On this very reasoning, Cowan & Ketron (2019) contributed by stating that co-creation activities taking place in virtual environments influence brand messages, that naturally can be either positive or negative, depending on the conditions of who spreads the message and how the user co-creation is enabled.
Accordingly, as already assessed, companies that want to benefit from such advantages must be willing to give up some control and trust the opinion of its customers. As a matter of fact, these consolidated relationships with customers take time and resources to correctly develop, since companies must put in strong marketing efforts to create emotional bonds that retain consumers' attention and interest.
Co-creation of value entails a collaboration between the brand and its customers in order to develop either improvement to products/services in use or whole new concepts of products/services. In addition to the behavioural impacts already addressed, it helps understanding consumers' interest by creating on-demand produce and, naturally, it encourages innovation. Therefore, systems of value co-creation must be implemented to collect intel on matters of design, production, and consumption of the product or service (Sheth et al., 2000).
The abovementioned need for autonomy on the part of customers also relates to gamification initiatives. In fact, the results collected indicated an intrinsic predisposition of gamification instances for co-creation as further response to consumers' need for emotional and mental involvement. In fact, they value the possibility of being part of the storytelling, influencing the decision related to rewards or changes in the narrative proposed.
For instance, the metaverse platform *Fortnite* is a great promoter of creativity in general, and offers the tools for co-creation. In fact, it allows users to create their own game logics in their personal digital "islands" by supplying them with actual tools and often pre-set assets. In return, the consumers are rewarded by the participation of other users willing to play according to the narratives designed by them.
Thereby, an activity of co-creation in metaverse applications functions via the technological tools provided by extended reality technologies, and the rewarding systems guaranteed by gamification. Their combination delivers a sense of autonomy and self-confidence to the participants, who can be considered further engaged in the experience when they feel part of the company's value creation process.

The other perspective toward customer creativity is instead related to the possibility of customising one's appearance (avatar) or personal space inside the metaverse (e.g., with collectibles), for the sake of expression of personality.

The investigations proved blockchain technology plays a significant role in its manifestation. In particular, the instruments that resulted more adapt are non-fungible tokens, as they univocally represent, via smart contracts, a digital asset in Web 3.0. In fact, these unique digital identifiers have recently made their appearance, both in augmented reality and in virtual reality instances, as representatives for art, music, skins, and collectibles in general.

The use of non-fungible tokens we want to refer to mainly consists in the employment of these unrepeatable assets as means to personalisation, helping consumers to define their digital identity or that of others. In fact, these digital items, as intended by this review, can be either produced by brands themselves or be content developed by other participants of the platform. Either way, consumers can decide to buy them or create them themselves, thus contributing to a whole parallel digital economy in the metaverse. Naturally, decentralised platforms are more inclined to implement these logics, particularly concerning the creation of owned content by consumers.

Companies' interest toward this intangible commerce is growing, as its dynamics have already been consolidated throughout centralised and decentralised platforms. Specifically, at the moment, there is hype surrounding the markets of "skin," now worth billions of dollars, with high-profile fashion investors like *Gucci*, *Ralph Lauren,* and *Louis Vuitton*. These assets are additional esthetical traits for one's avatar, including apparel and accessories, that customise its looks. Naturally, according to what specified before, they can be either bought or created. In particular, *Decentraland* famously incentivises users to create their own skins and put them in the platform's marketplace (Decentraland, 2023).

Considering the employment of this practice was inherited from the gaming industry and the related personalisation of characters, it is not difficult to reckon a possible use of such technologies for gamified experiences. In fact, allowing users to freely express themselves and customise their experience enhances the probability of immersion, and thus it is relevant for both retention and attraction. Moreover, collectible and/or wearable non-fungible tokens, and the related demand for customisable experiences, can also become the protagonists of a narrative gamified experience. Namely, they can become prizes themselves, further motivating consumers to take part in a brand's gamified proposals.

An example of this method is the collaboration between *Ralph Lauren* and *Fortnite*, which exploits the desire for customisation and self-transformation with the aim of engaging customers and condition their purchase behaviour. As in fact, in 2022, the luxury brand launched a global tournament (The "Polo Stadium Cup") rewarding the endeavour of participants with limited branded skins, which experienced remarkable success (Dall'Ava, 2022).

Ultimately, both creative perspectives analysed can positively contribute to gamified metaverse experience in terms of further immersion, enjoyment, and finally customer engagement. In fact, the reasonings and instances analysed proved to be important catalysts of psychological ownership and sense of self-transformation, for both practices adding value to a company and contributions to one's personal digital identity. Naturally, these feelings of fulfilment and actual purpose are sources of customers' satisfaction in the metaverse experience, and consequently enhance a consumer relation with the firm providing it.
In support of this hypotheses there is also the contribution of Wolf et al. (2020), which verified how the role of gamification in practices of "expressive freedom" positively influences customer commitment and willingness to pay.

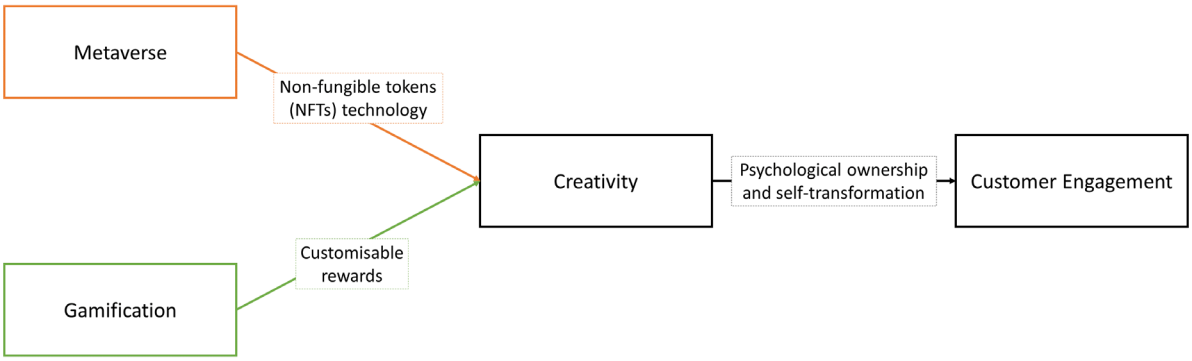

Figure 8 - Association framework: creativity

Considering the theoretical and factual instances supporting the coherence in the hypotheses brought forward, which related immersion, sociality, and creativity to gamified experiences as possible determinants of heighten customer engagement, the following paragraph briefly concludes the discourse by connecting the strong points.
Metaverse and gamification are practices developed to enhance the enjoyment of experiences, which engage participants in immersive context by means of technological instruments in the first case and narrative expedients in the second. Furthermore, their shared roots in the gaming industry allow them to exploit such logics in their applications, and give them access to involving dynamics, like creativity and sociality. These two latter dimensions perfectly merge with the sense of immersion as antecedents of such "flow" perception since they both provide additional context to a virtual or augmented environment. Both these hypothesis of relation with immersion have been verified, consulting respectively Mollen & Wilson (2010) and Cowan & Ketron (2019).
Finally, as widely argued and verified in the literature selected, immersion is an antecedent of customer engagement, as it enhances the sense of belonging of

consumers and successfully engages them in behaviours that promotive motivational drivers. Consequently, via the direct determinants already discussed and through their strong bond with immersion, also creativity and sociality can influence (passively and actively) customer engagement in gamified metaverse experiences.

6.2 Managerial implications

The following paragraphs are constructed so as to outline an overview of the current state of the art, in terms of tangible managerial benefits determined by the application of the instruments described up until this point of the discussion. Via current trends and advantageous tools of metaverse nature, firms' marketing units could work on the improvement of the relationship with its customers, and its related metrics of success.

First, as depicted throughout this body of work, the technologies now in use relate to either augmented reality or virtual reality. In particular, now, the concept of metaverse fits more cohesively in virtual reality solutions. Therefore, most of the focus of managers should stay on virtual reality tools and implementations, with particular attention on metaverse platforms.

Nonetheless, although virtual reality technologies have immense potential with respect to sensorial dynamics, managers should also be aware of what types of technologies better fit the possibilities of their targets. In fact, most of the interfaces now connecting a consumer to a virtual world are of static nature and low physical immersion, as the realism mainly weights on the sight sense, supplied by static monitors, and on the hearing sound, supplied by headphones at best. Therefore, firms must align to these tendencies and propose solutions primarily via computers and personal devices, like smartphones and tablets, to be as accessible as possible.

Thereby, the efforts should manly stay on solutions heightening immersion independently from the interface devices used: image quality, sound quality, storytelling, role-playing.

Together with the misleading tendency of thinking head-mounted displays are fully accessible by targeted consumers, another common belief managers should debunk before investing in the metaverse is the idea of creating a parallel digital life. As a matter of fact, metaverse platforms are not yet interrelated, on the contrary they are governed by different standards. Thereby, interfacing consumers as if they were conducting a parallel virtual life via their avatars is extremely unrealistic.

Accordingly, to date, brands are approaching customers via engaging individual experiences that often are not compatible with that of other companies. For instance, this is the case of *The Sandbox*, which presents itself a potentially infinite universe in which each company and individual can engage via singular owned "pieces" of land.

Consequently, the goal of customer engagement is currently more effectively achievable through the design of "complete" experiences. Namely, separated virtual worlds (e.g., *Nikeland*), with defined objectives (e.g., awareness), that propose a well-rounded environment of discovery and play (via gamification).

The depiction just presented inevitably brings to light another important determinant, which firms should take into consideration when defining their concrete marketing strategy in a metaverse context. Namely, the decision concerns the type of platforms to invest in.

In fact, companies can decide to implement their projects either on one metaverse platform only, or on multiple platforms, depending on their marketing objectives and their targeted markets. In fact, different approaches require distinct types of implementations, metaverse-wise, to fully achieve the target.

On one side, as mentioned before, centralised platforms are naturally more inclined to gamification, as they promote playfulness over control. On the other hand, decentralised platforms aim at a more mature audience, greatly influenced by exchange possibilities and owned creativity. Thereby, the application of gamification can take place, but it requires more effort and inventiveness.

However, the concept of uniqueness and ownership, promoted using non-fungible tokens as digital assets representors, is evidently more effective in decentralised platforms. In fact, they allow easier commerce of virtual lands and assets between consumers alone, or consumers and companies.

