HOLDING UP A BLACK MIRROR: EXPLORING ETHICAL ISSUES OF THE METAVERSE FROM A USER PERSPECTIVE

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ABSTRACT

The Metaverse, defined as an interconnected 3D virtual reality universe that is parallel and an enrichment to the physical world that users around the world can access and interact with through digital avatars, has been an emerging subject in recent studies in the social sciences and business domain. The Metaverse offers numerous opportunities for society and businesses but also raises criticism, which could be one of the reasons why the development of the Metaverse is not nearing a breakthrough. Therefore, this study explored the most prominent topics on which ethical issues can arise and current experiences of the future Metaverse from a user perspective by combining a systematic literature review with experiences in practice. The topics on which ethical issues can arise that resulted from the systematic literature review were explored in two focus group sessions, which were analyzed with the Gioia method. The exploration of literature and empirical evidence led to the most prominent topics on which ethical issues can arise privacy, societal control, health, social dynamics, misbehavior of users, globalization, and uncertainty. This study contributes to the academic field by delivering empirical evidence and providing a basis for scholars in the further research into the Metaverse. Moreover, this study contributes to practice by providing the big tech companies involved in developing the Metaverse an overview of the most prominent topics on which ethical issues can arise that engages among users, increasing consumers' technology acceptance.

KEYWORDS

TABLE OF CONTENTS

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1. INTRODUCTION

The first time the term "Metaverse" was introduced was in the 1992 science fiction novel Snow Crash (Stephenson, 1992). The novel takes place in the Metaverse, which is described as a "massive virtual environment parallel to the physical world, in which users interact through digital avatars" (Lee et al., 2021, p. 1). It illustrates the Metaverse as a 3D virtual reality world, which is an enrichment to the physical world. Second Life, Roblox, Fortnite, VR Chat, Minecraft, and Meta's Horizon Worlds are existing projects that are close to the concept of the Metaverse, but a mainstream Metaverse does not yet exist (Allam et al., 2022; Dwivedi et al., 2022; Falchuk et al., 2018; Fernandez & Hui, 2022; Lee et al., 2021).

The development of the Metaverse could bring great opportunities for society. For example, the Metaverse is seen as the next evolution of the internet, in which the Metaverse offers more immersiveness and interactivity, changing the way humans connect (Bibri, 2022; Garavand & Aslani, 2022). The Metaverse offers opportunities for various businesses, as the hospitality and tourism industries could offer immersive experiences of traveling virtually, making them less dependent on external shocks such as the COVID-19 pandemic, the Ukraine war, and climate change (Gursoy et al., 2022). In addition, the Metaverse has great potential for improving surgical accuracy, patient care, and medical training by using the cyberspace to practice (Garavand & Aslani, 2022). Moreover, as the COVID-19 pandemic resulted in the mass isolation of people, the Metaverse can extend the possibilities of people connecting with each other, increasing feelings of social presence (Oh et al., 2023).

The opportunities the Metaverse could provide for society increase the degree of interest in the Metaverse among businesses and scholars. At least 37 companies are involved in the development of the Metaverse, such as Adobe, Epic Games, Huawei, IKEA, Meta, and Microsoft (Metaverse Standards Forum, 2023) and it is an emerging subject in recent studies in the social sciences and business domain. For example, the Metaverse in combination with the wider social context was researched (Bibri, 2022). The Metaverse in education (Mystakidis, 2022). A multi-perspective study about the Metaverse in the perspectives of law and governance, behavioral and social effects, operations and marketing, health and education, and negative impacts (Dwivedi et al., 2022). And the Metaverse and technology and ecosystem dimensions (Lee et al., 2021).

Despite the presumably great impact on society, the interest of businesses in the Metaverse, and recent studies, the development of the Metaverse raises criticism and ethical questions. An ethical question refers to any moral issues and problems raised by a situation (Di Trocchio, 2015). For example, the Metaverse is often associated with a dystopian future that pictures "a world which is made worse by technological advancements" (Allam et al., 2022, p. 788). In addition, Bibri (2022) mentioned government interference, intrusion of private life, social inequality, control, and oppression as ethical implications of the Metaverse. Society's fear of the Metaverse becoming a cyber-dystopia and the ethical questions it raises may be one of the reasons why the development of the Metaverse is not nearing a breakthrough since user acceptance is of great importance when introducing a new technology (Venkatesh & Davis, 2000).

Because of society's fear of the Metaverse, research can benefit from more knowledge about how the future Metaverse is experienced in practice (Bibri, 2022). Although previous studies have reported on the overall concept "Metaverse" itself (Lee et al., 2021; Weinberger, 2022), identified benefits of implementing the Metaverse (Mystakidis, 2022; Oh et al., 2023), and mentioned possible issues of the Metaverse (Bibri, 2022; Dwivedi et al., 2022; Falchuk et al., 2018), concrete research on topics on which ethical issues can arise that is assessed and explored empirically is missing. Moreover, for a successful development of the Metaverse, the willingness of users to accept, participate, and be involved in the design process of the Metaverse is of importance (Bibri, 2022; Lee et

al., 2021). Thus, to delimit the scope of the study, this thesis focuses on the most prominent topics on which ethical issues can arise from a user perspective. This leads to the following research question:

"What are the most prominent topics on which ethical issues can arise of the future Metaverse from a user perspective?"

This research question allows us to focus on the exploration of what other scholars have found and reported in their studies and the ideas, perceptions, feelings, and experiences of users in practice. It combines literature with empirical evidence, which can be used to expand knowledge in this domain of research. Due to the combination of literature and current experiences, this research question can be split up into two sub-questions:

1. *"What are the most prominent topics on which ethical issues can arise of the future Metaverse from a user perspective identified by experts in their study?"*

In order to explore the most prominent topics on which ethical issues can arise of the Metaverse from a user perspective, the first step is to discover which topics were named by experts. A systematic literature review was used to answer this sub-question.

2. *"What are the most prominent topics on which ethical issues can arise of the future Metaverse from a user perspective identified in practice?"*

After having the most prominent topics on which ethical issues can arise identified by experts, these topics were explored with the current opinions of two focus groups. Focus group sessions were used to explore ideas, perceptions, feelings, and experiences.

In order to enrich knowledge in this research field, this study will contribute to the academic field. First, by conducting a qualitative exploratory study focusing on the most prominent topics on which ethical issues can arise of the Metaverse from a user perspective, the research scope of the Metaverse will be extended. This study is one of the first to deliver empirical evidence by triangulating the most prominent topics on which ethical issues can arise found in a systematic literature review with the experiences of two focus groups. Second, this study provides stepping stones for further research. Scholars can use the results of this thesis by researching other aspects of the Metaverse in-depth, extending knowledge in this field of research or they can use the results of this study as a basis for future exploratory or explanatory research.

This study also has practical relevance. It contributes to the business field by providing an overview of the most prominent topics on which ethical issues can arise of the Metaverse. With this overview, companies involved in the design of the Metaverse can take these topics into account by, for instance, implementing precautionary actions in the design or repressive measures in the form of law and regulation. Including the most prominent topics on which ethical issues can arise in the design of the Metaverse may increase trust in the future Metaverse and may reduce the aforementioned criticism. This can result in being one step closer to the realization of the mainstream Metaverse. Precautionary and repressive actions are not part of this study.

This report starts with a theoretical background that explains aspects of the Metaverse and its definition. After the elaboration of the definition of the Metaverse, the results of the systematic literature review will be discussed. The results show the most prominent topics on which ethical issues can arise found in a systematic literature review. Next, the methodology will be discussed, where the data collection method and data analysis are elaborated more. After the methodology section, the results will be presented. Finally, the conclusion and discussion.

2. THEORETICAL BACKGROUND

In this chapter, the theoretical background will be elaborated on. Before conducting the systematic literature review that resulted in topics on which ethical issues can arise, it was important to explore the definition of the Metaverse. To define the Metaverse, the aspects of the concept "the Metaverse" will be explored first, upon which a Metaverse definition will be built.

2.1 ASPECTS OF THE METAVERSE

Past studies have mentioned some aspects of the Metaverse, but these aspects differ among the studies. Since the used literature could not provide concrete aspects of the Metaverse, this thesis has taken the different approaches of the used literature into account and defined its own aspects of the Metaverse. Table 1 gives an overview of the found aspects after which the aspects used in this thesis are defined.

Table 1
Aspects of the Metaverse in literature

Source	Aspects
(Lee et al., 2021)	The Six Pillars of Metaverse Ecosystem: 1. Avatar 2. Content creation 3. Virtual economy 4. Social acceptability 5. Security & privacy 6. Trust & accountability The Eight Pillars of Metaverse Technology Enablers: 1. Network 2. Edge/cloud 3. Artificial intelligence 4. Computer vision 5. Blockchain 6. Robotics/IoT 7. User interactivity 8. Extended reality
(Dwivedi et al., 2022)	Key conceptualization of the Metaverse: 1. Physical world "use cases" (e.g., retail, education, gaming, public services) 2. Metaverse scenarios (e.g., mirror worlds, virtual worlds, augmented reality) 3. Metaverse features (e.g., immersive, boundless, connected) 4. Enabling technologies (e.g., blockchain, augmented reality, virtual reality) Key themes: 1. Governance, security, and safety 2. Behavioral and social 3. Operations, commerce, and marketing 4. Health and education 5. Negative impacts
(Mystakidis, 2022)	Main dimensions of the Metaverse: 1. Affordances (immersion, embodiment, presence, identify construction) 2. Challenges (physical well-being, psychology, ethics, privacy) 3. Technologies (virtual reality, augmented reality, mixed reality) 4. Principles (interoperable, open, hardware agnostic, network)

(Park & Kim, 2022)	Metaverse concepts:
	    1. Metaverse
	    2. Avatar
	    3. Extended reality
	
	Metaverse components:
	    1. Hardware components
	    2. Software components
	    3. Contents
	
	Metaverse approaches:
	    1. User interactions
	    2. Implementations
	    3. Applications

(Weinberger, 2022)	Key topic clusters:
	    1. One Metaverse comprising many virtual worlds
	    2. Interconnected
	    3. Fully immersive virtual shared space
	    4. Ubiquitous
	    5. Users represented by avatars
	    6. Persistence/permanent
	    7. User engagement (connecting and interacting with social activities)
	    8. User-generated content
	    9. Economic system
	    10. Scalable
	    11. Real-time synchronous

(Wang et al., 2023)	Key characteristics of Metaverse:
	    1. Immersiveness
	    2. Hyper spatiotemporality
	    3. Sustainability
	    4. Interoperability
	    5. Scalability
	    6. Heterogeneity

2.1.1   Interconnected

The first aspect is interconnected. Users being able to connect with each other in a virtual shared space (Dwivedi et al., 2022; Park & Kim, 2022; Weinberger, 2022), being able to travel across the virtual reality world (Wang et al., 2023), and the Metaverse being one cyberspace open for everybody (Mystakidis, 2022; Weinberger, 2022) were mentioned.

