What Does the Metaverse Have to Offer?
Exploring Value Propositions in Metaverse Gaming Platforms
A Comparative Case Study by Using the MAIN Model

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ABSTRACT

As the advancement of media and communication technology is opening the possibility of hyper-realistic virtual interaction, the notion of the metaverse with extended reality technology is often debated academically and socially. Consequently, there are many old and new gaming platforms that compete to offer the metaverse experience, bringing the users into the diverse virtual worlds they have created. However, due to the relative newness of the metaverse gaming platforms, the various values that different platforms offer to users have rarely been examined. Considering the increasing competition between gaming companies and the wide adoption of metaverse games, understanding the value propositions these platforms provide became essential. Thus, this research is aimed to answer the following question: *How do gaming companies provide value propositions for metaverse games?* To analyze the value propositions of the metaverse games in consideration of the complexity of the technological attributes these platforms obtain, the MAIN model (Modality, Agency, Interactivity, and Navigability), which is a theoretical tool invented to examine new media gratifications, was utilized to explore how gaming companies understand gratifications and how the corresponding values are delivered to users in an organized manner. By using qualitative comparative case studies, a total of 10 metaverse gaming platforms were selected and analyzed based on the possible MAIN model-based gratifications. The data consists of articles, observation notes, and screenshots from gaming companies' official websites and blogs, press, social media, and actual games or gameplay videos. A total of 14 themes were expected and 4 new themes were found. While most MAIN-model gratifications were visible in the metaverse gaming platforms, the findings suggest that Agency-based value propositions showed the most robust patterns as the platform environment promoted users to contribute their actions through various activities. Gratifications related to conventional video games are only partially relevant, and technologically embedded gratifications are implicit and intertwined with many other gratifications. The research found that the different metaverse platforms share similar value propositions although they are offered differently. This research contributes to the development of the uses-and-gratifications approach and the MAIN model but also suggests insights into creating innovative value propositions for gaming businesses.

KEYWORDS: *Metaverse, Gaming platform, Value propositions, Uses and Gratifications, MAIN model*

PREFACE

My journey with this thesis project was never easy as it challenged me many times, in many ways; I mentally struggled a lot due to the lack of confidence in the project, time-managing, knowledge gap, and balancing the workload, while my expectations of myself were too high. Despite these vulnerabilities I had, there are many people who helped me to continue working on this thesis project, which encouraged me to be confident and develop the project to be more interesting.

First, I would like to thank my supervisor, Matthijs Leendertse, for guiding my thesis, sharing supportive feedback, understanding my concerns, and helping me to successfully complete my research. Thanks to your sharp feedback, I could find the focus on the topic and try to create more critical, concrete arguments. Thank you to my coach Charlie Freestone, for always supporting me and thinking along with me whenever I felt stuck. I truly appreciate your openness to discuss the subject matter that made me struggle. Sharing your insight into gaming helped me to broaden my perspective. And special thanks to my biggest supporter, Koen, who encouraged and trusted me to continue whenever I was in self-doubt.

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Table of Contents

List of Figures

List of Tables

List of Abbreviations

AR   Augmented Reality

DLC   Downloadable Content

MAIN   Modality, Agency, Interactivity, and Navigability

MMORPGs   Massively Multiplayer Online Role-Playing Games

MR   Mixed Reality

NFTs   Non-Fungible Tokens

RQ   Research Question

UGC   User-Generated Content

U&G   Uses and Gratifications

VR   Virtual Reality

XP   Experience Points

XR   Extended Reality

3D   Three-Dimensional

1. Introduction

The virtual world and extended reality (XR) technology have never been considered more significant than now, especially after the COVID-19 pandemic happened. Many individuals looked for ways to meet and interact with other people online, and even after the pandemic, working at home became a "new normal" thing. Consequently, many tech giants looked for opportunities and the industry started competing to capture the value from the evolving market. Facebook rebranded itself to Meta in 2021 and invested heavily to build its own "metaverse" (Kraus et al., 2022). Microsoft invested in the gaming sector by acquiring Activision Blizzard, while Epic Games collaborated with Sony to expand the resources to build the "metaverse" (Ball, 2022). The term "metaverse" has arisen as an industry buzzword, encouraging many companies to innovate.

The metaverse, which originated in the novel *Snow Crash* by Neal Stephenson (1992), is a term used to indicate a three-dimensional (3D) virtual reality (VR) world. The prefix *meta* means transcendence or virtual and the word *universe* signifies the world (Lee & Kim, 2022). In the movie *Ready Player One*, the metaverse is depicted as a platform called OASIS, where people meet, play, and live with each other (Lee & Kim, 2022). Second Life, for example, was seen as the antecedent of the metaverse as it allows users to create avatars and worlds and engage in social activities (Dwivedi et al., 2022). Although some would argue that the metaverse is a term developed by Silicon Valley (Scheiding, 2022), it is worth debating as the concept is viewed as a foundation of new Web 3.0 connectivity platforms. If Web 1.0 connected people online and Web 2.0 connects people to an online community, Web 3.0 can connect people to a community-owned virtual environment, and the metaverse is at the core of the development of this Web 3.0 (Lee & Kim, 2022).

In the understanding of the opportunity that the metaverse brings, significantly more and more tech and gaming brands have attempted to explore the possibility of the metaverse by collaborating with other gaming firms and organizing interactive and personalized experiences for their consumers (Ball, 2022; Lee & Kim, 2022). Naturally, the gaming industry formed a core of the metaverse network due to the related technology, infrastructure, and resources they had, which can embody the metaverse (Chess & Consalvo, 2022). Game engines, such as Unity and Unreal, are positioned as an underlying system of the metaverse, offering fundamental tools for 3D creation across multiple genres (Chia, 2022). Existing gaming platforms like Roblox and Fortnite, have been associated as an embodiment of the metaverse (Dwivedi et al., 2022), while other new metaverse platforms, such as Decentraland and Horizon Worlds consecutively emerged. As the competition

between gaming and tech companies to become a fundamental platform for the metaverse increases, the value that these games deliver to their target audience becomes more significant than ever.

The number of daily active users in Roblox has expanded to 67.3 million in 2023 and has increased by 22% every year (Roblox, 2023). Among the many types of value that the metaverse gaming platforms offer, customizing avatars on the metaverse platforms became an important aspect of both self-expression and socialization. Especially, for the younger generation, the meaning of avatars and virtual identities is as significant as their real-life identities (Lee & Kim, 2022). Further, the avatar is not the only thing to express oneself. By creating virtual artifacts, worlds, or even feelings, the possibility of creation increases as people are encouraged to unleash their creativity (Dwivedi et al., 2022). Face-to-face virtual communication and interaction through avatars is another significant development, which highly enhanced the sense of "being there" compared to video calls (Davis et al., 2009).

Although there has been a growing body of literature related to the metaverse's definition and its future implications for the past few years (Dwivedi et al., 2022), not many studies examined how the current applications of the metaverse look like and what values the metaverse gaming platforms offer to users. Further, because the majority of previous studies on the metaverse before 2020 focused primarily on Second Life, studies on the newly emerged metaverse platforms since 2020 are required (Park & Kim, 2021). In order to explore the value propositions related to the various metaverse gaming platforms, it is necessary to look at how those platforms' systems and affordances are designed to satisfy users' needs. The value propositions are constructed by companies based on the understanding of the customers (Osterwalder et al., 2015), starting from a question like, 'Which problems are there to solve?', while the uses-and-gratifications (U&G) approach has been actively adopted specifically in media studies to investigate users' motivations for consuming media (Wu et al., 2010), asking similar questions as 'Why do people use this medium?'

Basically, both value propositions and U&G tap into the same subject matter, commonly scrutinizing what the medium or specific media product can offer and satisfy the needs of users. Specifically, the U&G approach can offer a fundamental understanding of how the value propositions were developed. Although there is a clearly equivalent relationship between value propositions and U&G, the academic discussion falls short on how users' gratifications are understood by companies to design and deliver value propositions. Thus, examining the understood or expected gratifications of metaverse games from a gaming company's perspective can help us to comprehend how and why a certain

value proposition is offered. This approach is meaningful; users' actual gratifications often do not necessarily correspond to the intended value of the companies (Holttinen, 2014). This means offered value propositions can be wrongly interpreted or used for different gratifications. As the previous U&G studies mainly focused on users' gratifications, which is the end result, the process of how businesses construct gratifications is highly unexplored. This became more important to understand because the gaming companies, as a part of the creative industry, compete on, capture, and create value through constant innovation in their gaming products, including in respective interfaces and content, to take the lead in the industry (Landoni et al., 2020). Therefore, in order to understand offered value of metaverse games, the following research question (RQ) had been devised: *How do gaming companies provide value propositions for metaverse games?*

However, the problem lies in that the previous U&G studies tried to explain too broad a range of psychological needs, making it difficult to be applied to technologically advanced new mediums, including metaverse gaming platforms. Furthermore, the suggested gratifications are repetitive for such different mediums; while media technology evolves at a fast pace, the exact same gratifications are repeatedly found. For example, escapism is suggested as the gratification of newspapers (Berelson, 1949), television (Greenberg, 1974), social media (Joinson, 2008), and games (Lucas & Sherry, 2004). Not many new gratifications are found while newspapers and games are significantly different mediums that own completely different user interfaces (Sundar & Limperos, 2013).

To solve this issue, Sundar & Limperos (2013) suggested a new paradigm of the U&G approach to reflect the development of a new media environment and information technology. The MAIN model (Sundar, 2008), namely Modality, Agency, Interactivity, and Navigability, explains how gratifications can be suggested by the technological attributes of the medium. In other words, the MAIN model is a new U&G approach that considers technology as a source of various gratifications. According to Sundar & Limperos (2013), the model is especially useful in analyzing new, complex media, such as metaverse platforms like Second Life. Although the model has been actively used in current studies regarding newer media, including social media (Rathnayake & Winter, 2018), messenger apps (Waddell, 2016; Yang & Lin, 2022), and streaming platforms (Evens et al., 2023; Zhang et al., 2023), it has not been used for gaming. In order to examine the value propositions of newly emerging metaverse platforms in understanding the technological complexity it has, the main research question above is divided into the following four sub-RQs based on MAIN model-based gratifications:

sub-RQ1. *How do gaming companies offer modality-based gratifications in metaverse games?*

sub-RQ2. *How do gaming companies offer agency-based gratifications in metaverse games?*

sub-RQ3. *How do gaming companies offer interactivity-based gratifications in metaverse games?*

sub-RQ4. *How do gaming companies offer navigability-based gratifications in metaverse games?*

Based on the suggested RQs, a qualitative case study was conducted to understand the context of value propositions and find patterns throughout the multiple cases of metaverse games. The research was aimed at uncovering differences between platforms and finding possible patterns in value propositions by looking into each MAIN model-based possible gratifications in an in-depth manner. Identifying the context throughout the cases can help scholars to discuss diverse applications of the metaverse in gaming and understand the offered gratifications of those platforms. The research can also help in enriching the discussion on the new potential gratifications of gaming platforms, considering the interpersonal communication aspect has increased. Moreover, the research can demonstrate the different applications of the MAIN model on the U&G of new media, further testing and developing the model to understand other types of new media.

This research paper consists of five big chapters. The next part of the chapter discusses the main theoretical concepts that underlie the research questions. The definition of the metaverse and metaverse games, value propositions and the importance of the technology in value proposition innovation, and the U&G with the MAIN model are explored in order. After familiarizing ourselves with these concepts, the Method chapter explains the methodologies, data, and operationalization utilized for this research. The Result section presents the 18 final themes, found in the context of 10 chosen cases, based on the four dimensions of the MAIN model in a detailed manner by using figures and tables. Finally, in the Conclusion and Discussion chapter, the answer to the research questions, key takeaways from the results, and the limitation and future implications of this study are formulated.

Lastly, the result of this study can contribute to gaming companies growing their businesses. Since this research is highly focused on the business aspect of gaming companies, the outcome of this thesis could help gaming companies to further improve their value propositions for users, particularly through these newly emerging metaverse platforms.

The results can be used to understand the pattern of the current phenomenon regarding what direction of innovation the metaverse gaming platforms are heading and how the values are created and offered by the major gaming companies. For small gaming companies, this information can be useful in developing the game product and devising compatible value propositions, while, for bigger companies, it suggests the overview of how the current industries understand the needs of users and how those needs are fulfilled in different ways through different platforms. As the research tackles a modern phenomenon, it gives a rich insight into gaming industry trends and competitive product development.

2. Theoretical Framework

In this section, theoretical concepts that were used for this research are discussed to enhance the understanding of the subject matter. First, the concept of the metaverse and metaverse games are explored and defined. Second, the value propositions and the significant role of technology in value propositions are explained. Lastly, by using the U&G approach and the MAIN model that is catered to new media technology, the possible gratifications of metaverse games are discussed in detail.

2.1. Metaverse and Gaming Platforms

2.1.1. Metaverse

Based on the bibliometric research by Feng et al. (2022), the research conducted related to the metaverse surged in 2021, ever since Facebook rebranded itself to Meta to create its own metaverse. Scholars view the metaverse as a core basis of Web 3.0, the next internet that is based on a 3D interface and decentralized economy supported by non-fungible tokens (NFTs) and blockchain. Many studies argue that the ultimate metaverse will fundamentally shift how people communicate, interact, and generate economies (Figueiredo, 2022; Lee & Kim, 2022). However, depending on the viewpoint and objective, the definition of the term "metaverse" greatly varies (Dwivedi et al., 2022). As there is no consensus exists on one meaning, many scholars have attempted to organize different perspectives to clarify its definition; Is metaverse a technology, a place, or merely a concept?

Initially, as the scope of the metaverse is considered wide, Lee et al. (2011) classified the metaverse into four different categories, which are life-logging, mirror world, augmented reality, and the virtual world, depending on *simulation* versus *augmentation*, and *intimate* versus *external*. This categorization is based on whether the space being utilized is reality-centered or virtual-oriented, and whether the information being utilized is individual-oriented or environment-centered. Video games, for instance, are intimate and focused on simulation, which can be seen as a virtual world. However, this research used the concept of the metaverse to analyze the structure of the virtual world, while, in more recent times, the metaverse is often viewed as a platform for engaging in social interaction that is more content-focused (Park & Kim, 2022).

Park & Kim (2022) defined the metaverse as a 3D virtual environment based on real life where avatars take part in social, political, economic, and cultural activities. An avatar is an alter ego that has come to earth, and the term originated with the idea that a primordial entity transforms into a person. In the metaverse, an avatar is analogous to the digital *me* of

the online environment and plays a social role suitable for a persona and a career. Younger generations tend to believe that their identities in both the physical and virtual worlds are overlapped, and as a result, they place equal importance on the social significance of each. The core components of the metaverse are hardware (physical devices), software (rendering), and contents (story). The technology that supports the metaverse can be classified into different kinds of Extended Reality (XR) that enable users to have interactive, immersive experiences, which include VR, AR (Augmented Reality), and MR (Mixed Reality) (Park & Kim, 2022).

There are several differences in the use of the term "metaverse" between previous and current studies. First, the new metaverse leverages mobile devices to improve accessibility and continuity in contrast to the old PC-based metaverse. Second, a more immersive setting and natural movement are now possible thanks to the rapid advancements in video processing and deep learning technology. Third, users' ability to generate content and exchange it with others by using virtual currency increased on metaverse platforms, offering diverse and rich social meaning to users (Park & Kim, 2022). Dwivedi et al. (2022) support Park & Kim (2022) by stating that the frequently mentioned metaverse is a virtual environment that functions similarly to the actual world by enabling immersive interactions. Due to the richer meaning of the new metaverse, they consider the definition of the metaverse varies by environment, interface, interaction, and social value.

Lee & Kim (2022) further developed the definition by Park & Kim (2022) and defined the metaverse as a perpetual, immersive, mixed-reality environment where individuals, groups of individuals, and objects can synchronously connect, work together, and live beyond the constraints of space and time by employing avatars and immersion-supporting infrastructures, platforms, and devices. Similar to this definition, Matthew Ball, a venture investor as well as a well-known metaverse expert, provides one of the most concise explanations of the metaverse in his book *The Metaverse and How it Will Revolutionize Everything* (2022):

> A **massively scaled** and **interoperable network of real-time rendered 3D virtual worlds** that can be **experienced synchronously** and **persistently** by an **effectively unlimited number of users** with an **individual sense of presence**, and with **continuity of data**, such as identity, history, entitlements, objects, communications, and payments. (Chapter 3, para 2) [Original emphasis]

Considering the suggested definitions above, the indispensable elements of the metaverse entail avatar, massive online presence, virtual world, three-dimensional, persistence, synchronous, real-time interaction, and interoperable network. Moreover, the metaverse is a conceptual term that refers to an environment or an infrastructure rather than a specific technology (Scheiding, 2022) since the metaverse may not necessarily depend on VR or AR technologies (Park & Kim, 2022). In sum, the metaverse can be defined as a 3D-based virtual, persistent world based on an interoperable network where users massively and synchronously interact with other individuals or objects in real-time by using immersion-supporting infrastructures, platforms, and devices.

2.1.2. Metaverse Games

Prior to identifying what is considered a *metaverse* game, discussing the definition of a *game* is essential. Despite the decades of effort of game studies put into defining games, the definition remains extensively wide and changeable based on trends. In its broadest definition, games refer to any activity that does not serve as "real work" for a living or normal physiological needs but rather is based on pure desire. However, it can be challenging to establish a clear boundary as actions related to the aforementioned exclusions might also be motivated by desire (Maigaard, 1951).

In order to identify a game, Stenros (2017) suggested asking questions based on 10 different common natures of games: rules, purpose and function, artifact or activity, connection with real life, the role of the player, productiveness, competition and conflict, goals and end conditions, construction of the category, and coherence of all these elements. However, the existence of these elements does not strictly limit what can be called a game and what cannot, as the scholar highlights that something without rules, purpose, competition, narrative, or production can still be called a game. Nevertheless, there is a high chance that the more boxes were ticked, the higher chance that something is identified as a game.

One other term that requires to be clarified for this research is "gaming platform," which implies a medium where the user can choose among multiple games or other activities within the platform, such as Roblox. Due to the relative newness of the concept of "metaverse game" (Shin, 2022), both terminologies "game" and "gaming platform" can be interchangeably used to call metaverse games because it is difficult to clearly point out the border between a metaverse game and a gaming platform. For example, Fortnite and Minecraft developed various play modes within the game to fulfill the different needs of

users. These games are intrinsically different from each other and have evolved at a face pace to give users various options within the platform, including gaming but also content creation functions (Dwivedi et al., 2022).

The metaverse games are considered to offer the closest experience to the metaverse (Faraboschi et al., 2022; Shin, 2022). Among numerous online games, 3D video games are seen as a fundamental application of the metaverse as well as the most often used medium for promoting the metaverse (Dwivedi et al., 2022; Narin, 2021; Park & Kim, 2022). For several decades, users have had access to these immersive, interactive social platforms, such as Second Life, or traditional console video games, which allow users to connect with others in a virtual setting by utilizing avatars. The feature that enables players to create avatars and communicate with other gamers inside their own virtual environment has often been compared to those of other 3D interactive platforms, such as Roblox and Fortnite (Dwivedi et al., 2022). Fortnite is perceived as a precursor of the metaverse in which users can seamlessly move between places with the chosen avatar to play, shop, communicate, and consume entertainment media (Jungherr & Schlarb, 2022). The sandbox games, such as Minecraft, where players can freely build constructions and virtual worlds by using their creativity, are also often associated with the metaverse (Rahimi et al., 2023).

Further, VR-based social games, such as VRChat, are highly associated with the metaverse. Much like Second Life, these games work as a 3D version of social media where people from a distance can stay connected to each other and interact in real-time as if they are physically together (Dwivedi et al., 2022). VR is currently the most available metaverse-related technology that is based on a simulative 3D graphic virtual environment (Park & Kim, 2022), which can stimulate users' emotions and actions through immersion (Shin, 2018). Users get a surreal experience in VR as if they escaped from the real world (Bale et al., 2022; Han et al., 2022). With VR, people can experience new things and travel to any location without any physical restrictions. However, due to the low accessibility of VR devices, many metaverse games are played on devices that have higher accessibility, such as mobile or PC (Dwivedi et al., 2022).

Drawing the definitions of the metaverse and game from above, metaverse games can be defined as platforms based on immersive 3D simulated virtual worlds where massively multiple users as avatars play with or without goals or narratives, interact with each other through different devices and infrastructures, collectively experience, create, explore, shop, and trade things by using in-game currency. The metaverse games, which are the first gaming application of the metaverse, are highly supported by the relevant metaverse

technology. However, as the current technology lacks to fully embody the ultimate metaverse, the definition of the metaverse games remains wider than the metaverse itself.

2.2. Innovating Value Propositions

As discussed above, there are different metaverse gaming platforms that existed and were relatively newly created, increasing the competition in the gaming industry. Consequently, the existing gaming companies constantly innovate the value propositions of the metaverse games to stay ahead and relevant in the industry, while new competitors look for new opportunities in the market. Having said that, how are the value propositions created and provided by gaming companies? It is crucial to understand the value propositions and the role of technology in value proposition innovation for metaverse games.

2.2.1. Value Propositions

A value proposition initially appeared in consultant frameworks as a part of a value delivery system, regarding benefit, price, and customer group (Lanning & Michaels, 1988). Later, it was mainly mentioned in business and marketing studies. Osterwalder et al. (2005) mention value proposition as how value is offered by a product, highlighting *what* value is provided for *whom* must be considered in determining value propositions. In the prominent innovation tool, Business Model Canvas, Osterwalder & Pigneur (2010) defined a value proposition as the collection of products and services that generate value specifically for a certain consumer segment, which aims to meet client needs and address consumer concerns. Basically, value propositions are benefits that a business provides to clients, which explain why consumers choose one brand over another.

Osterwalder et al. (2015) described a value proposition as a *statement* regarding the unique benefits that products and services will offer to clients. They suggest Value Proposition Canvas which entails the *customer segment*, the *value proposition*, and how these two elements fit together (i.e., *the fit of the two*). The customer segment is the group of customers that the value proposition targets. The value proposition is the expected benefit that the product or service can provide to the customer, whereas the fit of the two shows the specific outcomes that the customer experiences as a result of utilizing the product or service. In essence, the value proposition is the "promise" that the product or service makes to the customer based on certain expectations and an understanding of the customer segments (Holttinen, 2014). This means not every value propositions are successful in satisfying customers as a business can make a wrong assumption about customer

characteristics. In order to develop a value proposition that fits a customer segment, the business should first observe and understand the pains and the gains in the customer profile (Osterwalder et al., 2015).

However, Payne et al. (2020) point out that the value proposition and its customer value can be co-created through communication between the customer and the firm. Firms can use customer insights and feedback to refine their value propositions and ensure that they are more relevant and compelling to their target customers. This involves understanding the specific needs and preferences of their target customers and developing value propositions that address those needs and preferences.

Many scholars consider value propositions as a core element of an overall business model and strategy (Chesbrough & Rosenbloom, 2002; Johnson et al., 2008). Thus, developing a strong value proposition is crucial for companies that want to create a differentiation that can influence the market and produce value for their customers. Johnson et al. (2008) argue value propositions should solve customers' specific problems, such as lack of money, access, skill, or time, by doing the "job" that is not covered by competing products. That is, the realization of the value proposition that resonates with the target customers and precision in clarifying the offerings of value propositions that are distinguishable from other competitors are key to business model innovation. Porter (1996) and Frow et al. (2014) also stress the importance of creating a unique value proposition as the essence of a company's overall strategy. According to Osterwalder et al. (2015), a compelling value proposition may boost a company's profitability while also increasing customer satisfaction and loyalty. A value proposition may assist firms in effectively identifying and focusing on particular client segments to provide goods and services that cater to their demands.

In summary, based on Osterwalder & Pigneur (2010), Osterwalder et al. (2015), and Payne et al. (2020), a value proposition is a distinctive benefit of a product or service that a company promises to offer to a certain customer group based on the understanding of their customer's needs and problems, which can be constantly co-created by both a firm and consumers. Developing a strong value proposition is essential for businesses to create differentiation. It requires businesses to identify the unique value that the product or service provides and to communicate the value proposition effectively to customers.

2.2.2. The Role of Technology in Value Propositions of Metaverse Games

As creating an attractive value proposition is considered crucial in business strategy (Osterwalder & Pigneur, 2010), disruptive technology is often mentioned as an enabler of innovation in value propositions. Christensen (1997) asserts that companies should create value propositions considering disruptive technologies that can dominate existing markets as disruptive technologies offer a radically different value than what was previously offered on the market. Although effective value propositions can still be constructed even without decent technology (Chesbrough, 2007), it is self-evident that technology plays a tremendously significant role in the gaming industry.

Chesbrough & Rosenbloom (2002) view value propositions as the benefits that the technology-based offering brings to its users. Thus, the opportunity for companies comes from clarifying a value proposition hidden in the new technology (Johnson et al., 2008) by effectively establishing a link between technological potential and the creation of economic value. This is because there isn't a single objective value for technology on its own until it is somehow used for commercial purposes through the configuration of a value proposition (Chesbrough, 2010). Moreover, the technology does not have a single intrinsic value as various potential consumers can have varied preferences for the technology's latent features. Technical uncertainty plays a role in the technology itself as well as its external market (Chesbrough & Rosenbloom, 2002). Due to the incompatibility with the current value proposition, overlooking the latently valuable exploitation of technology can cause a business to miss the profit potential (Chesbrough, 2010).

Disruptive technology plays a significant role specifically in the gaming industry because of the highly technology-driven and faced-paced market characteristics. In such a competitive environment, the value propositions of video games are often developed in parallel as companies often get inspired by other companies and develop a corresponding rival product (Landoni et al., 2020). Due to the importance of technology in game development, devising and innovating value propositions of the metaverse games requires companies to witness the potential of new technology to deliver better experiences for users. Many gaming companies realized the opportunity in the metaverse technology and actively adopted it into their existing video games to create competitive value propositions.