Other dimensions to take in consideration are the ones related to demographical factors. In fact, dynamics like the age of the targeted customers should have major influence on the final decision of the platform, as different platforms host distinct types of users. As mentioned, the possible goals pursued by a user in a virtual world can be assessed via the definition of their age. Naturally, it is not the only determinant, as it is notably misleading to simply base a marketing campaign based on the age a consumer. However, it is a crucial factor, as coetaneous peers frequently share the same macro-groups of interest. Namely, younger generations proved to be more interested in the playful and social dynamics offered by metaverse platforms, whereas older generations tend to be interested in more technical related topics, such as NFTs markets and related cryptocurrencies.

The pie charts displayed in Figure 9 further prove what just implied. Notably, decentralised platforms are gaining more success with older, more adult generations; whilst centralised platforms are mostly attended by younger generations.

Those investing in *Roblox* are investing in the engagement and fidelity of the newest generations, which mainly include children and teenagers. Therefore, they are more likely to launch marketing campaigns aiming at the awareness stage of the marketing

funnel (e.g., *Lavazza* x *Roblox*), by means of events, particularly playful experiences and similar. Differently, *Fortnite* interfaces older segments of markets, mainly young-adults, who naturally have more saying in their purchase decisions and thus are more likely to act. On the other hand, decentralised platforms *The Sandbox* and *Decentraland* share similar numbers, with the first having a slightly greater impact on young adults. In fact, they both have gained the interest of an older segment of the market, that gathers generation Y (1981-1995 ca.) in toto. Again, the older the generation, the greater the disposable income and the associated possibilities of purchase and engagement.

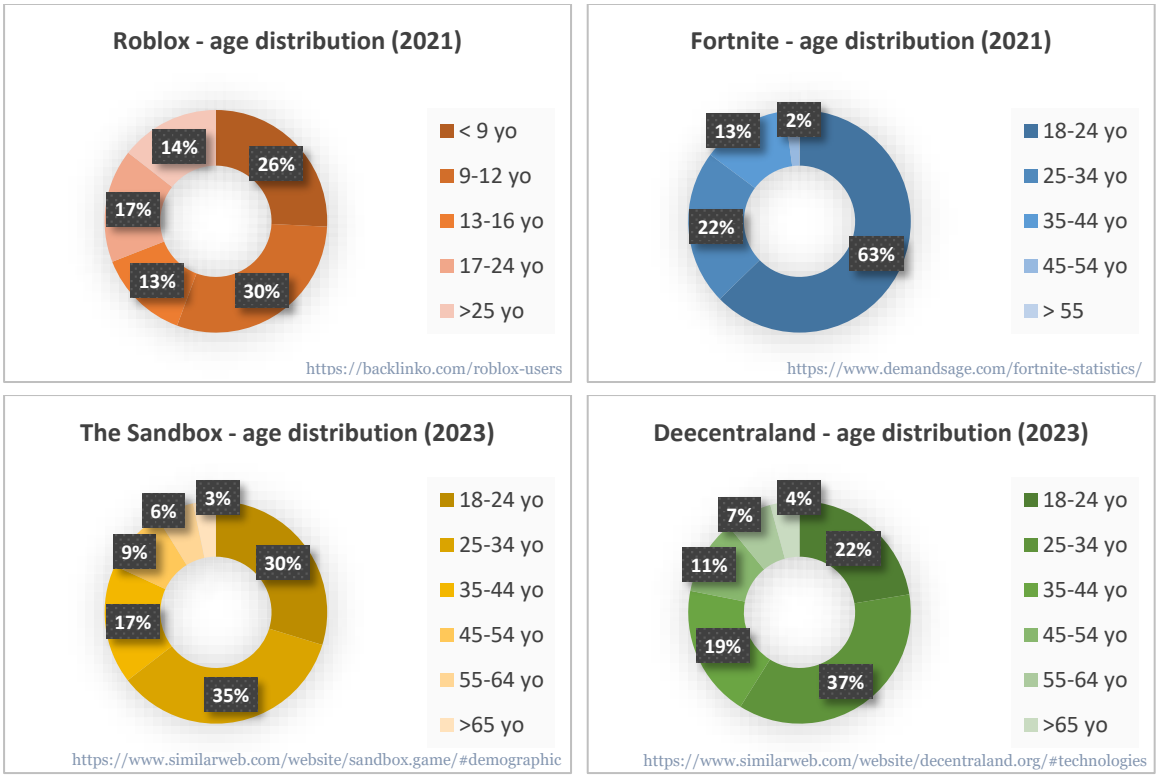

Figure 9 - Age distribution in known metaverse platforms

The depiction of these marketing management-related choices is relevant, particularly in light of the following firm-beneficial advantages, which derive from the correct sequence of choices of metaverse implementation. In fact, all the listed choices firms can make, marketing-wise, have an influence on applications' abilities to fully exploit the advantages of gamified experiences in metaverse contexts. And in doing so, they also have great effects on a company's perceived relationship with its customer base. Brand loyalty and awareness are then greatly affected, and antecedents of customer engagement.

Notoriously, these feelings of motivation and connection with a company during these experiences then influence firm-beneficial outcomes, in particular: customer

commitment to both the company and products, willingness to pay (and thus purchase) and customer referrals.

First, the dynamics outlined encourage a customer to put the effort in engaging with a firm's marketing campaign, either via co-creation or through an active participation in the related community. Thereby, the enhancement in terms of commitment brough forward by immersive customer experiences exploring creativity and sociality is self-evident. Furthermore, commitment naturally indicates a strong interest in a company and its work, and it is also demonstrated through purchase.

Second, with the term "willingness to pay," we refer to the maximum price a customer would be willing to pay for a product or service. Thereby it indicates the value a customer attributes to an asset and their intention on purchasing it. It is an important metric of success, as it determines a firm's chances of selling a certain asset.

Gamified metaverse experiences heighten a customer's willingness to pay for a product or service, if well marketized. In fact, playful dynamics, with possibilities of interactions and expression of creativity, all condition a customer's perception. They allow interaction with others' opinion and employment of inventiveness. The information collected with respect to a product, or a campaign, helps understanding the functioning of a product; and it allows for the "digital consumption" of digital twin product. Naturally, the possibility of interacting with a product before buying it and relate to the associated firm, and its values, enables customers' absorption of new information. With greater knowledge on the firm and its products, there is greater security and thus greater willingness to purchase and pay.

Furthermore, several papers, including Malik et al. (2022) among others, have outlined the immense value of no-fungible tokens for this outcome. In fact, their market proved to be strongly dependent on customers' willingness to purchase them, and thus their performance functions as indicator of a success digital venture.

Third, referral marketing is a topic already partially addressed by this body of work since it is a useful metric and tool to measure and foster customer engagement. In fact, it is word-of-mouth initiative designed by the company itself, thus it allows for the manipulation of the storytelling shared by customers. It incentivises existing customers to introduce the company and its proposals to their acquaintances, to acquire new customers. In particular, the dynamic that is most likely a source of further commitment in referring a certain brand and/or its products is the one of sociality. In fact, the creation of a community reinforces the need for new members and shared experiences.

Moreover, given it is a firm-driven initiative, a referral is usually encouraged via a system of rewards for the referrers. Naturally, his dynamic recalls that of gamification and empowers its influence on customer engagement. In fact, also in the case of referrals, there is the possibility for a rewarding system powered by gamification logics

and digital prizes, in the form of digital assets (i.e., NFTs) to be redeemed in the virtual universe. Thereby, proving again the power the interconnection of social and creativity dynamics has over customers' behaviours in the metaverse, and their potential managerial utility.

Ultimately, we principally referred to experiences that strongly related to brands per se and the messages they want to bring forward. Doing so, the type of platform described results adherent to the concept of "platform gaming", which promotes sociality, content creation and virtual world. However, it was also stressed the importance of offering products besides experiences, assets usable in a metaverse platform (e.g., *Nike* x *Fortnite*, *Gucci* x *Roblox*). Naturally, as proven, the combination of the two approaches can be realised via gamification logics, and it guarantees greater reach and engagement, as it satisfies the needs of different consumers. Once again, the choice must depend on the firm's marketing objectives.

6.3 Future research

The current section is dedicated to the compendium of all the research gaps and incoherencies noted within the work shared in previous chapters. The objective is to suggest potential future developments on the part of marketing researchers, ranging from the matter of metaverse implementations per se to specific investigations derived from the research question proposed.

The systematic literature review performed stressed the current state of research with respect to marketing implementations in the metaverse. In fact, the whole approach toward the theme is just taking its first steps, as most of the reliable documents collected naively presented heterogenous perspectives of advantages and applications. This consideration comes from the substantial knowledge, acquired via grey literature and attendance of seminars, with respect to the current state of the art. In fact, actual on-the-market implementations of the metaverse are proving to be far ahead of research. The main point that seizes the attention is the infinite possibilities, particularly creatively wise, that the technologies already at our disposal guarantee.

In fact, little research is concentrating on the opportunities given by metaverse platforms and the associated exploration of virtual worlds, as available now. On the contrary, a great part of the proposed readings concentrated on technology evolution and interface devices. Notably, this imbalance on technological narratives is predominantly featured in papers addressing virtual reality, since they promote implementations too dependent on specific tools like HMDs. However, only a small portion of consumers have access to these expensive devices.

Thereby, instead of concentrating the research efforts on technological enhancements only, studies should partially shift their focus. Whereby, researchers should analyse

real-case instances now in vogue and try to capture the actual advantages experienced by popular implementations.
As a matter of fact, it was detected a consistent lack in the analysis and consideration of current applications. It is notable from the sources linked to the information collected on centralised and decentralised platforms now in use. Moreover, centralised metaverse platforms proved to be slightly more considered in a small part of the literature. Whilst, on the other hand, decentralised platforms were never recognised in the papers analysed. Although part of the reason for this is to be attributed to their recent launch, the lack of investigations on the role of a more adult set of metaverse channels is alarming.
Thereby, we suggest future research should also concentrate part of the efforts on defining the distinction between centralised and decentralised metaverse platforms, by deepening their features and advantages, also via real-case instances. Furthermore, the possible different applications of gamification to the two should be deepened.