The benefit of such an open Metaverse is that it is possible to overcome geographical challenges since users from around the world are able to connect with each other and travel the world without moving. Moreover, the Metaverse makes it possible for users to connect with new people without feeling awkward, and it provides opportunities for self-expression (Szaniawska-Schiavo, 2022). Being able to connect with each other in some sort of virtual world is something that became important during the COVID-19 pandemic. The transition of the physical environment to a virtual environment was necessary during this period, making the Metaverse a promising development to increase the connection between people. As the Metaverse has more possibilities than a 2D virtual environment, the Metaverse can extend the possibilities of people connecting with each other, increasing feelings of social presence (Oh et al., 2023). However, the future Metaverse raises issues concerning hyper-connectivity. Due to the hyper-connectivity, more data can be collected, used, and processed, which makes the Metaverse prone to massive misuse of data (Allam et al., 2022; Bibri, 2022).

The possibility of users being able to connect in a 3D virtual reality world, the possible benefits, and hyper-connectivity are considerations that make interconnectedness an important aspect of the Metaverse.

2.1.2   Real-time synchronous

Table 1 shows that several papers emphasized the importance of the Metaverse being real-time synchronous to the physical world (Weinberger) and being a mirror world, in which the Metaverse reflects scenarios of the physical world (Dwivedi). For instance, the Metaverse could make it possible for people to have nested services in the virtual and physical world. Gaming, office, social, marketing, and education applications were examples Park & Kim (2022) mentioned in their paper as nested services in the Metaverse. Dwivedi et al. (2022) mentioned retail, education, gaming, and public services as physical world use cases for the Metaverse, and Weinberger (2022) mentioned the ability of the Metaverse to interact with in-world content, highlighting the interplay between the Metaverse and the physical world.

According to a survey with 1,050 respondents (Szaniawska-Schiavo, 2022), the main reasons for joining the Metaverse are increasing work possibilities, art and live entertainment, money investment, education, online dating and socializing, gaming, and adult entertainment, highlighting the need of people for nested services in the Metaverse. Moreover, the Metaverse not only can provide new education possibilities, new working environments such as working remotely in the Metaverse, and extended gaming possibilities (Bibri, 2022), but the hospitality and tourism industries could, for example, provide virtual vacations (Gursoy et al., 2022) or health care can improve their training by using the cyberspace to practice (Garavand & Aslani, 2022).

However, having a real-time synchronous Metaverse can also result in blurring boundaries between the real and Metaverse world. Wang et al. (2023) argued that a real-time synchronous Metaverse could make it more difficult to distinguish between fact and fiction, and Zallio & Clarkson (2022) mentioned the possibility of users being confused about which environment they are currently in.

Considering the connections between the Metaverse and the physical world, the claims of providing new services, and the blurring of boundaries between the real and Metaverse world, being real-time synchronous is an important aspect of the Metaverse.

2.1.3   Avatars

Being present in the Metaverse is also an important aspect. Specifically, being represented by avatars was an aspect mentioned four times (Lee et al., 2021; Mystakidis, 2022; Park & Kim, 2022; Weinberger, 2022), which is why avatars is the third aspect of the Metaverse in this thesis.

Avatars are "digital representations whose behaviors reflect those executed, typically in real time, by a specific human being" (Bailenson & Blascovich, 2004, p. 65). Since avatars are controlled by humans, avatars usually are a copy of a specific human being or a creation of a fictional personality, with the opportunity to switch between these identities (Boberg et al., 2008; Castronova, 2003).

To give an example of the possibilities of avatar identities, avatar customization and avatar capabilities were tested on several platforms. The Meta Quest 2 headset was used to test avatar customization possibilities. Several design possibilities include the choice between multiple skin tones, face shapes, hair style and color, eye color, a set of clothes, glasses, make up, masks, and hats. To illustrate the possibilities of avatars in a 3D virtual reality world, Horizon Worlds was used. Meta's Horizon Worlds is a 3D virtual reality open world in which users can meet with people, play games, attend events, and numerous of other exploring possibilities (Meta, 2023a). In Horizon Worlds, users can walk or run around with their avatar, jump, or teleport to another area. Walking, running, jumping, or

teleporting are not the only things avatars can do in (2D/3D) virtual worlds. Boberg et al. (2008) mentioned that common interactions of digital avatars are moving in a space, sharing, giving, and trading.

Allowing users to customize their avatar into either a copy of themselves or a fictional personality increases the chance that users can identify with their avatar, making their feelings of being present in the Metaverse stronger (Boberg et al., 2008). However, allowing users to experiment with another personality online can cause online disinhibition, a state where users are less restrained online than offline (Cheung et al., 2020). Online disinhibition can lead to misbehavior by users in the Metaverse, which could be a problem in the Metaverse (Dwivedi et al., 2022).

Due to the possibilities of digital avatars, needing avatars to walk around in the Metaverse, and avatar embodiment, avatars is an important aspect of the Metaverse.

2.1.4 Immersiveness
Considering that technologies for making the Metaverse as immersive as possible were mentioned in every paper from Table 1, for example, technology enablers (Dwivedi et al., 2022; Lee et al., 2021) and hard- and software components (Park & Kim, 2022), immersiveness is the fourth aspect.

The Metaverse is going to use numerous technologies for an immersive experience. Key technologies of the Metaverse mentioned in previous research are extended reality, artificial intelligence, and Blockchain (Allam et al., 2022; Bibri, 2022; Dwivedi et al., 2022; Lee et al., 2021; Mystakidis, 2022). It seems that extended reality is the most important technology for immersiveness since users need an extended reality device to enter the Metaverse.

Extended reality (XR) varies from fully digital environments to digital objects projected in the real world (Vasarainen et al., 2021). Extended reality can refer to virtual reality (VR), augmented reality (AR), and mixed reality (MR). Virtual reality simulates "a computer-generated world as if it were real" (Bowman & McMahan, 2007, p. 36), while augmented reality makes it possible to bring virtual objects into the real world (Carmigniani & Furht, 2011). This indicates that users in VR are in a fully digital environment, whereas AR is a virtual extension of the real world. Mixed reality does not have a universal definition (Speicher et al., 2019). Thus, this thesis defines MR as a mix of VR and AR. To give an example of MR, a couple of examples Speicher et al. (2019) used for VR and AR are going to be used. For example, users in VR experience a fully 3D virtual reality world with a VR headset, while in AR 3D graphics are merged with the real world. A simple example of AR mentioned in the paper is Pokémon GO, where users can use their camera to place their Pokémon in the "real world". Considering these examples, MR can be seen as an extension of AR where virtual objects can interact with the real world (Mystakidis, 2022). For example, while in AR the previously mentioned Pokémon can only be seen through a camera, in MR the Pokémon is a virtual 3D object standing in your living room that everyone can see with special MR glasses.

There are numerous possibilities for making the future Metaverse as immersive as possible. However, scholars mentioned possible issues with users' daily lives, such as addiction to Metaverse services (Allam et al., 2022; Chen, 2022; Dwivedi et al., 2022; Lee et al., 2021). For instance, Chen (2022) mentioned that the increased immersiveness of the Metaverse carries a strong risk of addiction. The Metaverse could increase interaction with digital environments, and these increased interactions with digital environments have the risk of making people dependent on them, which could influence their daily lives (Lee et al., 2021).

Due to the technological possibilities to make the Metaverse as immersive as possible, immersiveness is considered an important aspect of the Metaverse.

2.1.5 Economy

Economic aspects could be derived from the virtual economy and economic system, which were mentioned twice (Lee et al., 2021; Weinberger, 2022). Moreover, Blockchain and NFTs were also mentioned (Dwivedi et al., 2022; Lee et al., 2021), which is why economy is the fifth aspect of the Metaverse.

As mentioned in the introduction, at least 37 companies are involved in developing the Metaverse (Metaverse Standards Forum, 2023). Developing the Metaverse means making investments. For example, Meta invests 20% of their budget in Reality Labs (Bosworth, 2022), which are Meta's augmented and virtual reality products. According to their annual year report of 2021, Reality Labs cost 7 billion US dollars in 2020 and 12 billion US dollars in 2021 (Meta Platforms Inc, 2022, p. 51). Meta expects their investments to increase in future periods (Meta Platforms Inc, 2022, p. 25).

Due to the big investments made, companies must see profitability in the Metaverse. In 2021, the market size of augmented reality, virtual reality, and mixed reality was 27.96 billion US dollars and is expected to grow to 252.16 billion US dollars in 2028 (The Insight Partners, 2022). This growth can indicate profitability and market opportunities in the Metaverse market. Considering profitability and the former example of Meta and their Reality Labs, Reality Labs was responsible for 2 billion US dollars of revenue in 2021 for Meta (Meta Platforms Inc, 2022, p. 51). This led to a loss of 10 billion US dollars for the company, taking into account the aforementioned investment of 12 billion US dollars in 2021.

In addition, the Metaverse also creates a new digital economy. For example, users can trade their virtual contents at a marketplace, such as with non-fungible tokens (NFT) (Lee et al., 2021). Moreover, NFTs in the Metaverse could open up new income streams. For example, developers, investors, and gamers could have new income streams in the Metaverse, which might overcome challenges like unemployment (Allam et al., 2022). However, scholars have previously mentioned issues concerning a digital economy in the future Metaverse. Due to their assumed anonymity, lack of central authority, and complex circulation in the future Metaverse, NFTs are vulnerable to fraud, phishing, and ransomware (Wang et al., 2023).

Considering the big investments, the expected growth in market size, the delayed profitability, and a new digital economy, the economy of the Metaverse can be considered as an important aspect of the future Metaverse.

2.1.6 Social participation

The social aspects of participating in the Metaverse are also important, according to the authors. Five studies mentioned social aspects of the Metaverse in their papers. Specifically, social acceptability (Lee et al., 2021) and challenges (Mystakidis, 2022) were mentioned aspects. Moreover, Behavioral and social was a key theme Dwivedi et al. (2022) mentioned, Park & Kim (2022) considered user participation and the benefits of it, and Wang et al. (2023) mentioned social limitations in their paper.

According to Lee et al. (2021), the Metaverse is supposed to be inclusive. For example, the Metaverse includes the elderly who are not mobile enough to leave the house, people in wheelchairs, or people with any other physical limitation, as avatars are needed to walk around, offering those who have a physical disability the opportunity to live in the Metaverse in a similar manner as regular citizens (Park & Kim, 2022). In addition, Park & Kim (2022) mentioned that a fairer and more impartial participation in society is made possible by these avatars, increasing social participation in the Metaverse.

However, as mentioned previously, the Metaverse should be one 3D virtual reality world that is open to everyone (Mystakidis, 2022), which means that the Metaverse is not meant to create social exclusion. Bibri (2022) mentioned that the costs of VR headsets and additional products could lead to social exclusion. For example, people who do

not have the resources to access the Metaverse could be socially excluded. In addition, Dwivedi et al. (2022) mentioned the generational gap for elderly people, who might lack the technological skills to participate in the Metaverse, which excludes them from a possible mainstream Metaverse.

Considering the increasing diversity the Metaverse could offer and the issue of social exclusion, social participation is an important aspect of the Metaverse.

2.1.7   Governance

Laws, regulation, and governance were also clear emerging themes among the authors. It was mentioned in terms of security and privacy (Lee et al., 2021), challenges (Mystakidis, 2022), and it was a key theme of the paper of Dwivedi et al. (2022). To summarize these findings, this thesis names this aspect governance.