2.3. Gratifications of Metaverse Games

Considering the complexity of the technological elements of the newly emerged metaverse games, understanding the value propositions of metaverse games requires a new

measurement tool. In order to explain the value propositions of metaverse games, the U&G approach and MAIN model (Sundar, 2008) are explored to discuss possible gratifications of the metaverse games based on each technical attribute.

2.3.1. Uses and Gratifications of Gaming

Although value propositions reflect the intended value offered by the company, the customers' uses and experiences with the proposed value might turn out unexpectedly based on their goals, resources, and perceptions (Holttinen, 2014). In order to construct effective value propositions, a business must think of a solid reason why consumers would use this product or which problem they try to solve. Having said that, how can gaming businesses understand or predict the audience's motivation to consume a media product? Compared to other products and services, the uniqueness of media and entertainment products is that they offer an *experience* (Hennig-Thurau & Houston, 2019). For example, the value of gaming products can be evaluated only after people actually play them (Choi & Kim, 2004; Wu et al., 2010). Thus, businesses can devise value propositions based on observations or assumptions regarding the potential customers' inner needs. The uses-and-gratifications (U&G) approach has been widely used in media studies to understand the users' motivation for using a certain media product.

U&G is an approach that focuses on understanding individuals' psychological needs and desires in consuming media. It assumes people choose and consume certain media over other alternatives based on the benefits they expect to receive from them to solve their individual problems by satisfying their needs. Thus, U&G views individuals as active audiences with choices rather than passive recipients (Sundar & Limperos, 2013). Moreover, U&G may vary per person as the individual owns different ways of communication styles based on their social and psychological factors (Katz et al., 1974; Weibull, 1985). For example, some people may play online games to satisfy their desire for entertainment; others may play online games to connect with their friends.

Many previous studies adopted the U&G of other mediums, such as television, to examine the gratification of online video gaming (Lucas & Sherry, 2004). Sherry et al. (2006) developed six dimensions of the U&G of video games: arousal, challenge, competition, diversion, fantasy, and social interaction. Yee (2006) considers three components in the motivation of playing Massively Multiplayer Online Role-Playing Games (MMORPGs): achievement, social, and immersion component. The achievement component entails gaining power and competition. The social component involves socializing and

building relationships, whereas the immersion component contains discovery, role-playing, and customization. On the other hand, Li et al. (2015) categorized social network game gratification into hedonic gratification (e.g., enjoyment, fantasy, escapism), social gratification (e.g., social interaction, social presence), and utilitarian gratification (e.g., achievement, self-presentation). A recent study by Sweetser & Rogalewicz (2020) adopted the GameFlow model (Sweetser & Wyeth, 2005) to compare the enjoyment of VR and non-VR games, which is a model that suggests the criteria that make players enjoy the game. Interestingly, some elements that are specific to the technological setting of the VR or video game, such as feedback, control, and immersion, are found.

2.3.2. Uses and Gratifications 2.0: MAIN model

Sundar & Limperos (2013), however, found that many gratifications are repetitively found in different types of media in previous U&G studies. For example, entertainment gratification is related to television, the Internet, video games, etc. They throw questions on these overlapping, broad categories of gratifications that are used in multiple types of mass media. The old U&G approach does not accurately reflect the attributes of new, interactive media nor provide any new kinds of gratifications, while media and communication technology have greatly developed. Further, they believe medium-specific gratifications can be understood by features of the media, instead of intrinsic demands or perceptions.

To solve this issue, Sundar & Limperos (2013) suggested the MAIN model (Sundar, 2008), which is a fundamental tool for U&G research in new media environments, which views technology that supports modality, agency, interactivity, and navigability as source of gratifications. The MAIN model was initially developed for an essential understanding of the psychology of technological components found within digital media. It is a set of heuristic cues communicated by technological affordances and shows the process of how media users judge the credibility of the quality of the medium based on the capability of the medium to generate action (Sundar, 2008; Kim & Sundar, 2015). Although some would argue that newly emerging, more nuanced gratifications can still be found in newer media (Papacharissi & Mendelson, 2011), the MAIN model helps to understand the gratifications based on complex technological affordances of new media by narrowing the scattered gratifications into organized categories (Sundar & Limperos, 2013).

Therefore, the model has the possibility of application in different kinds of media products based on the product's technical aspects. Using this model to understand the technological characteristics of games has its advantage in grasping what is metaverse game-

specific gratifications and how the corresponding value propositions are offered in the technological affordance of the games. The application of the MAIN model in metaverse games may allow us to understand the metaverse games' gratifications by looking at the games' technological features in four different dimensions, which might be able to explain the fundamental reason for conventional video game gratifications.

2.3.3. The MAIN Model-based Gratifications of the Metaverse Games

Due to the media technology development, "The list of Possible New Gratifications from Media Technology (Sundar & Limperos, 2013, p. 513)" is somewhat outdated. Hence, the list is adjusted and new gratifications from other literature are added to recreate the possible gratifications of the metaverse games in consideration of their technological attributes.

2.3.3.1. Modality-based gratifications

Modality signifies the different structures of media content, such as audio and video, which appeal to users' perceptual and cognitive systems. It is the most noticeable part of an interface and is associated with the formats rather than the content of the medium. As the advent of digital media enabled produce of content in various combinations of modalities, this modality-based differentiation between media became complex (Sundar, 2008). On the other hand, the advancement of modalities increases the credibility of the information for users (Sundar & Limperos, 2013). For instance, the increased quality of visual fidelity or simulation can make the users believable of what they see. In this sense, the metaverse games own a complex combination of multimodal media formats, which can depict a reality-like virtual world.

Realism, Immersion, and Novelty can be considered as possible modality-based needs for metaverse games. *Realism* is about the feeling of being in reality, which can be enabled by realistic simulation. It influences the credibility of the information that users receive (Sundar, 2008). *Immersion* is added as another modality-specific gratification, which gives a feeling of escapism to another world and makes users constantly concentrated. It is enabled by immersion-supportive settings with the audio-visual fidelity of the game, which not only includes affordances but also the content setting regarding fictional narratives (Sweetser & Rogalewicz, 2020). Lastly, *Novelty* is about the newness or distinctiveness of the modality the medium offers (Sundar & Limperos, 2013). It is often suggested by innovative gaming interfaces and, thus, is associated with the positive assessment of the content delivered by the technology (Sundar, 2008).

2.3.3.2. Agency-based gratifications

Agency refers to functions that enable people to willingly participate in media as agents, gatekeepers, or information sources. The development of user-generated content and customization technologies has reinforced the power of digital media users as a sender of information rather than mere receivers. Collaborative online activities became feasible, which means a user can engage in other users' activities (Sundar & Limperos, 2013). Agency-related gratifications like sharing opinions or gaining followers have already often been found in social media (Lee & Ma, 2012; Whiting & Williams, 2013). In the current development of metaverse games, the level of agency that is given to the users is extremely high as they can build, play, express, and interact on the platform.

Possible agency-based gratifications are Agency enhancement, Community building, and Self-expression. *Agency enhancement* entails users individually and collectively being a source of content, which is triggered by platform affordances that encourage users to contribute their knowledge or creativity and reach a bigger audience. *Community building/Socializing* indicates the need for forming a group for collective activity, and it is fulfilled by functions to connect with others and expand the social network (Sundar & Limperos, 2013; Yee, 2006). *Self-expression* is included in consideration of the need for personalization and customization in metaverse games, which enables users to boost their individuality and creativity and be whomever they want through an avatar (Li et al., 2015).

2.3.3.3. Interactivity-based gratifications

Interactivity means the utilitarian affordance that permits the user to give instant changes to the content in the medium. It is the most distinctive feature of the virtual environment as users are encouraged to be active. The interactive features constantly trigger users to engage in activities (Sundar, 2008). The higher level of interactivity in digital media often implies openness to participation, which gives a positive image of the media regardless of the quality of the content (Sundar & Limperos, 2013).

Interactivity-related possible gratifications for metaverse games are Activity, Competition, Interaction, and Responsiveness/Dynamic control. *Activity* means the opposite of passivity (e.g., watching TV), meaning that users expect to be highly engaged by the game through an interactive device. Activity is a prominent gratification of games in general. Depending on the user's personal and situational factors, however, Activity can have a positive or negative meaning (Sundar & Limperos, 2013). *Competition* is added based on game content aspects as interactive technology in the metaverse games encourages

users not only to be active but also to compete and beat other players (Sherry et al., 2006). *Interaction* signifies reciprocal communication with other players or objects. However, in a broader sense, it means the need to have the chance to continuously specify their needs and preferences. *Responsiveness/Dynamic control* is the expectation to receive speedy, automatic feedback based on the user's information in real-time, giving control over their actions and having enough choices for those actions (Sundar & Limperos, 2013). Especially, in a virtual environment, Responsiveness is also related to Immersion as a natural feeling of flow and seamlessness can be achieved greater when a user's expectations and the system's reaction are consistently well-aligned (Sundar, 2008).

2.3.3.4. Navigability-based gratifications

Navigability is defined as the attribute that enables users to move through the medium. It is a core point of the user experience in the metaverse games, which let people explore between "spaces". Navigability depends on the creative design of the game as every game functions at different technological levels (Sundar & Limperos, 2013). Compared to the internet website, the overall level of navigability is higher in metaverse games as the user navigates in a 3D environment in a way that is similar to real-life.

Navigability-based gratifications are Play/Fun, Challenge, Exploring/Variety-seeking, and Navigation aids. *Play/Fun* is prominent gratification that is enabled by the highest dynamic of navigability that the metaverse games have. When the navigational structure of the interface provides for a continual sense of exploration and seamless transitions, the affective state of play is best achieved. In the same context, *Challenge* by Sherry et al. (2006) is added as the setting of the navigability of the metaverse game provokes the user to master the game and push oneself to achieve a higher level or map. *Exploring/Variety-seeking* is the need to browse and "check out" places and discover new, diverse things. It is enabled by affordances that allow users to move to wherever they want to go by offering many options. *Navigation aids* are a desire for assistance in navigating, especially in using new platform tools and exploring new places. In virtual environments like metaverse games, users might experience disorientation and confusion without aids for information. Offering maps, menus, or landmarks within the platform is a common example of a navigation aid. Increased visualization can enhance users' satisfaction and overall performance in a virtual world by saving their time and effort (Sundar & Limperos, 2013).

The possible MAIN-based gratifications of metaverse games suggested are not exhaustive. As Sundar & Limperos (2013) mentioned, one gratification can emerge in

multiple affordances and often the combination of gratifications can be found in multimedia, such as metaverse gaming platforms.

2.4. Conceptual Model

Based on the discussion of theoretical frameworks, the conceptual model is designed to visualize the relationship between the concepts (see Figure 1). The overall design with hierarchy and classification depicts the value propositions supported by MAIN-based gratifications. As discussed, the value proposition is closely related to U&G because they share a common goal of understanding what motivates individuals to engage with products or services. The value propositions are related to understanding how a gaming company offers value in a certain game product, while gratifications explain how the company expects why would people play their metaverse games. Thus, the adjusted MAIN model-based list of possible gratifications is used as a tool to understand the value propositions of the metaverse games. By connecting the two concepts together, it is possible to gain a more comprehensive understanding of gaming companies' strategies for developing values in metaverse games in relation to their understanding of users.
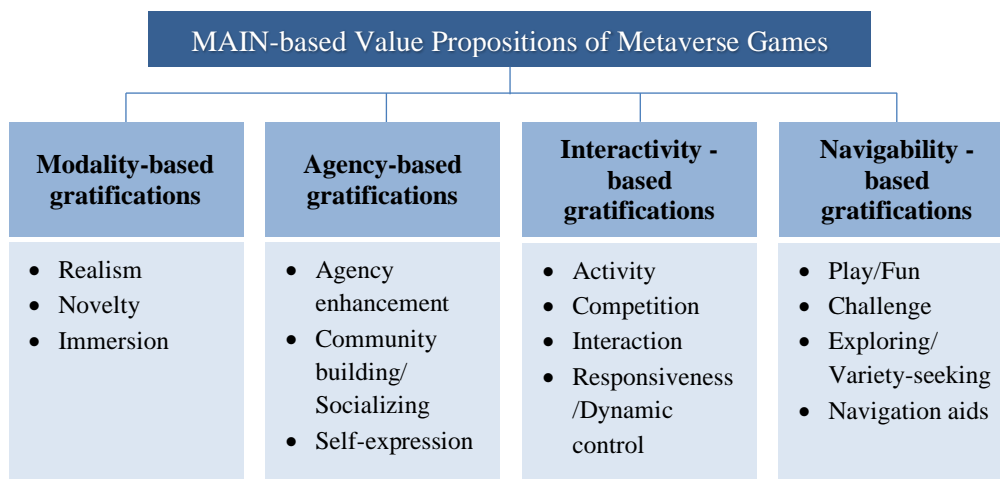

Figure 1. Conceptual model

3. Method

3.1. Qualitative Approach

This research will adopt a qualitative approach because the RQs focus on the "how" question that is aimed at the discovery of patterns rather than testing variables (Corbin & Strauss, 2008) to comprehend, describe, and explain social phenomena (Flick, 2018). Further, qualitative methods help us to investigate how reality is socially constructed by looking into the context while allowing the researcher to play an active role in the research processes (Brennen, 2017). In this case, this study will analyze the context of gaming companies' value propositions of their metaverse games based on expected gratifications.

3.2. Research Design: Comparative Case Studies

As this research aims to understand current cases of metaverse games' gratifications in the real-life context and find patterns and distinctiveness through comprehensive analysis, a comparative case study is considered an appropriate method. The case study is an iterative research method that is suitable for studying contemporary events that the researcher cannot influence or control. The qualitative case study is widely used in social science and examines a real-life phenomenon through a "how" question in an in-depth manner with the understanding of contextual situations that own many variables. Especially, the method is useful in understanding why a certain decision or process was implemented. Moreover, the case study has an advantage in its accountability on various evidence, including content, document, interviews, and observation. Among multiple cross-case study designs, the comparative case study is chosen in order to look for similarities and differences between cases under the same context (Gerring, 2007; Yin, 2014). This helps to easily find patterns from different cases, understand the current states of offerings of the metaverse games, and, further, comprehend how gaming companies configure the value proposition of the metaverse. The research is designed to compare the selected cases of metaverse platforms to recognize patterns regarding each MAIN model-based theme.

3.3. Validity and Reliability

In order to ensure the credibility of the descriptive research, Yin (2014) advises enhancing two different validities, construct validity and external validity, and reliability. Construct validity indicates determining the most accurate operational measures for the concepts being examined. Ensuring construct validity is especially crucial in the case study as the concepts formed in the operationalization can be subjective assessments. Based on

Yin (2014), the first solution the researcher did is to define gratifications and metaverse games in relation to the objective of the study. The second approach is to find operational measures that fit the concepts, which are based on the conceptual model. Another thing that strengthens the construct validity of this case study is *data triangulation*, which means the case study database was created based on a variety of sources of evidence for each theme (Yin, 2014).

On the other hand, external validity refers to identifying other fields in which a study's results can be generalized. According to Yin (2014), the solution for the enhancement of external validity lies in the formation of the RQ with "how" because descriptive or exploratory questions are easier to generalize compared to "what" questions that merely depict the elements. As the RQs based on "how" were initially settled in the research design phase, external validity is assured.

Last but not least, reliability is about proving that a study's procedures may be replicated and still produce the same results. The aim is to reduce a study's biases and inaccuracies. To guarantee the reliability of this study, documentation of each step is essential. Yin (2014) highlighted the importance of documentation as if the researcher is an audit or bookkeeper. By creating a case study protocol and a database, such systematic documentation became feasible.

3.4. Case Selection

The criteria for selecting cases should be carefully contemplated and purposively established based on the expectations of similarity or contrast between cases (Yin, 2014). A total of 10 cases were selected to find a pattern in gratifications in metaverse games. Firstly, the gaming platforms were deliberately chosen by their features based on the elements from the definition of the metaverse games. The cases are not limited to availability in VR as it decreases accessibility. Secondly, those games should often be associated with the metaverse by academic professionals or journalists, considering the reliability of the samples. Thirdly, those games must have acknowledged popularity as part of the aim of this research is to offer pioneering cases of the metaverse platforms from a business perspective. Fourth, those games should be accessible and available during the research period for observation. Lastly, each case should contain sufficient data that can be accessed. Accordingly, the following 10 metaverse games had been selected and displayed in Table 1. Further explanations of the selected case and the reasoning behind the selection can be found in Appendix A.

Table 1. Category of Case Selection

Games	Details
Roblox	• Released in 2006 by Roblox Corp. • Available on mobile, gaming console, desktop, and VR headsets • Gaming platform
Fortnite	• Released in 2017 by Epic Games • Available on mobile, gaming console, and desktop • Gaming platform
Minecraft	• Released in 2011 by Mojang Studios • Available on mobile, gaming console, and desktop • Sandbox gaming platform
Decentraland	• Developed in 2020 by Decentraland Foundation • Available on the desktop browser • Blockchain-based platform based on decentralized economy
The Sandbox	• Developed in 2011 by The Sandbox • Available on the desktop browser • Blockchain-based platform based on decentralized economy
VR Chat	• Released in 2014 by VR Chat Inc. • Available on desktop and VR headsets • VR-based social platform that caters to self-expression
Rec Room	• Released in 2014 by Rec Room Inc. • Available on desktop, mobile, gaming console, and VR headset • VR-based social platform that offers many games
Horizon Worlds	• Released in 2021 by Meta • Currently only available on VR headset • VR-based social platform
Second Life	• Released in 2003 by Linden Lab • Available only on desktop • PC-based social platform
Animal Crossing: New Horizons	• Released in 2020 by Nintendo • Available on gaming console and mobile • Social simulation game

3.5. Data Collection

This research takes a deductive approach, which signifies that data are examined using an established theoretical framework as an analytical tool when gathering and interpreting data (Flick, 2018). The deductive manner in qualitative research is similar to hypothesis testing, but it uses a theoretical framework instead of a hypothesis. Starting from the theoretical expectations to observations, deduction aims to whether the expectation based on general principles actually occurs in the chosen particular cases (Babbie, 2014). In this case, the deductive expectation, which is MAIN model-based gratifications for new media, is used to determine whether it can be applied to empirical reality, which is a metaverse gaming platform. In doing so, the research aims for analytic generalization (Yin, 2014) and internal generalization (Flick, 2014), which means the outcome can be generalized to theoretical propositions and within the cases studied.

The sources for this case study are any form of information that contains gratification based on technological attributes of the selected metaverse games from mainly company-intended perspectives but also from player-experienced perspectives. The data were gathered through documentation and observations to obtain a sufficient amount of data for each case to enhance validity (Yin, 2014). *Documentation* entails both internal sources, such as company websites, product descriptions, news and blogs, podcasts, reports or press releases, and official social media posts (including YouTube videos), and external sources, such as periodicals, news articles (e.g., TechCrunch, The Verge, The Insider, etc.) and blogs. The external sources were, however, mainly used to fill the gap in the internal data. On the other hand, *observations* were conducted by actually playing the games and looking into companies' homepage updates and social media activities. In some cases, to understand how the intended gratifications work in gameplay in-depth, observations were expanded to watching live streaming and participating in the gaming community on Twitch. A total of 235 textual data, 137 screenshots, and 10 field notes had been collected and saved in the database, meaning an average of 30 data per each case. All the audio and video data were transcribed into texts for efficient, cohesive analysis. Visual data, such as screenshots, are analyzed on the coding software together or on the observation notes. Due to the size restriction in TMS, all the datasets mentioned above are saved online database. The link for downloading the database can be found in Appendix B. Further, 10 tables of the unit of analysis that consists of the aforementioned internal and external sources with references were created in Appendix C.

3.6. Operationalization

Accordingly, the notions from the theoretical framework and conceptual model were used for operationalizing the MAIN model-based possible gratifications of metaverse games as the value propositions of metaverse games offered by gaming companies can be measured by the gratifications. By using the MAIN model (Sundar, 2008; Sundar & Limperos, 2013) in consideration of the characteristics of the metaverse games (Lee & Kim, 2022; Park & Kim, 2022), Table 2 suggests possible gratifications of metaverse games. Each operationalization will be the guidance for the evaluation of the cases' association with literature.

Table 2. Operationalization of MAIN-based Gratifications of Metaverse Games

1. Modality-based Gratifications	
a. Realism	Measured through direct observation from the offerings through the interfaces related to realism in their metaverse games and/or gaming companies' statements regarding how they aim to offer their games for users to… - Have realistic experiences - Have natural communication
b. Immersion	Measured through direct observation from the offerings through the interfaces related to immersion in their metaverse games and/or gaming companies' statements regarding how they highlight that their games… - Have narratives or settings that draw them in - Make them feel escaped into a different world - Make users constantly concentrate and be immersed
c. Novelty	Measured through direct observation of the offerings through the interfaces related to novelty in their metaverse games and/or gaming companies' statements regarding how they highlight that their games… - Are new and distinctive - Have innovative technology/interface - Offer unusual experience
2. Agency-based gratifications	

a. Agency enhancement	Measured through direct observation from the offerings through the interfaces related to agency enhancement in their metaverse games and/or gaming companies' statements regarding how they aim to offer their games for users to… - Share their thoughts/creations with others - Gain the power and reach a bigger audience - Have ownership of something
b. Community building	Measured through direct observation from the offerings through the interfaces related to community building in their metaverse games and/or gaming companies' statements regarding how they aim to offer their games for users to… - Connect with others and expand their social network - Build communities and gather like-minded people - Realize that they are part of a community
c. Self-expression	Measured through direct observation from the offerings through the interfaces related to self-expression in their metaverse games and/or gaming companies' statements regarding how they aim to offer their games for users to… - Assert their identity - Be who they want to be - Express themselves through their creativity - Customize and personalize
3. Interactivity-based gratifications	
a. Activity	Measured through direct observation from the offerings through the interfaces related to activity in their metaverse games and/or gaming companies' statements regarding how they aim to offer their games for users to… - Stay active - Engage in many activities
b. Competition	Measured through direct observation from the offerings through the interfaces related to competition in their

	metaverse games and/or gaming companies' statements regarding how they aim to offer their games for users to… - Beat other players - Demonstrate the best skill
c. Interaction	Measured through direct observation from the offerings through the interfaces related to interaction in their metaverse games and/or gaming companies' statements regarding how they aim to offer their games for users to… - Interact with other users and objects - Perform a number of tasks - Constantly specify needs and preferences
d. Responsiveness/ Dynamic control	Measured through direct observation from the offerings through the interfaces related to responsiveness and dynamic control in their metaverse games and/or gaming companies' statements regarding how they aim to offer their games for users to… - Are responsive to their commands and requests - Offer speedy, real-time feedback/reaction to users' expectations - Have control - Have enough choice for actions
4. Navigability-based gratifications	
a. Play/Fun	Measured through direct observation from the offerings through the interfaces related to play and fun in their metaverse games and/or gaming companies' statements regarding how they aim to offer their games for users to… - Have fun in exploring - Play and enjoy
b. Challenge	Measured through direct observation from the offerings through the interfaces related to challenges in their metaverse games and/or gaming companies' statements regarding how they aim to offer their games for users to… - Become mastered and skillful - Achieve higher levels

c. Exploring/Variety-seeking	Measured through direct observation from the offerings through the interfaces related to exploring and variety-seeking in their metaverse games and/or gaming companies' statements regarding how they aim to offer their games for users to… - Freely move around the space - Seamlessly move between spaces within the game - Discover something new and interesting - Have various options of content to choose
d. Navigation aids	Measured through direct observation from the offerings through the interfaces related to navigation aids in their metaverse games and/or gaming companies' statements regarding how they highlight that their games… - Have interfaces that assist them every step of the way - Are easy to use and explore - Offer guidance on how-to and where-to - Offer visual aids for more effective use

Note. The gratifications are not exhaustive. Adjusted from "Potential Measures of New Gratifications," by Sundar & Limperos, 2013, p. 518.

3.7. Data Analysis

After the case study database was organized, deductive thematic coding was conducted in analyzing obtained data. In order to categorize the large volume of data for the coding process, the qualitative analysis software ATLAS.ti was utilized. The data are evaluated and analyzed based on the operationalization of each possible gratification in consideration of gaming companies' intended value propositions. The codes were preliminary created in a deductive manner by adopting the MAIN model-based possible gratifications as a theoretical lens. According to Joffe (2012), deductive themes are particular patterns that can be observed in the theoretical idea. However, this research is also partially open to newly emerging, obvious themes to increase the quality of qualitative analysis (Joffe, 2012). The thematic analysis is a flexible method that allows decontextualizing and minimizes data by coding. It connects the context from different categorizations (Flick, 2014).

By adjusting six steps of thematic analysis by Braun & Clarke (2006) into this deductive research, the analysis was conducted in the following steps. First, the researcher familiarized herself with the existing theoretical theme and the data obtained. Secondly, for each data within the case, the researcher searched for the parts that correspond to each theme based on operationalization to create codes. At the same time, the researcher looked for any other newly emerging themes. Thirdly, the researcher reviewed new themes in relation to the existing theoretical framework and name them, while flexibly revising the existing theoretical themes and operationalization based on the dataset. An average of 140 codes per case were established. Consequently, including 14 existing ones and 4 new ones, a total of 18 themes were found.

Thereafter, by comparing the 10 cases, strong patterns and new insights were witnessed to answer each sub-RQ. Also, differences were found through pattern matching and cross-case comparisons. The narratives on "how" and "why" certain gratifications that are obvious in metaverse games were developed through an iterative process of explanation building (Yin, 2014), and were reported in the Result section. Moreover, a few tables based on patterns found from the metaverse games were created to visualize the outcome of specific gratification. The whole iterative process of data collection and analysis took 4 weeks from April to May 2023.

3.8. Research Ethics

Using mainly publicly available secondary data has the advantage of not only greatly enhancing the feasibility and efficiency of the research, but also reducing the ethical concern regarding confidentiality. Furthermore, no personal data has been used as collected data are from the official webpage of gaming companies and other public news websites or social media. None of the screenshots of the gaming platforms or social media that were used for this research contain user identification or personal information. Thus, there are no ethical concerns in this research.