Another evidence from what investigated is the depiction of virtual reality and augmented reality as very distinguished universes, with truly little mentions on the continuum and mixed reality.
The true applicability of metaverse logics, as intended by most research, is only possible in virtual reality settings. In fact, all the possible interactive and immersive dynamics investigated in this body of work regard virtual worlds that are necessarily powered by virtual reality technologies.
In augmented reality experiences, there are indeed more possibilities of distraction from the real environment of projection. Nonetheless, as already mentioned, this conditioning on immersion does not prevent augmented reality technologies from developing logics of "parallel reality," powered by sociality and creativity. In fact, there are few real-case instances proving this possibility in the gaming industry (e.g., *Pokémon Go*). Furthermore, to date, they are far more accessible by consumers (i.e., via personal devices like smartphones), who have greater familiarity with AR modalities (e.g., magic mirror).
Therefore, in light of the great research on the determinants influencing customer engagement in augmented reality conditions, and the propension of consumers toward such uses, further research should be conducted. In particular, the topics of interest are the possible application of sociality and creativity logics to augmented reality experiences as well, and how VR features could be declined to AR applications in view of the development of complex virtual worlds.
Moreover, other useful investigations are those relating to mixed reality environments. As in fact, the researcher individuated little to no reliable sources addressing the applicability of metaverse constructions involving the union of virtual and augmented

realities potentialities. Accordingly, the real-life cases individuated are still in their first steps and most importantly do not concern marketing or management subjects. They belong more likely to engineering and scientific developments. Moreover, this literature gap is further justified since mixed reality experiences employ interface devices that are highly inaccessible to the average consumer.
However, the opportunities of accessibility, familiarity and easiness of AR experiences mixed with those of immersion and exploration of VR's constitute an interesting point of view. Therefore, further research should be performed on the mixed reality features that could best incapsulate the advantages of both VR and AR, and thus better influence customer engagement in metaverse experiences.

In light of such premises on literature gaps with respect to the general knowledge of marketing metaverse experiences, the section is now investigating the current gaps and future research to be conducted on the three topics at heart of this body of work. Thereby, the focus is now shifting to research dedicated to immersive gamified experiences leveraging creativity and sociality in metaverse logics.
First, the creative dimension we deem so relevant in said experiences was widely detected in great part of the readings performed. However, the dynamics and, most importantly, the actual opportunities derivable from the proposal of activities promoting either co-creation or customisation have not yet been explicitly deepened by dedicated studies. As in fact, their potential was mostly inferred from documentation dedicated to projects enhancing customer engagement in general.
Therefore, we would suggest the conduction of additional in-depth research on gamified metaverse's features enabling co-creation, by means of both theoretical backgrounds, deriving from the marketing field, and practical backgrounds, stemming from real-case instances of successful co-creation proposals (e.g., *Fortnite*'s islands). The purpose would be collecting reliable data on the actual benefits a company could obtain when proposing co-creation activities to its customers in a gamified metaverse context.
On the customisation side of creativity, on the other hand, it would be beneficial to study the opportunities given by tools like NFTs, and the actual role played by the possibility of personalising one's own experience. In fact, although the relation between customisation and customer engagement is clear, additional studies should investigate the gamification features that could be employed in terms of personalised rewards, to further engage customers in a metaverse experience.
Second, the social aspect was also widely brought up and investigated by the three areas of focus. However, in marketing terms, the beneficial opportunities that could be achieved via the heightening of these interactive logics were not fully grasped by current studies. In fact, sociality was addressed as a possible side feature of metaverse

experiences, to be utilised as it is, without adding further depth to the actual potential given by strong communities and word-of-mouth activities. The main dimension on which research actually concentrated its effort was competition, which resulted greatly beneficial in gamified metaverse experiences.

Nonetheless, the conclusions drawn in this body of work resulted from cross-readings and reasonings built at posteriori. Thereby, additional research should be performed, to collect information on the social dynamics that prove to be more performative than others, and on the possibility of designing novel interaction modalities, within both VR and AR applications, to further influence immersion and customer engagement.

Moreover, further research should also be performed with respect to the issue of sociality not being everyone's "cup of tea." Namely, investigations on how to leverage sociality without irretrievably negatively affecting the experience of part of the market.

Finally, all these possible investigations outlined should be linked by the manifest leitmotif on gamification in metaverse dynamics. In fact, the two environments are compatible, and are potential strong sources of improved marketing experiences if united. However, research on gamification instances in metaverse context is scarce and clearly does not adhere to current implementations. As in fact, gamified experiences with engagement purposes represent the actual direction taken by real-life instances.

As mentioned in separate occasions, grey literature and seminars have widely emphasised the opportunities of this union, displaying current best practices. Thereby, researchers should further investigate this possible link between metaverse and gamification as promoters of more immersive and engaging customer experiences. Naturally, the data collected should aim at verifying a brand's concrete benefits.

7 Conclusion

This thesis focused on the features and tools characterising the metaverse and the dynamics via which they can be leveraged to enhance marketing experiences. Indeed, the present study aimed to answer the following research question.

> *Can the employment of immersive gamification experiences that leverage customer's creativity and sociality be a useful tool to influence customer engagement in metaverse applications?*

The study conducted was a systematic literature review, and it consisted in eleven searches concerning the four macro-areas of: *metaverse x marketing*, *gamification x marketing*, *blockchain*, and *customer engagement*.

Evidently, the number of searches conducted is strikingly high, when compared to the actual number of papers then taken into consideration. This happening and the consequent biases take origin from the decision of making the most out of the filters available on *Scopus*. Indeed, the objective of conducting specific searches like so, especially with respect to the "*metaverse x marketing*" macro-area (n. 1), might have altered the actual potential of the research in terms of further results. This risk of bias was addressed in the related chapter, but it is still significant to stress this bias in light of the following statements.

In fact, the searches performed with the initial goal of collecting information on the abovementioned topics and their results were then employed as sources of information in the support to the research question. The initial hypothesis envisaged the collection of robust evidence with respect to the possibility of exploiting creativity and sociality as key strong points in immersive metaverse gamified experiences.

In accordance, a consistent part of the documentation mentioned and deepen these topics (immersion, creativity, sociality) on various levels, in accordance with the themes of all metaverse, gamification and marketing (customer engagement). In fact, the identification of these three trending topics in literature are the actual source from which the research question arisen.

Nonetheless, the gathering of said robust evidence did not occur as planned, as the individuated links between the three variables are actually the result of relations determined at posteriori. In fact, they derive from the findings of common trends and usages, then connected with each other, and not from documentation deepening all three topics in all the macro-areas.

The expedient of detecting common grounds and relating them to one another was crucial. In fact, in absence of papers addressing both metaverse and its gamification applications in a context of customer engagement enhancement, the researcher had to

construct their own reasoning in support of their proposition. Namely, as mentioned, said arguments were fully supported by information collected from the disjointed sources.
Thereby, it is relevant to note how the search process did not guarantee the level of deepness and relation expected at the beginning of the work. Moreover, it is important to observe the already addressed lack of reliable literature investigating marketing gamification in the metaverse, despite its widely established use.

The results gathered highlighted a great tendency in academic research: the focus on technological development, in the face of digital dynamics evolution. This gap was stressed throughout the work as it constituted a great barrier, impeding the conduction of analyses able to fully grasp the potentials of marketing gamification in the metaverse. As in fact, the type of interface device chosen affects the final experience only to a point. Indeed, it mainly regards the quality of physical immersion, but not any other dimension making the final experience enjoyable and engaging.
This is particularly relevant, considering the main typology of immersion we decided to refer to is the mental one ("flow" theory), as more impactful and easier to improve, also monetarily wise.
To date, reality is far ahead of research itself since the market is now experiencing successful gamification and metaverse instances promoting customer engagement. A great part of these evolutions are to be attributed to single brands collaborating with metaverse platforms. Specifically, the examples taken into consideration almost exclusively belonged to the fashion and apparel industries, and predominantly took place in centralised metaverse platforms (e.g., *Fortnite*, *Roblox*).
Indeed, the metaverse platforms now achieving the most success are centralised, mainly due to their earlier launch with respect to decentralised platforms. Consequently, although decentralised platforms prove to be built in ways that could be considered beneficial for marketing actions, their presence in the scenarios depicted by the papers read is missing. Although justified by the novelty of these platforms, still in the "introduction" phase of their life cycle, the related research gap is concerning and should be addressed. Further information on the potential of these platforms should be collected to understand how their dynamics work differently, and in what way they could be leveraged to influence an older segment of consumers.
Anyhow, both types of platforms are now characterising the market, suppling consumers with infinite new possibilities of freedom and digital autonomy. Hence, what is considered by some a limiting experience constitutes a terrific opportunity for both users and brands. Indeed, on one hand, consumers have the possibility of "taking a break" from reality and explore virtual worlds with incredibly few limitations. This typology of digital exploration proved to be an optimal catalyst for social interactions,

fuelled by either socialisation or competition needs, and creative opportunities, in favour of either the company or the customers themselves. On the other hand, brands can leverage marketing gamification opportunities to involve its customers, and thus raise awareness and commitment with respect to their initiatives and products or services. Furthermore, the social aspect can be leveraged for the creation of strong brand communities and motivational drivers, while the creative aspect can be source of actual value and feedback.

The advantageous influence over consumers guaranteed by social and creative activities was actually proven to be well funded. In fact, they represent relevant levers for customer involvement in the marketing field, as inferred from the reasonings and propositions of a consistent number of documents analysed.

Sociality's impact on a consumer's experience and consequent motivation did not come as a surprise, especially with respect to metaverse implementations. In fact, the possible confrontation between the rise of social networks and the metaverse was addressed across this body of work.

Apart from the usual dynamics of risk-avoidance brought forward by both consumers and companies, the striking similarity between the two instances of Web 2.0 and virtual worlds lays in the interactive opportunities they promote. The whole conceptualisation of social networks depends in fact on human's need for sociality and interaction, and thus owes its success to the commitment of users dedicate to empower their networks of acquaintances. Similarly, metaverse platforms can be employed with the aim of sharing particular experiences with other peers. Likewise, companies can leverage this innate need for socialisation as a tool to attract customers via experiences that guarantee interaction. Indeed, interaction is motif for additional immersion in a specific experience. Furthermore, this dimension provides for the advantageous dynamic of competition.