Fernandez & Hui (2022) argued that the Metaverse comes with new ethical and privacy issues. They mentioned the possibility of avatars misbehaving in the Metaverse, such as through sexual harassment, abuse, killing other avatars, and theft of digital assets. These possibilities raise questions about the governance of the Metaverse, for example, who and how the Metaverse will be regulated and how the laws will be created. For instance, governmental surveillance, automation tools, or having a community govern the Metaverse could be options. With governmental surveillance, the government can, for instance, prosecute restrictions, execute punishments, or even ban a user from the Metaverse (Lee et al., 2021). In addition, automation tools or having a community govern the Metaverse are examples that are already implemented in social networks such as Facebook and Twitter or within massively multiplayer online games (Fernandez & Hui, 2022).

However, the degree of regulation and control in the Metaverse could influence the users' overall quality of experience (Falchuk et al., 2018). Having the Metaverse fully controlled by the government or big tech companies developing the Metaverse is associated with a dystopian future that pictures "a world which is made worse by technological advancements" (Allam et al., 2022, p. 788). For example, Bibri (2022) mentioned government interference, intrusion of private life, control, and oppression as warning signals of cyber-dystopia. In addition, allowing big tech companies to govern the Metaverse could result in them regulating the Metaverse according to their own hidden agenda (Bibri, 2022). Therefore, the balance between regulating the Metaverse in order to prevent misbehavior by users and having the Metaverse fully controlled should be justified.

As the Metaverse currently lacks law and regulation, which could result in new issues, governance is an important aspect of the Metaverse.

2.1.8   Outcome

To summarize, the seven aspects can be seen in Figure 1 on the next page.

Figure 1
Aspects Metaverse
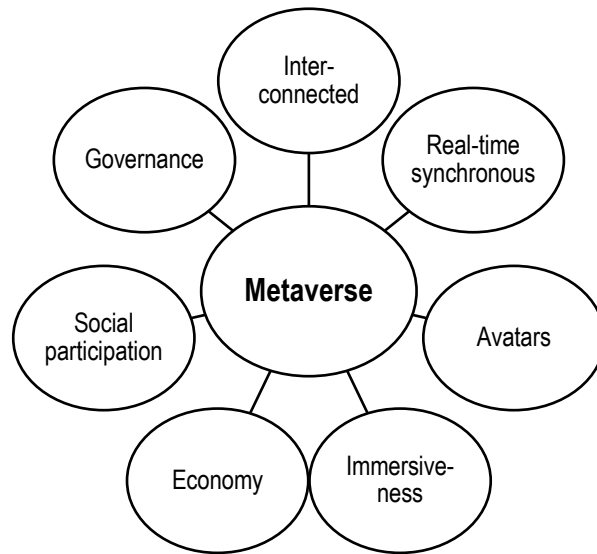
In addition to Figure 1, Table 2 provides a brief overview with a description per aspect.

Table 2
Summary aspects and description

Aspects Metaverse	Description
Interconnected	People connecting with each other in a virtual shared space, overcoming geographic challenges, and hyper-connectivity.
Real-time synchronous	Mirror world, nested services, interacting with in-world content, and blurring boundaries between the real and Metaverse world.
Avatars	Users are represented by avatars in the Metaverse, copy of a human being or a fictional personality, customization, and online disinhibition.
Immersiveness	Technology enablers and hard- and software components enhance the immersiveness of the Metaverse, extended reality (XR), and possible issues with users' daily lives, such as addiction.
Economy	Profitability and investments in the Metaverse, growing market size extended reality, a new digital economy, and the complex circulation of NFTs.
Social participation	Inclusive Metaverse, including people with physical limitations, fairer participation in society, and possible social exclusion.
Governance	Lack of regulation in the Metaverse, governmental surveillance, cyber-dystopia, and balance between the degree of regulation and control.

2.2 DEFINITION METAVERSE

In addition to the seven aspects of the Metaverse, the Metaverse can also be defined by considering the word "Metaverse" itself. "Metaverse" consist of two parts. The first part consists of the Greek word Meta, which means beyond, after, or behind. Combining it with the second part, verse, the Metaverse could be interpreted as a beyond-universe. Having taken the previous interpretation and aspects of section 2.1 into account, this report defines the Metaverse as follows:

The Metaverse is an interconnected 3D virtual reality universe that is parallel and an enrichment to the physical world that users around the world can access and interact with through digital avatars.

Having considered the previous given definition of the Metaverse, it was important to distinguish the definition of the Metaverse from the definition of virtual worlds. Virtual worlds can be defined as "shared, simulated spaces which are inhabited and shaped by their inhabitants who are represented as avatars. These avatars mediate our experience of this space as we move, interact with objects and interact with others, with whom we construct a shared understanding of the world at that time" (Girvan, 2018, p. 1099). The definitions of the Metaverse and virtual worlds share similarities considering the shared spaces with users represented as avatars, possibly causing confusion between the two terms.

However, the important difference is that the Metaverse is an immersive 3D virtual reality universe parallel to and an enrichment of the physical world, which is real-time synchronous. A virtual world is a 2D space, which can influence the level of self-perception, presence, activity, and emotional expression (Mystakidis, 2022). Due to the similarities between the Metaverse and virtual worlds, relevant papers of virtual worlds were also considered, keeping in mind that topics on which ethical issues can arise in a 3D virtual reality universe (Metaverse) can be bigger, smaller, or disappear compared to a 2D space (virtual world).

Based on the previously given definition of the Metaverse, a few existing projects are close to the concept of the Metaverse. Previous research mentioned Second Life, Roblox, Fortnite, VR Chat, Minecraft, and Horizon Worlds (Allam et al., 2022; Dwivedi et al., 2022; Falchuk et al., 2018; Fernandez & Hui, 2022; Lee et al., 2021). For example, Second Life is a virtual world where people can go to music clubs with their created avatars, go to cinemas, hang out spaces, conferences, and more (Linden Research Inc., 2023). Roblox is very similar, as Roblox is a global platform where people can come together virtually (Roblox Corporation, 2023). It is also possible to walk around in Minecraft, where players can travel, build, and play in various game modes (Microsoft, 2023).

3. SYSTEMATIC LITERATURE REVIEW

After conceptualizing the Metaverse, this chapter will explain the executed systematic literature review. To answer the first sub-research question "what are the most prominent topics on which ethical issues can arise of the future Metaverse from a user perspective identified by experts in their study?", a thorough exploration of the body of literature was needed. The approach and results of the most prominent topics on which ethical issues can arise are presented in the next sections.

3.1   APPROACH

In order to know what topics were identified by experts in their study, the body of literature was explored. The checklist of PRISMA-S was used to structure the approach of the systematic literature review (Rethlefsen et al., 2021). The search engine used was Web of Science. In addition, the snowball method was used to manually scan the reference lists of the included articles to increase the chance that all relevant literature was included (Greenhalgh & Peacock, 2005). The used PRISMA-S scheme is displayed in Figure 2, after which the steps taken are explained.

Figure 2
PRISMA scheme

Search terms all fields:
("metaverse*" OR "virtual world*") AND ("risk*" OR "negativ*" OR "concern*" OR "challeng*") AND ("user*" OR "societ*" OR "human*" OR "people*"

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources
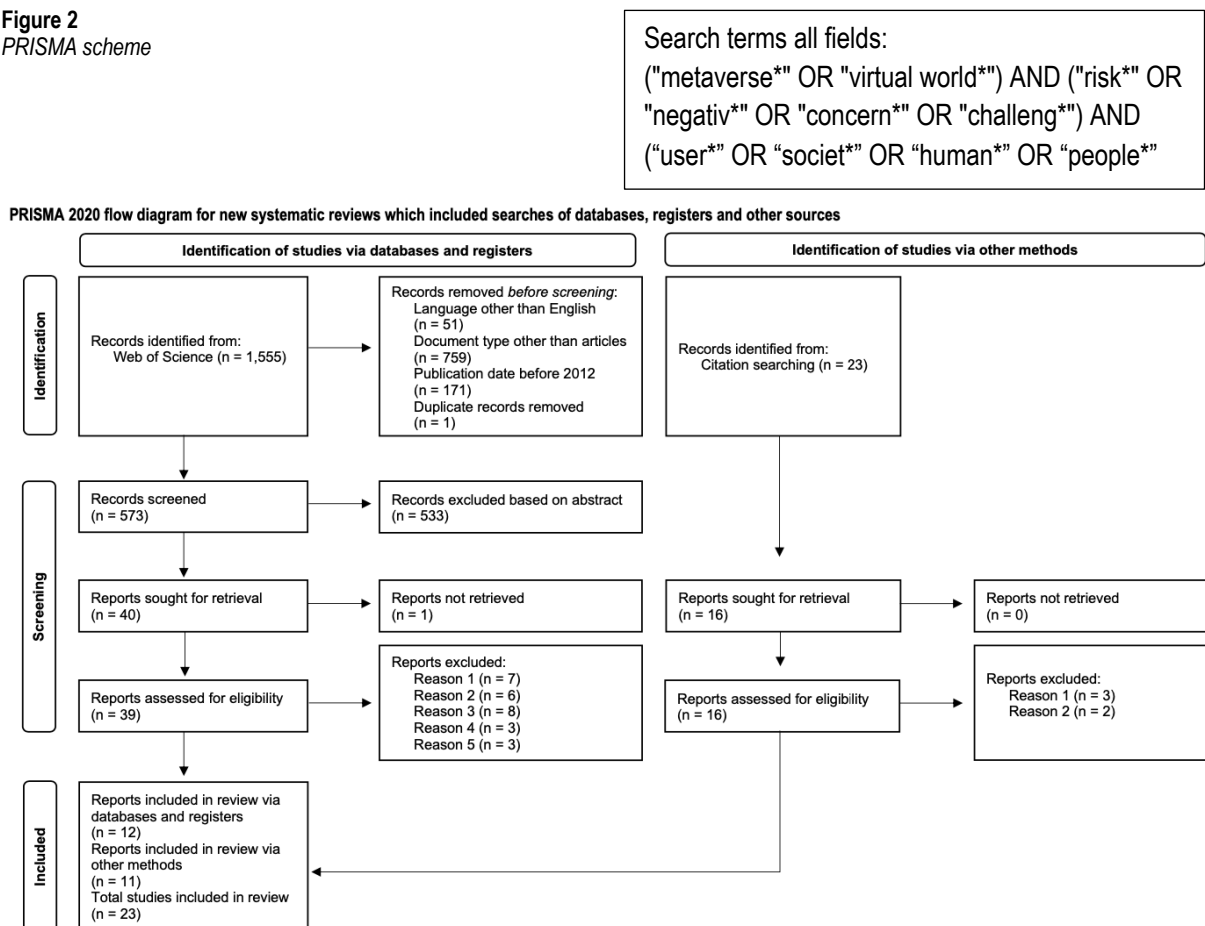
3.1.1   Search queries

At the start of the research, Web of Science showed 692 hits by only searching for the keyword "Metaverse*". Having considered that these hits would be reduced after the automated exclusion criteria, the chance of including several relevant papers in the review seemed too small. In light of the aspects and definition of Chapter 2, more keywords were added to the search. As mentioned in section 2.2, the similarities and differences between 2D virtual worlds and the Metaverse were considered, resulting in adding the keyword "virtual world*", and the aspect "avatar*" to the search, increasing the chance of including relevant papers about a similar virtual environment. Although the

keyword "virtual world*" did not return hits of articles that used "virtual" and "world*" separately, a quick comparison of the results revealed that adding more keywords to the search query did not add additional value in retrieving relevant articles. During the assessment of articles about virtual worlds, the consideration that issues in a 3D virtual reality universe (Metaverse) can be bigger, smaller, or disappear compared to a 2D space (virtual world) was taken into account.