4. Results

The findings of the case study research are presented in this section. The MAIN model-based themes that are found across the 10 cases are explained in order. For each theme, the strength of the patterns that emerged through the cross-case comparison and a few representative examples are discussed, while the exceptions and differences of a few distinctive cases are highlighted. The expected themes are presented in the same order as the operationalization and the newly emerged themes and sub-themes are presented after the expected themes. For some of the themes, tables are used to compare 10 cases and give a clearer explanation, and figures are attached to visualize a few cases. The analysis of the discovered patterns is then compared with the theoretical discussion and expectations.

4.1. Modality-based Gratifications

The three existing modality-based gratifications, which are Realism, Immersion, and Novelty, showed moderately strong patterns across the cases. However, Modality-based gratifications are relatively least explicitly offered by gaming companies compared to other gratifications, considering that modality-related gratifications often depend on users' judgment, which is subjective and highly experience-based.

4.1.1. Realism

Regarding the offerings based on modality, Realism was the first component expected to show a strong pattern. Therefore, cross-case analysis was focused on the parts where the companies provide a realistic, natural experience through the gaming platform. It includes technological development elements that boost hyper-realistic experiences and a feeling of presence. A quite robust pattern was visible as 7 out of 10 cases offer Realism value propositions. The exceptions were Fortnite, Minecraft, and Decentraland because these platforms either fundamentally do not support the VR experience or do not necessarily offer "realistic" experiences or "realistic" graphic depictions.

Firstly, the development of interfaces to enhance natural interaction is frequently highlighted, encompassing features such as spatial audio, as well as face and full-body tracking, which facilitate immersive virtual conversations through avatars. Spatial audio is the function that enables mimicking in-person conversations, which depicts the sound depending on proximity, such as whispering to someone nearby or raising the voice across the room (Takahashi, 2023). Face tracking is the work-on-progress functionality that captures real-time facial expressions of the users through their device's camera (Roblox,

2022d; 2023a), while full body tracking is enabled by an Inverse-Kinetics system that tracks the body movement (Rec Room, 2023a) (see Figure 2). VR Chat highlights their development in the Realism-supporting technology, in which they expect users to feel higher immersion and smoother communication (Mabini, 2022; VRChat, 2022b).

Figure 2. Work-in-progress hand model of an avatar by Rec Room (2023a)

Secondly, they stress high visual fidelity (Roblox, 2022a) and the depiction of material, texture, and even physics akin to the real world (Roblox, 2022d; 2023a). This is related to the *simulation* that Lee et al. (2011) suggested, which can highly increase immersion in the virtual world by enhancing the graphic movement. Roblox highlights their development effort related to realistic visual fidelity on their official blog (Roblox, 2023a):

> We are also investing in more realistic worlds. The Roblox engine models the real world, and we work to make materials and systems in Roblox behave as they would in our physical world […] how it behaves when hit by an axe, how it floats on water and catches fire when exposed to heat.

Thirdly, platforms like Second Life and Animal Crossing offer realistic activities that simulate real-life ones as one of the core gratifications. They emphasize that their platform is a virtual place where people can do the exact same activities as in real life or even enables impossible activities that they desire to do in real-life (Kalning, 2007). Animal Crossing offers various in-game activities based on the real-life time of day and season, including going to a café for a chat, going fishing, or stargazing (Nintendo, 2020).

Overall, as the technology that supports modalities of the metaverse platforms advances, Realism gratification has further developed with more complexity and offers a higher resemblance to the real world compared to the definition that Sundar (2008) suggested.

4.1.2. Immersion

As a second component of the modality-based gratifications, Immersion is examined by looking at metaverse platforms' offerings related to engaging content and the game setting, enabling escapism, constant retention, and concentration. Immersion shows a robust pattern as a value proposition as it was found in all of the 10 cases. However, the literal mention of the word "immersion" or "immersive experience" as a value was more often found rather than derived from the content or the setting of the games, indicating that the word "immersion" itself owns a strong implication in promoting a positive value proposition. It is assumed that "immersion" is a buzzword that instantly grabs people's attention, and the immersive environment is considered fundamental to engagement on metaverse platforms.

First, immersion is offered by the content or events on platforms. Some content or events in the metaverse games often contain certain narratives, which make users feel like escaping reality or traveling to another world. Fortnite, Minecraft, and The Sandbox highlight the avatar skin pack or event based on popular stories or narratives, stimulating people to join and be "immersed" in their favorite show. Minecraft, for example, offers the skin pack of the well-known character, Sonic the Hedgehog (Austin, 2023a): "Texture packs completely transform the way your Overworld looks and feels, and in this epic pack, it feels like you're stepping into one of your favorite Sonic the Hedgehog games!" Animal Crossing, on the other hand, has its own narrative within the game compared to other platforms. The producer considers that the strong narrative of Animal Crossing makes users emotionally immersed in the game and forget other things while they are playing, which they consider a positive immersive experience (Nintendo, 2016).

Secondly, immersion is offered by the setting of the games. VR-based games, such as VRChat, Rec Room, and Horizon Worlds highlight the high level of immersion in the VR setting as VR technology that is related to Realism increases the immersion (Rec Room, 2023a). Further, Rec Room and Horizon Worlds put emphasis on sound elements to create a more immersive world. Evidently, they think it is fundamental to set up a suitable sound to increase immersion (Meta, 2023a; Rec Room, 2022d).

Immersion is not mentioned by Sundar & Limperos (2013), considering that it can be a result of multiple combinations of gratifications. Nonetheless, it turns out to be a strong value proposition of the metaverse games, which enables effortless involvement by users (Sweetser & Wyeth, 2005).

4.1.3. Novelty

The third modality-based gratification examined was Novelty, which is based on the value propositions that highlight the distinctive value of the platform, the experience it offers, or innovative technology or interface. As Novelty gratification is also somewhat a subject indicator of the value, it is examined based on explicit highlights of gaming companies' modality-related distinctiveness. Based on the cross-case analysis, 8 out of 10 companies offer novelty as a value proposition of their metaverse platform. Novelty can be mainly found in offerings related to iconic, charming aesthetics, unique experiences, or innovative interface.

Many platforms show off the unique audiovisual aspect of the game and the unusual experiences the platform offers. For instance, Minecraft possesses high novelty as its modality-related offerings are quite different from other platforms. Although it looks far from a realistic depiction, its iconic blocky design touches people's nostalgia (see Figure 3), which is a big part of the reason why people play Minecraft (Gallegos, 2021). Moreover, compared to other games, the intentional absence of music or prompt in Minecraft game settings is an interesting distinctive characteristic. The music composer of Minecraft explains this in the interview (Austin, 2023):

> "Minecraft is notable in terms of its music because at times it's more about the absence of sound than the presence of it. Even when there is in-game music the score is reserved in terms of rhythm and percussion. That's the opposite of most games, which pack audio at you constantly to try and make you feel a certain way. […] With Minecraft, the music rarely intrudes, letting the ambiance of the game world carry the mood for the players."

Additionally, many platforms offer different innovative aspects related to new technology or content. Roblox recently changed the platform category from "games" to "experiences" and changed the "Game" tab into the "Discover" tab within the app (Robertson, 2021), calling themselves a platform for the next generation (Roblox, 2019). Besides Roblox, most other platforms also do not limit their offerings to games and keep

innovating the platform system to embrace diverse content created. Novelty can be also shown by the constantly updated content. Fortnite runs in seasons that bring changes to the game aesthetically, renewing the themes of maps and avatars (Epic Games, n.d.-a; Malcom, 2021).

Figure 3. Minecraft's blocky aesthetics (Minecraft, n.d.)

To summarize, Novelty is not only highly associated with offering a new, higher quality experience, but also, as Sundar (2008) mentioned, is related to the credibility of the content with distinctive, authentic modalities, as Minecraft's case showed us being new is not always novel.

4.2. Agency-based Gratifications

As the boundary between player and creator is blurred in metaverse gaming platforms, it is prominent that gaming companies increasingly encourage users to actively engage and contribute to their platforms, offering a high level of agency. In addition to existing themes, which are Agency Enhancement, Community Building, and Self-expression, one more new agency-based gratification, Creativity Enhancement, emerged.

4.2.1. Agency Enhancement

Agency enhancement is evaluated by how companies encourage users to share their thoughts or creations with other users to reach a bigger audience, strengthen their power by

owning something, or do what they want to do within the platform. Among all the possible gratifications, Agency Enhancement was the second-most robust gratification offered by gaming companies. It has been found in all of the 10 platforms, confirming that companies innovate the platform further towards empowering the users. Gaming companies highlight the limitless things that users can do within the platform, including creating their own worlds, owning virtual assets, becoming a part of a community, and sharing creations and ideas.

Generally, the metaverse games expect every user to become a creator as a default, not just merely a player. Therefore, many platforms constantly stress the importance of the creators' role in their platform, often implying that the platform is "community-driven". They value the engagement of creators within the platform as the core resource that forms and runs the platform. Further, the gaming companies aim to enhance agency through creation as the creators can make their own rules in their own worlds. The statement by Roblox regarding its platform exemplifies this (Roblox, 2022e): "This world isn't being built by us; it's being built by all of us. There are endless possibilities on Roblox. What part of this world will you create next?"

Moreover, the platforms encourage users to share their own creations with other users and become successful by gaining users, similar to social media. There are multiple reasons for platforms to encourage users to share; to promote the platform's visibility outside, to inspire other creators, and to connect people to communities that share similar interests. Animal Crossing, for example, encourages users to share their islands with other people to inspire them (*Share Your Community*, n.d.). Rec Room considers sharing the creation crucial as creators want to reach a large audience, which might not always be about money (Takahashi, 2023).

The enhanced agency comes not only from being able to create but also from owning assets and partaking in decision-making for the platform, especially in the decentralized metaverse, such as Decentraland or The Sandbox. Owning virtual land opens up all the possibilities for them to do many things on the platform, including building, experimenting, or hosting events (The Sandbox, 2021a; 2021b), enables users to involve in important decision-making for the community (Decentraland, n.d.). Enhancing agency and giving full credit to creators ("true ownership") is clearly stated as a goal of these platforms (Marquez, 2021; The Sandbox, 2020b).

Overall, Agency Enhancement can be visible in a broader sense, compared to its definition discussed by Sundar & Limperos (2013). Users are encouraged to contribute their actions, ideas, or knowledge to the community by using the platform's infrastructure.

Table 3. Agency Enhancement

	By creating	By sharing	By owning/ By shaping the platform
Roblox	By creating games, artifacts, and experiences.	By sharing and publishing creations within the platform.	
Fortnite			
Minecraft			
Decentraland			Participation in its own governing system is granted by owning virtual land based on cryptocurrency.
The Sandbox			
VRChat			
Rec Room			
Horizon Worlds			
Second Life			
Animal Crossing	By decorating the island.		

4.2.2. Community Building/Socializing

In analyzing the gratifications related to Community Building, the focus was on the gaming companies' offerings for users to connect with other people, build a community and feel a sense of belonging, and have a bonding experience. Aligned with the expectation, Community Building/Socializing was also notable gratification from all of the 10 cases, although Socializing showed a weaker pattern in Fortnite and Minecraft. Community Building was mainly encouraged by functions to add or invite friends, explore and join communities, which connect people from distant and who share similar interests.

The majority of metaverse games encourage people to connect from different places around the world or even with friends. By adding a new friend or inviting a real-life friend, users can broaden their social network on the platform. Especially, VR-based social games, VRChat, Rec Room, and Horizon Worlds highlight the platform connects people from far away closer and let people socialize with other users (Faber, 2022; Rabkin, 2021). These

metaverse social platforms suggest value beyond connection, deepening the relationship and bonding experience (Butler, 2022; Lyons, 2021). Further, metaverse platforms offer creators to connect with their fans, and vice versa. Roblox encourages users to find their favorite creators and join the fan community (Roblox, 2022f).
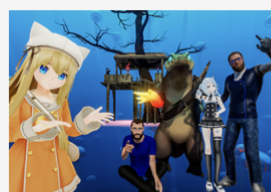
Figure 4. Community Building encouraged by the social metaverse platforms
(Screenshots, From top to bottom: VRChat, Horizon Worlds, and Second Life)

Notably, metaverse platforms explain their innovation towards a "community-driven" platform, as one of the developers of Minecraft says (Austin, 2023b): "One of the other things that inspired me so much on this project was how the community is at the heart of Minecraft, and it feels like the game is such a collaborative effort between the development team and its gaming community." All of the metaverse platforms inspire users to form a community (see Figure 4), which resides not only within the platform but also

outside of the platform. The platforms encourage communities to cooperate, help each other, share knowledge, and work together to enrich the platform, aiming to harness the power of the community. Roblox states its vision is "to reimagine the way people come together" by forming a community that builds the platform together (Roblox, 2023a). Roblox, Minecraft, Decentraland, and The Sandbox promote their own social hub where people with the same interest can find one another (Austin, 2023b; Decentraland, 2023a; Roblox, 2023a; The Sandbox, n.d.-a).

To conclude, Community Building/Socializing gratification is a core value proposition of the metaverse platforms, which facilitates various collective activities (Sundar & Limperos, 2013).

4.2.3. Self-expression

The third agency-based gratification predicted is Self-expression, examined by looking at value propositions encouraging users to express themselves and be who they want to be. Self-expression showed a very strong pattern throughout all of the 10 metaverse gaming platforms, offered by allowing detailed customization with avatars and expressions. As an avatar is a significant part of the metaverse, designing personalized representation in a digital world is an important gratification, which is the reason why many fashion brands collaborate with these platforms (Park & Lim, 2023).

All metaverse games consider the avatars important and let users design their own avatars by customizing skin colors, body shapes, faces, hairstyles, heads, etc (see Figure 5). The platforms offer diverse costumes, but users can also create their own costumes or buy costumes made by other users in the marketplace with virtual in-game currency. Further, using Emotes, which are specific movements performed by the player's avatar, is a popular way for players to express themselves (Baszucki, 2022; Decentraland, 2022a; VRChat, 2018). Fortnite offers diverse outfit packages, skins, and emotes that users can use to express themselves (Malcom, 2021). Some skin packs are famous characters usually from movies or cartoons, allowing players an opportunity to be immersed in their favorite story (Fortnite, 2023a). The platforms consider people pick avatars that are a reflection of their own identities, values, and social standing as well as those that allow them to express a desired identity through an avatar or that can help them socialize and form relationships.
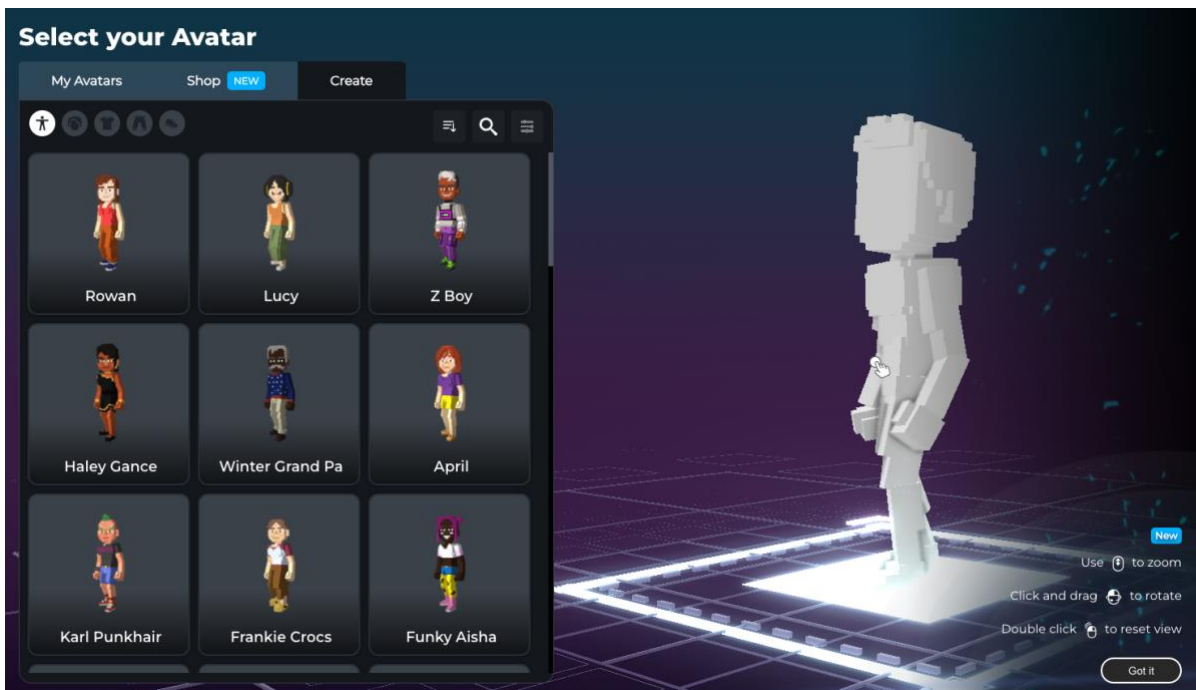
Figure 5. Avatar customization page of The Sandbox (The Sandbox, n.d.-a)

The CEO of Roblox, David Baszucki, stresses the significance of developing greater self-expression and unleashing the self-identity on the platform (Baszucki, 2022):

"People won't just use someone else's creation. They will make their very own, from head to toe, reflecting their style, personality, and physique. New cutting-edge technology will help these identities be more personal and expressive, with more opportunities for customization and user-generated avatar body and face creation. This is a big focus for us at Roblox, given how important digital identity is to our community."

Roblox considers that the level of self-expression is closely related to the level of engagement (Roblox, 2021a). They launched a functioned item called "Layered clothing," which is clothing that fits any type of avatar body, to increase freedom for users to wear various clothing (Roblox, 2022a; Takahashi, 2023) (see Figure 6).

Figure 6. Layered Clothing feature by Roblox (Roblox Creator Hub, n.d.)

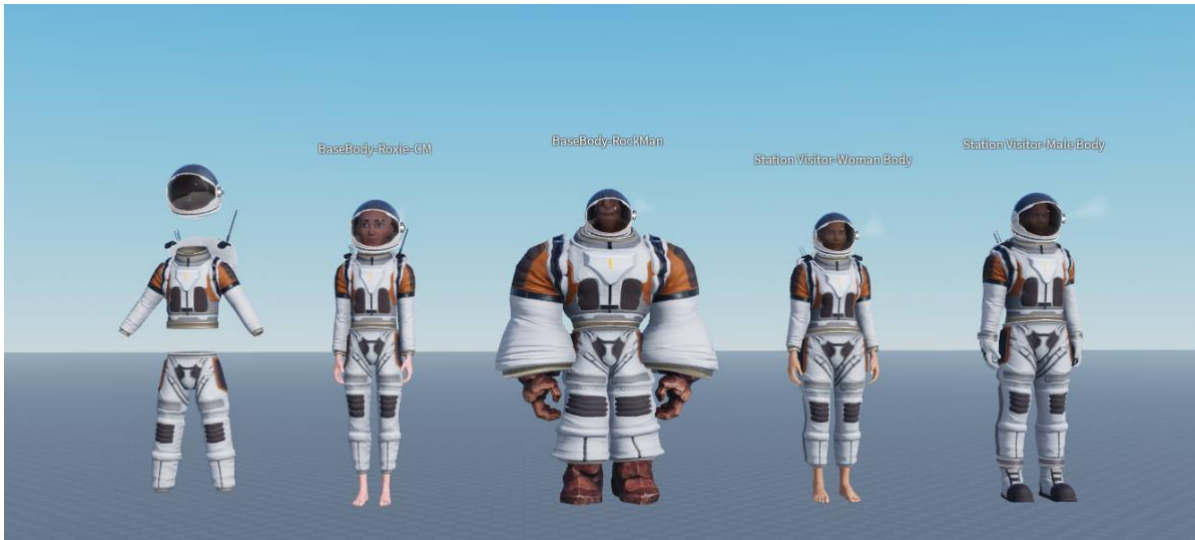Customization is not limited to avatars, on many metaverse games, users can create and decorate their own space which they invite others into. For example, a whole island in Animal Crossing is a personal space where users can decorate freely, which gives a hint of the personality or style of the owner of the island (Nintendo, 2016).

Aligned with the self-representation theory by Li et al. (2015), Self-expression is an obvious value of the metaverse games, which lets users create a specific self-image and thereby influence how the player is seen and treated by others.

4.2.4. Emerging Sub-theme: Creativity Enhancement

Creativity enhancement is a newly found theme regarding the value proposition that boosts users' creativity. Although this gratification might sound overlapping with Agency Enhancement, the difference comes from that companies encourage users to create something even if it is experimental or without any objectives, whereas Agency Enhancement has a clear goal to reach out to audiences and influence one's power to others. The CEO of Rec Room exemplifies this (Takahashi, 2023): "The reasons people are creating content, it's a wide range. The goal might be reaching an audience, or seeing a creative vision fulfilled." Surprisingly, despite that it is a newly emerged gratification, it shows the strongest pattern across the 10 cases.

Many metaverse platforms consider creation as a core part of the platform, and, thus, they encourage creators to bring their visions to life. The platforms are based on User-generated Content (UGC) that ranges from avatar items, spaces, games, experiences, etc. Roblox says that more than 90% of items that are available on the marketplace are UGC and they would like to increase the proportion even higher (Takahashi, 2023). Most metaverse games do offer basic content created by gaming companies, but the majority of the content is

created by users. Due to this creative-friendly environment, the platforms became a canvas for many artists as well (Decentraland, 2022c; Second Life Community, 2023a; 2023b).

Moreover, each metaverse platform offers its own creator tool that is often a software build for users to easily build what they want without any coding skills (see Table 4). The Sandbox offers different types of creative tools for games, experiences, and items, pushing users to explore the limitation of their creativity (The Sandbox, n.d.-a). Rec Room has newly developed its simple creation tool "Rec Room Studio" so that the creation is accessible to everyday users (Matney, 2020; Takahashi, 2023) (see Figure 7).
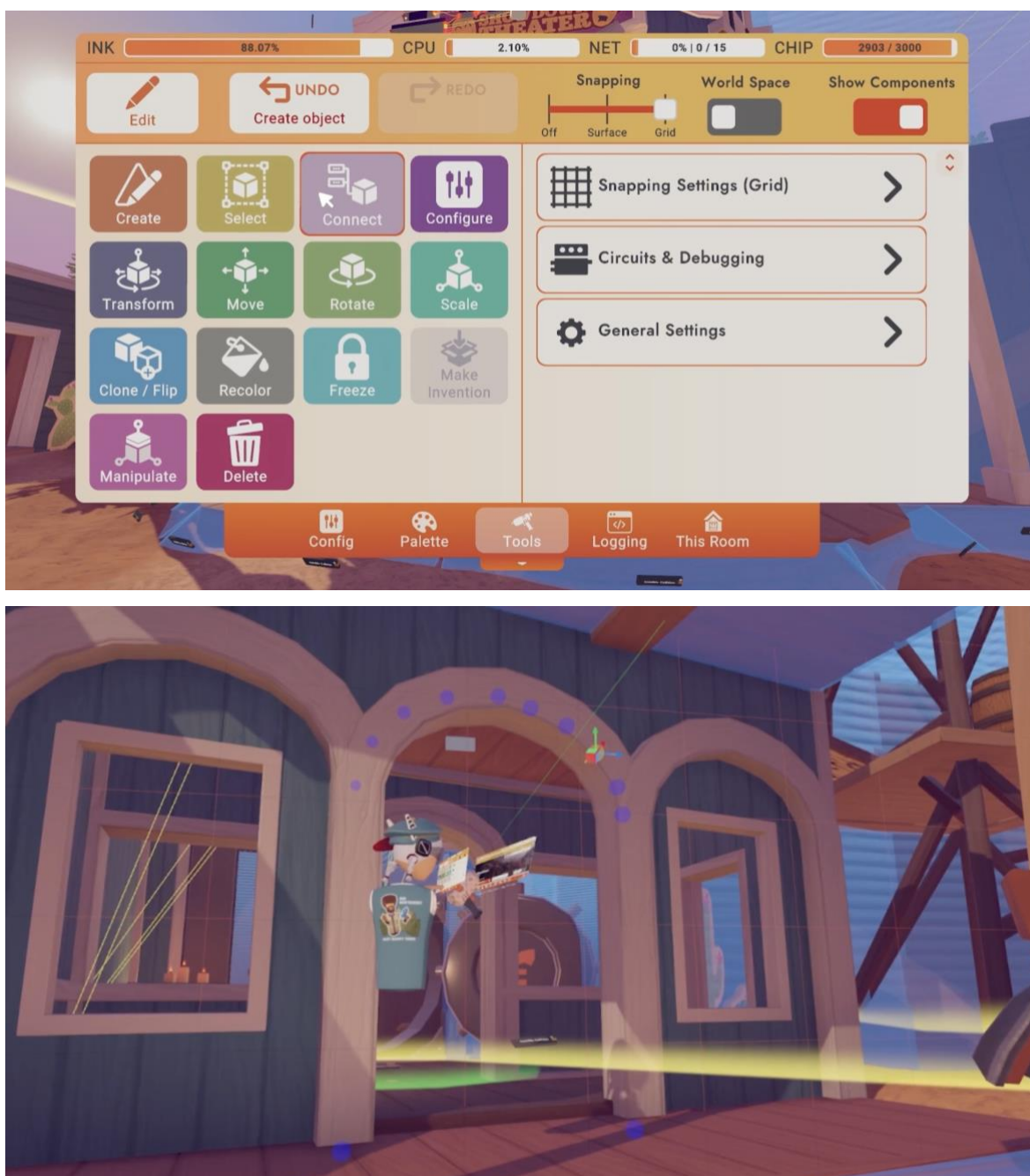
Figure 7. Rec Room's new creation tool: Rec Room Studio (Rec Room, n.d.)

Creation is not necessarily the main offering for some games, but those games try to offer creative opportunities as an option to choose through the creative game mode. As Animal Crossing has relatively less freedom in building things within the platform, Nintendo separately launched the game extension called *Animal Crossing: New Horizons – Happy Home Paradise*, where users can freely build and design (Nintendo, n.d.). In games with stronger competition and challenge gratifications, such as Fortnite and Minecraft, building is a big part of the game to survive and compete with other players. However, they offer Creative modes where users can build things without any goals or missions to attain, stimulating users' creativity (see Figure 8).