As a matter of fact, a great part of the documentation analysed stressed the impactful role played by competition in building a coherent environment for a person's immenseness and engagement. This notion was helpful for the connection of metaverse and marketing gamification. In fact, metaverse's propension for sociality and competition makes it a perfect ground for marketing gamification's implementation. Manifestly, we refer to an application that leverages users' enjoyment in competing to empower other gamification tools (i.e., rewards). In fact, competition can bring additional interest on the part of the user, as they could decide to engage in a gamified experience with the aim of achieving both personal self-affirmation and superiority over their peers.

On the other hand, the creativity aspect naturally fits metaverse's premise of virtual freedom. Indeed, users are allowed to freely express their personality via self-made avatars, owned lands, and digital collectibles. The possibility of self-transformation,

also via customisation, is key to guarantee a certain needed level of autonomy to the consumer.
As investigated, this search for self-expression can be leveraged by companies by adding gamification dynamics to the mix, and by exploiting customers' creative powers to add value to their propositions (co-creation). Indeed, it was proposed the possibility of harnessing this consumers' propension to empower the possible storytelling of a gamified experience. Namely, proposing digital collectibles, like skins and other forms of NFTs, as prizes, together with the eventual possibility of customising the rewards themselves.
Finally, the third relevant dimension of analysis considered throughout this literature review is immersion. Again, the significant role it plays in marketing gamification and metaverse was proven across this body of work, and its impact on customers is now self-evident. Indeed, the sense of immersion provoked by a metaverse experience consists of nothing but an extension and digital materialization of what has been produced to date in the physical world. Hence, it is naturally positive in terms of narration, which has always established a sense of mental "flow," starting from books, movies, and role-play games, that now characterises virtual realties as well. The difference lays in the technological devices employed and the ability of answering with more autonomy to brands' gamified cues.

Ultimately, we are satisfied by the results achieved in terms of confirmation of the research question proposed. Naturally, the findings were not as strong as anticipated, although the evidence on the relation between marketing gamification and metaverse applications is fully confirmed and undeniable. The same can be noted with respect to the benefits guaranteed by immersion, creativity, and sociality in these contexts.
Furthermore, the highlighted partial shortage of information allowed for the individuation of clear literature gaps to be filled in future research. Nonetheless, given the novelty of the topics addressed and the hype surrounding the conceptualisation of the metaverse, we do not doubt the future satisfaction of the study gaps indicated.

8 Figure index

9 Table index

10 Annex

Database collecting the selection criteria and information with respect to the sources read, selected and discarded. In the following pages.