During the search it became apparent that too many irrelevant hits showed up (19,795), indicating that the search queries were not of good quality, in which screening would have taken too much unnecessary time. Since this thesis is about the most prominent topics on which ethical issues can arise focusing on a user perspective of the Metaverse, keywords that could return hits on topics on which ethical issues can arise and keywords that could return hits from the user perspective were added. According to the papers used in the theoretical background, whenever an author mentioned topics on which ethical issues can arise, the terms risk, negative, concerns, challenge, ethical, critics, problem, issue, threat, and barrier were used. As a result, the terms "risk*", "negativ*", "concern*", and "challeng*" were added to the search query for more specific hits. The search terms "ethic*", "critic*", "problem*", "issue*", "threat*", and "barrier*" were also considered, but after a quick comparison of the results, adding more keywords to the search query did not add additional value in retrieving relevant articles.

In addition, the hits still showed irrelevant records. The records showed, for example, issues in technical aspects, which are out of the scope of this thesis. To reflect the user perspective in the search queries, the keywords "user*", "societ*", "human*", and "people*" were added, showing 1,555 hits. Important articles that were missed because of excluding terms in the search query were expected to show up after the snowball method.

3.1.2   Inclusion and exclusion criteria

The final keyword search in Web of Science showed 1,555 hits on January 11, 2023. To exclude non-relevant articles, automated exclusion criteria were first applied. Automated exclusion criteria were language other than English, document types other than articles, and publication date before 2012. A date limit was set because the Metaverse is a relatively new concept, and the hits go back to 1996. The young entrepreneur Palmer Luckey launched the Oculus Rift on Kickstarter in 2012, a 3D VR headset that is currently in the hands of Meta (Egliston & Carter, 2021). The launch of the Oculus Rift increased the attention in 3D virtual reality worlds, explaining that the Web of Science hits do not show records under 30 from 2012. As a result, the date limit was set at 2012. The expectation was that relevant articles before 2012 would show up after the snowball method. The distribution of articles that led to this decision can be seen in Figure 3.

Figure 3
Number of English articles per year
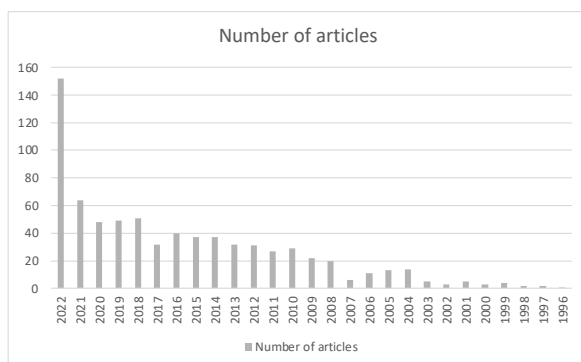
Finally, any filters were doubled out. Second, the records were screened based on the abstract. Exclusion criteria were articles about something other than the Metaverse or virtual reality world, articles that focused on something other than users of the Metaverse, and articles that focused on technical factors of the Metaverse or virtual reality

world. Inclusion criteria were focused on the Metaverse or virtual reality world, and the mentioning of ethical, social, physical, economic, or behavioral aspects meant as a challenge, critic, problem, issue, risk, negative aspect, concern, threat, barrier, or other derivates. After that, the articles that had full text access were included and screened for eligibility. The remaining articles were included in the literature review. An overview of the main reasons for excluding articles based on eligibility is given in Table 3.

Table 3
Excluded based on eligibility

Reason	Description
1	Did not mention topics on which ethical issues can arise of virtual (reality) worlds or the Metaverse
2	Too focused on other specific subjects, e.g., technical aspects, copyright, shame of children, people's workload, intellectual property rights, NFTs, Blockchain
3	Too general, e.g., the whole internet or social media, virtual reality, national security
4	Too focused on a specific user group, e.g., medical students, faculty members, social workers
5	Other

3.1.3 Citation searching

The reference lists from the remaining articles were also examined. The titles in the reference lists were checked based on a combination of two sets of keywords. The first series of keywords were terms that were frequently used in combination with the Metaverse according to the literature review. Next to "Metaverse", the terms "smart cities", "virtual worlds", "virtual reality", and "virtual environment" were part of the first series of keywords. The second series of keywords were "ethics", "challenge", "critic", "problem", "issue", "risk", "negative", "concern", "threat", "barrier", or other derivates. Titles that did not mention a combination of series 1 and series 2 were excluded. There were titles that had one of the keywords from the first series but did not indicate whether a combination from the second series could be made. These titles received the benefit of the doubt and were not excluded. This approach led to 23 additional records.

Although the right side of the PRISMA-S model does not include the screening of abstracts, this step is included in this thesis. It would have taken too much irrelevant time to assess 23 records in full text, while the left side of the PRISMA-S model shows that the abstract is considered a sufficient estimation. The same exclusion and inclusion criteria from the previous section were used, which led to 16 records. After that, the records that had full text access were included and also screened for eligibility. The remaining articles were included in the literature review. An overview of the main reasons for excluding articles based on eligibility is given in Table 4.

Table 4
Excluded based on eligibility other sources

Reason	Description
1	Did not mention topics on which ethical issues can arise of virtual (reality) worlds or the Metaverse
2	Too focused on other specific subjects, e.g., technical aspects, Terms and Conditions of Second Life

3.2 RESULTS

The articles included in the literature review can be found in Appendix 1. Each topic on which ethical issues can arise from a user perspective was counted in these articles. Mentioning a topic once, twice, or more was counted as one per paper. The frequency of a topic does not mean that this topic is the most important. It could, for example, be that a topic is the most obvious topic considering technologies. Moreover, the topics on which ethical issues can arise from the systematic literature review should not be confused with the aspects of the Metaverse mentioned in section 2.1 as multiple topics could be applicable to one aspect of the Metaverse, or multiple aspects could be

applicable to one topic. Therefore, the topics will be treated individually. The following section will elaborate on the most prominent topics on which ethical issues can arise from the systematic literature review.

First, privacy. The Metaverse can store a huge amount of information, including personal and sensitive information about people (Bibri, 2022). With the huge amount of information in the Metaverse, Allam et al. (2022, p. 795) mentioned that Meta and other big tech companies have increased opportunities to "collect users' personal information, share it, trade, and abuse it". The increased storage of sensitive information results in additional issues in cyber security (Lee et al., 2021). Moreover, Wang et al. (2023, p. 320) mentioned that hackers have increased opportunities in the Metaverse because of the "massive data streams".

Second, regulation. Fernandez & Hui (2022) mentioned the users' need for regulation and governance in the Metaverse. For example, they questioned whether moderators could monitor every aspect of the Metaverse in order for users to feel safe in the Metaverse and who will monitor the Metaverse, possibly the users themselves. In addition, Wang et al. (2023) argued that the Metaverse needs new laws and regulations as new events will emerge in the Metaverse, in which the direct application of laws and regulations in daily life could be challenging, which could influence the protection of users in the Metaverse.

Third, deviant behavior. Dwivedi et al. (2022) highlighted that deviant behaviors can be magnified in the Metaverse. For example, the immersiveness can impact users more in cases of harassment and bullying. Moreover, due to the technological advancements of the Metaverse, Hennig-Thurau et al. (2022) saw increased possibilities to develop deepfakes for people to engage in bad behaviors using other people's avatars.

Fourth, several experts were concerned that the Metaverse will have an impact on human health. Regarding psychological health, Ning et al. (2021, p. 28) mentioned the phenomenon of cyber-syndrome, which is "a physical, social, and mental disorder caused by excessive use of the Internet", indicating serious health concerns for Metaverse users. In addition, as headsets are required to enter the Metaverse, Jaung (2022) saw problems in terms of the physical health of users. For example, motion sickness. Moreover, amongst others, Park & Kim (2022) were concerned whether the immersiveness of the Metaverse can cause over-addiction to virtual reality.

Fifth, social exclusion. Experts mostly saw problems in accessing the Metaverse, as to access the Metaverse one needs an internet connection, basic technological knowledge, and equipment (Allam et al., 2022; Bibri & Allam, 2022a; Dwivedi et al., 2022; Zallio & Clarkson, 2022). For example, Bibri (2022) argued that people who lack technological skills may have a hard time accessing the Metaverse as it is a new technology and that the Metaverse comes with high costs for equipment that not everyone can afford. In addition, Dwivedi et al. (2022) questioned whether the Metaverse will generate a gap for elderly people. Besides the possible difficulties of accessing the Metaverse, Bibri and Jaung (2022; 2022) mentioned that biased algorithms can cause social inequality in the Metaverse, as the algorithm might favor the more fortunate over the unfortunate.

Last, freedom. Following up on the privacy concerns and the regulatory aspects, experts were concerned about the magnitude of data in the Metaverse. The magnitude of personal data can be collected by elites and regulators to constantly control people's behavior and continuously monitor the users of the Metaverse, which can make the users feel less free (Bibri, 2022; Bibri et al., 2022; Bibri & Allam, 2022b). In addition, Bibri (2022) argued that surveillance capitalism and technological determinism in the Metaverse can lead to democratic backsliding.

The results, including a brief description and their frequency, can be seen in Table 5 on the next page.

Table 5
The most prominent topics on which ethical issues can arise from a user perspective of the Metaverse found in the literature review

Topic on which ethical issues can arise	Description	Count	%
Privacy	Data privacy risks for users, e.g., hacking of data, which will have a greater impact due to the magnitude of the data in the Metaverse.	22	24%
Regulation	Experts wonder who will monitor the Metaverse in order for users to be protected. E.g., what are right and wrong behaviors, who decides what is wrong, and who is going to maintain the rules?	17	19%
Deviant behavior	Increased misbehavior of users due to the possibility of "hiding behind a screen", e.g., killing of avatars, harassing avatars, cyberbullying, or spreading disinformation.	15	17%
Health	Experts worry about the personal and physical health of Metaverse users, e.g., motion sickness, addiction, and mental health problems.	14	16%
Social exclusion	Exclusion of specific groups, e.g., lacking technological knowledge to enter the Metaverse.	12	13%
Freedom	Having no freedom or personal autonomy for users, e.g., the possibility of being controlled and monitored constantly, or democratic backsliding.	10	11%

UNIVERSITY OF TWENTE.

4. METHODOLOGY

In this chapter, the research design will be elaborated on. First, a description of the research design will be discussed. After the brief description, the data collection method, the selection of the sample, the execution in practice, and how the data was analyzed are going to be explained.

4.1 RESEARCH DESIGN

As stated before, research can benefit from more empirical evidence in this field. In order to answer the research question, the research question was split into two parts. First, a systematic literature review was conducted to assess what the most prominent topics on which ethical issues can arise were that other scholars had found and reported. Second, due to the exploratory nature of the research question, qualitative data was needed for the second sub-question. To explore the feelings and experiences in practice of topics on which ethical issues can arise, focus group sessions were conducted to discuss these findings.