Figure 8. Fortnite Creative Mode (Koczwara, 2018)

In summary, the metaverse platforms suggest to users that everything in the world is customizable and buildable, encouraging limitless creation and unleashing creativity. This value proposition seems devised by gaming companies to increase the quality and richness of the platform content. Compared to social media, being creators in the metaverse games seems more strongly encouraged based on the observed value proposition.

Table 4. Creativity Enhancement

	Creative game mode	Offering own creation tool
Roblox		A separate studio program, Roblox Studio.
Fortnite	Creative mode developed from the original game.	A PC-based toolset, Unreal Editor for Fortnite (UEFN).
Minecraft		
Decentraland		Web-based Decentraland Studio.
The Sandbox		VoxEdit for creating assets and GameMaker for experiences.
VRChat		Unity-based Software Development Kit (SDK).
Rec Room		In-game studio Maker Pen & Newly released Unity-based Rec Room Studio.
Horizon Worlds	In-game Create mode.	In-game Build mode.
Second Life		Various in-game building and texture tools.
Animal Crossing	A paid downloadable content (DLC) extension, *Animal Crossing: New Horizons – Happy Home Paradise.*	

4.3. Interactivity-based Gratifications

For interactivity-based gratifications, four themes, which are Activity, Competition, Interaction, and Responsiveness/Dynamic Control, are predicted. Besides Competition, three themes showed strong patterns, and one new emerging theme, Safety, was found.

4.3.1. Activity

Activity is the first predicted interactivity-based gratification regarding the value proposition that makes users stay active and engage in many activities. Corresponding to the expectation, Activity shows a strong pattern throughout all 10 cases. This is because Activity is the driving force of metaverse platforms, encouraged by Agency-based gratifications. The

metaverse games devise a system and organize events to increase opportunities for users to engage.

The metaverse platforms make users engaged to maintain their retention by offering many activities to perform, such as creating, sharing, selling, and buying things, which they view as a key part of the platform ecosystem (Peters, 2023; Sidhwani, 2023). For instance, The Sandbox assigns allowances to users to enable them to engage in the economy immediately (The Sandbox, 2020). Further, the platform encourages users to have LAND ownership so that users can have the freedom to organize and engage in many activities (The Sandbox, 2021b). VRChat offers various official and community events and activities that users can engage in, such as watching movies, playing sports, learning sign language, and participating in dancing lessons (Mabini, 2022; VRChat, 2018).

Many platforms organize festivals or concerts, movies, and sports events within the platform (Malik, 2022). In Second Life, the residents can attend social gatherings, press conferences, and even college classes (Pathak, 2017). Animal Crossing provides numerous seasonal activities that users can engage in, such as cooking, farming, fishing, and making a snowman (Animal Crossing, 2021) (see Figure 9). Minecraft offers Activity gratification in a unique way. The game does not give many hints for users and, therefore, users need to find out and earn everything by themselves. In Survival Mode, users are compelled to collect materials to make food, shelter, and tools (Gallegos, 2021).

Many metaverse games also offer play-to-earn games, which indicates games that offer rewards or in-game items as incentives. On The Sandbox, users can collect assets while playing the games by clearing the quests. In Decentraland, Butterfly Prawn Farm is the most popular play-to-earn game that provides multiple activities (Decentraland, 2023a). Fortnite offers many quests and rewards where users can win in-game items or points by completing a given mission (Fortnite, 2023d).

In summary, Activity can be found in metaverse games by offering a system or content that constantly engages people in (Sundar & Limperos, 2013).

Figure 9. Building a snowman in winter on Animal Crossing (Nintendo, 2021)

4.3.2. Competition

Competition is video game-related gratification that encourages users to beat other players and show off their best skills. As the majority of the metaverse platforms offer various competitive games, the competition was predicted to be found as a part of the interactivity-based value proposition. However, this also means competition can be only found from a few games or activities within the platform, which are often not the main value the platforms offer. Competition showed a strong pattern in two cases, Fortnite and Rec Room, but only Fortnite offers competition as a main value proposition as the platform was developed based on the popularity of their original game Fortnite Battle Royale.

Although Fortnite Battle Royale became a part of the platform, it is still the most popular game mode for players. This popularity led the game to be an e-sport, indicating the game provokes users to compete against other users. The Battle Royale has the rules where 100 players are dropped on the island at the same time, and they need to build a fortress and eliminate opponents until one player or team survives while the map is shrinking smaller. Fortnite has a leaderboard for users to rank up and brag about their ranking to friends (Malcom, 2021). In order to increase competitive elements, Fortnite launched Ranked mode, where users can register in the global leaderboard and compete globally (Epic Games, n.d.-a).

In conclusion, although Competition can be found in the games that metaverse platforms offer, it is difficult to see as a main gratification of the metaverse platforms because it is not the explicitly and mainly offered value proposition. Even Fortnite

announced that Fortnite Battle Royale will remain but only be one part of the value of the whole platform (Webster, 2023).

4.3.3. Interaction

Interaction is the third interactivity-based gratification, which was examined by looking for value propositions that let users interact with other users or objects and constantly specify their preferences. Interaction gratification is found across the 10 cases, showing a strong pattern. It is a gratification closely connected with Socializing, Activity, and Responsiveness. Considering that Interaction has been an essential gratification on the internet and social media (Whiting & Williams, 2013), it is no wonder that it is a fundamental gratification for metaverse platforms. Fortnite stresses that the platform enhances personal and natural interaction between users compared to the social media environment (Webster, 2023).

Most metaverse games allow users to interact with other users in multiple ways, including text, voice, body positioning, and body language. Roblox expanded the user interaction from text-based to audio-based, adding realistic spatial audio depending on the distance (Takahashi, 2023). It has been a medium for children to communicate with their friends during the pandemic (Sidhwani, 2023). Now, Roblox is aiming to make in-person conversations between avatars possible to enable more social, natural interactions (Baszucki, 2022; Roblox, 2023a). At the same time, the platform would like to give freedom to users for how they would like to communicate conveniently based on their situation and context (Roblox, 2021d).

Emotes and avatar body movement help users to interact with body language, enriching the quality of social interaction. VRChat attempts to improve the ways to interact with other users as Interaction is the significant value of the platform (Butler, 2022). To increase the interaction, VRChat developed Avatar Dynamics, which is an optional interactive function that allows users to interact with avatars in diverse ways, including giving a high-five, patting a head, and grabbing the cheeks (VRChat, 2022a). Further, the metaverse platforms aim to increase the number of collaborative games as they consider games highly interactive, engaging activities for users.

Moreover, the platforms put effort into designing the objects and events in the world more interactive. For its own music festival, Decentraland installed interactive billboards with real-time content streaming and previews, seamless event navigation, and cross-metaverse connection, allowing users to jump from one event venue to another.

(Decentraland, 2023b) (see Figure 10). Further, Decentraland encourages creators and brands to construct interactive event settings, such as clickable information panels and virtual guided tours (Decentraland, 2023d; 2023e).

In sum, Interaction gratification is offered by suggesting more enriched, diverse ways of communication with users and objects, constantly satisfying users' needs (Sundar & Limperos, 2013).

Figure 10. Decentraland's interactive billboard (Decentraland, 2023b)

4.3.4. Responsiveness/Dynamic Control

Other elements that decide gratifications related to high interaction are how much the games are responsive to users' commands and offer speedy feedback while letting users stay in control. The fourth dimension of interactivity-based gratifications is Responsiveness/Dynamic Control. Although two gratifications were separately suggested in the list by Sundar & Limperos (2013), the two elements share similarities as they can be seen from the same context of value propositions. Although both gratifications can be found in all 10 cases, they are not the highly noticeable value propositions offered by the companies. They are often taken for granted because these games intrinsically have a high level of responsiveness and control functions. Instead, the companies explain how they would like to refine the existing functions for better response and control.

Many metaverse gaming platforms highlight their innovation towards real-time interaction and instant feedback. The aforementioned technologies that produce Realism are supported by speedy responsiveness and offer higher dynamic control. Roblox, VRChat, Rec Room, and Horizon Worlds specifically highlight the future features that capture facial

expressions from a user's camera and translate them onto their avatar in real-time (Baszucki, 2022; Meta, n.d.; Rec Room, 2023a; VRChat, 2022b). However, this functionality highly depends on the performance of the hardware that a player is using.

Another Responsiveness gratification that many platforms offer is physics simulation: that 3D graphic simulates based on real-world material (Roblox, 2023a): "When you drop a feather or toss a paper airplane, they float and glide to the ground." VRChat offers an interactive avatar function where players can see their friends' hair, ears, and clothes move with real-time physics (VRChat, 2022a). In order to increase responsiveness, Rec Room explains that they simplified their avatar to make the game run smoothly (Rec Room, 2023d).

Dynamic control is offered by giving more options to choose from in the settings for users. By giving certain functions freedom, users gain more power in customizing and controlling the game in the way they want it to be. Hence, increased dynamic control brings increased Self-expression and Agency Enhancement. For instance, Rec Room offers a Default control scheme where users can customize the key settings for different actions, such as picking up and dropping stuff (Rec Room, 2022f).

Responsiveness and Dynamic Control are fundamental gratifications of the games, and it is more apparent that the level of this gratification increases on the metaverse gaming platforms, giving more control to users and catering to their preferences (Sundar & Limperos, 2013).

4.3.5. Emerging Sub-theme: Safety

Safety is a newly found theme that is about offering safe and private environments based on users' preferences to improve the quality of the experience. The theme is an integral value proposition for all 10 platforms, revealing a strong pattern. The metaverse games put a high priority on creating a safe environment for users by educating the community rules, giving the option to block or report other users, and creating tailored experiences for underaged users. Regarding safety, Roblox considers that the same standards for civility in real-world need to be applied to the platform (Roblox, 2021d).

Firstly, the platforms obligate users to read the community rules and guidelines before they join. Fortnite continuously stresses its community standards and rules and encourages users to be friendly to each other for everyone to have a fun experience (Fortnite, 2023b; Webster, 2023). Horizon World and Rec Room offer a code of conduct, which is a

guideline that users can see everywhere during the experience to moderate the user experience (Meta, n.d.-b) (see Figure 11).
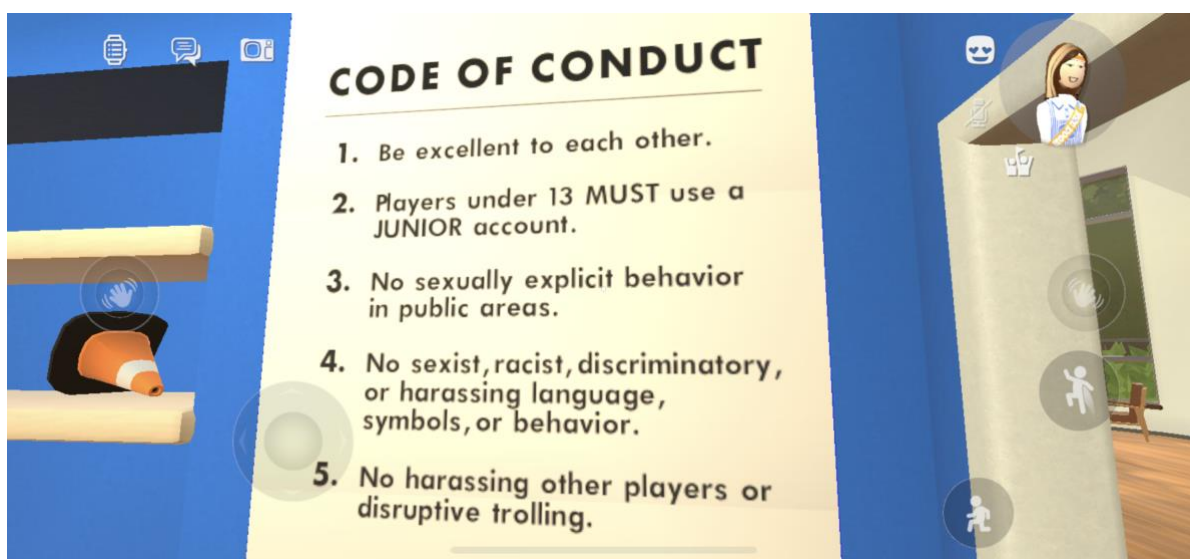
Figure 11. Rec Room's Code of Conduct in a public area (Screenshot)

Secondly, the platforms offer users safety options to protect themselves from malicious behavior or content by blocking, muting, or reporting other users. By giving moderation options, the platforms let everyone become a moderator in the virtual world, which helps the platforms to recognize bad actors faster. VRChat offers users more control over their surroundings by filtering what they hear or see based on their preferences (see Figure 12). Users can sort other players into six different categories depending on the level of trust (VRChat, n.d.). Rec Room has the option to vote to remove someone in the room for violating the community code of conduct (Bowles, 2022). On Horizon World, users can even set up limits for their personal space so that no one can approach beyond the set boundary (Constine, 2019).

Figure 12. VRChat's safety menu (VRChat, n.d.-b).

Third, the platforms offer various moderation and regulation for underaged users. Roblox highlights its effort to make a safe and civil environment for users, especially for kids (Takahashi, 2023). Fortnite runs Cabined Accounts, which are tailored accounts for younger players to play in a safer environment (Epic Games, 2022a). Further, although Fortnite is a shooter game, it does not depict hyper-realistic violent scenes compared to other shooter games. There is no blood and the players do not get "killed" but "eliminated" (Malcom, 2021).

Lastly, the metaverse platforms are working towards creating more privacy options. They consider users to often be in need of a private space for intimate communication with a few selected people whereas the platform is an open, public space. Roblox, for example, will offer different types of communication, depending on the privacy preference of users (Roblox, 2021d).

Although Safety is not mentioned by Sundar & Lim (2013), it turns out to be significant gratification for users that requires interactive technological functionalities based on users' situational and contextual preferences.

4.4. Navigability-based Gratifications

Four navigability-based gratifications, Play/Fun, Challenge, Exploring/Variety-seeking, and Navigation Aids were predicted as value propositions of metaverse games. All of the gratifications showed relatively robust patterns, indicating that navigability affordances become more significant in the metaverse platforms.

4.4.1. Play/Fun

Play/Fun is the first navigability-based gratification that was predicted, which lets users play and have fun on the platform. A strong pattern from 10 cases shows that Play/Fun is a common gratification for the metaverse games. It is self-evident that this gratification can be satisfied when other gratifications, such as immersion, responsiveness, or activity, synchronously work together (Sundar & Limperos, 2013). Play/Fun is an essential gratification for games and other various entertaining content that the metaverse platforms offer.

To make the overall experience enjoyable and pleasant, the metaverse platforms highlight the power of play and try to expand games and organize entertaining events within the platform, including festivals and concerts. Rec Room constantly expands its original games that are fun to play (Rec Room, 2022d). Fortnite aims to create a whimsical atmosphere and make the platform an entertaining place where it feels like a party. It arranged Coachella Island which enables users to enjoy the well-known music event remotely while dancing and hanging out with friends (Forristal, 2023). During the events, users can dance by using fun emotes and simply enjoy the experience (Webster, 2023). On Fortnite, many players are willing to spend a few dollars for skins and emotes that make the game more whimsical for themselves or their friends (Malcom, 2021). Decentraland and Rec Room also organize an annual music festival to entertain their users (Decentraland, 2022c; Hayden, 2023). The Sandbox offers tourism as entertainment, which includes various events such as museum tours, live concerts, or nightclubs (The Sandbox, 2023f). VRChat offers unique and enjoyable experiences where newcomers can relax, play, and have parties (Butler, 2022). Horizon World offers a world where users can simply have fun and play like a child, such as movie nights or comedy clubs (Meta, 2023a). Second Life offers relaxation, entertainment, and escapism from users' day-to-day real life (Kalning, 2007; Second Life Community, 2022; 2023c).

Although it is derived from a technological aspect, having fun is closely related to the emotional evaluation of the overall value propositions. Animal Crossing's producers mention the importance of creating games that users can have fun with during the interview (Nintendo, 2016): "Number one is that the player is happy, has fun, is surprised and that the game moves their emotions. […] During the time that they are playing, they can forget everything, like all the troubles they have."

Despite that Play/Fun might also be a subjective, experience-based gratification, it is still a crucial value that is offered by various entertaining content of the metaverse games

supported by the coordination of various technological attributes (Sundar & Limperos, 2013).

4.4.2. Challenge

Challenge is the second navigability-based gratification predicted, which motivates users to master the game and achieve higher levels. Similar to Competition, Challenge is derived from video game-specific gratifications and, thus, only partially explains the value of the metaverse platforms. A moderate pattern was visible in five out of 10 cases, which is still stronger than the Competition element. This is because Challenge is also offered in various ways through platform activities that let people engage.

Games with rules, such as the shooting match or survival mode, offer higher challenges than social games as there is a clear objective, whether by collecting things, beating opponents, or completing quests. To attain certain goals, those games require users to be skilled. For instance, Fortnite stimulates users to be skillful in building a defense and attacking opponents to eliminate them, and ultimately rank higher on the leaderboard. The highest league is called "Unreal", in which all the best global players are ranked every season (Fortnite, 2023c). In the understanding of their players' needs, Fortnite created Zero Build, Battle Royale's spin-off, to offer the extra option to purely test their fighting skills without building (Epic Games, n.d.-a). Many other platforms, such as Rec Room, Decentraland, and The Sandbox try to integrate Fortnite's Challenge gratifications into their platforms by creating similar Battle Royale types of games. Minecraft's environment requires users to experiment and learn and gain mastery through those earned experiences and knowledge. Minecraft's Survival Mode encourages users to fight against zombies and defend themselves to survive (Gallegos, 2021).

Related to Activity gratification, many play-to-earn games or quests from the metaverse platforms challenge people to earn an item by playing the game. Fortnite offers many quest events where users can get in-game rewards when achieving them (see Figure 13). Fortnite's experience points (XP) are also a good example of a Challenge as collecting XP makes players challenge themselves. The Sandbox aims to build many games with skill-based challenges, which require players to pay an entry fee and win the prize pool by winning a certain game (The Sandbox, 2020). Animal Crossing considers that, whether it is a small or big achievement, giving an opportunity to achieve something is crucial for the game setting. For example, catching a rare kind of fish or a certain amount of bugs gives a feeling of accomplishment for players (Nintendo, 2016).

Figure 13. Fortnite's quests menu (Fortnite Wiki, n.d.)

In summary, Challenge can still be considered as a gratification of metaverse games as many platforms require users to get more skillful in controlling but also there are diverse games and systems that offer challenge in various ways.

4.4.3. Exploring/Variety-seeking

In examining Exploration/Variety-seeking gratification, the research focused on the value proposition that encourages users to move from space to space and discover something new. This gratification was also found across the 10 cases, showing a strong pattern. The metaverse gaming platforms, as the term "platform" suggest, offer various options for users to choose to discover and explore.

The metaverse games offer numerous options of games and experiences to satisfy the various needs of different users. Roblox drives discovery as they have an increasingly broad set of creators, content, and users (Roblox, 2023a). The Sandbox offers various games and experiences, including action, adventure, performance, parkour, and puzzles (The Sandbox, n.d.-a). Fortnite not only offers various modes of original games made by themselves but also encourages users to discover various creator-made game genres (Epic Games, n.d.-a). Both original content and user-generated content stimulate users to explore the metaverse platforms. Fortnite's CEO highlights its ambition to produce various content beyond Battle Royale experiences to serve diverse users (Webster, 2023):

"A lot of people come to the Fortnite concerts because they love the musicians, but then they leave because they're not shooter players. We see massive opportunities for growth. There are potentially hundreds of millions of gamers who could become active users of this thing if we serve enough of their different needs. Every genre of games brings in a new audience along with it. Some are really niche and hardcore, some are very broad and mass market, and we'll welcome them all."

To facilitate exploration, the platforms give suggestions to users for new discoveries. Roblox features numerous user-created games and experiences of countless genres on the Discover tab (Sidhwani, 2023). VRChat offers a World menu, which is designed to help users to explore new places that they might not have otherwise found. VRChat's Variety Box is a page that showcases a randomly selected world from a variety of categories, giving creators more chances to be discovered by users (VRChat, 2022b). Second Life offers a Destination Guide, highly encouraging users to visit new places (Axon, 2017).

Exploring/Variety-seeking gratification can be also found in the settings of metaverse platforms. For example, Minecraft encourages users to explore the map in an interesting way by suggesting no tutorial level or prompt to tell what to do (Lewis, 2014). Due to this absence of instruction, new users are forced to explore, wander around, and find out what is there and how things work. This adventurousness is what makes Minecraft exhilarating as users do not know what they would encounter during their journey (Gallegos, 2021).

Exploration/Variety-seeking is an important gratification of the metaverse games, which lets users move around in the 3D world and find something new (Sundar & Limperos, 2013).

4.4.4. Navigation Aids

Navigation Aid is the value proposition that assists users to explore easily and effectively by offering guidance and visual information. It showed a strong pattern across all 10 cases. Many metaverse platforms put effort into making navigating as easy as possible by offering location, status, and extra information to assist smoother exploration.

Many metaverse platforms offer a map and share real-time location, and through a convenient menu, users can check the status update and move from space to space. Decentraland offers the Atlas View, which is a birds-eye perspective of the map of Decentraland in color codes. Users can click and drag the map to move around, zoom in and out, or hover the cursor over a parcel to see its location and owner (Decentraland, 2023e).

Similarly, the Sandbox offers functionality called Neighborhood View, a navigational tool that makes it simple for users to zoom into neighborhoods and easily find experiences on the map (The Sandbox, 2023e). Horizon Worlds placed a 3D Meta logo to serve as a central landmark to help people orient themselves, while a nearby wayfinding sign helps people quickly find the content they are interested in (Meta, 2022).

It is often overwhelming for new users to navigate in 3D environments freely and find something that they are looking for. Thus, many metaverse games offer tutorials (see Figure 14) and suggest users check the documentation or how-to-guide available on the official and community websites to help them learn and navigate easily. Roblox's Creator Hub is a website where creators can check multiple types of information from creators' dashboards (Peters, 2023). Decentraland offers a protocol for starters to explain the platform system and encourage them to continue learning through diverse open-source repositories (Decentraland, n.d.-b).
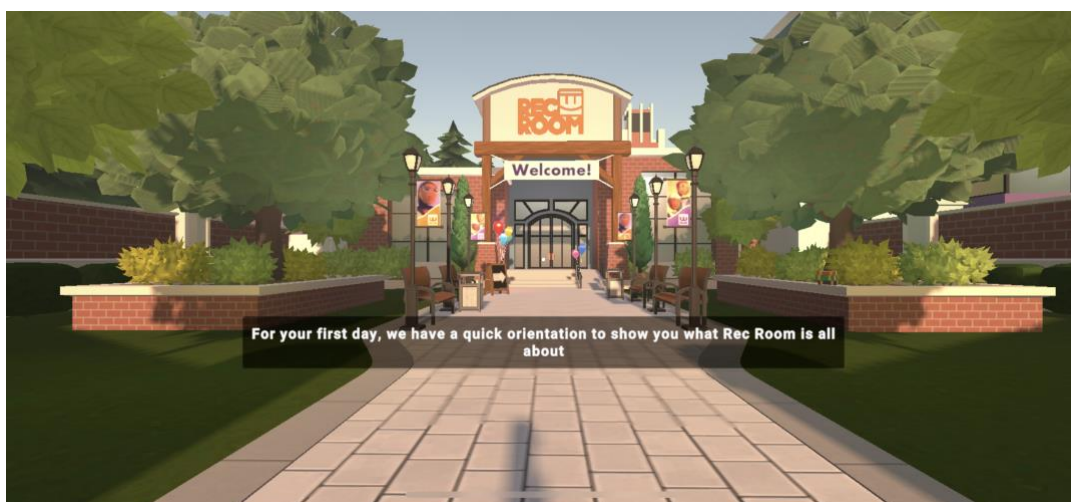
Figure 14. The tutorial of Rec Room mobile (Screenshot)

Furthermore, platforms keep improving the design of the menus to be clearer and more accessible for users. VRChat developed its main menu to be more functional, organized, and informative by offering customization options for users to help them quickly find the features they are looking for (VRChat, 2022b). Animal Crossing offers Navigation Aids through its storytelling; Resident Services is the spot players can visit when they are stuck and need advice on what to do next by asking the character Tom Nook. Further, NookPhone offers a menu for status updates and a map that assists players (Nintendo, 2020a) (see Figure 15).

Figure 15. Animal Crossing's navigation tool: NookPhone (Nookipedia, n.d.)

Minecraft is an exceptional case that intentionally does not offer Navigation Aids. Since the game is a creative sandbox game that has a steep learning curve, the majority of players find out how-to while gameplay or searching external websites or communities where other users share this information and "recipes" to create material (Gallegos, 2021). To give more options, Minecraft added NPCs in several game modes, which deliver story content, provide quests, and give players instructions (Poerschke, 2021).

To summarize, compared to 2D websites, metaverse platforms offer Navigation Aids in diverse ways to assist users' navigation in a 3D environment to enhance user experience.

4.5. Newly Emerged Theme: Accessibility

Accessibility is a newly emerged theme that refers to the offerings of metaverse games regarding being accessible from diverse user environments without any limitations or complicated procedures. It can be related to both modality and agency gratifications because it is offered by both the devices and the platform systems. Among 10 cases, a total of 8 cases mention accessibility as a value of the platform. Second Life's infrastructure is relatively old and only supports desktop mode, while Animal Crossing is a paid-to-play game. Nevertheless, 8 platforms highlighted the inclusive platform environment by lowering the barrier to play or create and compatibility with multiple devices.

Firstly, all the platforms stress that anyone can join the platform, play, and create. Roblox, Fortnite, The Sandbox, and Rec Room state that they are working on building tools that enable anyone to create everywhere, accelerating accessibility (Epic Games, 2022c; Grossman, 2021; Roblox, 2023b; The Sandbox, 2021c; Takahashi, 2023). Decentraland

highlights that accessibility is the advantage of virtual events they organize as concerts or festival events can be difficult to access, especially for those with physical or financial limitations (Decentraland, 2022b).