	Source	Authors	Title	# cit	Type	Journal	Year	Macro-area	# ric	Origin	Why	Stop
2	Yes	Giang Barrera, K., & Shah, D.	Marketing in the Metaverse: Conceptual understanding, framework, and research agenda	3	Q1	Journal of Business Research	2023	-	-	Co-advisor	The paper investigates the current definition of the metaverse, taking into consideration its evolution. It deepens the related tools (e.g., blockchain, computing, IoT, XR, interface devices). Moreover, this literature review investigates its dimensions and future developments. This study was fundamental for the conception of the definition of the metaverse in the review.	Reading
3	Yes	Cowan, K., & Ketron, S.	A dual model of product involvement for effective virtual reality: The roles of imagination, co-creation, telepresence, and interactivity	85	Q1	Journal of Business Research	2019	MA1	1		Focused on VR and its technologies, it gives an overview of what are the technology and senses mostly used in the market nowadays and tries to indicate here they best fit in context of either high product involvement or low product involvement. It is useful as it investigates the dimensions of co-creation, immersivity, (tele)presence and interactivity, which are dimensions that return often.	Reading
4	Yes	Flavián, C., Ibáñez-Sánchez, S., & Orús, C.	The impact of virtual, augmented and mixed reality technologies on the customer experience	374	Q1	Journal of Business Research	2019	MA1	1	Virtual and augmented reality: Advancing research in consumer marketing	It proposed an overview of the current state of the art in term of extended reality technologies and their application (VR, AR, and MR). It was crucial as it was one of the very few papers addressing the topics of the Reality-Virtuality continuum and, most importaintly, of Mixed Reality. It was key to understand the devices related and the dynamics of the continuum, including the metaverse dimensions presented (immersion, presence, interaction)	Reading
5	Yes	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	216	Q1	Journal of the Academy of Marketing Science	2017	MA1	1		Focused on AR, it deepens the concepts of situated cognition, environemental embedding, simulated physical control, decision comfort and word of mouth dynamics in the context of AR technologies. It is important as it addresses and investigates hypothesis on their link to utalitarian and hedonic value perceptions, which are the main drivers of a marketing experience.	Reading
6	Yes	Hudson, S., Matson-Barkat, S., Pallamin, N., & Jegou, G.	With or without you: Interaction and immersion in a virtual reality experience	140	Q1	Journal of Business Research	2019	MA1	1	Virtual and augmented reality: Advancing research in consumer marketing	It only focuses on Virtual Reality. It investigated the dimensions of interaction/interactivity and immersion/immersivity as predictors of customer satisfaction and loyalty, which is key for our body of work. The seven hypothesis proposed were verified via a field study using cross-sectional survey design in a marine life center in France.	Reading
7	Yes	Muhanna, M. A.	Virtual reality and the CAVE: Taxonomy, interaction challenges and research directions	144	Q1	Journal of King Saud University - Computer and Information Sciences	2015	MA1	1	The impact of virtual, augmented and mixed reality technologies on the customer experience	The paper was key for understanding the functioning of the CAVE tool and investigating VR's taxonomy. The four main topics addressed are: virtualreality and its elements and dimensions (e.g. immersion, interactivity); taxonomy of virtual reality systems; the functioning and employment of CAVE; interaction styles used, challenges faced, and research directions followed in building software applications for virtual reality systems and the CAVE.	Reading
8	Yes	Nikhashemi, S. R., Knight, H. H., Nusair, K., & Liat, C. B.	Augmented reality in smart retailing: A (n) (A) Symmetric Approach to continuous intention to use retail brands' mobile AR apps	52	Q1	Journal of Retailing and Consumer Services	2021	MA1	1		It investigates the augmented reality retail context, which was a recurring topic in AR. This study investigates shopping AR app attributes and their influence on hedonic and utilitarian benefits, continuous intention to employ shopping AR app and willingness to pay price premium. In order to prove its eleven associated hypothesis, the paper employs non-probability, purposive sampling approach in data collection as the sample size is not well defined. It was useful for the understanding of the implication of current AR application.	Reading
9	Yes	Scholz, J., & Duffy, K.	We ARe at home: How augmented reality reshapes mobile marketing and consumer-brand relationships	142	Q1	Journal of Retailing and Consumer Services	2018	MA1	1		It only addresses augmented reality. It was deemed useful for the understanding of the technology in general, and in particular of the magic mirror paradigm through a study conducted on the use of the sephora AR application.	Reading
10	Yes	Scholz, J., & Smith, A. N.	Augmented reality: Designing immersive experiences that maximize consumer engagement	215	Q1	Business Horizons	2016	MA1	1		It investigates only augmented reality applications. The paper gives an overview of the technologies that have already reached markets. It describes the dynamics of an AR experience, especially in public. The idividuation of passive and active AR "ingredients" and their reciprocal relationships of engagement were useful to understand the functioning of the experience. The paper establishes steps to follow to design an AR experience.	Reading
11	Yes	Tan, Y.-C., Chandukala, S. R., & Reddy, S. K.	Augmented Reality in Retail and Its Impact on Sales	30	Q1	Journal of Marketing	2022	MA1	1		It addresses augmented reality applications only. Questions: 1. How does the use of AR to facilitate product evaluation impact product sales? 2. How does the sales impact of AR usage differ across product characteristics, such as brand popularity, product appeal, rating, and price? 3. How do customers' prior experiences with the online channel and product category influence the sales impact of AR usage? - the study proposed 3 complex hypothesis and tested them through data from an international cosmetics retailer with both an online and offline presence. The results are interesting in terms of what type of customers can be greatly influenced by AR experiences in retail settings.	Reading
12	Yes	Wedel, M., Bigné, E., & Zhang, J.	Virtual and augmented reality: Advancing research in consumer marketing	102	Q1	International Journal of Research in Marketing	2020	MA1	1		Already proposed as point of reference from the beginning of the work, the paper reappeared in many of the searches made and this occurrence consolidated its relevance. In fact, it proposes an overview of the current connection between extended reality technologies and customer engagement possibilities. It highlights current gaps in the comprehension of these technologies' possibilities. It defines the difference between the dimensions of immersion and presence. It proposes instances of the current state of the art, in terms of marketing and advertisements by means of extended reality technology. Finally it investigates possible limits in metaverse applications.	Reading
13	Yes	Yang, S., Carlson, J. R., Chen, S.	How augmented reality affects advertising effectiveness: The mediating effects of curiosity and attention toward the ad	39	Q1	Journal of Retailing and Consumer Services	2020	MA1	1		It focuses on augmented reality applications. It investigates the psychological features induced by AR, which influence customer responses to marketing campaigns. Specifically, it investigates the relationship going from curiosity, to attention, and finally to attitude toward the campaign. It followed an experiement with data coming from surveys on purchase intention and attitude toward the add.	Reading
14	Yes	Qin, H., Peak, D. A., Prybutok, V.	A virtual market in your pocket: How does mobile augmented reality (MAR) influence consumer decision making?	47	Q1	Journal of Retailing and Consumer Services	2021	MA1	1		It only investigats augmented reality implementations. The focal questions to which the paper wants to answer are: 1) how do users evaluate their ex periences with MAR apps, as measured by interactivity and visuality? 2 What are the effects of user experience on perceptions of hedonic gratificaiton, informativeness, ease of use, and utilitarian gratification? 3) To what extent can MAR apps influence user attitudes toward adopting the MAR application and modifying their shopping behaviors?. The study analyses the answers to a questionnaire that sought user perceptions concerning their selected MAR app in order to verify its 7 hypothesis on the matter.	Reading
15	Yes	Alcañiz, M., Bigné, E., & Guixeres, J.	Virtual reality in marketing: A framework, review, and research agenda	57	Q1	Frontiers in Psychology	2019	MA1	3		This article's goal is to define how Extended Realities can be employes in marketing campaigns, via the analysis of previous papers on the matter and a study defining the concept of Virtual Experience in research Marketing (VEM). It provides the history behind the arisal of XRs and useful definitions throughout the text. It provides investigations on interface devices employed, interaction techniques, and the purposes behind teh use of VEM. Moreover, it provides the depiction of important VE measures and dimensions, including presence. Therefore, it is a didactical approach to XR, and thus it was deemed very useful for the review.	Reading
16	Yes	Xi, N., & Hamari, J.	Shopping in virtual reality: A literature review and future agenda	43	Q1	Journal of Business Research	2021	MA1	3		It is a systematic literature review. This research has the goals of understanding: the enhancement a VR shopping experience could bring with respect to traditional experiences; whether and how VR inlcuences consumers' psychology and behaviour during shopping; the different application of VR technoogies in shopping contexts. After anaysing the reviews based on topics, the paper positive remarks on virtual reality effectiveness in shopping contexts. It highlights a gap in research on VR shopping, and a lack in allignement on definitions and applications, the latter due to reaserch mostly performed in laboratories and not in real life experiments. Finally suggests future research developments. The paper is inspiring as it is full of ideas and information on the application of VR in shopping, which is very useful for the review.	Reading
17	Yes	Violante, M.G., Vezzetti, E., Piazzolla, P.	How to design a virtual reality experience that impacts the consumer engagement: the case of the virtual supermarket	26	Q2	International Journal on Interactive Design and Manufacturing	2019	MA1	3	Shopping in virtual reality: A literature review and future agenda	The paper only focuses on virtual reality aspects. Its focus is on the development of an immersive virtual reality online shopping environment. It addesses multisensory experiences, and the experiencial benefits given by metaverse applications. It investigates dimensions that are of great interest or the review: interactivity, connettivity, immersion. Most importaintly, it addresses VR experiences via a perspective of enhancement of customer engagement in its multidimensionality. Thereby, it was a great source of inormation.	Reading
18	Yes	Hilken, T., Heller, J., Chylinski, M., Keeling, D. I., Mahr, D., & de Ruyter, K.	Making omnichannel an augmented reality: the current and future state of the art	112	Q1	Journal of Research in Interactive Marketing	2018	MA1	4		It addresses augmented reality only. The paper highlights the gap in literature with respect to the application of AR in omnichannel experiences. It introduces the noteworthy concept of situated cognition related to AR, and consequently depicts three features enhancing realism: embedding, emboding and extending. Afterwards it outlines the possible connections between online and offline experiences via AR. It is a useful document because it provides an overview of the employment of AR in omnichannel dynamics.	Reading
19	Yes	Hollebeek, L. D., Clark, M. K., Andreassen, T. W., Sigurdsson, V., & Smith, D.	Virtual reality through the customer journey: Framework and propositions	53	Q1	Journal of Retailing and Consumer Services	2020	MA1	4		The paper highlights a gap in research regarding customer's drivers/outcomes of marketing-based VR applications through the customer journey (pre-, intra- post- interaction). Thus, the paper defines VR customer journey and classifies VR features and tech. Thus it is an interesting POV into the academic definition of VR.	Reading
20	Yes	Jessen, A., Hilken, T., Chylinski, M., Mahr, D., Heller, J., Keeling, D. I., & de Ruyter, K.	The playground effect: How augmented reality drives creative customer engagement	58	Q1	Journal of Business Research	2020	MA1	4		The paper highlights the gap in literature with respect to guides for managers on how to apply AR for enhanced customer creativity, thus the research question is connected. The focus is on customer creativity via AR applications as a source of differentiation and customer engagement. The two hypothesis veryfied prove that AR-enabled customer creativity represents a partial second stage mediation from customer engagement, and that in these AR experiences customer engagement is amplified when they have a stronger assessment orientation . Thus: AR use -> customer engagement -> customer creativity ->anticipated satisfaction pathway. The document is key to connect AR and customer engagement, and for the introduction of teh playground effect.	Reading
21	Yes	Rauschnabel, P. A., Babin, B. J., tom Dieck, M. C., Krey, N., & Jung, T.	What is augmented reality marketing? Its definition, complexity, and future	40	Q1	Journal of Business Research	2022	MA1	4		The paper defines augemented reality marketing and its brick four goals: branding, inspiration, convincing, and keeping. Moreover, it compares traditional extant marketing practices and digital implementations with the innovation that AR brings to the table, by combining the benefits of reduced reality and normal reality. It is a good point of view to compare past and future solutions.	Reading
22	Yes	Dionisio, J. D. N., Burns Iii, W. G., & Gilbert, R.	3D virtual worlds and the metaverse: Current status and future possibilities	192	Q1	ACM Computing Surveys	2013	MA1	5	A Metaverse: Taxonomy, Components, Applications, and Open Challenges	The paper provides in-depth and detailed information on the history of the metaverse and its definition in terms of virtual worlds (starting from analog gaming experiences like Dungeons and Dragons). It investigates various features of the metaverse: psychological realism; ubiquity of access and identity; interoperability of content and experience across virtual environments; scalability. These characteristics constitute the basis onto which our definition of the metaverse is built. It allows for investiagtions on each measure as it deepens fully each one of them.	Reading
23	Yes	Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M., Dennehy, D., Metri, B., Buhalis, D., Cheung, C. M. K., Viglia, G., & Wamba, S. F.	Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy	77	Q1	International Journal of Information Management	2022	MA1	5		The paper, on which contributed tens of researchers, frames the metaverse perfecty, through 20 contributions. Some of the topics the article addesses are: overviews of the features and toold now defining the metaverse; blockchain technologies applied to the metaverse; legal and govenring aspects; metaverse il marketing's perspectives; human and psychological features enhanced by the metaverse; digital marketing; metaverse retail; tourism and hospitality in the metaverse.	Reading
24	Yes	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	12	Q1	Business Horizons	2022	MA1	5	Science Direct	The paper highlights the current lack of knowledge of the metaverse's tre potential in businesses. It denouces the inability to understand the true concept of falsity and its customer-centric view. It describes both the positive and negative impacts of falsity via AR, VR and NeR. It provides a guide on how to manage such Sinthetic Customer Experience: reality precision, market making, enrichment of customer understanding. It as useful in terms of metaverse's dynamics of implementation.	Reading
25	Yes	Hollensen, S., Kotler, P., & Opresnik, M. O.	Metaverse – the new marketing universe	47	Q2	Journal of Business Strategy	2022	MA1	5		The document provides the 8 building blocks of the metaverse by M. Ball (hardware; networking; compute; virtual platforms; interchange standards and tools; payments; content, services and assets; consumer and business behaviours) and thus frames the current functioning of the metaverse. It was useful to understand and collect information on the dynamics characterising current implementations.	Reading
26	Yes	Park, S.-M., & Kim, Y.-G.	A Metaverse: Taxonomy, Components, Applications, and Open Challenges	158	Q1	IEEE Access	2022	MA1	5		This paper utilised systematic literature reviews techniques to obtain reliable references. It is of interest because it investigates current technologies and components of the metaverse. It also provides examples of applications and directions of implementation wich are of particular interest, particularly referred to Roblox. It is however important to note that the document is not useful in its entierity because some chapters investigare with too specificity the technology.	Reading
27	Yes	Cheng, L.-K., Chieng, M.-H., & Chieng, W.-H.	Measuring virtual experience in a three-dimensional virtual reality interactive simulator environment: A structural equation modeling approach	48	Q1	Virtual Reality	2014	MA1	7		The study analyses the dimensions characterising VR experiences in order to verify their correlation and mediation relationships. The paper adresses the "flow" theory and its influence. It was employed as a source of data concerning the "flow" theory and its impacts. Moreover it defines how the qualities of a VR experience can affect dymensions such as loyalty.	Reading
28	Yes	Huotari, K., & Hamari, J.	Defining gamification - A service marketing perspective	760	Q1	Proceedings of the 16th International Academic MindTrek Conference 2012: "Envisioning Future Media Environments", MindTrek 2012	2012	MA2	2	Gamification and Mobile Marketing Effectiveness	The paper defines gamification from the perspective of service marketing, which was very useful considering the purpose of the review because it highlights the experiential nature of games and gamification. It starts from the game perspective and lends to defining the subjective nature of games and gamifications via service marketing pov.	Reading