Focus groups are "a form of qualitative interviewing that uses a researcher-led group discussion to generate data" (Given, 2008, p. 352). As focus groups allow for the generation of data based on a group dialogue where participants can freely discuss subjects (Given, 2008, p. 352), the increased interaction in a focus group session was considered the greatest advantage. Interaction between subjects was favorable for this thesis since the participants were stimulated to share and compare their experiences with each other (Breen, 2006). As this thesis is about a relatively novel subject with a social nature, interaction in a focus group would allow the participants to have discussions and a deeper understanding of their argument. In addition, due to the interaction with multiple people, the chance of participants being affected by the knowledge and possible biases of one person was decreased. Last, having multiple participants in one focus group session presumably took less time than, for example, having multiple interviews.

However, it could be possible that more timid participants could "lose their voice" in a focus group discussion, which made it necessary to define a few rules in advance (Bolderston, 2012; Bradbury-Jones et al., 2009). Not interrupting other people and respecting someone else's opinion were ground rules defined beforehand for the executed focus group sessions. In addition, the focus groups were small. Bradbury-Jones et al. (2009) mentioned that small focus groups are favorable for natural interaction among the group members, increasing the chance of hearing all individual participants equally. In addition, getting all participants together at the same place at the same time could have been challenging for a focus group session (Breen, 2006). The researcher had to take into account the schedules of multiple participants at once. Having multiple date options, communicating the dates as soon as possible, accepting a smaller number of participants, and the possibility of having multiple focus group sessions were measures that were taken to overcome this obstacle.

In conclusion, the qualitative and exploratory nature of focus group sessions made it possible to collect the exploratory material needed for this thesis, as the goal of the data collection method was to explore the ideas, perceptions, feelings, and experiences of a sample group. Table 6 on the next page shows an overview of the considerations that justify the choice of having focus group sessions as a data collection method.

Table 6
Considerations focus groups

Considerations	Focus groups
Number of participants at the same time	Many
Interaction	With the whole group
Research goal	Sharing and comparing experiences
Time of session(s)	One session, saves time
Hearing all respondents	Challenging, due to different characters
Getting participants to a session	Challenging, due to having multiple people at the same place at once

The goal of the focus group sessions was to explore the most prominent topics on which ethical issues can arise from a user perspective in practice. This outcome delivers empirical evidence to the research field of the Metaverse and can be used by companies to further develop the Metaverse. For example, the topics can be extended with precautionary actions and repressive measures in the form of technical and design aspects or law and regulation. Companies involved in the design of the Metaverse can take into account these most prominent topics on which ethical issues can arise by implementing or designing actions and measures against these topics.

4.2   DATA COLLECTION

Before the actual focus group discussion started, a VR experience was given. The VR experience required VR headsets, of which the University of Twente's department had access to six Meta Quest 2 headsets and two Meta Quest Pro headsets. To prevent any differences in quality or immersiveness of the VR experience, the participants only used the Meta Quest 2 headsets, meaning that one focus group session could consist of a maximum of six participants at the same time. To collect a reliable amount of data, two sessions were executed, which meant a maximum of twelve participants. A minimum of four participants per session was accepted in case of last-minute scheduling conflicts, sickness, or other unexpected circumstances. In addition, a colleague who also researches the Metaverse was present to make sure the VR experience went as smoothly as possible. As it did not matter whether the colleague and researcher had differences in quality or immersiveness during the VR experience, they both used the Meta Quest Pro headsets.

Due to the qualitative and novel nature of this research, the focus group discussions were based on the ideas, perceptions, feelings, and experiences of the groups. Although the participants were aware of the purpose of this thesis, which was to explore the most prominent topics on which ethical issues can arise of the Metaverse from a user perspective, the topics found in the systematic literature review were withheld from the participants until the last ten minutes of the focus group discussion to keep an open mind. Within these last ten minutes, the participants were asked about the not yet discussed topics found in the literature review. It could, for example, have happened that the participants had not thought about a topic or did not agree with a topic.

An overview of the setting of the focus group session is displayed in Table 7 on the next page.

Table 7
Overview focus group sessions

Description focus group	Time
Welcome, short general description of Metaverse, and short instruction Meta Quest 2	8 minutes
Time taken into account before all participants are ready in Meta's Horizon Worlds	5 minutes
VR demo in separate rooms	10 minutes
Returning to physical focus group room	2 minutes
Focus group discussion (exploration)	25 minutes
Focus group discussion (checklist)	10 minutes
Ending session and thanking participants	2 minutes
Total maximum duration	62 minutes

4.2.1 Checklist

The checklist used for the focus group sessions can be seen in Table 8. It does not differ from the topics in section 3.2, where the results of the systematic literature review were viewed. The first column shows topics on which ethical issues can arise, while examples of those topics are shown in the second column. Whenever an example from a topic came up during the focus group discussion, that topic was crossed off the checklist. The remaining topics on the checklist were briefly explored in the last ten minutes of the session.

Table 8
Checklist focus group sessions

Topic on which ethical issues can arise	Description
Privacy	Data privacy risks for users, e.g., hacking of data, which will have a greater impact due to the magnitude of the data in the Metaverse.
Regulation	Experts wonder who will monitor the Metaverse in order for users to be protected. E.g., what are right and wrong behaviors, who decides what is wrong, and who is going to maintain the rules?
Deviant behavior	Increased misbehavior of users due to the possibility of "hiding behind a screen", e.g., killing of avatars, harassing avatars, cyberbullying, or spreading disinformation.
Health	Experts worry about the personal and physical health of Metaverse users, e.g., motion sickness, addiction, and mental health problems.
Social exclusion	Exclusion of specific groups, e.g., lacking technological knowledge to enter the Metaverse.
Freedom	Having no freedom or personal autonomy for users, e.g., the possibility of being controlled and monitored constantly, or democratic backsliding.

4.2.2 Considerations

It was required that the participants start the VR experience in separate rooms due to the microphone communication of the Meta Quest headsets. If participants were doing the VR experience in the same room, real-life voices and microphone sounds from the headsets would probably not be aligned, causing lag. In addition, Meta's Horizon Worlds had been chosen due to the compatibility with the Meta Quest headsets, the open world nature, and similarities with the possible future Metaverse. Moreover, ten minutes had been chosen because the purpose of the VR demo is to give a sense of the future Metaverse. For giving the participants an idea of the future Metaverse, it was likely that ten minutes would be enough. Last, having a ten-minute VR experience would reduce the chance of someone getting motion sick, as motion sickness had been mentioned as a possible issue users could experience in the Metaverse.

Moreover, the researcher was also present in Horizon Worlds to briefly guide the participants. The decision to be personally present in Horizon Worlds was based on several considerations. Normally, when users enter Meta's Horizon Worlds, they all start in separate home environments. To prevent confusion among the participants and them not knowing where to go, it was required to connect the participants to one party. A party in the Meta Quest allows users to travel between worlds in groups (Meta, 2023b). In this party, one user would have needed to be assigned as the head of the party to allow all participants to start at the same home, the home of the head of the party. It would have been too difficult to assign one participant as head of the party, as this would have relied too much on the VR experience or possible dominance of one participant. On the one hand, making the researcher the head of the party could have made the participants feel as if they were being controlled or monitored. On the other hand, the VR experience would have relied less on the good preparation, experience, and neutrality of other participants, which would have increased the efficiency. Having taken the considerations into account, allowing the researcher to be the head of the party to guide the participants through Horizon Worlds was the best option. Being personally head of the party, the VR experience started in "my home" in Meta's Horizon Worlds. Letting the participants start in the home environment of Horizon Worlds was a good way to start the experience as a group since outsiders did not have access to this environment. If needed, the home environment made it possible to give additional explanations, for which the researcher's presence in Horizon Worlds was also required. Although the interaction between the participants and the researcher was as limited as possible to prevent any biases beforehand, exceptions were made when users struggled to walk around in Horizon Worlds, struggled to handle the controllers, or had any other technical issues.

4.2.3   Ethical approval

Before the focus group discussion started, explicit informed consent was asked. Important aspects highlighted in the informed consent were that participants could experience motion sickness during the VR experience and that they were able to quit the VR experience and focus group session at any time. In addition, the collected data of the respondents, such as personal information and recordings of the session, was processed carefully. The data was stored digitally, was secured, and will be deleted after the completion of the thesis. The data used in this thesis was anonymized, for instance, "Statement Participant 1".

4.3   SAMPLE

In order to execute focus group sessions, this thesis needed to define a sampling group (Babbie, 2021). In the following sections, the choice of having university students as a sampling group will be justified, and the sampling method will be discussed.

4.3.1   Sampling group

The novel character of the research subject (the future Metaverse) required a certain level of abstract thinking. The higher level of education of university students was considered the greatest advantage, as it increased the chance of exploring topics on which ethical issues can arise more critically and thoroughly in the focus group sessions. Moreover, the expectation was that university students were more likely to have heard of the Metaverse or could better imagine the concept of the Metaverse than other groups. Therefore, university students could possibly exchange more knowledge, experiences, and opinions in the focus group sessions about this subject than other groups. In addition, the efficiency of the focus group sessions. Having considered the higher educational level and possible knowledge of the Metaverse, the expectation was that a focus group session would not take longer than needed to explain the concept of the Metaverse or to demonstrate something in VR. Last, the likelihood of finding participants for the focus group session. Due to the VR experience, the participants needed to come to the University of Twente on a weekday and during normal working hours. It was more likely that university students were willing to participate and willing to make time for a master's student.

However, having knowledge of the Metaverse could also have caused biases in the results. For example, technical students could be more positive towards new technologies than university students from a social department. To decrease the chance of any positive or negative attitudes towards the Metaverse, different studies were put together in one session when possible.

In conclusion, university students were the best choice with respect to the novel character of the research. The considerations that justify the choice of using university students as the sampling group are summarized in Table 9.

Table 9
Considerations university students

Considerations	University students
Abstract thinking	High probability
Knowledge Metaverse	High probability
Efficiency focus group sessions	High probability
Likelihood of participating	High probability
Expected outcome session	Could be biased

4.3.2   Sampling method

After the determination of having university students as the sampling group, snowball sampling was used as a nonprobability sampling method to get to a smaller sample group. Babbie (2021) defines nonprobability sampling as a sampling method that is not based on probability, often used in qualitative research, and snowball sampling as a method where the researcher uses their own network to recruit participants and then uses the participants' network to recruit more participants. Nonprobability sampling was the best option for this thesis due to the novel and qualitative character of this research (Berndt, 2020). The two focus group sessions required no more than six participants each, of which snowball sampling was the fastest and easiest method compared to other sampling methods (Shorten & Moorley, 2014). The researcher's network, the participants' networks, and the networks of the University of Twente were used to recruit participants.

However, the chosen nonprobability sampling method could also have caused biases in the results. Snowball sampling increases the chance of having sampling bias because not every university student had an equal chance of being included in the sample (Babbie, 2021). This resulted in that the findings of this thesis should be taken with caution, as the findings are not a representation of the population and do not allow for generalizations. Still, snowball sampling was the best choice for this type of study, in which the resource savings weighed more than the disadvantages. To decrease the chance of sampling bias, participants were asked to recruit students from different studies when possible.