Secondly, the metaverse platforms offer accessibility through multiple devices with the simplified step without the cost. Except for Animal Crossing, all the gaming platforms are free-to-play for that anyone with internet-enabled devices. Regarding the costs, Roblox highlights that users may start creating right away with no setup fees, and without any prior coding experience (Roblox, 2022d), as the platform offers free hosting and cross-platform distribution as a service (Roblox, 2023a). Regarding the devices, many of the platforms support multiple devices and operating systems to increase accessibility. For VR-oriented platforms, including VRChat, Rec Room, and Horizon Worlds, being accessible for those without VR devices is considered crucial as VR devices are not as ubiquitous as desktop or mobile. Thus, these platforms support desktop mode and some even more. (Meta, 2023; VRChat, n.d.; Wutz, 2023).

Table 5. Accessibility

	Device compatibility	Financial cost	Accessible tool
Roblox	VR devices, desktops, mobile, and consoles.	Free-to-play. The premium version requires people to pay.	Offers free, easy creation tool.
Fortnite	Desktops, mobile, and consoles.		
Minecraft	VR devices, desktops, mobile, and consoles.		
Decentraland	Desktop browsers.	Free-to-play.	
The Sandbox			
VRChat	VR devices and desktops.	Free-to-play. Premium version requires people to pay.	
Rec Room	VR devices, desktops, mobile, and consoles.		
Horizon Worlds	Currently only for VR. Planning to expand.	Currently free-to-play.	
Second Life	Only on desktop.	Free-to-play.	

Animal Crossing	Mobile and consoles.	Paid-to-play.	

4.6. Newly Emerged Theme: Monetization

The second new theme found is Monetization, which is profit compensation for the efforts creators put into their creations. Monetization was found as a value proposition in 9 out of 10 cases, showing a strong pattern. Although gaming companies encourage users to create to enhance their agency and creativity, creation itself often does not produce any financial benefit for them. In order to increase engagement, financial incentives are offered for users to feel rewarded. However, Monetization value does not have a direct relationship with any of the MAIN gratifications, which is why separately discussed.

Fortnite and VRChat aim to build a Creator Economy and give payouts to many creators on the platform (Epic Games, 2023; VRChat, 2023). Fortnite announced that it would like to build an open ecosystem that allows all creators and developers to generate income from content creation (Epic Games, 2023). Roblox mentions that the monetization opportunities will keep expanding (Roblox, 2022f; 2023a). Decentralized economy platforms, such as Decentraland and The Sandbox, emphasize that they would like to establish a system that permits creators to fully own and be rewarded for their contributions (Decentraland, n.d.-b; The Sandbox, 2020) in order to disrupt other metaverse platforms (The Sandbox, 2021c). Rec Room states that properly rewarding creators is necessary for the platform to build a new economy (Rec Room, 2022a). Horizon Worlds highlights that creator monetization is indispensable since they need to be able to support and make a living out of what they do (Silberling, 2022).

When it comes to monetization, every platform has a somewhat different system and, within one platform, there are multiple ways to get monetized. On Roblox, when a user makes a purchase, the item's developer receives a share of the sale in in-game money, Robux, which then can be exchanged for real-world currencies (Roblox, 2022d; Sidhwani, 2023). According to Roblox (2022d), the company distributed more than $500 million to the community in 2021. Roblox and Fortnite mainly reward creators for engagement-based payouts, which automatically reward experiences depending on user involvement (Epic Games, 2023; Roblox, 2022d), and give feedback to creations to increase user engagement further (Roblox, 2023a), much like social media creators. A creator on Horizon Worlds can earn 52.5% from the total amount of money of the sold item, excluding the commission for the platform (Bowles, 2022).

Compared to the Web 2.0 creator economy, Monetization seems to be a stronger value proposition in the metaverse platforms because the central administration and content creation are delegated, and the power is decentralized through the platform system by utilizing the engagement and labor of users.

5. Conclusion and Discussion

The research was aimed at understanding the value propositions offered by gaming companies through a lens of MAIN-model gratification (Sundar & Limperos, 2013) based on the technological features of various metaverse gaming platforms. By examining 10 cases of metaverse games through comparative case studies, this research attempted to answer the following main research question: *How do gaming companies provide value propositions for metaverse games?*

Since the metaverse and the XR technology are gaining attention in the tech industry, existing metaverse gaming platforms innovate their value propositions to seize the opportunities while some new metaverse platforms are created. As the competition between the metaverse gaming platforms increases, the value propositions of these platforms keep evolving and expanding, forming a dynamic, complex chain of values (Landoni et al., 2020). For that reason, the research tapped into offered value propositions of the metaverse platforms based on the understanding of various technological complexity that are sources of the values.

This research has a few significant findings. First, three modality-based gratifications predicted, which are Realism, Immersion, and Novelty, showed relatively strong patterns. It is noteworthy that the Realism gratification is the one part that many metaverse platforms are constantly working on to improve the quality of the experience. Innovative audiovisual technologies that can enhance realism are offered, which helps users to feel a higher presence of others and greater immersion. Further, the simulation of real-life activities in the metaverse platforms is highlighted regarding the realism gratifications as metaverse platforms attempt to mirror real life in virtual settings. Moreover, the metaverse games try to offer Immersion through both content and technology. Content with strong storytelling and narratives makes users feel absorbed or taking part in the setting, while VR technology offers an immersive environment on VR-based social games. Novelty gratification is offered through the distinctiveness of the audiovisual attributes and content compared to other rivalry platforms. By creating an iconic difference in the game interface or system, gaming companies make the platform an irreplaceable place for users. Overall, gaming companies develop communication technology and advanced game interface to offer users satisfy users' modality-based gratifications. This conclusion aligns with what Sundar & Limperos (2013) suggested; enhanced modalities offer users a more convenient experience and perceptually and cognitively enhanced reception. Furthermore, from a business perspective, modality-related gratifications are the values that create the distinctiveness of each platform.

Secondly, compared to traditional video games, it is evident that agency-based gratifications are major value propositions of the metaverse gaming platforms due to the increased freedom for actions. The platforms encourage users to contribute and influence the platform ecosystem by creating, sharing, collaborating, and customizing. Agency enhancement is offered by giving a high level of freedom within technological and ethical boundaries. The platforms encourage users to become creators and influencers by sharing their creations, and the owner and administrator of their own assets and the community. Overall, gaming companies give higher freedom to users and, in turn, actively induce users to contribute their labor to build the platform together. Community Building/Socializing gratifications are provided by encouraging users to find the community that they are interested in within the platform, make collaborative work, stay connected with others, and have a bonding experience. Further, the metaverse games actively offer Self-expression value by allowing users to customize their avatars, express their identity and emotions, and be who they want to be. The platforms keep developing more diverse personalization options and an open environment for users to express themselves. Interestingly, Creativity enhancement, a new agency-based gratification, is the strongest value proposition provided by gaming companies. The platforms expect users to unleash their creativity by designing and building the items, experiences, and games by utilizing the creative tool and interfaces that they offer.

Third, many interactivity-based gratifications are clearly present in the metaverse gaming platforms by giving opportunities for users to make a real-time change, engage, and interact through the platform. Activity gratification of the metaverse platforms is obviously visible by offering various ways to engage in platform activities and organizing various events that intrigue users, keeping users active in the platform. On the other hand, Competition gratification was not the main offering in the majority of metaverse platforms as it can only partially explain a few games while the various content constantly expands in the platform. Moreover, metaverse games provide Interaction gratification by offering multiple ways of communication for users, increasing the opportunity for interacting with the object, and enhancing the quality of interpersonal communication to be more interactive. Although Responsiveness/Dynamic Control gratification is less apparent, the metaverse games provide speedy and proper feedback on command by users and offer customization in key settings for users to conveniently control while they move in the platform. Safety gratification is a newly emerged interactivity-based gratification that is a crucial value highlighted by gaming companies. The platforms offer tailored content for younger

audiences, educate the guidelines users, and provide various safety options that allow users to actively block or report violence of the community rules.

Fourth, all of the predicted navigability-based gratifications are visible in the metaverse games' value propositions. Play/Fun gratification is offered through entertaining content and an immersive platform environment. On the other hand, Challenge gratification is offered not only in gaming content with rules but also in quest missions that make users more adaptive to the platform environment, encouraging users to become more skillful and engaged. Exploring/Variety-seeking gratification is provided through the diverse content that the platform offers and users created, a setting of the map that encourages exploring, and suggestions for new content. Similarly, Navigation aids gratification is offered by a real-time update of the user's location and status, a well-organized navigation menu that assists users to find what they want, and documentation or promotion for self-education for how-to through external community-created sources.

Lastly, two extra new themes, Accessibility and Monetization, were found, which do not clearly fit into one aspect of the MAIN model. Accessibility is associated with both modality and agency as it regards how the metaverse games are being accessible to users in a different way, which is either expanding the compatibility with more devices and software or creating accessible tools and environments for users to easily join the platform. Monetization, on the other hand, is partially associated with an agency as it works as an incentive for users to create something. Depending on the system of the platform, Monetization gratification is provided in multiple opportunities for users to be rewarded for their creations, which keeps encouraging users to create more. However, it does not directly connect to any aspect of the MAIN model even though financial incentives can be a big reason for many users to join the metaverse platforms.

Let us go back to the main research question: *how do gaming companies provide the value propositions for metaverse games?* The overall MAIN-model gratifications are present in the value propositions of the metaverse games, and agency-based gratifications are predominantly offered due to the unique user-equals-creator environment of the metaverse games. Compared to traditional video games, many value propositions of metaverse games are clearly new and complicated. Many gratifications are overlapping or are related to each other as the list of the gratifications is non-exhaustive. Interactivity-based gratifications are somewhat subtle to observe and often offered together with agency-based gratifications. Overall, the platforms do not have identical systems and function differently but share similar value propositions. The MAIN model-based value propositions are offered by

continuous innovation and development of the platform interface and content, supported by active communication with users and improvement based on feedback.

The results bring us a few significant theoretical implications. This research helps to clarify the value propositions of the metaverse games based on the academically debated concept of the metaverse. Especially, by connecting the two concepts, value propositions and the U&G approach, the research tackles the business perspective on how the value propositions are created in an understanding of the users' gratifications. Using the comparative case study method was particularly useful to examine patterns from multiple cases and understand the real-life context of value propositions of the metaverse games from a comprehensive perspective. As the metaverse gaming platforms possess complex combinations of technological affordances, using the MAIN model was appropriate to analyze that complexity in an organized manner. Accordingly, the MAIN model is actively utilized and thoroughly tested by using the example of the metaverse gaming platforms. The results can be attributed to the further application of the MAIN model by Sundar & Limperos (2013) on other new media, but also to the development of the U&G approach to capture the complexity of new media technology.

Nevertheless, the study has several limitations that should be noted. Although the metaverse gaming platforms are defined in the theoretical framework, there is dynamical complexity in the word "platform," which is distinctive from just a "game". Thus, using traditional game-related gratifications, such as competition and challenge, only can partially explain the platform, where multiple games and other content exist within one system. On the other hand, the reason why diverse platforms have different systems is to compete and offer distinctive value propositions, considering how different Roblox and Animal Crossing are, for example. None of the gaming platforms can offer values of the complete definition of the metaverse yet.

Another limitation regarding validity comes from solely depending on the MAIN model as a theoretical tool. Although the MAIN model does explain gratifications better in depth by focusing on the technology-specific feature of the medium, it is limited in understanding the original psychological desire, such as diversion or escapism. The model may lack in explaining the main reason why people play the game as people would not play the metaverse game just because of Responsiveness, for instance. Though, this research points out such psychological gratifications can be fulfilled by the combinations of different MAIN model gratifications. Furthermore, because the list of possible gratifications suggested by Sundar & Limperos (2013) is not mutually exclusive, many themes are related to each other, making it difficult to examine and distinguish different value propositions. For

example, Interaction gratifications were often recognized together with Activity, Socializing, and Responsiveness. Similarly, some gratifications can belong to more than one dimension of the MAIN model, such as Accessibility. For example, a free-to-play game is accessible in terms of both modality and agency. In this regard, this research might have not found all the gratifications that the metaverse games have.

Lastly, the research might have neglected the diverse roles that exist in the metaverse platform ecosystem, as users are encouraged to become creators, whereas, in real life, the different roles might have different reasons for using the platform. Further, as the research focused on extensive cases rather than one or a few cases, the depth of the results might be insufficient.

Based on these limitations that this research owns, the possible topics or focus points for future research can be suggested. First, future comparative research can either focus on multiple games that one platform offers or on gaming platforms under an identically constructed system. Secondly, the MAIN model can be used to explain the conventional gratifications, regarding how technological affordances altogether satisfy a certain psychological desire. Thirdly, the gratifications can be analyzed depending on the different roles the metaverse platforms have, including players, creators, developers, artists, owners, etc. Fourth, to increase the depth of the research, qualitative interviews with experts in gaming companies can be followed. Furthermore, quantitative studies by using surveys or experiments can be conducted to test the relationships between various gratifications of a metaverse platform, using the MAIN model. Despite that such methods might lack the depth of understanding the gratifications of a medium, they can be used to distinguish different gratifications and construct the relationships between the gratifications.

To conclude, the outcome of this thesis can serve as a guide for gaming companies, enabling them to better understand the current patterns and trends in the metaverse gaming industry. It can shed light on the direction of innovation that these platforms are heading toward and how major gaming companies are creating and offering value to their users. Understanding the current needs and preferences of users within the metaverse gaming landscape can provide gaming companies with a competitive edge, allowing them to tailor their offerings to meet the demands of the market.

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Appendix A: Explanation for Case Selection

1. Roblox

Roblox is an online gaming platform that was established by the American developer, Roblox Corporation. Roblox's virtual universe offers immersive "experiences," including gaming, social hangouts, cultural event, education, and entertainment (Roblox, 2022). Due to this reason, Roblox is also called social gaming platform. Users can create games through their own software, Roblox Studio, and play their own games. Entering the platform is free but in order to play games and buy virtual products made by other users, users need to make a purchase by using their virtual currency, Robux. The creator can earn a certain portion of the money (Kutuchief, 2022). Roblox was ranked one of the most popular gaming platforms in the US for kids under 16 (Lyles, 2020).

2. Fortnite

Fortnite is a season-based free-to-play gaming platform created by the American game company Epic Games. Fortnite initially become popular due to the Battle Royale mode (Roach, 2021), in which 100 players collect materials to build and weapons to fight and battle against each other for survival. Including Battle Royale, Zero Build, and Save the World, Fortnite offers different modes of play and even encourages users to create games and experiences by using Creative mode. Creative mode is its own sandbox game where players can create and share their own virtual islands and experiences (Fortnite, 2020). Through the in-game currency V-bucks, users can make purchases of the outfit or equipment (Roach, 2021). Fortnite offers a variety of avatars and costumes that are popular, such as Marvel Comics or Star Wars (Jungherr & Schlarb, 2022).

3. Minecraft

Minecraft is a pioneer of sandbox-style games created by Swedish developers from Mojang Studio and was sold by Microsoft for $2.5bn. It is the best-selling online game (Bitner, 2021) that owns its unique blocky design that pokes people's nostalgia for the 8-bit era. The game has two different modes: Survival and Creative. In survival mode, users need to collect resources to sustain themselves, whereas, in Creative mode, users can create and explore their own virtual worlds and interact with other players (Gallegos, 2021). Minecraft is a well-known game that unleashes users' creativity (Cipollone et al., 2014). It released multiple spin-offs, such as Dungeons and Legends, and offers to play on multiple devices besides VR headsets (Minecraft, 2023b).

4. Decentraland

Decentraland is a browser-based virtual economy platform created by Argentinian developers and overseen by the non-profit organization, the Decentraland Foundation. It is a decentralized virtual world "owned by its users," which is run by users' votes on policies through the decentralized autonomous organization (DAO). Through its own coin MANA, NFTs that are based on the Ethereum blockchain, users can create, explore, monetize, and trade their own virtual spaces and experiences (Becher, 2023). The platform also offers games and cultural events, such as galleries and concerts, where people can socialize with other people. Decentaland explicitly aims to become a "metaverse" as its ultimate destination (Decentraland, n.d.).

5. The Sandbox

Aligned with Decentraland, The Sandbox is a real estate metaverse platform, developed by The Sandbox, based on a decentralized user-based gaming ecosystem with the Ethereum blockchain. It enables users to create, share, and monetize their games and experiences in the marketplace (The Sandbox, n.d.-b), while users can play, interact, construct, own their properties, and earn in-game items in the virtual world. Thus, the platform highly depends on user-generated content (The Sandbox, 2023). The platform was built with the objective to challenge established game developers, like Minecraft and Roblox, by giving creators actual ownership of their works in the form of NFTs and rewarding them for contributing to the ecosystem (The Sandbox, 2021).

6. VRChat

VR Chat is an online social platform developed by American company VR Chat, Inc., where users can create and share their own avatars, virtual spaces, experiences, and games. By empowering its community to create, VRChat delivers an infinite variety of social VR experiences. Users can be whoever or whatever they want to be (Fagan, 2018). The initial development was for use with VR devices with spatial audio, but it is also being used in PC with a mouse and keyboard. The platform is run based on 25,000 global communities that exist within the platform. Each community opens weekly events and users can build social bonding with others through these events (*VRChat*, n.d.-a).

7. Rec Room

Rec Room is another social platform created by American developer Rec Room, Inc. Although the platform is highly VR-based, it is possible to play it on PC and mobile. The platform allows players to create and share their own virtual experiences by using their own program Maker Pen, including games, sports, activities, and art events. The popular games are team battle paintball or laser gun shooting games. Players can hang out and chat with each other in a variety of settings, and participate in activities in diverse communities (Rec Room, 2023b). The avatar has a minimalistic, cartoony design, consisting of head, torso, and hands. The default design of the space is a school dormitory room and cafeteria recreational center.

8. Horizon Worlds

Horizon Worlds is a social VR platform that is developed by Meta, formerly Facebook. The platform encourages users to create and share their own virtual worlds and experiences. It also allows users to collaborate and socialize through games or experiences that take place within a shared virtual space, such as Soapstone Comedy Club. Players can customize their own avatars, attend various events planned by the platform, and interact with each other in real time (Meta, n.d.). Although it is not the most successful VR platform so far, the platform is suitable for the comparative case as the company Meta is considered as one of the major companies putting effort into the metaverse development.

9. Second Life

Second Life, the antecedent of virtual social platforms and the metaverse (Novak, 2022) built by American developer Linden Lab in 2003. It owns multiple virtual worlds, called Grids, where people can participate in activities and interact with each other in a variety of regions. There is no objective or narrative within the game, which means it is mostly a player-created universe. The game is free-to-play, but to customize characters and decorate the house users need to pay via in-game currency Linden Dollar. Although Second Life does not support VR devices, many users still play the game via desktop actively, engaging around the communities (Galov, 2023).

10. Animal Crossing: New Horizon

Animal Crossing is a social simulation game developed by the Japanese company Nintendo, Inc., a major global gaming company. The game simulates the rhythm of days and seasons and allows players to customize their own characters and interact with various

anthropomorphic animal villagers. To bring civilization to a deserted island, players can decorate their islands and homes, collect items, and engage in relaxing, peaceful activities such as fishing, bug catching, and socializing with other players by visiting other players' islands (Nintendo, n.d.). Compared to other platforms, users cannot collectively, freely interact with each other in Animal Crossing and there is only one narrative exists within the game. Although many features of games differ from other platforms, the game is chosen as it is often associated with the metaverse (Park & Kim, 2022).

Appendix B: Access to Dataset

As the compressed file (.zip) exceeds 100MB, it is impossible to upload in Thesis Management System.

Thus, a link to download the dataset for this research are following:

https://drive.google.com/drive/folders/1zEUlSZCXlxv0C8BsdaktRWTAQK9MjLVZ?usp=drive_link

Appendix C: Units of Analysis

B1. Roblox

Theme	Sub-theme	Reference of source
Modality-based gratifications	Realism	*Internal* Baszucki, D. (2022). Coming soon: More ways to be yourself in the metaverse. *WIRED UK*. Retrieved May 16, 2023, from https://www.wired.co.uk/article/digital-identity-avatars Roblox. (2019). *The story of Roblox* [Video]. YouTube. Retrieved April 2, 2023, from https://www.youtube.com/watch?v=VL6rYNmfrjM Roblox. (2021d). *The future of communication in the metaverse*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2021/09/future-communication-metaverse/ Roblox. (2022a). *Bring your dynamic self to the metaverse with layered clothing*. Roblox Blog. Retrieved April 2, 2023, from https://blog.roblox.com/2021/10/bring-dynamic-self-metaverse-layered-clothing/ Roblox. (2022b). *Funding the future of Roblox creations*. Roblox Blog. Retrieved May 1, 2023, from https://blog.roblox.com/2022/09/funding-future-roblox-creations/ Roblox. (2022c). *Introducing contact importer and friend recommendations*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2022/12/introducing-contact-importer-and-friend-recommendations/ Roblox. (2022e). *Why content creators are moving from 2D screens to 3D worlds*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2022/06/content-creators-moving-2d-screens-3d-worlds/ Roblox. (2023a). *Enabling creation of anything, anywhere, by anyone*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2023/03/enabling-creation-anything-anywhere-anyone/ *External* Takahashi, D. (2023). Roblox says 70 user-created games have crossed a billion plays. *VentureBeat*. Retrieved May 1, 2023, from https://venturebeat.com/games/roblox-ceo-says-70-user-created-games-have-crossed-a-billion-plays/#:~:text=Roblox%20announced%20that%2070%20player,to%2058.8%20million%20daily%20users.
	Novelty	*Internal*

		Roblox. (2019). *The story of Roblox* [Video]. YouTube. Retrieved April 2, 2023, from https://www.youtube.com/watch?v=VL6rYNmfrjM
		Roblox. (2021b). *Avatars and identity in the metaverse, part 2*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2021/12/avatars-identity-metaverse-part-2/
		Roblox. (2022b). *Funding the future of Roblox creations*. Roblox Blog. Retrieved May 1, 2023, from https://blog.roblox.com/2022/09/funding-future-roblox-creations/
		Roblox. (2022e). *Why content creators are moving from 2D screens to 3D worlds*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2022/06/content-creators-moving-2d-screens-3d-worlds/
		Roblox. (2023a). *Enabling creation of anything, anywhere, by anyone*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2023/03/enabling-creation-anything-anywhere-anyone/
		Roblox. (2023b). *Generative AI on Roblox: Our vision for the future of creation*. Roblox Blog. Retrieved May 2, 2023, from https://blog.roblox.com/2023/02/generative-ai-roblox-vision-future-creation/
		External
		Allsup, M. (2023). It might be time to rethink what you know about Roblox. *Retail Brew*. Retrieved May 16, 2023, from https://www.retailbrew.com/stories/2023/01/23/it-might-be-time-to-rethink-what-you-know-about-roblox?cid=30333593.76948&mid=525935f2d3b7910abf9f71cd12afa54d&utm_campaign=rtb&utm_medium=newsletter&utm_source=morning_brew
		Robertson, A. (2021). Apple said Roblox developers don't make games, and now Roblox agrees. *The Verge*. Retrieved May 16, 2023, from https://www.theverge.com/2021/5/14/22436014/apple-roblox-epic-fortnite-trial-what-is-game-name-chang
		Takahashi, D. (2023). Roblox says 70 user-created games have crossed a billion plays. *VentureBeat*. Retrieved May 1, 2023, from https://venturebeat.com/games/roblox-ceo-says-70-user-created-games-have-crossed-a-billion-plays/#:~:text=Roblox%20announced%20that%2070%20player,to%2058.8%20million%20daily%20users.
		Waldman, S. (2022). Roblox: The future of fashion is definitely digital. *Hypemoon*. Retrieved April 2, 2023, from https://hypemoon.com/2022/11/roblox-the-future-of-fashion-is-definitely-digital
	Immersion	*Internal*
		Roblox. (2021c). *Roblox acquires Guilded, a platform to connect gaming communities*. Retrieved May 16, 2023, from

		https://corp.roblox.com/2021/08/16/roblox-acquires-guilded-platform-connect-gaming-communities/
		Roblox. (2021d). *The future of communication in the metaverse*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2021/09/future-communication-metaverse/Roblox. (2023a). *Enabling creation of anything, anywhere, by anyone*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2023/03/enabling-creation-anything-anywhere-anyone/
		Roblox. (2022e). *Why content creators are moving from 2D screens to 3D worlds*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2022/06/content-creators-moving-2d-screens-3d-worlds/
		Roblox. (2023b). *Generative AI on Roblox: Our vision for the future of creation*. Roblox Blog. Retrieved May 2, 2023, from https://blog.roblox.com/2023/02/generative-ai-roblox-vision-future-creation/
		External
		Baszucki, D. (2022). Coming soon: More ways to be yourself in the metaverse. *WIRED UK*. Retrieved May 16, 2023, from https://www.wired.co.uk/article/digital-identity-avatars
		Takahashi, D. (2023). Roblox says 70 user-created games have crossed a billion plays. *VentureBeat*. Retrieved May 1, 2023, from https://venturebeat.com/games/roblox-ceo-says-70-user-created-games-have-crossed-a-billion-plays/#:~:text=Roblox%20announced%20that%2070%20player,to%2058.8%20million%20daily%20users.
	Accessib ility	*Internal*
		Roblox. (2017). *Roblox - About Us* [Video]. YouTube. Retrieved May 16, 2023, from https://www.youtube.com/watch?v=zwyGPW7Zp4k
		Roblox. (2021d). *The future of communication in the metaverse*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2021/09/future-communication-metaverse/Roblox. (2023a). *Enabling creation of anything, anywhere, by anyone*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2023/03/enabling-creation-anything-anywhere-anyone/
		Roblox. (2022d). *Supporting and protecting the Roblox developer and user community*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2022/02/supporting-protecting-roblox-developer-user-community/
		Roblox. (2022e). *Why content creators are moving from 2D screens to 3D worlds*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2022/06/content-creators-moving-2d-screens-3d-worlds/
		Roblox. (2023a). *Enabling creation of anything, anywhere, by anyone*. Roblox Blog. Retrieved May 16, 2023, from