29	Yes	Robson, K., Plangger, K., Kietzmann, J. H., McCarthy, I., & Pitt, L.	Is it all a game? Understanding the principles of gamification	394	Q1	Business Horizons	2015	MA2	2		The article is useful as it provides an interesting overview of gamification dynamics and parties involved (players, designers, spectators, observers), since it wants to highlight a gap in cademic literature regarding the understanding of gamification and its principles. It defines gamification in ters of applications, and its psychology. Afterward, it uses the MED framoework to explain the role of players, designers, spectators and observers in a gamified experience.	Reading
30	Yes	Blohm, I., & Leimeister, J. M.	Gamification: Design of IT-based enhancing services for motivational support and behavioral change	244	Q1	Business and Information Systems Engineering	2014	MA2	2	Gamification and Mobile Marketing Effectiveness	The article, cited by several other works already reviewed, provides an overview of gamification experiences in the IT universe, highlighting its potential. Although short, it captures many of the defining features of gamification, and it functions as a possible starting point for subsequent definitions. It also quotes the "flow" theory.	Reading
31	Yes	Hofacker, C. F., de Ruyter, K., Lurie, N. H., Manchanda, P., & Donaldson, J.	Gamification and Mobile Marketing Effectiveness	214	Q1	Journal of Interactive Marketing	2016	MA2	2		The study reenacts the four elements of player immersion and engagement outlined by Schell (story, mechanism, aesthetic, technology) by answering to twentytwo questions, ranging from the influece of genre to wearables. The paper is of interest as it analyses mobile gamification, which is the closest application of gamification to consumers to date.	Reading
32	Yes	Robson, K., Plangger, K., Kietzmann, J. H., McCarthy, I., & Pitt, L.	Game on: Engaging customers and employees through gamification	154	Q1	Business Horizons	2016	MA2	2		The same authors of "Is it all a game? Understanding the principles of gamification" start from this work's premise in order to further investigate the topic of gamification. They deepen the knowledge of the latter work, for instance introducing types of players. They analyse the dynamics of gamification on customers and employees via successful and unsuccessful cases.The idea is that of giving a guide to designers and managers in using appropriate gamification mechanisms. It is quite a useful article for our review.	Reading
33	Yes	Hwang, J., & Choi, L.	Having fun while receiving rewards? Exploration of gamification in loyalty programs for consumer loyalty	85	Q1	Journal of Business Research	2020	MA2	2	Science Direct	The paper covers the gap of how gamification in customer relationship management impacts customer behaviour. The study investigates the use of loyalty programs in current applications, employing the successful instance of Starbucks LP. In fact it wants to statistically verify seven hypothesis on: gamified loyalty programs' superiority, what influences its loyalty, the impact of playfullness and attitude toward the LP, and the final participation intention to the LP. As for the case of other studies, it employs the SOR framework and the social exchange theory. It was included in the review because it provides a good explenation of how gamified loyalty programs impact on customers in current implementations.	Reading
34	Yes	Jang, S., Kitchen, P. J., & Kim, J.	The effects of gamified customer benefits and characteristics on behavioral engagement and purchase: Evidence from mobile exercise application uses	52	Q1	Journal of Business Research	2018	MA2	2		The study verifies hypothesis on the matter of mobile gamification via the instance of mobile exercise applications. It employs a constructed data set of exercise and purchase activities from users of a South Korean app (Tranggle). It tries to verify the links between behavioural engagement and purchase, and epistemic benefits, social integrative benefits, personal integrative benefits, age and experience.It was selected beacuse it takes into consideration the engagement component.	Reading
35	Yes	Wolf, T., Weiger, W. F., Hammerschmidt, M.	Experiences that matter? The motivational experiences and business outcomes of gamified services	52	Q1	Journal of Business Research	2020	MA2	2		The paper has the goal of understanding how user experiences in gamified services can generate firm-beneficial user behavior (customer committment, willingness to pay, customer referrals). To do so, it employs service-dominant logic (S-D logic) and self-determination theory (SDT). The data collected for the study originates from a field survey across four service contexts. First, they examine the impact of gamification characteristics (e.g. socialisation) on customer committment, willingness to pay and customer referrals, via 10 hypothesis. Afterwards such verifiction are commented. Naturally, the impact of gamification on customer's behaviour was of great interest for the review.	Reading
36	Yes	Hsu, C., Chen, M.	How does gamification improve user experience? An empirical investigation on the antecedences and consequences of user experience and its mediating role	48	Q1	Technological Forecasting and Social Change	2018	MA2	2		It provides an overview of many founding concepts, including gamification, user esperience, brand loyalty and so further. Moreover, it addreses the experiential benefits guaranteed by gamification, linking these advantages to brand opportunities. It was included as it investigates the utilitarian and hedonic features of a gamified experience, and it outlines the importance of crucial dimensions like sociality and quality.	Reading
37	Yes	Yang, Y., Asaad, Y., & Dwivedi, Y.	Examining the impact of gamification on intention of engagement and brand attitude in the marketing context	191	Q1	Computers in Human Behavior	2017	MA2	6	Does gamification affect brand engagement and equity? A study in online brand communities	This study aims to examine gamification in a marketing context through a model with brand attitude as a dependant variable. The main objective is the examination of the relationship between behavioural intention of engagement and brand attitude. The paper tries to verify nine hypothesis regarding percieved usefullness, perceived ease of use, perceived social influence, and percieved enjoyment's influence on engagement and brand attitude. It takes into consideration the TAM model. It is useful as it links gamification and marketing via mediators of engagement.	Reading
38	Yes	Landers, R. N., Auer, E. M., Collmus, A. B., & Armstrong, M. B.	Gamification Science, Its History and Future: Definitions and a Research Agenda	130	Q2	Simulation and Gaming	2018	MA2	6		The document provides an investigation on gamification science, including contributions on game elements, costructs of moderation and mediation, and core differences between game design and gameful design. Therefore, it was a useful tools in terms of comparison between gamification and gaming, and in the understanding of their common grounds.	Reading
39	Yes	Xi, N., & Hamari, J.	Does gamification affect brand engagement and equity? A study in online brand communities	104	Q1	Journal of Business Research	2020	MA2	6		The paper is useful as its objective is to investigate the relationships between the three main categories of gamification features (immersion, achievement and social interaction-related),and the three main dimensions of brand engagement (emotional, cognitive and social) and further brand equity. In fact, it highlights a gap regarding the relationship between gamification and the different dimensions of brand engagement. To do so, they conducted an online survey among users of gamified brand communities of Xiaomi and Huawei. After highlighting the dimensions of immersion, achievement and social interaction, the study outlines the relationship between gamification and brand engagement and the one between brand engagement and brand equity, defining four hypothesis. From the verifications, the results are that: interaction with achievement-related gamification features is positively associated with cognitive brand engagement; interaction with social interaction-related gamification features is positively associated with social brand engagement; the three dimensions of brand engagement (emotional, cognitive and social) are positively associated with brand awareness.	Reading
40	Yes	Eisingerich, A.B., Marchand, A., Fritze, M.P., Dong, L.	Hook vs. hope: How to enhance customer engagement through gamification	80	Q1	International Journal of Research in Marketing	2019	MA2	6	Enhancing user engagement: The role of gamification in mobile apps	The study employs a mixed method design in order to explore key gamification principles affecting customer engagement, and then examines their relationships with digital sales (mainly in digital apps). The results identify the typical characteristics of gamification (social interaction, sense of control, goal and progress tracking, rewards, and prompts) as as motivators for customers to engage with apps. In particular, the paper focuses on the sense of hope. Manifestly, it was an important source of information to give strenght to the proposition of creativity (and consequent autonomy) and sociality as sources of customer engagement.	Reading
41	Yes	Nobre, H., & Ferreira, A.	Gamification as a platform for brand co-creation experiences	52	Q1	Journal of Brand Management	2017	MA2	6		The paper depicts gamification as an experiential process, where the consumer is voluntarily involved in value co-creation game activities that are seen as game service systems. It is the pov also employed in the review. After developing two hypothesis, results suggest that gamification can be used as a marketing tool that allows: (1) collecting data, opinions and ideas from consumers on products, forms, and moments of consumption, etc.; (2) helping with market segmentation and consumer profiles definition; (3) reinforcing the positioning and associations with innovation; (4) stimulating customers to visit the store (if applicable) in order to make the experience more tangible; (5) communicating directly with consumers; (6) promoting word-of-mouth and brand advocacy; (7) stimulating relationships between peers; (8) promoting brand experiences. Moreover, it was proven that gamification is a motivating factor, promoting the generation of groups and brand communities. Cognitive processing dimension: consumers seek gamified systems that promote an environment of fun, rewards, competition, social interactions, but, essentially, customization. Regarding the affection dimension, consumers pointed out the importance to be recognized, differentiated, considered, and listened to by the brands. Regarding the activation dimension, players seek benefits and show availability and willing in adhering, suggesting and recommending gamified experiences.	Reading
42	Yes	Bitrián, P., Buil, I., & Catalán, S.	Enhancing user engagement: The role of gamification in mobile apps	47	Q1	Journal of Business Research	2021	MA2	6		The paper addresses the gap in literature related to how gamification can increase user engagement and thus forster positive outcome, in the case of mobile apps. To do so, the study employs the SSMMD model that recognises gamification's dimensions (competence , autonomy and relatedness) and relates them to social, immersion and achievement features. Since the employment of digita tools in gamification applications is of interest, the paper is included in the review. After studying 7 hypothesis, the results that interest aour review are: H1, H2C, H3C, H4.	Reading
43	Yes	Malik, N., Wei, Y., Appel, G., & Luo, L.	Blockchain technology for creative industries: Current state and research opportunities	3	Q1	International Journal of Research in Marketing	2022	MA3	9	Science Direct	Initially, the paper investigates the characteristics of blockchain that hold back their development in several markets (e.g. lack of stanrdardisation). Afterwards, NFTs functioning and applications are deepen as the creative tool of blockchain technology. Finally, some research opportunities related to NFTs are shared. The work is useful as it provides further information on the functioning of NFTs and blockchain, and their opportunities marketing wise.	Reading
44	Yes	Valeonti, F., Bikakis, A., Terras, M., Speed, C., Hudson-Smith, A., & Chalkias, K.	Crypto collectibles, museum funding and openGLAM: Challenges, opportunities and the potential of non-fungible tokens (NFTs)	30	Q2	Applied Sciences	2021	MA3	9		The paper addresses the theme of NFTs and their employment through the instance of the heritage sector selling ownership of digitised images of collections items. It deepens the history of NFTs and their functioning, also via the blockchain emergence. The paper was useful in order to understand the functioning of NFTs (smart contracts, costs and risks, storage) which consititute a great asset in the metaverse, especially in decentralised platforms. Indeed they can be employed also for marketing use. Moreover it investigates the use of the OpenGLAM initiative, which however does not concern the review.	Reading
45	Yes	Wilson, K. B., Karg, A., & Ghaderi, H.	Prospecting non-fungible tokens in the digital economy: Stakeholders and ecosystem, risk and opportunity	27	Q1	Business Horizons	2022	MA3	9		The article provides a useful overview on NFTs' history and functioning, investigating the role of blockchain, the opportunities given and the protagonists influencing the NFTs market. It addresses topics like: the utility of the Ethereum blockchain; the new trend of digital collectibles; the possible related content creators; smart contracts. The knoledge shared in this paper was employed to fully understand the promise of NFTs in the metaverse.	Reading
46	Yes	Aste, T., Tasca, P., & di Matteo, T.	Blockchain Technologies: The Foreseeable Impact on Society and Industry	359	Q1	Computer	2017	MA3	10		The paper provides an overview of blockchain technologies and, in particular, it investigates cryptocurrency via the Bitcoin instance. The functioning of a blockchain structure and its protagonists (e.g., miners) were the core information needed for the review. In fact, transactions in the metaverse are posisble via the use of cryptocurrencies.	Reading
47	Yes	Hassani, H., Huang, X., & Silva, E.	Big-crypto: Big data, blockchain and cryptocurrency	42	Q2	Big Data and Cognitive Computing	2018	MA3	10		The paper investigates the use of blockchain and serves as further source of information on the matter. In fact, it deepens the cryptocurrency topic, and its functioning. There are also further insights on its connection with artificial intelligence and big data.	Reading
48	Yes	Hughes, A., Park, A., Kietzmann, J., & Archer-Brown, C.	Beyond Bitcoin: What blockchain and distributed ledger technologies mean for firms	139	Q1	Business Horizons	2019	MA3	10		The paper provides further insights on blockchain technologies and their applications, exploring in particular its application on different sectors. The work was used as a further source to gain full information on the matter.	Reading
49	Yes	Brodie, R. J., Hollebeek, L. D., Jurić, B., & Ilić, A.	Customer engagement: Conceptual domain, fundamental propositions, and implications for research	1946	Q1	Journal of Service Research	2011	MA4	8		The paper presented five fundamental propositions to define customer engagement, concerning multidimensionality, psychological determinants and interactive experiences. It represents the basis onto which the whole concept of customer engagement was addressed in the review, as it provides an overview of the definition and dimensions tackled by other studies.	Reading
50	Yes	Harmeling, C. M., Moffett, J. W., Arnold, M. J., & Carlson, B. D.	Toward a theory of customer engagement marketing	465	Q1	Journal of the Academy of Marketing Science	2017	MA4	8		The paper investigates via a literature review the role played by customer engagement in the marketing field, highlighting the great role played by customers themselves as promoters. The study also outlines the role of firms in ehnacing this co-creative behaviour. It is of interest the investigation on experiential engagement initiatives because it might strongly relate to the dynamics of experiences in the metaverse (via gamification or not). The work also provides several examples for each detail of customer engagement marketing. They used a before-and-after, quasi-experimental design to test the effects of experiential engagement initiatives on customer engagement	Reading
51	Yes	Hollebeek, L.	Exploring customer brand engagement: definition and themes	708	Q2	Journal of Strategic Marketing	2011	MA4	8	A Critical Analysis of Consumer Engagement Dimensionality	The review highlights gaps in literature with respect to the definition of nature, dimensionality and measurement of customer engagement. In fact, it proposes a conceptualisation of Customer Behavioural Engagement. It is a literature review, thus it is of interest as it provides complete information on the topic, moreover it uses data from a survey taken in New Zealand). Furthermor. The author, Linda Hollebeek, is the author of several other documents on the matter, few of which are part of the review. This work in particular was useful for its contribution on multidimensionality.	Reading
52	Yes	Jaakkola, E., & Alexander, M.	The Role of Customer Engagement Behavior in Value Co-Creation: A Service System Perspective	706	Q1	Journal of Service Research	2014	MA4	8		The study was particularly relevant as it outlined four typologies of behavioural customer engagement based on the purposes to which customers may answer when employing their resources (augmenting, codeveloping, influencing, mobilising). Moreover, it links them to customer and stakeholder's reactions via nine propositions, proving for instance how organizations can improve and differentiate their offering by incorporating customers and other stakeholders' resources invested via codeveloping or augmenting behaviors, ceding control.	Reading
53	Yes	Kumar, V., Aksoy, L., Donkers, B., Venkatesan, R., Wiesel, T., & Tillmanns, S.	Undervalued or overvalued customers: Capturing total customer engagement value	789	Q1	Journal of Service Research	2010	MA4	8		The study addresses the concept of custoemr engagement, deepeining its core value factors defined: customer lifetime value, customer referral value, customer influencer value, and customer knowledge value. The paper also links them to the three dimensions recognised by the paper: behavioural, attitudinal and network (thus social). The study allowed for the collection of further information on the concept of customer engagement and its framework.	Reading
54	Yes	Kuvykaitė, R., & Tarutė, A.	A Critical Analysis of Consumer Engagement Dimensionality	3	Q1	Procedia - Social and Behavioral Sciences	2015	MA4	8	Science Direct	The short paper serves as a tool to indentify the marketing literature trends reguarding customer engagement and its defining dimensions, including the ones chosen (cognitive, emotional, behavioural).	Reading