4.4   EXECUTION IN PRACTICE

In order to increase the chance of conducting successful research, good preparation was required. The preparations for this thesis started in November 2022, whereas the activities became concrete at the beginning of February 2023. After conducting the systematic literature review for several weeks, the focus group sessions were held on May 13, 2023. The exact time frame from February 2023 until June 2023 is displayed in Appendix 2.

In addition, concrete preparation was required for the focus group sessions. Six guest accounts were made beforehand, and the participants were assigned to a random guest account, including a random avatar. Even though this thesis previously mentioned that not allowing users to customize their avatars may influence their feelings of being present, allowing the participants to make avatars themselves would have taken too much time. Moreover, the VR experience only lasted ten minutes, which made it less likely that avatar embodiment influenced

UNIVERSITY
OF TWENTE.

their short experience. An overview of the preparation required for the focus group sessions is displayed in Appendix 3.

Regarding the executed focus group sessions, the first focus group consisted of five male students and one female student. The distribution was very diverse in this group, as there was one Health Sciences student, two Business Administration students, one Industrial Engineering & Management student, one Applied Physics student, and one Interaction Technology student. The second focus group consisted of two male students and four female students. The distribution of this group was less diverse than the first one, as there were five Business Administration students and one Tourism Management student.

In the VR experience, both groups spent time in "My Home" to experience the basic handling of the controllers. Next, they traveled to Venues (common space in Horizon Worlds to travel further to other rooms), where the group entered a concert by J Balvin. During the VR experience, three people in the second group experienced motion sickness, which resulted in breaking off the VR experience earlier than expected. Although this group spent less time in the third space, the plan of spending time in "My Home", Venues, and one additional space had succeeded.

The recording started after the VR experience, when the focus group discussion started. The sessions were recorded through video because one session had multiple participants. The video recordings made it possible to distinguish voices from one another during transcribing and prevented confusion during transcribing.

4.5   DATA ANALYSIS

After transcribing the focus group recordings, the transcriptions were analyzed. Due to the qualitative data and research, it was necessary to analyze the data in a qualitative way. To make sense of the focus group data, the Gioia method was used. The Gioia method makes it possible to structure qualitative data in order to analyze this data in a systematic way (Gioia et al., 2013). Gioia et al. (2013) argued that this method is best used in combination with an interview. Even though this thesis used focus group discussions, the analysis could be done in the same way since group interviewing and focus group discussions are terms that are often used interchangeably (Bolderston, 2012). In conclusion, the Gioia method was used to analyze the focus group discussions. See Figure 4 for an example of the Gioia method.

Figure 4
Example Gioia data structure
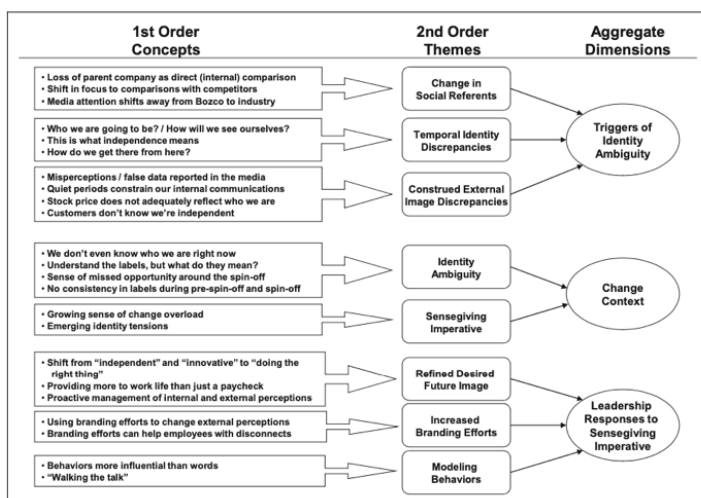
Note. Retrieved from "Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology" by D.A. Gioia, K.G. Corley & A.L. Hamilton, 2013, Organizational Research Methods, 16(1), p. 21. Copyright 2012 by The Author(s)

The analysis started with grouping the quotes of the respondents together. This grouping revealed first-order concepts that were categorized into themes. These themes led to the main overarching topics of the focus group sessions, which Gioia et al. (2013) named aggregate dimensions.

After the textual data was analyzed, the results were interpretable. The quotes were used in the results to view the context of the topics on which ethical issues can arise discussed in the focus group sessions. The findings of the focus group sessions were used to explore the topics found in the literature review. The results are discussed in the next chapter.

5. RESULTS

In this chapter, the results of the focus group sessions will be explored. Since two focus group sessions were conducted, the results were initially analyzed separately. According to the Gioia method, two sets of topics on which ethical issues can arise came out for each focus group. Next, the two sets of topics were compared and merged. The last section discusses the topics in more detail.

5.1   FIRST FOCUS GROUP

There were 92 quotes derived from this focus group session, which led to 29 first-order concepts. For example, the quotes "I think another thing is privacy", "we know this Metaverse is owned by Meta which has some major leaks in data information and personal information", and "if I say something to my friend, I do not want Meta to have this information" were combined into the first-order concept personal information. These first-order concepts eventually led to 11 second-order themes. For example, the first-order concepts personal information and use of data were combined into the second-order theme information. Next, the aggregate dimensions were derived from the second-order themes. For example, the second-order themes information and overhearing were combined into the aggregate dimension privacy. This approach led to the six aggregate dimensions privacy, authority, health, social context, violation, and globalization, the topics on which ethical issues can arise discussed in the first focus group session. For a more detailed overview, the quotes, first-order concepts, second-order themes, and aggregate dimensions can be found in Appendix 4.

5.2   SECOND FOCUS GROUP

There were 105 quotes derived from this focus group session, which led to 29 first-order concepts. For example, the quotes "I think a moderator can keep that in check", "it seems harder in a virtual world that is open 24/7", and "then you must need a lot of moderators" were combined into the first-order concept moderators. These first-order concepts eventually led to 15 second-order themes. For example, the first-order concepts regulations and moderators were combined into the second-order theme maintain order. Next, the aggregate dimensions were derived from the second-order themes. For example, the second-order themes maintain order and control were combined into the aggregate dimension authority. This approach led to the six aggregate dimensions privacy, authority, health, social context, violation, and uncertainty, the topics on which ethical issues can arise discussed in the second focus group session. For a more detailed overview, the quotes, first-order concepts, second-order themes, and aggregate dimensions can be found in Appendix 5.

5.3   FOCUS GROUP TOPICS

There are similarities and differences between the two focus groups. Both focus groups had the topics on which ethical issues can arise privacy, authority, health, social context, and violation. In addition, the first focus group had the topic globalization, and the second focus group had the topic uncertainty. In the following sections, the topics on which ethical issues can arise discussed in the focus group sessions will be explored individually.

5.3.1   Privacy

In both focus groups, privacy aspects were mentioned as a topic on which ethical issues can arise. "If I say something private to my friend, I do not want Meta to have this information", which resembled concerns regarding the sharing of personal information. Participants especially had concerns about the involvement of Meta, as "we know this Metaverse is owned by Meta which has some major leaks in data information and personal information". In addition, the handling and use of data in the Metaverse were mentioned. For example, "what do they do with such discussions? Are they recorded? Are they on servers? How do they manage that?". Besides concerns regarding the designers of the Metaverse, there were also concerns in relation to third parties, as "it can be dangerous if a third party uses this data".

Second, the participants mentioned that the Metaverse is going to be a major source of data collection, as "if it is open access then you know what the revenue model is. It is going to be either data collection or a marketplace" and "I think that they are able to know a lot about you".

Third, the participants questioned the possibilities of eavesdropping on conversations. As users are not physically present in the Metaverse, the participants argued "how do you know who is listening in on the conversation?" as it would be possible to take someone else's avatar or "it could be someone on the other side of the room that is listening in on the conversation".

5.3.2 Authority

In both focus groups, authority aspects were mentioned as a topic on which ethical issues can arise. For example, "I guess in that world you will be able to track everything" indicated that the participants were worried about the possibility of being constantly monitored in the Metaverse. In addition, democracy had been a point of discussion among the participants. The participants agreed that "it should not be controlled by a company". More importantly, to ensure democracy, a participant stated "if you really want to adopt Metaverse, governments should develop it and not the tech companies who already have such control with all the data they own". Furthermore, the participants saw problems with the influence of people in the Metaverse. It is already happening on Twitter, as a participant stated "you already notice that on Twitter, there are bots who are steering political behaviors or thoughts of people". The participants found that information coming from an avatar will seem more real than a tweet, which has an influence on the degree of steering. For example, "I think in the Metaverse it could be more amplified. If it is closer to you, it influences you more".

Second, the participants questioned whether decisions in the Metaverse are legally valid. "Is it valid when decided there? Does the company accept it?" and "what are the legal terms? Are there any laws behind it?" were questions that arose during the focus group sessions. Not being able to see the exact person behind the avatar could also be a problem, as "we do not know and see the person exactly signing it. If he was coerced or not?". Besides the legal validity, the participants wondered, "who decides what? The community? The moderators?" and stated that the tech companies developing it could not be the ones enforcing it. For example, "if Meta itself is enforcing its own environment, it is weird. They would like as many users as possible and are less likely to ban people". In order to prevent hidden agendas of Metaverse developers, the Metaverse should be enforced by "independent parties or the community". This also led to the question "what law applies in the Metaverse?". If something happens in the Metaverse that is considered wrong in the physical world, "could that be judged legally in the real world?".

Third, the participants questioned the function of a safe space in the Metaverse, which is possible in Meta's Horizon Worlds. In case someone is bothering you, you can go to a personal space where you will be separated from your surroundings (Meta, 2023d). A participant mentioned that "it is a little bit of fudge that if you get harassed, you have to go to a safe space. Meanwhile that person can stay". In addition, the participants argued for the possibility of moderators enforcing the rules in the Metaverse. The participants questioned whether moderators are the solution, as "you need to know who that is. And they accidentally have to be there, and they must happen to experience it as negatively as you experienced it". As the Metaverse is conceptualized as a massive virtual environment, the participants noted that moderating "seems harder in a virtual world that is open 24/7" and "then you must need a lot of moderators".

Fourth, the degree of freedom. As it is currently unclear what the rules will be in the Metaverse, such as who is going to enforce them and how many moderators are needed, the participants noted on the one hand that "you need to have a balance" and "you must have a feeling of freedom". On the other hand, participants saw possibilities in a world that does not have clear rules, as "you could say that people feel less free or maybe freer. Because there are no rules yet".

5.3.3 Health

In both focus groups, health aspects were mentioned as a topic on which ethical issues can arise. The human development, especially of children, was discussed. As the participants encountered other avatars using "adult" language, they questioned "do you really want kids to be in touch with people who are saying those kinds of things?". The participants also questioned whether young people could defend themselves enough in a massive virtual world, as they "think that is hard for some young people". Moreover, the participants noted that currently "we see the kids spending more and more time at home playing games". As the Metaverse is supposed to be a world that takes place virtually, the Metaverse "would only encourage them to spend more time at home". It was something that concerned the participants, as "how will this affect their psychological being?".