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Agency-based gratifications	Agency enhancement	*Internal* Roblox. (2017). *Roblox - About Us* [Video]. YouTube. Retrieved May 16, 2023, from https://www.youtube.com/watch?v=zwyGPW7Zp4k Roblox. (2019). *The story of Roblox* [Video]. YouTube. Retrieved April 2, 2023, from https://www.youtube.com/watch?v=VL6rYNmfrjM Roblox. (2021c). *Roblox acquires Guilded, a platform to connect gaming communities*. Retrieved May 16, 2023, from https://corp.roblox.com/2021/08/16/roblox-acquires-guilded-platform-connect-gaming-communities/ Roblox. (2021d). *The future of communication in the metaverse*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2021/09/future-communication-metaverse/ Roblox. (2022a). *Bring your dynamic self to the metaverse with layered clothing*. Roblox Blog. Retrieved April 2, 2023, from https://blog.roblox.com/2021/10/bring-dynamic-self-metaverse-layered-clothing/ Roblox. (2022b). *Funding the future of Roblox creations*. Roblox Blog. Retrieved May 1, 2023, from https://blog.roblox.com/2022/09/funding-future-roblox-creations/ Roblox. (2022d). *Supporting and protecting the Roblox developer and user community*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2022/02/supporting-protecting-roblox-developer-user-community/ Roblox. (2022e). *Why content creators are moving from 2D screens to 3D worlds*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2022/06/content-creators-moving-2d-screens-3d-worlds/ Roblox. (2023a). *Enabling creation of anything, anywhere, by anyone*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2023/03/enabling-creation-anything-anywhere-anyone/

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	Activity	*Internal*

Interactivity-based gratifications		Roblox. (2022d). *Supporting and protecting the Roblox developer and user community*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2022/02/supporting-protecting-roblox-developer-user-community/
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	Interaction	*Internal*
		Roblox. (2021d). *The future of communication in the metaverse*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2021/09/future-communication-metaverse/
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	Safety	*Internal*

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Navigability-based gratifications	Play/Fun	*Internal* Roblox. (2019). *The story of Roblox* [Video]. YouTube. Retrieved April 2, 2023, from https://www.youtube.com/watch?v=VL6rYNmfrjM Roblox. (2021c). *Roblox acquires Guilded, a platform to connect gaming communities*. Retrieved May 16, 2023, from https://corp.roblox.com/2021/08/16/roblox-acquires-guilded-platform-connect-gaming-communities/ Roblox. (2021d). *The future of communication in the metaverse*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2021/09/future-communication-metaverse/ Roblox. (2022c). *Introducing contact importer and friend recommendations*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2022/12/introducing-contact-importer-and-friend-recommendations/ Roblox. (2022f). *Why content creators are moving from 2D screens to 3D worlds*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2022/06/content-creators-moving-2d-screens-3d-worlds/ Roblox. (2023a). *Enabling creation of anything, anywhere, by anyone*. Roblox Blog. Retrieved May 16, 2023, from https://blog.roblox.com/2023/03/enabling-creation-anything-anywhere-anyone/

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B2. Fortnite

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Agency-based gratifications	Agency enhancement	*Internal* Epic Games. (n.d.-c). *What is Creative mode in Fortnite? How does it work?* Retrieved May 20, 2023, from https://www.epicgames.com/help/en-US/fortnite-c5719335176219/creative-c5719344003995/what-is-creative-mode-in-fortnite-how-does-it-work-a5720352367643

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	Creativity enhancement	*Internal* Epic Games. (n.d.-a). *Fortnite*. Epic Games Store. Retrieved May 23, 2023, from https://store.epicgames.com/en-US/p/fortnite Epic Games. (n.d.-b). *What is Creative mode in Fortnite? How does it work?* Epic Games - FAQ. Retrieved May 23, 2023, from https://www.epicgames.com/help/en-US/fortnite-c5719335176219/creative-c5719344003995/what-is-creative-mode-in-fortnite-how-does-it-work-a5720352367643 Epic Games. (2022b). Sony and KIRKBI invest in Epic Games to build the future of digital entertainment. *Epic Games*. Retrieved May 23, 2023, from https://www.epicgames.com/site/en-US/news/sony-and-kirkbi-invest-in-epic-games-to-build-the-future-of-digital-entertainment Epic Games. (2023b). Introducing Unreal Editor for Fortnite, Creator Economy 2.0, Fab and more. *Epic Games*. Retrieved May 20, 2023, from https://www.epicgames.com/site/en-US/news/introducing-unreal-editor-for-fortnite-creator-economy-2-0-fab-and-more Fortnite. (2023a). Creative Builders challenge: Discover new worlds in fortnite and earn in-game rewards! *Fortnite*. Retrieved May 20, 2023, from https://www.fortnite.com/news/creative-builders-challenge-discover-new-worlds-in-fortnite-and-earn-in-game-rewards Fortnite. (2023c). *Fortnite island creator rules*. Retrieved May 23, 2023, from https://www.fortnite.com/news/fortnite-island-creator-rules Fortnite. (2023g). *Unreal Editor for Fortnite and creator economy 2.0 are here. New worlds await.* Retrieved May 23, 2023, from https://www.fortnite.com/news/unreal-editor-for-fortnite-and-creator-economy-2-0-are-here-new-worlds-await *External* Fairfax, Z. (2021). Every community-made Fortnite skin that made it into the game. *Fortnite INTEL*.

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Navigability-based gratifications	Play/Fun	*Internal* Epic Games. (n.d.-a). *Fortnite*. Epic Games Store. Retrieved May 23, 2023, from https://store.epicgames.com/en-US/p/fortnite Epic Games. (2022b). Sony and KIRKBI invest in Epic Games to build the future of digital entertainment. *Epic Games*. Retrieved May 23, 2023, from https://www.epicgames.com/site/en-US/news/sony-and-kirkbi-invest-in-epic-games-to-build-the-future-of-digital-entertainment Fortnite. (2023e). *Fortnite island creator rules*. Retrieved May 23, 2023, from https://www.fortnite.com/news/fortnite-island-creator-rules Fortnite. (2023i). *The weekend never ends with the return of Coachella in Fortnite!* Retrieved May 23, 2023, from https://www.fortnite.com/news/the-weekend-never-ends-with-the-return-of-coachella-in-fortnite *External* Forristal, L. (2023). *Fortnite players are getting a new Coachella-themed destination*. TechCrunch. Retrieved May 23, 2023, from https://techcrunch.com/2023/04/13/fortnite-players-are-getting-a-new-coachella-themed-destination/ Malcom, M. (2021). With over 200m users & 2bn in revenue here's why Fortnite may be the ultimate growth marketing example. *Medium*. Retrieved May 23, 2023, from https://gallantway.medium.com/with-over-200m-users-2bn-in-revenue-heres-why-fortnite-may-be-the-ultimate-growth-marketing-e278a3c684d Webster, A. (2020). Travis Scott is touring inside Fortnite this week. *The Verge*. https://www.theverge.com/2020/4/20/21227852/fortnite-concert-travis-scott-astronomical-schedule-date Webster, A. (2023). Tim Sweeney explains how the metaverse might actually work. *The Verge*. Retrieved April 15, 2023, from https://www.theverge.com/2023/3/23/23652928/tim-sweeney-interview-epic-games-fortnite-metaverse
	Challenge	*Internal* Epic Games. (n.d.-a). *Fortnite*. Epic Games Store. Retrieved May 23, 2023, from https://store.epicgames.com/en-US/p/fortnite Fortnite. (2023c). *Earn in-game Fortnite rewards with your friends as Reboot Rally returns May 2023*. Retrieved May 20, 2023, from https://www.fortnite.com/news/earn-in-game-fortnite-rewards-with-your-friends-as-reboot-rally-returns-may-2023 Fortnite. (2023d). *Fortnite Battle Royale v24.30 update: "Find the force" and begin your training*. Retrieved May 23, 2023, from https://www.fortnite.com/news/fortnite-battle-royale-v24-30-update-find-the-force-and-begin-your-training

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	Exploring/Variety-seeking	*Internal* Epic Games. (n.d.-a). *Fortnite*. Epic Games Store. Retrieved May 23, 2023, from https://store.epicgames.com/en-US/p/fortnite *External* Malcom, M. (2021). With over 200m users & 2bn in revenue here's why Fortnite may be the ultimate growth marketing example. *Medium*. Retrieved May 23, 2023, from https://gallantway.medium.com/with-over-200m-users-2bn-in-revenue-heres-why-fortnite-may-be-the-ultimate-growth-marketing-e278a3c684d Webster, A. (2023). Tim Sweeney explains how the metaverse might actually work. *The Verge*. Retrieved April 15, 2023, from https://www.theverge.com/2023/3/23/23652928/tim-sweeney-interview-epic-games-fortnite-metaverse
	Navigation aids	*Internal* Epic Developer Community. (n.d.). *Exploring the sidebar and game menu*. Retrieved June 21, 2023, from https://dev.epicgames.com/documentation/en-us/fortnite-creative/exploring-the-sidebar-and-game-menu-in-fortnite-creative *External*

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B3. Minecraft

Theme	Sub-theme	Reference of source
Modality-based gratifications	Novelty	*Internal* Austin, S. (2023b). The sound of cherry groves. *Minecraft.net*. Retrieved May 24, 2023, from https://www.minecraft.net/en-us/article/cherry-groves-composer-interview Dankis, S. (2023). The Trails & Tales update is here. *Minecraft.net*. https://www.minecraft.net/en-us/article/trails-tales-update-here *External* Gallegos, A. (2021). Minecraft review - IGN. *IGN*. Retrieved May 9, 2023, from https://www.ign.com/articles/2011/11/24/minecraft-review Lewis, H. (2014). A game for children who dream big and reach high. *Financial Times*. Retrieved April 15, 2023, from https://www.ft.com/content/1adf16e0-d50e-11e3-9187-00144feabdc0
	Immersion	*Internal* Austin, S. (2023a). A Sonic-tastic texture pack. *Minecraft.net*. Retrieved June 7, 2023, from https://www.minecraft.net/en-us/article/new-sonic-texture-pack
Agency-based gratifications	Agency enhancement	*Internal* Anderca, C. (2023). Minecraft Legends: Return of the Piglins. *Minecraft.net*. Retrieved May 24, 2023, from https://www.minecraft.net/en-us/article/minecraft-legends-return-piglins Horner, K. (2022). SpongeBob build challenge. *Minecraft.net*. Retrieved May 24, 2023, from https://www.minecraft.net/en-us/article/spongebob-build-challenge- Logan, G. (2022). Minecraft Maker Series episode 1: Making the goblin chef. *Minecraft.net*. Retrieved April 20, 2023, from https://www.minecraft.net/en-us/creator/article/minecraft-maker-series-episode-1--making-goblin-chef *External* Gallegos, A. (2021). Minecraft review - IGN. *IGN*. Retrieved May 9, 2023, from https://www.ign.com/articles/2011/11/24/minecraft-review
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B4. Decentraland

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Agency-based gratifications	Agency enhancement	*Internal* Decentraland. (n.d.-b). *Welcome!* Decentraland Documentation. Retrieved April 14, 2023, from https://docs.decentraland.org/contributor/ Decentraland. (n.d.-c). Whitepaper. In *Decentraland*. Retrieved June 11, 2023, from https://decentraland.org/whitepaper.pdf Decentraland. (2022b). *Introducing Decentraland Worlds Beta: Your own 3D space in the metaverse*. Decentraland Blog. Retrieved May 20, 2023, from https://decentraland.org/blog/announcements/introducing-decentraland-worlds-beta-your-own-3d-space-in-the-metaverse Decentraland. (2022c). LAND rentals become an easy process via Decentraland's marketplace. *Decentraland Blog*. Retrieved June 6, 2023, from https://decentraland.org/blog/announcements/land-rentals-become-an-easy-process-via-decentraland-s-marketplace Decentraland. (2022d). Looking back at Decentraland Metaverse Music Festival 2022. *Decentraland Blog*. Retrieved June 7, 2023, from https://decentraland.org/blog/announcements/looking-back-at-decentraland-metaverse-music-festival-2022 Decentraland. (2023b). *Community highlight: doWow's interactive billboards*. Retrieved April 13, 2023, from https://decentraland.org/blog/community-projects/community-spotlight-dowows-interactive-billboards Decentraland. (2023c). *Decentraland Foundation quarterly update: Q1 2023*. Decentraland Blog. Retrieved May 20, 2023, from https://decentraland.org/blog/announcements/decentraland-foundation-quarterly-update-q1-2023 Decentraland. (2023d). *Decentraland Studios: A verified registry of creators in the metaverse*. Retrieved May 29, 2023, from https://decentraland.org/blog/community-projects/decentraland-studios-a-verified-registry-of-creators-in-the-metaverse

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		External
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	Monetiza tion	*Internal*
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B5. The Sandbox

Theme	Sub-theme	Reference of source
Modality-based gratifications	Realism	*Internal* The Sandbox. (2023f). The Sandbox Q1 2023 project update. *Medium*. Retrieved May 11, 2023, from https://medium.com/sandbox-game/the-sandbox-q1-2023-project-update-96644c0fc996
	Immersion	*Internal* The Sandbox. (2020). The Sandbox Whitepaper 2020. In *The Sandbox*. https://installers.sandbox.game/The_Sandbox_Whitepaper_2020.pdf The Sandbox. (2023b). Get cooking with Gordon Ramsay's Hell's Kitchen metaverse experience! *Medium*. Retrieved May 29, 2023, from https://medium.com/sandbox-game/get-cooking-with-gordon-ramsays-hell-s-kitchen-metaverse-experience-95899d6cd85b The Sandbox. (2023d). The Sandbox partners with SBS Contents Hub to create a metaverse space, "Running Man Park." *Medium*. Retrieved May 24, 2023, from https://medium.com/sandbox-game/the-sandbox-partners-with-sbs-contents-hub-to-create-a-metaverse-space-running-man-park-2d85527e1ab6 The Sandbox. (2023h). Tourismverse is bringing tourism and travel industry on Web3. *Medium*. Retrieved April 12, 2023, from https://medium.com/sandbox-game/tourismverse-is-bringing-tourism-and-travel-industry-on-web3-1ca74931321b
Agency-based gratifications	Agency enhancement	*Internal* The Sandbox. (n.d.-a). *What can I make?* Retrieved June 8, 2023, from https://sandboxgame.gitbook.io/the-game-maker-academy/welcome-to-the-sandbox/what-can-i-make The Sandbox. (n.d.-b). *What is the Game Maker? - Game Maker Academy*. Game Maker Academy. Retrieved May 24, 2023, from https://sandboxgame.gitbook.io/the-game-maker-academy/welcome-to-the-sandbox/game-maker The Sandbox. (2020). The Sandbox Whitepaper 2020. In *The Sandbox*. https://installers.sandbox.game/The_Sandbox_Whitepaper_2020.pdf The Sandbox. (2021a). LAND token economics. *Medium*. Retrieved June 6, 2023, from https://medium.com/sandbox-game/land-token-economics-1efe442eb49 The Sandbox. (2021b). The Sandbox Tokens: LANDS. *Medium*. Retrieved June 6, 2023, from https://medium.com/sandbox-game/the-sandbox-tokens-lands-730b36217070 The Sandbox. (2021c). What is The Sandbox? *Medium*. Retrieved June 7, 2023, from https://medium.com/sandbox-game/what-is-the-sandbox-850de68d893e The Sandbox. (2023a). Become a metaverse icon with Paris Hilton's Long-Awaited avatar collection! *Medium*. Retrieved May 24,

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	Community building/ Socializing	*Internal*
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	Creativity enhancement	*Internal*
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Interactivity-based gratifications	Activity	*Internal* The Sandbox. (n.d.-b). *What is the Game Maker? - Game Maker Academy*. Game Maker Academy. Retrieved May 24, 2023, from https://sandboxgame.gitbook.io/the-game-maker-academy/welcome-to-the-sandbox/game-maker The Sandbox. (2020). The Sandbox Whitepaper 2020. In *The Sandbox*. https://installers.sandbox.game/The_Sandbox_Whitepaper_2020.pdf The Sandbox. (2021b). The Sandbox Tokens: LANDS. *Medium*. Retrieved June 6, 2023, from https://medium.com/sandbox-game/the-sandbox-tokens-lands-730b36217070 The Sandbox. (2021c). What is The Sandbox? *Medium*. Retrieved June 7, 2023, from https://medium.com/sandbox-game/what-is-the-sandbox-850de68d893e The Sandbox. (2023c). LAND owner roadmap update Q1 2023. *Medium*. Retrieved May 21, 2023, from https://medium.com/sandbox-game/land-owner-roadmap-update-q1-2023-655722f6fb0e
	Interaction	*Internal* The Sandbox. (n.d.-b). *What is the Game Maker? - Game Maker Academy*. Game Maker Academy. Retrieved May 24, 2023, from https://sandboxgame.gitbook.io/the-game-maker-academy/welcome-to-the-sandbox/game-maker The Sandbox. (2023f). *The Sandbox Press page*. Retrieved March 6, 2023, from https://press.sandbox.game/?_gl=1*1wz4d95*_ga*MTI1OTE1 MzA2Ny4xNjc4MTAyOTg3*_ga_R0TLSXCC02*MTY3ODE wMjk4Ni4xLjEuMTY3ODEwMzIyMC41Ni4wLjA. The Sandbox. (2023h). TIME is partering with The Sandbox to build 'TIME Square' in the metaverse. *Medium*. Retrieved May 15, 2023, from https://medium.com/sandbox-game/time-is-partering-with-the-sandbox-to-build-time-square-in-the-metaverse-6cd361e3e5f0

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	Safety	*Internal* The Sandbox. (2020). The Sandbox Whitepaper 2020. In *The Sandbox*. https://installers.sandbox.game/The_Sandbox_Whitepaper_2020 .pdf
Navigability-based gratifications	Play/Fun	*Internal* The Sandbox. (n.d.-a). *What can I make?* Retrieved June 8, 2023, from https://sandboxgame.gitbook.io/the-game-maker-academy/welcome-to-the-sandbox/what-can-i-make The Sandbox. (n.d.-b). *What is the Game Maker? - Game Maker Academy*. Game Maker Academy. Retrieved May 24, 2023, from https://sandboxgame.gitbook.io/the-game-maker-academy/welcome-to-the-sandbox/game-maker The Sandbox. (2020). The Sandbox Whitepaper 2020. In *The Sandbox*. https://installers.sandbox.game/The_Sandbox_Whitepaper_2020 .pdf The Sandbox. (2023c). LAND owner roadmap update Q1 2023. *Medium*. Retrieved May 21, 2023, from https://medium.com/sandbox-game/land-owner-roadmap-update-q1-2023-655722f6fb0e The Sandbox. (2023e). The Sandbox partners with SBS Contents Hub to create a metaverse space, "Running Man Park." *Medium*. Retrieved May 24, 2023, from https://medium.com/sandbox-game/the-sandbox-partners-with-sbs-contents-hub-to-create-a-metaverse-space-running-man-park-2d85527e1ab6 The Sandbox. (2023f). *The Sandbox Press page*. Retrieved March 6, 2023, from https://press.sandbox.game/?_gl=1*1wz4d95*_ga*MTI1OTE1 MzA2Ny4xNjc4MTAyOTg3*_ga_R0TLSXCC02*MTY3ODE wMjk4Ni4xLjEuMTY3ODEwMzIyMC41Ni4wLjA. The Sandbox. (2023h). TIME is partering with The Sandbox to build 'TIME Square' in the metaverse. *Medium*. Retrieved May 15, 2023, from https://medium.com/sandbox-game/time-is-partering-with-the-sandbox-to-build-time-square-in-the-metaverse-6cd361e3e5f0 The Sandbox. (2023i). Tourismverse is bringing tourism and travel industry on Web3. *Medium*. Retrieved April 12, 2023, from https://medium.com/sandbox-game/tourismverse-is-bringing-tourism-and-travel-industry-on-web3-1ca74931321b
	Challenge	*Internal*

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	Explorin g/Variety -seeking	*Internal* The Sandbox. (n.d.-a). *What can I make?* Retrieved June 8, 2023, from https://sandboxgame.gitbook.io/the-game-maker-academy/welcome-to-the-sandbox/what-can-i-make The Sandbox. (n.d.-b). *What is the Game Maker? - Game Maker Academy*. Game Maker Academy. Retrieved May 24, 2023, from https://sandboxgame.gitbook.io/the-game-maker-academy/welcome-to-the-sandbox/game-maker The Sandbox. (2020). The Sandbox Whitepaper 2020. In *The Sandbox*. https://installers.sandbox.game/The_Sandbox_Whitepaper_2020.pdf The Sandbox. (2023f). *The Sandbox Press page*. Retrieved March 6, 2023, from https://press.sandbox.game/?_gl=1*1wz4d95*_ga*MTI1OTE1MzA2Ny4xNjc4MTAyOTg3*_ga_R0TLSXCC02*MTY3ODEwMjk4Ni4xLjEuMTY3ODEwMzIyMC41Ni4wLjA. The Sandbox. (2023h). TIME is partering with The Sandbox to build 'TIME Square' in the metaverse. *Medium*. Retrieved May 15, 2023, from https://medium.com/sandbox-game/time-is-partering-with-the-sandbox-to-build-time-square-in-the-metaverse-6cd361e3e5f0 The Sandbox. (2023i). Tourismverse is bringing tourism and travel industry on Web3. *Medium*. Retrieved April 12, 2023, from https://medium.com/sandbox-game/tourismverse-is-bringing-tourism-and-travel-industry-on-web3-1ca74931321b
	Navigati on aids	*Internal* The Sandbox. (2023g). The Sandbox Q1 2023 project update. *Medium*. Retrieved May 11, 2023, from https://medium.com/sandbox-game/the-sandbox-q1-2023-project-update-96644c0fc996
Newly emerged	Accessib ility	*Internal* The Sandbox. (n.d.-a). *What can I make?* Retrieved June 8, 2023, from https://sandboxgame.gitbook.io/the-game-maker-academy/welcome-to-the-sandbox/what-can-i-make

gratifications		The Sandbox. (2021c). What is The Sandbox? *Medium*. Retrieved June 7, 2023, from https://medium.com/sandbox-game/what-is-the-sandbox-850de68d893e
	Monetization	*Internal* The Sandbox. (n.d.-b). *What is the Game Maker? - Game Maker Academy*. Game Maker Academy. Retrieved May 24, 2023, from https://sandboxgame.gitbook.io/the-game-maker-academy/welcome-to-the-sandbox/game-maker The Sandbox. (2020). The Sandbox Whitepaper 2020. In *The Sandbox*. https://installers.sandbox.game/The_Sandbox_Whitepaper_2020.pdf The Sandbox. (2021b). The Sandbox Tokens: LANDS. *Medium*. Retrieved June 6, 2023, from https://medium.com/sandbox-game/the-sandbox-tokens-lands-730b36217070 The Sandbox. (2021c). What is The Sandbox? *Medium*. Retrieved June 7, 2023, from https://medium.com/sandbox-game/what-is-the-sandbox-850de68d893e The Sandbox. (2023f). *The Sandbox Press page*. Retrieved March 6, 2023, from https://press.sandbox.game/?_gl=1*1wz4d95*_ga*MTI1OTE1MzA2Ny4xNjc4MTAyOTg3*_ga_R0TLSXCC02*MTY3ODEwMjk4Ni4xLjEuMTY3ODEwMzIyMC41Ni4wLjA. The Sandbox. (2023g). The Sandbox Q1 2023 project update. *Medium*. Retrieved May 11, 2023, from https://medium.com/sandbox-game/the-sandbox-q1-2023-project-update-96644c0fc996

B6. VRChat

Theme	Sub-theme	Reference of source
Modality-based gratifications	Realism	*Internal* VRChat. (2018). VRChat is now available on Steam. *Medium*. Retrieved May 28, 2023, from https://medium.com/@vrchat/vrchat-is-now-available-on-steam-6fab988817fb VRChat. (2022a). Avatar dynamics is now live. *VRChat*. Retrieved May 28, 2023, from https://hello.vrchat.com/blog/avatar-dynamics-live VRChat. (2022c). VRChat IK 2.0. *VRChat*. Retrieved April 1, 2023, from https://hello.vrchat.com/blog/vrchat-ik-2 *External* Butler, S. (2022). VRChat is a universe of virtual worlds: Here's what it's like. *How-To Geek*. Retrieved May 28, 2023, from https://www.howtogeek.com/798868/vrchat-is-a-universe-of-virtual-worlds-heres-what-its-like/ Faber, T. (2022). Finding community, and freedom, on VRChat. *The New York Times*. Retrieved May 28, 2023, from https://www.nytimes.com/2022/12/27/arts/music/vrchat-virtual-reality-clubbing.html Mabini, M. (2022). Metaverse review: VRChat. *Medium*. Retrieved May 1, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-vrchat-e365a80eed30
	Novelty	*Internal* VRChat. (n.d.-b). *Community guidelines*. Retrieved April 9, 2023, from https://hello.vrchat.com/community-guidelines VRChat. (2021). Stuck inside? A quick guide for using VRChat to stay connected. *Medium*. Retrieved April 21, 2023, from https://medium.com/vrchat/stuck-inside-a-quick-guide-for-using-vrchat-to-stay-connected-f71430cf8a11 VRChat. (2022b). UI 2.0 is now live! *VRChat*. Retrieved April 14, 2023, from https://hello.vrchat.com/blog/main-menu-update-live
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Agency-based gratifications	Agency enhancement	*Internal* VRChat. (2018). VRChat is now available on Steam. *Medium*. Retrieved May 28, 2023, from https://medium.com/@vrchat/vrchat-is-now-available-on-steam-6fab988817fb VRChat. (2021). Stuck inside? A quick guide for using VRChat to stay connected. *Medium*. Retrieved April 21, 2023, from https://medium.com/vrchat/stuck-inside-a-quick-guide-for-using-vrchat-to-stay-connected-f71430cf8a11 VRChat. (2022b). UI 2.0 is now live! *VRChat*. Retrieved April 14, 2023, from https://hello.vrchat.com/blog/main-menu-update-live VRChat. (2023). Introducing the Creator Economy. *VRChat*. Retrieved May 11, 2023, from https://hello.vrchat.com/blog/creator-economy *External* Mabini, M. (2022). Metaverse review: VRChat. *Medium*. Retrieved May 1, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-vrchat-e365a80eed30
	Community building/ Socializing	*Internal* VRChat. (n.d.-a). *Community FAQ*. Retrieved May 7, 2023, from https://hello.vrchat.com/community-faq VRChat. (2018). VRChat is now available on Steam. *Medium*. Retrieved May 28, 2023, from https://medium.com/@vrchat/vrchat-is-now-available-on-steam-6fab988817fb VRChat. (2021). Stuck inside? A quick guide for using VRChat to stay connected. *Medium*. Retrieved April 21, 2023, from https://medium.com/vrchat/stuck-inside-a-quick-guide-for-using-vrchat-to-stay-connected-f71430cf8a11 VRChat. (2022b). UI 2.0 is now live! *VRChat*. Retrieved April 14, 2023, from https://hello.vrchat.com/blog/main-menu-update-live VRChat. (2023). Introducing the Creator Economy. *VRChat*. Retrieved May 11, 2023, from https://hello.vrchat.com/blog/creator-economy *External* Alexander, J. (2017). VRChat is a bizarre phenomenon that has Twitch and YouTube obsessed. *Polygon*. Retrieved May 28, 2023, from https://www.polygon.com/2017/12/22/16805452/vrchat-steam-vive-oculus-twitch-youtube Butler, S. (2022). VRChat is a universe of virtual worlds: Here's what it's like. *How-To Geek*. Retrieved May 28, 2023, from https://www.howtogeek.com/798868/vrchat-is-a-universe-of-virtual-worlds-heres-what-its-like/ Faber, T. (2022). Finding community, and freedom, on VRChat. *The New York Times*. Retrieved May 28, 2023, from https://www.nytimes.com/2022/12/27/arts/music/vrchat-virtual-reality-clubbing.html