	A	B	C	D	E	F	G	H	I	J	K	L
55	Yes	Mollen, A., & Wilson, H.	Engagement, telepresence and interactivity in online consumer experience: Reconciling scholastic and managerial perspectives	785	Q1	***Journal of Business Research***	2010	MA4	8	*Customer engagement: Conceptual domain, fundamental propositions, and implications for research*	The paper was particularly useful as it deepens information on dimensions of customer engagement, such as presence and interactivity, taking into consideration the SOR model and customer experience. In fact, via three propositions is investigates telepresence's antecedent nature, suggesting interactivity as one of them. Moreover, it addresses a definition of online engagement as a form of cognitive and affective commitment.	Reading
56	Yes	Pansari, A., & Kumar, V.	Customer engagement: the construct, antecedents, and consequences	757	Q1	***Journal of the Academy of Marketing Science***	2017	MA4	8		The paper provides optimal insights on the history of customer engagement in the marketing field, supporting the concepts with strong instances, such as the one of Dove's campaign. It tackles thirteen propositions on the themes of customer satisfaction, emotions and engagement. Based on the results, the study develops a customerengagement matrix, classifying customers' strategy into frour quadrants (passion, true love, indifference, attraction) based on their positioning in terms of emotions and satisfaction.	Reading
57	Yes	van Doorn, J., Lemon, K. N., Mittal, V., Nass, S., Pick, D., Pirner, P., & Verhoef, P. C.	Customer engagement behavior: Theoretical foundations and research directions	1986	Q1	***Journal of Service Research***	2010	MA4	8		The paper investigates the behavioural dimension of custoer engagement, highlighting what goes beyond the mere transaction and the co-creational aspect. It deepend the concept of CEB via further connected dimensions (valence, form or modality, scope, nature of its impact, and customer goals). The paper also outlines the antecedents and consequences of CEB. The antedecents were particulrly of interset for the review. The study also details the temporal aspects of CEB and its natural change in a relationship with the customer.	Reading
58	Yes	Sheth, J. N., Sisodia, R. S., & Sharma, A.	The Antecedents and Consequences of Customer-Centric Marketing	520	Q1	***Journal of the Academy of Marketing Science***	2000	MA4	11		The paper investigates the origins of customer-centric marketing in the late nineties and the events that lead to the birth of the methodology. It was a good source for the understanding of the event, as it academically analyses the the path then followed by companies, the antecedents and the consequences that affected the marketing field.	Reading
59	rep-Yes		Virtual and augmented reality: Advancing research in consumer marketing	103	Q1	***International Journal of Research in Marketing***	2020	MA1	3		repetition search 1	
60	rep-Yes		Virtual and augmented reality: Advancing research in consumer marketing	102	Q1	***International Journal of Research in Marketing***	2020	MA1	4		repetition search 1	Reading
61	rep-Yes		What is augmented reality marketing? Its definition, complexity, and future	40	Q1	***Journal of Business Research***	2022	MA1	5		repetition search 4	Reading
62	rep-Yes		Virtual and augmented reality: Advancing research in consumer marketing	103	Q1	***International Journal of Research in Marketing***	2020	MA1	7		repetition search 1	Reading
63	rep-Yes		Gamification and Mobile Marketing Effectiveness	214	Q1	***Journal of Interactive Marketing***	2016	MA2	6		repetition research 2	Reading
64	rep-No		Transforming the Customer Experience Through New Technologies	167	Q1	***Journal of Interactive Marketing***	2020	MA1	4		repetition search 3	Reading
65	rep-No		Transforming the Customer Experience Through New Technologies	167	Q1	***Journal of Interactive Marketing***	2020	MA1	7		repetition research 3	Reading
66	rep-No		Gameful Experience in Gamification: Construction and Validation of a Gameful Experience Scale [GAMEX]	104	Q1	***Journal of Interactive Marketing***	2018	MA2	6		repetition research 2	Reading
67	No		"It's an illusion, but it looks real!" Consumer affective, cognitive and behavioural responses to augmented reality applications	164	Q1	***Journal of Marketing Management***	2016	MA1	1		not accessible	NA
68	No		Augmented reality marketing: A technology-enabled approach to situated customer experience	65	Q1	Australasian Marketing Journal	2020	MA1	1		not accessible	NA
69	No		Blending the real world and the virtual world: Exploring the role of flow in augmented reality experiences	50	Q1	***Journal of Business Research***	2021	MA1	1		not accessible	NA
70	No		What's Mine Is a Hologram? How Shared Augmented Reality Augments Psychological Ownership	45	Q1	***Journal of Interactive Marketing***	2019	MA1	1		The paper investigates the relationship between AR and customers in terms of psychological ownership, particularly in a social context. The relation is investigated via three studies on control over visual aspects of AR customization, shared hologram experience and the adaptability of a user to AR. Although interesting, it does not include the dimensions we are interested in.	Reading
71	No		Experiential exposure to texting and walking in virtual reality: A randomized trial to reduce distracted pedestrian behavior	38	Q1	Accident Analysis and Prevention	2017	MA1	1		not related	Title
72	No		Augmented or admented reality? The influence of marketing on augmented reality technologies	37	Q1	Information Communication and Society	2015	MA1	1		not accessible	NA
73	No		Consumer experiences of virtual reality: Insights from VR luxury brand fashion shows	37	Q1	***Journal of Business Research***	2021	MA1	1		It investigates only VR applications. It posed the objective of broadening the perspective on VR marketing communications and consumption experiences. To achieve it, the study anayses the answers of twenty participants from South Korea who experienced a staged VR luxury brand fashion show, and were then asked to reflect on their experiences. The analysis focused on three themes: VR as democratization, VR as embodied escapism, and VR as actualized anxiety. However, it is more of a onthological/political statement and thus is distant from the purpose of the research.	Reading
74	No		New realities: a systematic literature review on virtual reality and augmented reality in tourism research	319	Q1	Current Issues in Tourism	2019	MA1	3		not related (tourism)	Title
75	No		Transforming the Customer Experience Through New Technologies	167	Q1	***Journal of Interactive Marketing***	2020	MA1	3		The paper investigates on innovative current technology application in the shopping field. After describing each typology of AI-powered new technologies, including AR/VR/MR, it allocates each technology to the relative segment of the customer journey, based on its usefullness and its framework. Furthermore, it presents future research ideas. Although interesting, the document does not focus on XRs technology only, but depicts a more vague picture of current technologies and their applications. Thus, this limited pov does not add any useful information for the review.	Reading
76	No		Virtual Reality (VR) & Augmented Reality (AR) technologies for tourism and hospitality industry	77	Q4	International Journal of Engineering and Technology(UAE)	2018	MA1	3		not related (tourism)	Title
77	No		Research progress on virtual reality (VR) and augmented reality (AR) in tourism and hospitality: A critical review of publications from 2000 to 2018	73	Q1	Journal of Hospitality and Tourism Technology	2019	MA1	3		not related (tourism)	Title
78	No		The role of elaboration likelihood model in consumer behaviour research and its extension to new technologies: A review and future research agenda	30	Q2	International Journal of Consumer Studies	2021	MA1	3		The research analyses the elaboration likelihood model (ELM) application to vr and ar. However, the specifics of such research are not of interest for the review.	Abstract
79	No		The impact of representation media on customer engagement in tourism marketing among millennials	39	Q1	***European Journal of Marketing***	2019	MA1	4		not related (tourism)	Title
80	No		The metaverse in the hospitality and tourism industry: An overview of current trends and future research directions	43	Q1	Journal of Hospitality Marketing and Management	2022	MA1	5		not related (tourism, hospitality)	Title
81	No		Educational applications of metaverse: Possibilities and limitations	82	Q2	Journal of Educational Evaluation for Health Professions	2021	MA1	5		not related (education)	Title
82	No		Quality of virtual reality and its impacts on behavioral intention	55	Q1	International Journal of Hospitality Management	2020	MA1	7		not related (tourism, hospitality)	Abstract
83	No		VR is on the edge: How to deliver 360- videos in mobile networks	114	-	VR/AR Network 2017 - Proceedings of the 2017 Workshop on Virtual Reality and Augmented Reality Network, Part of SIGCOMM 2017	2017	MA1	7		The paper is extremely focused on technical issues that do not fit the goal of the search, as in fact a 360°-video does not fit the brief of metaverse.	Abstract
84	No		Integrating virtual reality devices into the body: effects of technological embodiment on customer engagement and behavioral intentions toward the destination	51	Q1	***Journal of Travel and Tourism Marketing***	2019	MA1	7		not related (tourism)	Abstract
85	No		Video Coding Optimization for Virtual Reality 360-Degree Source	99	Q1	IEEE Journal on Selected Topics in Signal Processing	2020	MA1	7		The paper is extremely focused on technical issues that do not fit the goal of the search, as in fact a 360°-video does not fit the brief of metaverse.	Abstract
86	No		Non-immersive virtual reality technologies in real estate: How customer experience drives attitudes toward properties and the service provider	43	Q1	***Journal of Retailing and Consumer Services***	2020	MA1	7		not related (real estate)	Title
87	No		Gamification and the online retail experience	89	Q1	International Journal of Retail and Distribution Management	2014	MA2	2		The article wants to answer to two research questions: How do consumers derive entertainment experiences from partaking in online shopping? How do consumers respond to the inclusion of game mechanics within online retail experiences? Naturally, only the second question would be of the review's interest, but it did not inform the study as expected, thus it was not included. The paper develops in three parts: the theory and mechanics of the gamification of non-game environments; the role of such game elements in influencing online customer experience and present cases of existing retailers activities in this area; in-depth qualitative study into the role of such game elements in the online shopping process; guide for retailers to successfully "gamify" their online stores. To answer to the two questions, the paper proposed a qualitative analysis based on a sample consisting of 19 UK consumers who purchased fashion clothing items online.	Reading
88	No		Motivational effects and age differences of gamification in product advertising	123	Q1	Journal of Consumer Marketing	2014	MA2	2		not related (sports)	Abstract
89	No		The application and impact of gamification funware on trip planning and experiences: the case of TripAdvisor's funware	108	Q1	Electronic Markets	2015	MA2	2		not related (tourism)	Title
90	No		Gameful Experience in Gamification: Construction and Validation of a Gameful Experience Scale [GAMEX]	103	Q1	***Journal of Interactive Marketing***	2018	MA2	2		The paper has the aim of filling a gap by developing a gameful experience scale (GAMEX), as a result of six studies, and demonstrating its reliability and validity. This level of specificity in terms of scale does not interest the review as it does not come useful in our analyses.	Reading
91	No		The use of gamification mechanics to increase employee and user engagement in participative healthcare services: A study of two cases	68	Q1	Journal of Service Management	2017	MA2	2		not related (healthcare)	Title
92	No		Gamification in e-learning: Introducing gamified design elements into e-learning systems	62	Q4	Journal of Computer Science	2015	MA2	2		not related and Q4	Title
93	No		Governments Should Play Games: Towards a Framework for the Gamification of Civic Engagement Platforms	54	Q2	***Simulation and Gaming***	2017	MA2	2		not related	Title
94	No		Gamification of Creativity: Exploring the Usefulness of Serious Games for Ideation	51	Q1	Creativity and Innovation Management	2015	MA2	2		not related	Abstract
95	No		Applying basic gamification techniques to it compliance training: Evidence from the lab and field	47	Q1	Journal of Information Systems	2016	MA2	2		not related (training)	Title
96	No		Gamification in Management: Between Choice Architecture and Humanistic Design	39	Q1	Journal of Management Inquiry	2019	MA2	2		not related (management)	Abstract
97	No		Gamification and serious game approaches for adult literacy tablet software	38	Q3	Entertainment Computing	2014	MA2	2		not related (literacy)	Title
98	No		When gamification backfires: the impact of perceived justice on online community contributions	32	Q1	***Journal of Marketing Management***	2020	MA2	2		not related (focuses on negative repercussions)	Title
99	No		A qualitative investigation of gamification: Motivational factors in online gamified services and applications	31	Q3	International Journal of Technology and Human Interaction	2015	MA2	2		Q3	Q3
100	No		Tourists as Mobile Gamers: Gamification for Tourism Marketing	131	Q1	***Journal of Travel and Tourism Marketing***	2016	MA2	6		not related (tourism)	Title
101	No		Design approaches for the gamification of production environments. A study focusing on acceptance	42	-	8th ACM International Conference on PErvasive Technologies Related to Assistive Environments, PETRA 2015 - Proceedings a6	2015	MA2	6		not sure about its origin (quartile)	No clear source quartile
102	No		The impact of gamification adoption intention on brand awareness and loyalty in tourism: The mediating effect of customer engagement	40	Q1	Journal of Destination Marketing and Management	2021	MA2	6		not related (tourism)	Title
103	No		Construction payment automation using blockchain-enabled smart contracts and robotic reality capture technologies	39	Q1	Automation in Construction	2021	MA3	9		The paper deeply details a newfound method for an autonomous payment administration solution, which integrates blockchain-enabled smart contracts and robotic reality capture technologies. However, from a superficial reading, the study is too technically focused on aspects of blockchain technologie that do not inetrest the review.	Reading
104	No		Applications of blockchain technology beyond cryptocurrency	108	Q2	Annals of Emerging Technologies in Computing	2018	MA3	10		The features investigated are those of security and privacy in machine-to-machine interchanges, such as in the instance of an IoT ecosystem, therefore is not related to the metaverse topic and it is irrelevant for the review.	Reading
105	No		Socialism and the blockchain	53	Q2	Future Internet	2016	MA3	10		Political nuances do not interest the research	Abstract
106	No		Toward Fairness of Cryptocurrency Payments	39	Q1	IEEE Security and Privacy	2018	MA3	10		It investigated too specificly the topic of cryptocurrencies instances, which do not interest the review, as the focus (blockchain wise) is on NFTs.	Abstract
107	No		A petri nets model for blockchain analysis	37	Q2	Computer Journal	2018	MA3	10		not accessible	NA