Second, the psychological health of humans. It concerned the participants that people with "a psychological condition may go there to vent out" and "to vent out their frustration", which can have an influence on other users in the Metaverse. Moreover, the idea of a whole world that takes place virtually made the participant question "then you can also get lonely when you are going to a concert in your own room", as they imagined that "you are alone in your room and have to just wait until you can put it back on". In addition, it concerned the participants that "literally everything you want is there". They saw both advantages and disadvantages to having everything in the Metaverse. For example, "people can forget the transition to reality. You can easily get lost in it. And then you may not realize that you may have been in it for hours" was a statement of which participants did not know whether it is a good development or not. On the one hand "you can escape really easily" and participants thought that "it can be really fun". On the other hand, "you do not drink, you do not eat, you do not sleep". Furthermore, the participants were worried that the use of avatars could also affect someone's psychological health. For instance, "you can act very differently from who you are" was a disadvantage the participants saw when people can create a different personality for their avatar in the Metaverse. The participants argued that it can be harmful when "if you make friends there in a certain way, I think you can get insecure in real life if it does work in the Metaverse with another personality". The participants saw problems with "body dysmorphia" and "dissociation from who you are" if users are going to "identify themselves with their personality in the Metaverse".

Third, the physical health of humans. The participants saw problems with the "physical inconvenience" combined with the VR headsets. They questioned "could it affect your eyes as well?" as "you will have them on for eight hours a day". Moreover, because in the Metaverse "you do not have to move", the participants saw negative aspects for human health, including their orientation to both the real world and the Metaverse. One participant said that "sometimes I got lost in the room and in the VR too". Furthermore, half of the participants in the second focus group experienced motion sickness. Based on this experience, they questioned "how can you work for eight hours?". On the other hand, they expected that "you will get used to it" and suggested a "smoother camera" for more convenience.

In addition, the participants compared contacts and interaction in the Metaverse to the COVID-19 period, as they argued that "this is definitely better than being locked at home and not having any contact with other people". However, they stated that "I do not think this will substitute human contact and human interaction" as they mentioned that people always "need human contact, see how humans express themselves, and see other people's faces".

5.3.4 Social context

In both focus groups, social context aspects were mentioned as a topic on which ethical issues can arise. "For elderly people, there is no way they are going to use this" was an example of exclusion the participants saw. However, the participants did not see the exclusion of the elderly as a big problem, as the elderly "are a group together" and "the elderly in twenty years might be more perceptive". In addition, they saw opportunities for elderly people "to meet if they cannot leave their house". Moreover, as an internet connection is needed to enter the

Metaverse, the participants only saw issues for "maybe people living in the countryside or maybe in Africa where there is no internet connection". However, the participants did not think this was social exclusion, as "they would anyway connect together with themselves". Moreover, the participants saw exclusion for people who cannot enter the Metaverse, due to the costs of equipment. For example, "these equipment are quite expensive, so not everyone can buy it". In contrast to the previous points, the participants also thought that "the Metaverse is more about inclusion than exclusion". Furthermore, the participants noted that designers of the Metaverse should be aware that humans can reject the technological advancements of the Metaverse. For example, a participant mentioned the Uncanny Valley theory, which stated that "when the Metaverse becomes more advanced, graphics become better, and it resembles more as a person, the avatar you are seeing, could actually lead to us rejecting the Metaverse". Moreover, the participants saw the group of people who reject technology growing. For example, "I think that the group of people who are less on social media or who are starting to turn around from social media is starting to get bigger and bigger" and "so people are less interested in that in the end". Moreover, "even though you have the minimum wage, I do not think that your first thought will be "I will buy a headset"", meaning that the participants found the threshold of buying a € 350 headset too high.

Second, the participants argued that the designers of the Metaverse should pay attention to the societal approval of the Metaverse. For example, "I used to think it was scary to use your fingerprint to log in on your computer or facial recognition". The participants stated that "now I only pay with facial recognition" and that "your boundaries are pushed increasingly". The participants concluded that this aspect is about the "technology acceptance" of the Metaverse.

Third, the participants felt that the "interaction will be different because normally you build up relationships with people and interact with them" in real life, which is different in the Metaverse. The participants felt it is important "for people to know how to interact" in the Metaverse, as "the normal will change". Moreover, the participants were hoping that the Metaverse will be "50/50, co-existence with the real world" as they would like to "still go out and play" in the real world.

5.3.5 Violation

In both focus groups, violation aspects were mentioned as a topic on which ethical issues can arise. In Horizon Worlds, when someone is considered to be violating the rules, that user is removed from the room through a vote (Meta, 2023c). Participants saw problems with this way of regulating as "we can also decide to kick out everyone in the public room, just because we feel like it". In addition, the participants felt that "it is easier to mess with people" using avatars. The participants felt "not threatened but vulnerable" whenever another user, the participants themselves or others in the public space, approached them. Moreover, the participants imagined new forms of (cyber) bullying. For example, "I think that it will be that kids buy a 5-euro outfit and that everyone needs to get that outfit because otherwise you will be left out".

Second, the participants compared the interactions in the Metaverse to current social media. They saw differences in the physical aspect of the Metaverse as "actually having a group of people standing there shouting at you, making arguments at you, I guess that could actually hurt you more than just seeing something in the chat". One participant compared the Metaverse to Habbo Hotel, where "everything was in the chat. You could insult each other there". However, "that negative effect from Habbo Hotel in the chat seems to be more real. And that would be a danger to me". The participants felt that the interactions in the Metaverse "amplifies" the feelings of being hurt compared to social media.

Third, the participants argued that the lack of transparency could be a problem with respect to the misbehavior of users. For example, "you have a username from which you also do not know who it is". They felt that "the biggest disadvantage, in my opinion, is that you can say and do everything without knowing who it is". In addition, the

participants mentioned problems with "deep fakes" and the possibilities of "scamming" in the Metaverse. Moreover, the anonymity of users was considered a concern. As avatars are used in the Metaverse "someone else can take over our person and go there" because there were no identity checks. Participants saw additional problems in having no identity checks as "in the future, you can have AI bots just roaming around there" and "the thing with the AI bots, that is a serious consideration". The participants also had problems with recognition in Horizon Worlds, especially in the public space "I could not recognize who was speaking and who was saying what" which could result in problems when reporting an avatar, as "if someone starts to harass me, I will not really know from who it could come from". This indicated that it would be hard to report someone if users cannot distinguish avatars from one another. Moreover, "how do you know in which country someone is? Are they using a VPN?", stressed that the possibility of using a VPN complicates the recognizability of users. On the other hand, the participants also saw advantages to the anonymous use of avatars. "If you are for instance insecure about yourself, you can make your avatar however you want to" and "people cannot see you in real life" were mentioned as advantages. Furthermore, according to the participants, being able to meet new people in the Metaverse can either be an opportunity or a threat for users. For example, "sometimes it is a good way to make new friends. If you find it hard to do it face-to-face". On the other hand, they questioned whether it is a good thing for "people to easier meet people" as it increases the possibilities of "grooming".

5.3.6   Globalization
A topic on which ethical issues can arise that was discussed in the first focus group but not in the second was globalization. As it would become possible for users all around the world to access the Metaverse, the participants argued that "with one place where everybody can be together and speak one language, English, how will this impact culture?". As globalization was not extensively discussed in the literature review or in the first focus group session, the participants stated that the topics on which ethical issues can arise also have "more societal roots, so it could become an ethical issue on personal growth and international culture".

As a result of the interconnectedness of the Metaverse, the participants feared that the Metaverse will lead to "losing a part of our culture" and "stimulates even more globalization". The participants found "culture really important in our society" and found the loss of culture to have a "negative impact".

5.3.7   Uncertainty
Another topic on which ethical issues can arise that was discussed in the second focus group but not in the first was uncertainty about whether the Metaverse will be adopted. Even though uncertainty is not an ethical issue, it was a big discussion topic during the focus group session, which led to the decision to include uncertainty in the aggregate dimensions.

First, the participant questioned whether the Metaverse is just a hype, as "how long does VR exist? That hype? It has been a hype for a little while, but it has crashed down immediately", and "I do not think this will stay. Because later there will be another new thing to go to" was mentioned by the participants. In addition, as the development of the Metaverse remained insecure for the participants, they felt like they could not judge the Metaverse based on their current knowledge. For example, "you do not know to what extent this is going to grow" and "for now you have this, but I think in thirty years it will be completely different".

Second, as the Metaverse is currently in development, the participants questioned the potential outcome. They did not think the Metaverse will be ready in five years, but that "it can take a very long time". Participants imagined that the Metaverse is going to be adopted first by companies before it will have success in personal use. Comparing the Metaverse to computers, it took a long time "before computers could run together, faster, be smaller, and actually useful for personal use". Moreover, the participants argued that it will take a long time "before all the people are replaced by people who see potential in the Metaverse", since managers and CEOs are the decisionmakers. Furthermore, they stated that "you could be prepared. I think it will happen, but I do not think it is going to be very

fast" as big tech companies are "not throwing in a lot of money for just walking around" in the Metaverse. The participants stated to "not underestimate the influence" of big tech companies.

5.4   OUTCOME

The results, including a brief description, can be seen in Table 10.

Table 10
*Results focus group sessions*

Topic on which ethical issues can arise	Description
Privacy	The sharing of personal information, e.g., the involvement of big tech companies, handling and use of data, and data collection as revenue model of the Metaverse.
Authority	Skepticism against monitoring, e.g., the possibility of being constantly tracked, influencing people, lack of regulation, and legal validity.
Health	Concerns regarding the well-being of humans, e.g., the development of humans, psychological and physical health, body dysmorphia, and differences in human interaction.
Social context	Social considerations, e.g., opportunities for excluding people from society, humans rejecting the Metaverse, technology acceptance, and co-existence with the real world.
Violation	Misbehavior of users, e.g., new forms of bullying, amplified feelings of being hurt, anonymity of users, deep fakes, and scams.
Globalization	Risk of cultural loss, e.g., people from around the world living in one place can have a negative impact on culture.
Uncertainty	Uncertainty for the future, e.g., the hype of the Metaverse, to what extent the Metaverse is going to grow, lack of knowledge, and the lengthy process of having a mainstream Metaverse.

6. ANALYSIS

Based on the previous results and the systematic literature review, the main research question "what are the most prominent topics on which ethical issues can arise of the future Metaverse from a user perspective?" can be answered in this chapter.

The systematic literature review revealed six topics on which ethical issues can arise from a user perspective, while the focus group sessions revealed seven topics. The main research question allowed us to combine a systematic literature review with empirical evidence. The exploration of literature and opinions in practice led to the most prominent topics on which ethical issues can arise privacy, societal control, health, social dynamics, misbehavior of users, globalization, and uncertainty. The exploration of literature and experiences in practice can be seen in Figure 5. After Figure 5, the most prominent topics on which ethical issues can arise will be explained in more detail.