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	Self-expressio n	*Internal* VRChat. (n.d.-a). *Community FAQ*. Retrieved May 7, 2023, from https://hello.vrchat.com/community-faq VRChat. (n.d.-b). *Community guidelines*. Retrieved April 9, 2023, from https://hello.vrchat.com/community-guidelines VRChat. (2018). VRChat is now available on Steam. *Medium*. Retrieved May 28, 2023, from https://medium.com/@vrchat/vrchat-is-now-available-on-steam-6fab988817fb *External* Colp, T. (2022). The VRChat documentary gets VR right, but already feels old. *Pcgamer*. Retrieved May 28, 2023, from https://www.pcgamer.com/the-vrchat-documentary-gets-vr-right-but-already-feels-old/ Faber, T. (2022). Finding community, and freedom, on VRChat. *The New York Times*. Retrieved May 28, 2023, from https://www.nytimes.com/2022/12/27/arts/music/vrchat-virtual-reality-clubbing.html
	Creativit y enhance ment	*Internal* VRChat. (n.d.-b). *Community guidelines*. Retrieved April 9, 2023, from https://hello.vrchat.com/community-guidelines VRChat. (2018). VRChat is now available on Steam. *Medium*. Retrieved May 28, 2023, from https://medium.com/@vrchat/vrchat-is-now-available-on-steam-6fab988817fb VRChat. (2021). Stuck inside? A quick guide for using VRChat to stay connected. *Medium*. Retrieved April 21, 2023, from https://medium.com/vrchat/stuck-inside-a-quick-guide-for-using-vrchat-to-stay-connected-f71430cf8a11 VRChat. (2022a). Avatar dynamics is now live. *VRChat*. Retrieved May 28, 2023, from https://hello.vrchat.com/blog/avatar-dynamics-live VRChat. (2023). Introducing the Creator Economy. *VRChat*. Retrieved May 11, 2023, from https://hello.vrchat.com/blog/creator-economy *External* Alexander, J. (2017). VRChat is a bizarre phenomenon that has Twitch and YouTube obsessed. *Polygon*. Retrieved May 28, 2023, from https://www.polygon.com/2017/12/22/16805452/vrchat-steam-vive-oculus-twitch-youtube Mabini, M. (2022). Metaverse review: VRChat. *Medium*. Retrieved May 1, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-vrchat-e365a80eed30
	Activity	*Internal*

Interactivity-based gratifications		VRChat. (2018). VRChat is now available on Steam. *Medium*. Retrieved May 28, 2023, from https://medium.com/@vrchat/vrchat-is-now-available-on-steam-6fab988817fb *External* Mabini, M. (2022). Metaverse review: VRChat. *Medium*. Retrieved May 1, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-vrchat-e365a80eed30
	Interaction	*Internal* VRChat. (n.d.-b). *Community guidelines*. Retrieved April 9, 2023, from https://hello.vrchat.com/community-guidelines VRChat. (2018). VRChat is now available on Steam. *Medium*. Retrieved May 28, 2023, from https://medium.com/@vrchat/vrchat-is-now-available-on-steam-6fab988817fb VRChat. (2021). Stuck inside? A quick guide for using VRChat to stay connected. *Medium*. Retrieved April 21, 2023, from https://medium.com/vrchat/stuck-inside-a-quick-guide-for-using-vrchat-to-stay-connected-f71430cf8a11 VRChat. (2022a). Avatar dynamics is now live. *VRChat*. Retrieved May 28, 2023, from https://hello.vrchat.com/blog/avatar-dynamics-live VRChat. (2022b). UI 2.0 is now live! *VRChat*. Retrieved April 14, 2023, from https://hello.vrchat.com/blog/main-menu-update-live *External* Butler, S. (2022). VRChat is a universe of virtual worlds: Here's what it's like. *How-To Geek*. Retrieved May 28, 2023, from https://www.howtogeek.com/798868/vrchat-is-a-universe-of-virtual-worlds-heres-what-its-like/ Mabini, M. (2022). Metaverse review: VRChat. *Medium*. Retrieved May 1, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-vrchat-e365a80eed30
	Responsiveness/Dynamic control	*Internal* VRChat. (n.d.-c). *Keyboard and mouse*. Retrieved June 21, 2023, from https://docs.vrchat.com/docs/keyboard-and-mouse VRChat. (2022a). Avatar dynamics is now live. *VRChat*. Retrieved May 28, 2023, from https://hello.vrchat.com/blog/avatar-dynamics-live
	Safety	*Internal* VRChat. (n.d.). *VRChat safety and trust system*. VRChat Documentation. Retrieved May 15, 2023, from https://docs.vrchat.com/docs/vrchat-safety-and-trust-system *External* Butler, S. (2022). VRChat is a universe of virtual worlds: Here's what it's like. *How-To Geek*. Retrieved May 28, 2023, from https://www.howtogeek.com/798868/vrchat-is-a-universe-of-virtual-worlds-heres-what-its-like/

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Navigability-based gratifications	Play/Fun	*Internal* VRChat. (n.d.-b). *Community guidelines*. Retrieved April 9, 2023, from https://hello.vrchat.com/community-guidelines VRChat. (2018). VRChat is now available on Steam. *Medium*. Retrieved May 28, 2023, from https://medium.com/@vrchat/vrchat-is-now-available-on-steam-6fab988817fb *External* Alexander, J. (2017). VRChat is a bizarre phenomenon that has Twitch and YouTube obsessed. *Polygon*. Retrieved May 28, 2023, from https://www.polygon.com/2017/12/22/16805452/vrchat-steam-vive-oculus-twitch-youtube Butler, S. (2022). VRChat is a universe of virtual worlds: Here's what it's like. *How-To Geek*. Retrieved May 28, 2023, from https://www.howtogeek.com/798868/vrchat-is-a-universe-of-virtual-worlds-heres-what-its-like/
	Exploring/Variety-seeking	*Internal* VRChat. (2018). VRChat is now available on Steam. *Medium*. Retrieved May 28, 2023, from https://medium.com/@vrchat/vrchat-is-now-available-on-steam-6fab988817fb VRChat. (2021). Stuck inside? A quick guide for using VRChat to stay connected. *Medium*. Retrieved April 21, 2023, from https://medium.com/vrchat/stuck-inside-a-quick-guide-for-using-vrchat-to-stay-connected-f71430cf8a11 VRChat. (2022b). UI 2.0 is now live! *VRChat*. Retrieved April 14, 2023, from https://hello.vrchat.com/blog/main-menu-update-live *External* Butler, S. (2022). VRChat is a universe of virtual worlds: Here's what it's like. *How-To Geek*. Retrieved May 28, 2023, from https://www.howtogeek.com/798868/vrchat-is-a-universe-of-virtual-worlds-heres-what-its-like/ Mabini, M. (2022). Metaverse review: VRChat. *Medium*. Retrieved May 1, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-vrchat-e365a80eed30
	Navigation aids	*Internal* VRChat. (2022b). UI 2.0 is now live! *VRChat*. Retrieved April 14, 2023, from https://hello.vrchat.com/blog/main-menu-update-live VRChat. (2023). Introducing the Creator Economy. *VRChat*. Retrieved May 11, 2023, from https://hello.vrchat.com/blog/creator-economy
Newly emerged	Accessibility	*Internal* VRChat. (n.d.-a). *Community FAQ*. Retrieved May 7, 2023, from https://hello.vrchat.com/community-faq

gratificat ions		VRChat. (2021). Stuck inside? A quick guide for using VRChat to stay connected. *Medium*. Retrieved April 21, 2023, from https://medium.com/vrchat/stuck-inside-a-quick-guide-for-using-vrchat-to-stay-connected-f71430cf8a11 *External* Mabini, M. (2022). Metaverse review: VRChat. *Medium*. Retrieved May 1, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-vrchat-e365a80eed30
	Monetiza tion	*Internal* VRChat. (2023). Introducing the Creator Economy. *VRChat*. Retrieved May 11, 2023, from https://hello.vrchat.com/blog/creator-economy *External* Faber, T. (2022). Finding community, and freedom, on VRChat. *The New York Times*. Retrieved May 28, 2023, from https://www.nytimes.com/2022/12/27/arts/music/vrchat-virtual-reality-clubbing.html

B7. Rec Room

Theme	Sub-theme	Reference of source
Modality-based gratifications	Realism	*Internal* Rec Room. (2022e). Showdown (Pt. 3). *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/showdown3 Rec Room. (2023a). Avatar embodiment. *Rec Room Developer Blog*. Retrieved May 1, 2023, from https://blog.recroom.com/posts/avatars3 Rec Room. (2023b). Avatar faces. *Rec Room Developer Blog*. Retrieved May 21, 2023, from https://blog.recroom.com/posts/avatars4 Rec Room. (2023e). The future of avatars in Rec Room. *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/avatars
	Novelty	*Internal* Rec Room. (2023e). The future of avatars in Rec Room. *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/avatars
	Immersion	*Internal* Rec Room. (2022e). Showdown (Pt. 3). *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/showdown3 Rec Room. (2023a). Avatar embodiment. *Rec Room Developer Blog*. Retrieved May 1, 2023, from https://blog.recroom.com/posts/avatars3 *External* Hayden, S. (2023). *"Rec Room" is putting on Its first-ever "Rec Rocks" music festival this weekend*. Road to VR. Retrieved May 23, 2023, from https://www.roadtovr.com/rec-room-vr-music-festival-tokyo-machine-bortnick/
Agency-based gratifications	Agency enhancement	*Internal* Rec Room. (2022c). *Rec Room Storefront Trailer 2022* [Video]. YouTube. Retrieved May 23, 2023, from https://www.youtube.com/watch?v=8o32m_b4oqU *External* Bowles, S. (2022). Metaverse review: Rec Room. *Medium*. Retrieved April 14, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-rec-room-1748a67e0fee Grossman, M. (2021). Online-Gaming platform Rec Room valued at $1.25 billion in fundraising round. *WSJ*. Retrieved June 7, 2023, from https://www.wsj.com/articles/online-gaming-platform-rec-room-valued-at-1-25-billion-in-fundraising-round-11616544000

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	Commun ity building/ Socializi ng	*Internal* Rec Room. (2022a). Custom shirts marketplace. *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/showdown3-s4l5y Rec Room. (2022b). Rec Room crosses 75 million downloads after 6 years of consistent growth. *GamingonPhone*. Retrieved June 8, 2023, from https://gamingonphone.com/news/rec-room-crosses-75-million-downloads-after-6-years-of-consistent-growth/ Rec Room. (2022c). *Rec Room Storefront Trailer 2022* [Video]. YouTube. Retrieved May 23, 2023, from https://www.youtube.com/watch?v=8o32m_b4oqU Rec Room. (2022d). Showdown (Pt. 1). *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/showdown1 *External* Grossman, M. (2021). Online-Gaming platform Rec Room valued at $1.25 billion in fundraising round. *WSJ*. Retrieved June 7, 2023, from https://www.wsj.com/articles/online-gaming-platform-rec-room-valued-at-1-25-billion-in-fundraising-round-11616544000 Kaser, R. (2022). Rec Room announces new Studio creator tool at Rec Con. *VentureBeat*. Retrieved May 23, 2023, from https://venturebeat.com/games/rec-room-announces-new-studio-creator-tool-at-rec-con/ Lyons, K. (2021). Rec Room rides uptick in users during the pandemic to become a VR unicorn. *The Verge*. Retrieved May 24, 2023, from https://www.theverge.com/2021/3/25/22350421/rec-room-teenagers-gaming-users-pandemic-virtual-reality Takahashi, D. (2023). How Rec Room looks at the metaverse opportunity. *VentureBeat*. Retrieved May 23, 2023, from https://venturebeat.com/games/how-rec-room-looks-at-the-metaverse-opportunity/ Wilde, T. (2022). Why avatar-based social gaming app Rec Room doesn't consider itself a "metaverse" company. *GeekWire*.

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	Self-expression	*Internal* Rec Room. (2022a). Custom shirts marketplace. *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/showdown3-s4l5y Rec Room. (2022c). *Rec Room Storefront Trailer 2022* [Video]. YouTube. Retrieved May 23, 2023, from https://www.youtube.com/watch?v=8o32m_b4oqU Rec Room. (2023b). Avatar faces. *Rec Room Developer Blog*. Retrieved May 21, 2023, from https://blog.recroom.com/posts/avatars4 Rec Room. (2023c). Dressing the full-body avatar. *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/avatars2 Rec Room. (2023e). The future of avatars in Rec Room. *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/avatars *External* Matney, L. (2020). *Social gaming platform Rec Room scores $20 million Series C*. TechCrunch. Retrieved May 24, 2023, from https://techcrunch.com/2020/12/17/social-gaming-platform-rec-room-scores-20-million-series-c/ Wilde, T. (2022). Why avatar-based social gaming app Rec Room doesn't consider itself a "metaverse" company. *GeekWire*. Retrieved April 21, 2023, from https://www.geekwire.com/2022/why-avatar-based-social-gaming-app-rec-room-doesnt-consider-itself-a-metaverse-company/
	Creativity enhancement	*Internal* Rec Room. (n.d.). *Rec Room Studio*. Retrieved June 11, 2023, from https://recroom.com/studio Rec Room. (2022a). Custom shirts marketplace. *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/showdown3-s4l5y Rec Room. (2022b). Rec Room crosses 75 million downloads after 6 years of consistent growth. *GamingonPhone*. Retrieved June 8, 2023, from https://gamingonphone.com/news/rec-room-crosses-75-million-downloads-after-6-years-of-consistent-growth/

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Interactivity-based	Activity	*Internal* Rec Room. (2022b). Rec Room crosses 75 million downloads after 6 years of consistent growth. *GamingonPhone*. Retrieved June 8, 2023, from https://gamingonphone.com/news/rec-room-crosses-75-million-downloads-after-6-years-of-consistent-growth/

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	Competition	*Internal* Rec Room. (2022c). *Rec Room Storefront Trailer 2022* [Video]. YouTube. Retrieved May 23, 2023, from https://www.youtube.com/watch?v=8o32m_b4oqU Rec Room. (2022d). Showdown (Pt. 1). *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/showdown1 *External* Matney, L. (2020). *Social gaming platform Rec Room scores $20 million Series C*. TechCrunch. Retrieved May 24, 2023, from https://techcrunch.com/2020/12/17/social-gaming-platform-rec-room-scores-20-million-series-c/
	Interaction	*Internal* Rec Room. (2023e). The future of avatars in Rec Room. *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/avatars *External* Bowles, S. (2022). Metaverse review: Rec Room. *Medium*. Retrieved April 14, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-rec-room-1748a67e0fee
	Responsiveness/Dynamic control	*Internal* Rec Room. (2022a). Custom shirts marketplace. *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/showdown3-s4l5y Rec Room. (2022e). Showdown (Pt. 3). *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/showdown3 Rec Room. (2023e). The future of avatars in Rec Room. *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/avatars Rec Room. (2022g). Updating our screens controls. *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/2022/5/26/updating-our-screens-controls
	Safety	*Internal* Rec Room. (2022a). Custom shirts marketplace. *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/showdown3-s4l5y *External*

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Navigability-based gratifications	Play/Fun	*Internal* Rec Room. (2022c). *Rec Room Storefront Trailer 2022* [Video]. YouTube. Retrieved May 23, 2023, from https://www.youtube.com/watch?v=8o32m_b4oqU Rec Room. (2022d). Showdown (Pt. 1). *Rec Room Developer Blog*. Retrieved May 23, 2023, from https://blog.recroom.com/posts/showdown1 *External* Grossman, M. (2021). Online-Gaming platform Rec Room valued at $1.25 billion in fundraising round. *WSJ*. Retrieved June 7, 2023, from https://www.wsj.com/articles/online-gaming-platform-rec-room-valued-at-1-25-billion-in-fundraising-round-11616544000 Hayden, S. (2023). *"Rec Room" is putting on Its first-ever "Rec Rocks" music festival this weekend*. Road to VR. Retrieved May 23, 2023, from https://www.roadtovr.com/rec-room-vr-music-festival-tokyo-machine-bortnick/ Wilde, T. (2022). Why avatar-based social gaming app Rec Room doesn't consider itself a "metaverse" company. *GeekWire*. Retrieved April 21, 2023, from https://www.geekwire.com/2022/why-avatar-based-social-gaming-app-rec-room-doesnt-consider-itself-a-metaverse-company/
	Exploring/Variety-seeking	*Internal* Rec Room. (2022b). Rec Room crosses 75 million downloads after 6 years of consistent growth. *GamingonPhone*. Retrieved June 8, 2023, from https://gamingonphone.com/news/rec-room-crosses-75-million-downloads-after-6-years-of-consistent-growth/ Rec Room. (2022c). *Rec Room Storefront Trailer 2022* [Video]. YouTube. Retrieved May 23, 2023, from https://www.youtube.com/watch?v=8o32m_b4oqU *External* Lyons, K. (2021). Rec Room rides uptick in users during the pandemic to become a VR unicorn. *The Verge*. Retrieved May 24, 2023, from https://www.theverge.com/2021/3/25/22350421/rec-room-teenagers-gaming-users-pandemic-virtual-reality Wilde, T. (2022). Why avatar-based social gaming app Rec Room doesn't consider itself a "metaverse" company. *GeekWire*. Retrieved April 21, 2023, from https://www.geekwire.com/2022/why-avatar-based-social-gaming-app-rec-room-doesnt-consider-itself-a-metaverse-company/
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Newly emerged gratifications	Accessibility	*Internal* Rec Room. (2022b). Rec Room crosses 75 million downloads after 6 years of consistent growth. *GamingonPhone*. Retrieved June 8, 2023, from https://gamingonphone.com/news/rec-room-crosses-75-million-downloads-after-6-years-of-consistent-growth/ Rec Room. (2022c). *Rec Room Storefront Trailer 2022* [Video]. YouTube. Retrieved May 23, 2023, from https://www.youtube.com/watch?v=8o32m_b4oqU *External* Bowles, S. (2022). Metaverse review: Rec Room. *Medium*. Retrieved April 14, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-rec-room-1748a67e0fee Grossman, M. (2021). Online-Gaming platform Rec Room valued at $1.25 billion in fundraising round. *WSJ*. Retrieved June 7, 2023, from https://www.wsj.com/articles/online-gaming-platform-rec-room-valued-at-1-25-billion-in-fundraising-round-11616544000 Matney, L. (2020). *Social gaming platform Rec Room scores $20 million Series C*. TechCrunch. Retrieved May 24, 2023, from https://techcrunch.com/2020/12/17/social-gaming-platform-rec-room-scores-20-million-series-c/ Takahashi, D. (2023). How Rec Room looks at the metaverse opportunity. *VentureBeat*. Retrieved May 23, 2023, from https://venturebeat.com/games/how-rec-room-looks-at-the-metaverse-opportunity/ Wilde, T. (2022). Why avatar-based social gaming app Rec Room doesn't consider itself a "metaverse" company. *GeekWire*. Retrieved April 21, 2023, from https://www.geekwire.com/2022/why-avatar-based-social-gaming-app-rec-room-doesnt-consider-itself-a-metaverse-company/ Wutz, M. (2023). NFL and Rec Room partner up for virtual fan experience. *Yardbarker*. Retrieved May 23, 2023, from https://www.yardbarker.com/video_games/articles/nfl_and_rec_room_partner_up_for_virtual_fan_experience/s1_17144_38346100
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B8. Horizon Worlds

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Modality -based gratifications	Realism	*Internal* Meta. (2021). Expanding Horizon: New funding to support creators. *Meta Quest blog*. Retrieved April 11, 2023, from https://www.meta.com/en-gb/blog/quest/expanding-horizon-new-funding-to-support-creators/?intern_source=connect-2021-recap-horizon-home-the-future-of-work-presence-platform-and-more&utm_source=www.meta.com&utm_medium=oculusredirect Meta. (2023e). Meta Horizon Worlds v111 release notes. *Meta Quest blog*. Retrieved May 21, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-v111-release-notes *External* Bowles, S. (2022). Metaverse Review: Horizon Worlds. *Medium*. Retrieved April 11, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-horizon-worlds-b9f003ea84af
	Novelty	*Internal* Meta. (2021). Expanding Horizon: New funding to support creators. *Meta Quest blog*. Retrieved April 11, 2023, from https://www.meta.com/en-gb/blog/quest/expanding-horizon-new-funding-to-support-creators/?intern_source=connect-2021-recap-horizon-home-the-future-of-work-presence-platform-and-more&utm_source=www.meta.com&utm_medium=oculusredirect
	Immersion	*Internal* Meta. (2023a). Meta Horizon Worlds spotlight: Eemit. *Meta Quest blog*. Retrieved May 21, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-spotlight-eemit/ Meta. (2023d). *Meta Horizon Worlds v99 release notes*. Meta Quest Blog. Retrieved June 7, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-v99-release-notes/ *External* Bowles, S. (2022). Metaverse Review: Horizon Worlds. *Medium*. Retrieved April 11, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-horizon-worlds-b9f003ea84af
Agency-based gratifications	Agency enhancement	*Internal* Meta. (2021). Expanding Horizon: New funding to support creators. *Meta Quest blog*. Retrieved April 11, 2023, from https://www.meta.com/en-gb/blog/quest/expanding-horizon-new-funding-to-support-creators/?intern_source=connect-2021-recap-horizon-home-the-future-of-work-presence-platform-and-more&utm_source=www.meta.com&utm_medium=oculusredirect

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	Community building/ Socializing	*Internal* Meta. (2021). Expanding Horizon: New funding to support creators. *Meta Quest blog*. Retrieved April 11, 2023, from https://www.meta.com/en-gb/blog/quest/expanding-horizon-new-funding-to-support-creators/?intern_source=connect-2021-recap-horizon-home-the-future-of-work-presence-platform-and-more&utm_source=www.meta.com&utm_medium=oculusredirect Meta. (2022a). How we brought Connect 2022 to Meta Horizon Worlds. *Meta Quest blog*. Retrieved April 14, 2023, from https://www.meta.com/en-gb/blog/quest/meta-connect-horizon-worlds-behind-the-scenes/ Meta. (2023a). Meta Horizon Worlds spotlight: Eemit. *Meta Quest blog*. Retrieved May 21, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-spotlight-eemit/ Meta. (2023b). Meta Horizon Worlds spotlight: Fairywebmother. *Meta Quest blog*. Retrieved March 12, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-spotlight-fairywebmother/ Meta. (2023c). Meta Horizon Worlds spotlight: gungangoose. *Meta Quest Blog*. Retrieved April 8, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-spotlight-gungangoose/ Meta. (2023e). *Meta Horizon Worlds v99 release notes*. Meta Quest Blog. Retrieved June 7, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-v99-release-notes/ Meta. (2023h). UPDATE: Meta Horizon Worlds begins beta test for Members-Only spaces. *Meta*. Retrieved June 7, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-members-only-alpha-test *External* Constine, J. (2019). *Facebook announces Horizon, a VR massive-multiplayer world*. TechCrunch. Retrieved April 14, 2023, from https://techcrunch.com/2019/09/25/facebook-horizon/ Rabkin, M. (2021). Connect 2021 recap: Horizon Home, the future of work, presence platform, and more. *Meta Quest blog*. Retrieved April 8, 2023, from https://www.meta.com/en-