	A	B	C	D	E	F	G	H	I	J	K	L
108	No		A comparative study of bitcoin price prediction using deep learning	78	Q1	Mathematics	2019	MA3	10		Detailed economical investigations on bitcoin and blockchain's functioning is not of interest.	Title
109	No		Understanding the motivations, challenges and needs of Blockchain software developers: a survey	40	Q1	Empirical Software Engineering	2019	MA3	10		Analysis on motivators of blockchain developers do not interest the research.	Abstract
110	No		Bitcoin and Blockchain: Security and Privacy	48	Q1	IEEE Internet of Things Journal	2020	MA3	10		The privacy and security matters does not concern this research.	Title
111	No		Policy uncertainty and Bitcoin returns	30	Q2	Borsa Istanbul Review	2020	MA3	10		The privacy and security matters does not concern this research.	Title
112	No		Customer engagement and the relationship between involvement, engagement, self-brand connection and brand usage intent	232	Q1	***Journal of Business Research***	2018	MA4	8		It applies customer engagement theories to the tourism social media context, thus is not of interest fro the review.	Reading
113	No		Customer Engagement as a New Perspective in Customer Management	622	Q1	***Journal of Service Research***	2010	MA4	8		It is simply a summary of current research, thus it did not provide particularly usefu information.	Reading
114	No		Demystifying customer brand engagement: Exploring the loyalty nexus	784	Q1	***Journal of Marketing Management***	2011	MA4	8	*A Critical Analysis of Consumer Engagement Dimensionality*	not accessible	NA
115	No		Customer engagement: Exploring customer relationships beyond purchase	1137	Q1	Journal of Marketing Theory and Practice	2012	MA4	8		not accessible	NA
116	No		Corporate social responsibility in business-to-business markets: How organizational customers account for supplier corporate social responsibility engagement	221	Q1	***Journal of Marketing***	2013	MA4	8		not related market (B2B)	Title
117	No		Co-creation and higher order customer engagement in hospitality and tourism services: A critical review	236	Q1	International Journal of Contemporary Hospitality Management	2016	MA4	8		not related (tourism, hospitality)	Title
118	No		Customer empowerment in tourism through consumer centric marketing (CCM)	80	Q2	Qualitative Market Research	2007	MA4	11		not related (tourism)	Title
119	No		Customer-centric marketing with internet coupons	36	Q1	Decision Support Systems	2008	MA4	11		Too specific on the topic of coupons, which do not interest the review.	Abstract
120	No		Entrepreneurial marketing: Acknowledging the entrepreneur and customer-centric interrelationship	110	Q2	***Journal of Strategic Marketing***	2010	MA4	11		not related (entrepreneurial)	Title
121	No		Integrated marketing communication – from an instrumental to a customer-centric perspective	43	Q1	***European Journal of Marketing***	2017	MA4	11		It did not depeen the orging of customer-centric dynamics as it only focused on communication.	Reading

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