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	Self-expression	*Internal* Meta. (2023b). Meta Horizon Worlds spotlight: Fairywebmother. *Meta Quest blog*. Retrieved March 12, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-spotlight-fairywebmother/ *External* Constine, J. (2019). *Facebook announces Horizon, a VR massive-multiplayer world*. TechCrunch. Retrieved April 14, 2023, from https://techcrunch.com/2019/09/25/facebook-horizon/ Rabkin, M. (2021). Connect 2021 recap: Horizon Home, the future of work, presence platform, and more. *Meta Quest blog*. Retrieved April 8, 2023, from https://www.meta.com/en-gb/blog/quest/connect-2021-recap-horizon-home-the-future-of-work-presence-platform-and-more/?utm_source=about.fb.com&utm_medium=oculusredirect
	Creativity enhancement	*Internal* Meta. (2021). Expanding Horizon: New funding to support creators. *Meta Quest blog*. Retrieved April 11, 2023, from https://www.meta.com/en-gb/blog/quest/expanding-horizon-new-funding-to-support-creators/?intern_source=connect-2021-recap-horizon-home-the-future-of-work-presence-platform-and-more&utm_source=www.meta.com&utm_medium=oculusredirect Meta. (2022a). How we brought Connect 2022 to Meta Horizon Worlds. *Meta Quest blog*. Retrieved April 14, 2023, from https://www.meta.com/en-gb/blog/quest/meta-connect-horizon-worlds-behind-the-scenes/ Meta. (2022b). Testing new tools for Horizon Worlds creators to earn money. *Meta Quest Blog*. Retrieved April 20, 2023, from https://about.fb.com/news/2022/04/testing-creator-monetization-horizon-worlds/ Meta. (2023a). Meta Horizon Worlds spotlight: Eemit. *Meta Quest blog*. Retrieved May 21, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-spotlight-eemit/ Meta. (2023b). Meta Horizon Worlds spotlight: Fairywebmother. *Meta Quest blog*. Retrieved March 12, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-spotlight-fairywebmother/ Meta. (2023c). Meta Horizon Worlds spotlight: gungangoose. *Meta Quest Blog*. Retrieved April 8, 2023, from

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Navigability-based gratifications	Play/Fun	*Internal* Meta. (2023b). Meta Horizon Worlds spotlight: Fairywebmother. *Meta Quest blog*. Retrieved March 12, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-spotlight-fairywebmother/
	Exploring/Variety-seeking	*Internal* Meta. (2021). Expanding Horizon: New funding to support creators. *Meta Quest blog*. Retrieved April 11, 2023, from https://www.meta.com/en-gb/blog/quest/expanding-horizon-new-funding-to-support-creators/?intern_source=connect-2021-recap-horizon-home-the-future-of-work-presence-platform-and-more&utm_source=www.meta.com&utm_medium=oculusredirect Meta. (2023d). Meta Horizon Worlds Spotlight: Wake the Robot. *Meta Quest blog*. Retrieved May 15, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-spotlight-wake-the-robot/ *External* Malik, A. (2022). *Meta is integrating its Horizon Venues live events app into Horizon Worlds*. TechCrunch. Retrieved April 12, 2023, from https://techcrunch.com/2022/05/06/meta-integrating-venues-into-horizon-worlds/?guccounter=1&guce_referrer=aHR0cHM6Ly9lbi53Wt pcGVkaWEub3JnLw&guce_referrer_sig=AQAAAD8RTWRY UNa5l2Gv34PjDoBMyCY3VLdhWPDa4mCjIw-rrO-CzuNGx-pONnNYtbWw0cwH1_jaaCVr_VOLKZcPBUzRaLF39SZyMd 82VQ9rJ1CwdWhJUAvwqPqRULNT04GPZCooISXDTwfDD TS6kA2ujc8yASXuzs-ZggzezuMsvLN-
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Newly emerged gratificat ions	Accessib ility	*Internal* Meta. (2021). Expanding Horizon: New funding to support creators. *Meta Quest blog*. Retrieved April 11, 2023, from https://www.meta.com/en-gb/blog/quest/expanding-horizon-new-funding-to-support-creators/?intern_source=connect-2021-recap-horizon-home-the-future-of-work-presence-platform-and-more&utm_source=www.meta.com&utm_medium=oculusredirect Meta. (2023e). *Meta Horizon Worlds v99 release notes*. Meta Quest Blog. Retrieved June 7, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-v99-release-notes/ Meta. (2023i). UPDATE: Meta Horizon Worlds begins beta test for Members-Only spaces. *Meta*. Retrieved June 7, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-members-only-alpha-test *External* Constine, J. (2019). *Facebook announces Horizon, a VR massive-multiplayer world*. TechCrunch. Retrieved April 14, 2023, from https://techcrunch.com/2019/09/25/facebook-horizon/ Malik, A. (2022). *Meta is integrating its Horizon Venues live events app into Horizon Worlds*. TechCrunch. Retrieved April 12, 2023, from https://techcrunch.com/2022/05/06/meta-integrating-venues-into-horizon-worlds/?guccounter=1&guce_referrer=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnLw&guce_referrer_sig=AQAAAD8RTWRYUNa5l2Gv34PjDoBMyCY3VLdhWPDa4mCjIw-rrO-CzuNGx-pONnNYtbWw0cwH1_jaaCVr_VOLKZcPBUzRaLF39SZyMd82VQ9rJ1CwdWhJUAvwqPqRULNT04GPZCooISXDTwfDDTS6kA2ujc8yASXuzs-ZggzezuMsvLN-
	Monetiza tion	*Internal* Meta. (2022b). Testing new tools for Horizon Worlds creators to earn money. *Meta Quest Blog*. Retrieved April 20, 2023, from https://about.fb.com/news/2022/04/testing-creator-monetization-horizon-worlds/ Meta. (2023a). Meta Horizon Worlds spotlight: Eemit. *Meta Quest blog*. Retrieved May 21, 2023, from https://www.meta.com/en-gb/blog/quest/meta-horizon-worlds-spotlight-eemit/ *External* Bowles, S. (2022). Metaverse Review: Horizon Worlds. *Medium*. Retrieved April 11, 2023, from https://medium.com/the-lab-apply-digital/metaverse-review-horizon-worlds-b9f003ea84af

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B9. Second Life

Theme	Sub-theme	Reference of source
Modality-based gratifications	Realism	*Internal* Second Life Community. (2022a). *Second Life destinations - Le Jardin des Tuileries*. Retrieved May 21, 2023, from https://community.secondlife.com/blogs/entry/11563-second-life-destinations-le-jardin-des-tuileries/ Second Life Community. (2022b). *Second Life destinations: The Forgotten Gardens*. Retrieved April 21, 2023, from https://community.secondlife.com/blogs/entry/10263-second-life-destinations-the-forgotten-gardens/ Second Life Community. (2023e). *Sneak peek: Shaking up the terrain with physically-based rendering*. Retrieved June 6, 2023, from https://community.secondlife.com/blogs/entry/13498-sneak-peek-shaking-up-the-terrain-with-physically-based-rendering/ *External* Axon, S. (2017). *Returning to Second Life*. Ars Technica. Retrieved May 28, 2023, from https://arstechnica.com/gaming/2017/10/returning-to-second-life/ Kalning, K. (2007). If Second Life isn't a game, what is it? *NBC News*. Retrieved May 29, 2023, from https://www.nbcnews.com/id/wbna17538999#.U9uyeEi49yw
	Immersion	*Internal* Second Life Community. (2022a). *Second Life destinations - Le Jardin des Tuileries*. Retrieved May 21, 2023, from https://community.secondlife.com/blogs/entry/11563-second-life-destinations-le-jardin-des-tuileries/ Second Life Community. (2022b). *Second Life destinations: The Forgotten Gardens*. Retrieved April 21, 2023, from https://community.secondlife.com/blogs/entry/10263-second-life-destinations-the-forgotten-gardens/ Second Life Community. (2023a). *Second Life destinations - Elephant Island*. Retrieved May 21, 2023, from https://community.secondlife.com/blogs/entry/12482-second-life-destinations-elephant-island/ Second Life Community. (2023e). *Second Life spotlight - BadUnicorn*. Retrieved April 21, 2023, from https://community.secondlife.com/blogs/entry/12717-second-life-spotlight-badunicorn/
Agency-based	Agency enhancement	*Internal* Second Life Community. (2022a). *Second Life destinations - Le Jardin des Tuileries*. Retrieved May 21, 2023, from https://community.secondlife.com/blogs/entry/11563-second-life-destinations-le-jardin-des-tuileries/

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| | Community building/ Socializing | *Internal*
Second Life Community. (2022a). *Second Life destinations - Le Jardin des Tuileries*. Retrieved May 21, 2023, from https://community.secondlife.com/blogs/entry/11563-second-life-destinations-le-jardin-des-tuileries/

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	Self-expressio n	*Internal*
		Second Life Community. (2022b). *Second Life destinations: The Forgotten Gardens*. Retrieved April 21, 2023, from https://community.secondlife.com/blogs/entry/10263-second-life-destinations-the-forgotten-gardens/
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		External
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	Creativit y enhance ment	*Internal*
		Second Life Community. (2022b). *Second Life destinations: The Forgotten Gardens*. Retrieved April 21, 2023, from https://community.secondlife.com/blogs/entry/10263-second-life-destinations-the-forgotten-gardens/
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Interactivity-based gratifications	Activity	*Internal* Second Life Community. (2022d). *Second Life spotlight - Pour up winery & vineyard*. Retrieved April 13, 2023, from https://community.secondlife.com/blogs/entry/10114-second-life-spotlight-pour-up-winery-vineyard/ *External* Axon, S. (2017). *Returning to Second Life*. Ars Technica. Retrieved May 28, 2023, from https://arstechnica.com/gaming/2017/10/returning-to-second-life/ Kalning, K. (2007). If Second Life isn't a game, what is it? *NBC News*. Retrieved May 29, 2023, from https://www.nbcnews.com/id/wbna17538999#.U9uyeEi49yw Pathak, N. (2017). Second Life - Create your virtual world with your imagined stories. *My Ultimate Success Tips*. Retrieved April 9, 2023, from https://www.mustips.com/second-life-create-virtual-world-imagined-stories/
	Interaction	*Internal* Second Life Community. (2022a). *Second Life destinations - Le Jardin des Tuileries*. Retrieved May 21, 2023, from https://community.secondlife.com/blogs/entry/11563-second-life-destinations-le-jardin-des-tuileries/ Second Life Community. (2023c). *Second Life Spotlight - Apple Dismantled*. Retrieved April 11, 2023, from https://community.secondlife.com/blogs/entry/12884-second-life-spotlight-apple-dismantled/ *External* Pathak, N. (2017). Second Life - Create your virtual world with your imagined stories. *My Ultimate Success Tips*. Retrieved April 9, 2023, from https://www.mustips.com/second-life-create-virtual-world-imagined-stories/

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		External
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		    Life Community.
		    https://community.secondlife.com/knowledgebase/english/how-
		    to-deal-with-abuse-and-harassment-r610/
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		    Life Wiki.
		    https://wiki.secondlife.com/wiki/Linden_Lab_Official:Teen_Saf
		    ety_Guidelines

Navigability-based gratifications	Play/Fun	*Internal*
		Second Life Community. (2022d). *Second Life spotlight - Pour up
		    winery & vineyard*. Retrieved April 13, 2023, from
		    https://community.secondlife.com/blogs/entry/10114-second-
		    life-spotlight-pour-up-winery-vineyard/
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		    Island*. Retrieved May 21, 2023, from
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		    Mercury*. Retrieved April 12, 2023, from
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		    life-spotlight-aurora-mercury/
		
		External
		Kalning, K. (2007). If Second Life isn't a game, what is it? *NBC News*.
		    Retrieved May 29, 2023, from
		    https://www.nbcnews.com/id/wbna17538999#.U9uyeEi49yw

	Exploring/Variety-seeking	*Internal*
		Second Life Community. (2023a). *Second Life destinations - Elephant
		    Island*. Retrieved May 21, 2023, from
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		External
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	Navigation aids	*Internal* Second Life. (2011a). *Landmarks and navigation Project*. Second Life Wiki. https://wiki.secondlife.com/wiki/Landmarks_and_Navigation_Project *External* Axon, S. (2017). *Returning to Second Life*. Ars Technica. Retrieved May 28, 2023, from https://arstechnica.com/gaming/2017/10/returning-to-second-life/ Pathak, N. (2017). Second Life - Create your virtual world with your imagined stories. *My Ultimate Success Tips*. Retrieved April 9, 2023, from https://www.mustips.com/second-life-create-virtual-world-imagined-stories/
Newly emerged gratifications	Monetization	*Internal* Second Life. (2015). *Making money*. Second Life Wiki. https://wiki.secondlife.com/wiki/Making_money *External* Pathak, N. (2017). Second Life - Create your virtual world with your imagined stories. *My Ultimate Success Tips*. Retrieved April 9, 2023, from https://www.mustips.com/second-life-create-virtual-world-imagined-stories/

B10. Animal Crossing

Theme	Sub-theme	Reference of source
Modality-based gratifications	Realism	*Internal* Animal Crossing. (2021c). *May Day, International Museum Day, and wedding season come to Animal Crossing: New Horizons*. Animal Crossing: New Horizons. Retrieved April 21, 2023, from https://www.animal-crossing.com/new-horizons/news/#!/may-day-international-museum-day-and-wedding-season-come-to-animal-crossing-new-horizons Nintendo. (2020a). *Start deserted island life right with these Animal Crossing: New Horizons tips!* Nintendo of Europe GmbH. Retrieved April 1, 2023, from https://www.nintendo.co.uk/News/2020/March/Start-deserted-island-life-right-with-these-Animal-Crossing-New-Horizons-tips--1751422.html Nintendo. (2020b). *Top tips for playing Animal Crossing: New Horizons with friends*. Nintendo of Europe GmbH. Retrieved April 8, 2023, from https://www.nintendo.co.uk/News/2020/May/Top-tips-for-playing-Animal-Crossing-New-Horizons-with-friends-1783708.html Nintendo. (2021). *Have a cosy time this winter in Animal Crossing: New Horizons!* Nintendo of Europe GmbH. Retrieved April 12, 2023, from https://www.nintendo.co.uk/News/2021/December/Have-a-cosy-time-this-winter-in-Animal-Crossing-New-Horizons--2095038.html
	Novelty	*Internal* Animal Crossing. (n.d.). Getting started — New to the game? Animal Crossing: New Horizons. https://www.animal-crossing.com/new-horizons/getting-started/ *External* *Why has Nintendo's Animal Crossing become so successful?* (2021). Norwich University of the Arts. https://www.nua.ac.uk/about-nua/blog/student-blog-why-has-nintendos-animal-crossing-become-so-successful/#:~:text=Another%20thing%20that%20may%20account,need%20for%20an%20emotional%20refuge.
	Immersion	*Internal* Nintendo. (2016). *Learn more about the development of the Animal Crossing series in our interview!* Nintendo of Europe GmbH. Retrieved June 7, 2023, from https://www.nintendo.co.uk/News/2016/November/Learn-more-about-the-development-of-the-Animal-Crossing-series-in-our-interview--1159916.html
Agency-based	Agency enhancement	*Internal* Animal Crossing. (2021a). *Animal Crossing: New Horizons expands into new waters with a free update and paid expansion on Nov 5.*

gratifications		Animal Crossing: New Horizons. Retrieved April 21, 2023, from https://www.animal-crossing.com/new-horizons/news/#!/animal-crossing-new-horizons-expands-into-new-waters-with-a-free-update-and-paid-expansion-on-nov-5 Animal Crossing. (2021e). *New DLC! Expand your horizons with the Animal Crossing: New Horizons – Happy Home Paradise DLC*. Animal Crossing: New Horizons. https://www.animal-crossing.com/new-horizons/news/#!/animal-crossing-new-horizons-happy-home-paradise-dlc-available-now Nintendo. (2016). *Learn more about the development of the Animal Crossing series in our interview!* Nintendo of Europe GmbH. Retrieved June 7, 2023, from https://www.nintendo.co.uk/News/2016/November/Learn-more-about-the-development-of-the-Animal-Crossing-series-in-our-interview--1159916.html Nintendo. (2020b). *Top tips for playing Animal Crossing: New Horizons with friends*. Nintendo of Europe GmbH. Retrieved April 8, 2023, from https://www.nintendo.co.uk/News/2020/May/Top-tips-for-playing-Animal-Crossing-New-Horizons-with-friends-1783708.html Nintendo. (2021). *Have a cosy time this winter in Animal Crossing: New Horizons!* Nintendo of Europe GmbH. Retrieved April 12, 2023, from https://www.nintendo.co.uk/News/2021/December/Have-a-cosy-time-this-winter-in-Animal-Crossing-New-Horizons--2095038.html
	Community building/ Socializing	*Internal* Nintendo. (2016). *Learn more about the development of the Animal Crossing series in our interview!* Nintendo of Europe GmbH. Retrieved June 7, 2023, from https://www.nintendo.co.uk/News/2016/November/Learn-more-about-the-development-of-the-Animal-Crossing-series-in-our-interview--1159916.html Nintendo. (2020a). *Start deserted island life right with these Animal Crossing: New Horizons tips!* Nintendo of Europe GmbH. Retrieved April 1, 2023, from https://www.nintendo.co.uk/News/2020/March/Start-deserted-island-life-right-with-these-Animal-Crossing-New-Horizons-tips--1751422.html Nintendo. (2020b). *Top tips for playing Animal Crossing: New Horizons with friends*. Nintendo of Europe GmbH. Retrieved April 8, 2023, from https://www.nintendo.co.uk/News/2020/May/Top-tips-for-playing-Animal-Crossing-New-Horizons-with-friends-1783708.html
	Self-expression	*Internal* Animal Crossing. (2021a). *Animal Crossing: New Horizons expands into new waters with a free update and paid expansion on Nov 5*. Animal Crossing: New Horizons. Retrieved April 21, 2023, from https://www.animal-crossing.com/new-

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	Creativity enhancement	*Internal* Animal Crossing. (2021a). *Animal Crossing: New Horizons expands into new waters with a free update and paid expansion on Nov 5*. Animal Crossing: New Horizons. Retrieved April 21, 2023, from https://www.animal-crossing.com/new-horizons/news/#!/animal-crossing-new-horizons-expands-into-new-waters-with-a-free-update-and-paid-expansion-on-nov-5 Animal Crossing. (2021c). *Get ready for August fireworks and newly added seasonal items*. Animal Crossing: New Horizons. Retrieved April 15, 2023, from https://www.animal-crossing.com/new-horizons/news/#!/free-update-adds-fireworks-to-august-in-animal-crossing-new-horizons Animal Crossing. (2021d). *May Day, International Museum Day, and wedding season come to Animal Crossing: New Horizons*. Animal Crossing: New Horizons. Retrieved April 21, 2023, from https://www.animal-crossing.com/new-horizons/news/#!/may-day-international-museum-day-and-wedding-season-come-to-animal-crossing-new-horizons Nintendo. (2016). *Learn more about the development of the Animal Crossing series in our interview!* Nintendo of Europe GmbH.

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		Nintendo. (2021). *Have a cosy time this winter in Animal Crossing: New Horizons!* Nintendo of Europe GmbH. Retrieved April 12, 2023, from https://www.nintendo.co.uk/News/2021/December/Have-a-cosy-time-this-winter-in-Animal-Crossing-New-Horizons--2095038.html
Interactivity-based gratifications	Activity	*Internal*
		Animal Crossing. (2021a). *Animal Crossing: New Horizons expands into new waters with a free update and paid expansion on Nov 5.* Animal Crossing: New Horizons. Retrieved April 21, 2023, from https://www.animal-crossing.com/new-horizons/news/#!/animal-crossing-new-horizons-expands-into-new-waters-with-a-free-update-and-paid-expansion-on-nov-5
		Animal Crossing. (2021b). *Free update! Expanded options, cooking DIYs, and much, much more come to Animal Crossing: New Horizons.* Animal Crossing: New Horizons - Island News. Retrieved April 12, 2023, from https://www.animal-crossing.com/new-horizons/news/#!/animal-crossing-new-horizons-free-update
		Animal Crossing. (2021c). *Get ready for August fireworks and newly added seasonal items*. Animal Crossing: New Horizons. Retrieved April 15, 2023, from https://www.animal-crossing.com/new-horizons/news/#!/free-update-adds-fireworks-to-august-in-animal-crossing-new-horizons
		Animal Crossing. (2021d). *May Day, International Museum Day, and wedding season come to Animal Crossing: New Horizons*. Animal Crossing: New Horizons. Retrieved April 21, 2023, from https://www.animal-crossing.com/new-horizons/news/#!/may-day-international-museum-day-and-wedding-season-come-to-animal-crossing-new-horizons
		Nintendo. (2016). *Learn more about the development of the Animal Crossing series in our interview!* Nintendo of Europe GmbH. Retrieved June 7, 2023, from https://www.nintendo.co.uk/News/2016/November/Learn-more-

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		Nintendo. (2020a). *Start deserted island life right with these Animal Crossing: New Horizons tips!* Nintendo of Europe GmbH. Retrieved April 1, 2023, from https://www.nintendo.co.uk/News/2020/March/Start-deserted-island-life-right-with-these-Animal-Crossing-New-Horizons-tips--1751422.html
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		Nintendo. (2021). *Have a cosy time this winter in Animal Crossing: New Horizons!* Nintendo of Europe GmbH. Retrieved April 12, 2023, from https://www.nintendo.co.uk/News/2021/December/Have-a-cosy-time-this-winter-in-Animal-Crossing-New-Horizons--2095038.html
	Interaction	*Internal*
		Nintendo. (2016). *Learn more about the development of the Animal Crossing series in our interview!* Nintendo of Europe GmbH. Retrieved June 7, 2023, from https://www.nintendo.co.uk/News/2016/November/Learn-more-about-the-development-of-the-Animal-Crossing-series-in-our-interview--1159916.html
		Nintendo. (2020a). *Start deserted island life right with these Animal Crossing: New Horizons tips!* Nintendo of Europe GmbH. Retrieved April 1, 2023, from https://www.nintendo.co.uk/News/2020/March/Start-deserted-island-life-right-with-these-Animal-Crossing-New-Horizons-tips--1751422.html
		Nintendo. (2020b). *Top tips for playing Animal Crossing: New Horizons with friends*. Nintendo of Europe GmbH. Retrieved April 8, 2023, from https://www.nintendo.co.uk/News/2020/May/Top-tips-for-playing-Animal-Crossing-New-Horizons-with-friends-1783708.html
	Responsiveness/Dynamic control	*Internal*
		Nintendo. (2021). *Have a cosy time this winter in Animal Crossing: New Horizons!* Nintendo of Europe GmbH. Retrieved April 12, 2023, from https://www.nintendo.co.uk/News/2021/December/Have-a-cosy-time-this-winter-in-Animal-Crossing-New-Horizons--2095038.html
	Safety	*Internal*
		Nintendo. (n.d.-a). *Can I block friends or other players?* Retrieved June 21, 2023, from https://faq.ac-pocketcamp.com/hc/en-us/articles/4409489384729-Can-I-block-friends-or-other-players-

		#:~:text=%E2%9D%B7%20Select%20Friends%20or%20Visitors,%E2%9D%BA%20Tap%20Block.
Navigability-based gratifications	Play/Fun	*Internal* Animal Crossing. (2021a). *Animal Crossing: New Horizons expands into new waters with a free update and paid expansion on Nov 5.* Animal Crossing: New Horizons. Retrieved April 21, 2023, from https://www.animal-crossing.com/new-horizons/news/#!/animal-crossing-new-horizons-expands-into-new-waters-with-a-free-update-and-paid-expansion-on-nov-5 Animal Crossing. (2021c). *Get ready for August fireworks and newly added seasonal items*. Animal Crossing: New Horizons. Retrieved April 15, 2023, from https://www.animal-crossing.com/new-horizons/news/#!/free-update-adds-fireworks-to-august-in-animal-crossing-new-horizons Nintendo. (2016). *Learn more about the development of the Animal Crossing series in our interview!* Nintendo of Europe GmbH. Retrieved June 7, 2023, from https://www.nintendo.co.uk/News/2016/November/Learn-more-about-the-development-of-the-Animal-Crossing-series-in-our-interview--1159916.html Nintendo. (2020b). *Top tips for playing Animal Crossing: New Horizons with friends*. Nintendo of Europe GmbH. Retrieved April 8, 2023, from https://www.nintendo.co.uk/News/2020/May/Top-tips-for-playing-Animal-Crossing-New-Horizons-with-friends-1783708.html Nintendo. (2021). *Have a cosy time this winter in Animal Crossing: New Horizons!* Nintendo of Europe GmbH. Retrieved April 12, 2023, from https://www.nintendo.co.uk/News/2021/December/Have-a-cosy-time-this-winter-in-Animal-Crossing-New-Horizons--2095038.html
	Challenge	*Internal* Nintendo. (2016). *Learn more about the development of the Animal Crossing series in our interview!* Nintendo of Europe GmbH. Retrieved June 7, 2023, from https://www.nintendo.co.uk/News/2016/November/Learn-more-about-the-development-of-the-Animal-Crossing-series-in-our-interview--1159916.html Nintendo. (2020a). *Start deserted island life right with these Animal Crossing: New Horizons tips!* Nintendo of Europe GmbH. Retrieved April 1, 2023, from https://www.nintendo.co.uk/News/2020/March/Start-deserted-island-life-right-with-these-Animal-Crossing-New-Horizons-tips--1751422.html
	Exploring/Variety-seeking	*Internal* Animal Crossing. (2021a). *Animal Crossing: New Horizons expands into new waters with a free update and paid expansion on Nov 5.* Animal Crossing: New Horizons. Retrieved April 21, 2023, from https://www.animal-crossing.com/new-

		horizons/news/#!/animal-crossing-new-horizons-expands-into-new-waters-with-a-free-update-and-paid-expansion-on-nov-5
		Animal Crossing. (2021b). *Free update! Expanded options, cooking DIYs, and much, much more come to Animal Crossing: New Horizons.* Animal Crossing: New Horizons - Island News. Retrieved April 12, 2023, from https://www.animal-crossing.com/new-horizons/news/#!/animal-crossing-new-horizons-free-update
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		Nintendo. (2021). *Have a cosy time this winter in Animal Crossing: New Horizons!* Nintendo of Europe GmbH. Retrieved April 12, 2023, from https://www.nintendo.co.uk/News/2021/December/Have-a-cosy-time-this-winter-in-Animal-Crossing-New-Horizons--2095038.html
	Navigation aids	*Internal* Nintendo. (2020a). *Start deserted island life right with these Animal Crossing: New Horizons tips!* Nintendo of Europe GmbH. Retrieved April 1, 2023, from https://www.nintendo.co.uk/News/2020/March/Start-deserted-island-life-right-with-these-Animal-Crossing-New-Horizons-tips--1751422.html *External* Nookipedia. (n.d.). *NookPhone - Animal Crossing Wiki - Nookipedia.* Retrieved May 15, 2023, from https://nookipedia.com/wiki/NookPhone