Figure 5
Literature vs exploration in practice
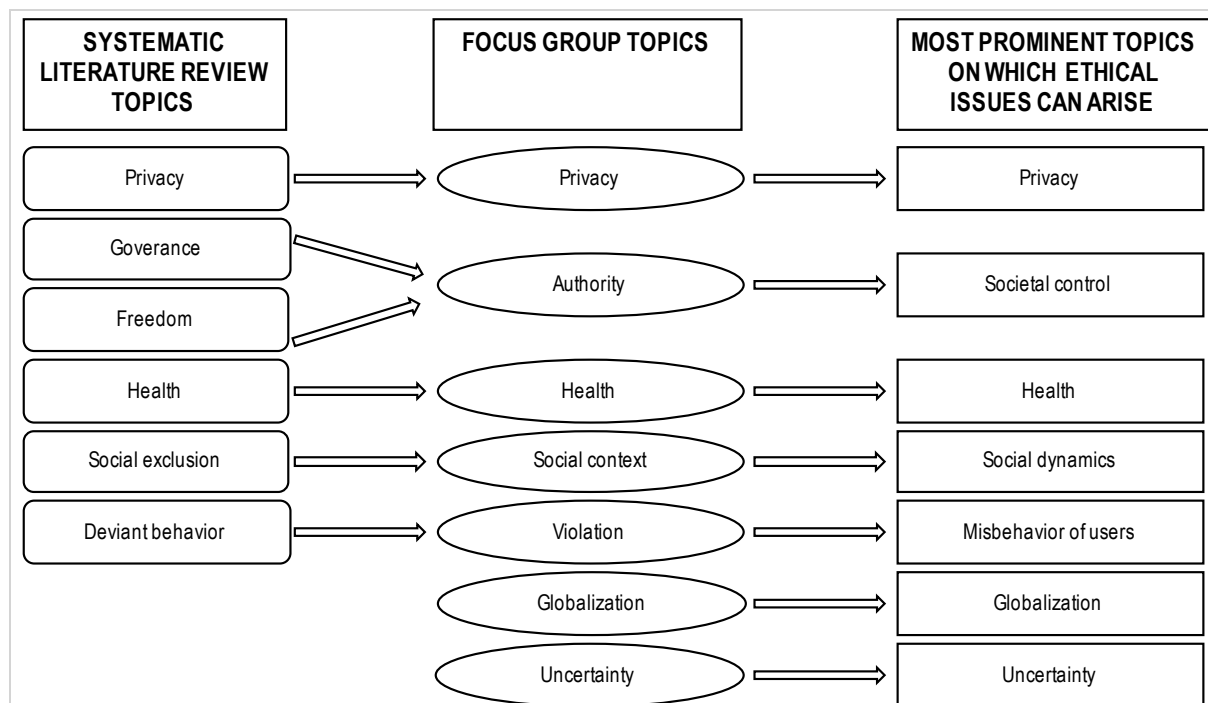
Privacy

The aspect interconnected in the theoretical background revealed that the Metaverse will be a hyper-connected world, being able to collect, process, and use more data than currently possible (Allam et al., 2022; Bibri, 2022). This was closely linked to the statements of the focus group participants, in which they argued that technological advancements nowadays are capable of doing a lot.

In addition, the literature review revealed concerns in terms of the handling of the huge amount of personal information, data collection, cyber security, and the increased opportunities for hackers that led to the formulation of the topic privacy (Allam et al., 2022; Bibri, 2022; Lee et al., 2021; Wang et al., 2023). The topic privacy could be linked to the focus groups' topic privacy, where the participants expressed equal concerns. They, for example, argued that the revenue model of the Metaverse will be data collection and that they do not want personal or sensitive information collected by the Metaverse or third parties.

In conclusion, this topic on which ethical issues can arise could be defined as privacy. This topic sheds light on the conflict of privacy, where the Metaverse on the hand will be a hyperconnected world. On the other hand, privacy and security issues need to be taken into consideration.

Societal control

The systematic literature revealed questions in terms of the law, regulation, and monitoring of the Metaverse in order for users to be protected. As the Metaverse currently lacks concrete regulation, the topic regulation was formulated (Fernandez & Hui, 2022; Wang et al., 2023). Compared to the statements the focus group participants generated, the focus groups' topic authority could be linked. The focus groups expressed concerns regarding the law and legal validity of decisions in the Metaverse. They also proposed moderators as a possible solution to enforce the Metaverse but thought that an independent party or the community itself must do it due to the already existing power of big tech companies.

In addition, the systematic literature review revealed concerns regarding the level of control that elites or regulators of the Metaverse will have, especially in terms of being constantly monitored or controlling people's behavior (Bibri, 2022; Bibri et al., 2022; Bibri & Allam, 2022b). As this could lead to freedom erosion or democratic backsliding, the topic freedom was defined. The topic freedom could also be linked to the focus groups' topic authority, where the participants were worried about the constant monitoring and tracking of users in the Metaverse and the extent of being influenced.

To merge the literature review and exploration in practice into one topic on which ethical issues can arise, this topic could be defined as societal control. This topic sheds light on the conflict of societal control, where on the one hand there should be enforcement of the rules in the Metaverse to protect users. On the other hand, the freedom of users needs to be taken into consideration.

Health

The aspect real-time synchronous in the theoretical background revealed that the Metaverse increases the opportunities for education, gaming, working, and meeting together (Bibri, 2022). This was closely linked to the statements of the focus group participants, in which they stressed the importance of interactions with other humans, relating to the isolation of the COVID-19 period. They found that the Metaverse increases opportunities for connecting with other people virtually. It makes it possible to interact with one another with more immersiveness than by calling, chatting, or meeting through Microsoft Teams.

In addition, the literature review revealed concerns in terms of human health. For example, physical health issues such as motion sickness and psychological health issues such as addiction and mental health problems led to the formulation of the topic health (Jaung, 2022; Ning et al., 2021; Park & Kim, 2022). The topic health could be linked to the focus groups' topic health, where the participants were worried about the human development, having children in such massive virtual reality world, escapism, loneliness, and dissociation.

In conclusion, this topic on which ethical issues can arise could be defined as health. This topic sheds light on the conflict of health, where the Metaverse on the one hand increases the pleasure of users by going virtually to concerts and creating a more fun personality for themselves. On the other hand, human development and human health need to be taken into consideration.

Social dynamics

The aspect social participation in the theoretical background revealed that the Metaverse is supposed to be inclusive and could make the ease of social participation equal between citizens (Lee et al., 2021; Park & Kim,

2022). This could be compared to the statements the focus group participants regenerated, in which they stated that the Metaverse will be more about inclusion than exclusion.

In addition, the systematic literature review revealed concerns in terms of people being excluded in and from the Metaverse. For example, people lacking technological skills, high costs for equipment, and elderly people are more likely to be excluded from the Metaverse (Bibri, 2022; Dwivedi et al., 2022). The previous has led to the topic social exclusion. The topic social exclusion had similarities with the focus groups' topic social context, where the participants expressed concerns that were equal to the topics from the literature review. For example, the elderly, having access to an internet connection, and costs. Moreover, they stressed the importance of the societal approval of the Metaverse, otherwise people might reject the Metaverse.

To merge the literature review and exploration in practice into one topic on which ethical issues can arise, this topic could be defined as social dynamics. This topic sheds light on the conflict of social dynamics, where the Metaverse on the one hand increases the possibilities of people connecting with each other virtually. On the other hand, social exclusion in terms of accessibility to the Metaverse should be taken into consideration.

Misbehavior of users
The aspect avatars in the theoretical background revealed that users are present in the Metaverse through digital avatars. Users can create a copy of themselves or a fictional personality, which can make it easier to make friends for users who might feel insecure about themselves (Boberg et al., 2008; Castronova, 2003; Szaniawska-Schiavo, 2022). This was closely linked to the statements of the focus group participants, in which they argued that another online personality can make users feel better about themselves and could increase the chance of users making friends who find it hard to make friends face-to-face.

In addition, the literature review revealed the topic deviant behavior. For example, deviant behaviors can be magnified in the Metaverse and have greater impacts on users (Dwivedi et al., 2022). The topic deviant behavior could be linked to the focus groups' topic violation, in which the participants expressed concerns regarding the anonymity of users. They argued that users will feel freer to do and say anything because of the anonymity. Moreover, the participants also expressed concerns in terms of the ease of meeting new people. For example, grooming, bullying, and trolling were named as examples of being amplified in the Metaverse.

In conclusion, this topic on which ethical issues can arise could be defined as misbehavior of users. This topic sheds light on the conflict of misbehavior of users, where the Metaverse on the one hand makes it easier for people to meet people who might find that hard face-to-face. On the other hand, the increased possibility for users to misbehave should be taken into consideration.

Globalization
A topic that did not come up during the systematic literature review but did come out of the focus group sessions was globalization. The participants argued that the Metaverse could be the next place where people can virtually meet, even though they could be 1,000 kilometers away from each other. The participants also expressed concerns regarding the impact on culture, as users from around the world can come together in one place, which stimulates globalization.

In conclusion, this topic on which ethical issues can arise could be defined as globalization. This topic sheds light on the conflict of globalization, where the Metaverse on the one hand is going to be one place where users all around the world can connect with each other. On the other hand, cultural loss needs to be taken into consideration.

Uncertainty

A topic that did not come up during the systematic literature review but did come out of the focus group sessions was uncertainty. The participants saw the opportunities the Metaverse can offer regarding technological advancements and a new way of meeting people virtually.

The participants also questioned whether the Metaverse is just the next technological hype or whether it is going to grow extensively. This led to the participants feeling like they could not judge the Metaverse, as they needed more concrete information about its development. They argued that the uncertainty around the Metaverse could lead to a longer period of time for actually implementing the Metaverse.

In conclusion, this topic on which ethical issues can arise could be defined as uncertainty. This topic sheds light on the conflict of uncertainty, where the Metaverse on the one hand is an opportunity for technology and science. On the other hand, the uncertainty that comes with the Metaverse should be taken into consideration.

7. DISCUSSION

In this chapter, the conclusion of this study will be given. Next, the limitations of this research will be discussed and implications for future research.

7.1 CONCLUSION

This study aimed to explore the most prominent topics on which ethical issues can arise of the Metaverse from a user perspective. A systematic literature review was executed, after which two focus group sessions explored possible topics. The exploration of the most prominent topics on which ethical issues can arise revealed useful insights about how the Metaverse is experienced in practice. The systematic literature review revealed that the topics privacy, regulation, deviant behavior, health, social exclusion, and freedom are the most prominent topics mentioned in studies and should be given more attention in the development of the Metaverse. By conducting two focus group sessions to explore topics on which ethical issues can arise in practice, this study identified that the topics privacy, authority, health, social context, violation, globalization, and uncertainty were the most prominent topics experienced in practice. As these topics could also occur in every new technology, the increased immersiveness, interconnectedness, and massive data streams in the Metaverse amplify the effects of these topics, making these topics relevant for the development of the Metaverse. For example, the participants argued that being insulted by an avatar gives a more real experience than being insulted by text, indicating that the feelings of being hurt are amplified in the Metaverse. Furthermore, the exploration between a systematic literature review and opinions in practice allowed us to define the most prominent topics on which ethical issues can arise from a user perspective. The found topics are valuable information for companies developing the Metaverse because it will help these companies develop the Metaverse further, increasing the chance of a successful implementation.

The main research question "what are the most prominent topics on which ethical issues can arise of the future Metaverse from a user perspective?" revealed that privacy, societal control, health, social dynamics, misbehavior of users, globalization, and uncertainty are the most prominent topics on which ethical issues can arise from a user perspective. Based on the systematic literature review and the focus group discussions, one could conclude that having good governance in the Metaverse could solve the most issues. For example, the participants in the focus group session argued that societal control can be exercised by either the government, the community itself, the big tech companies, or a third party in order to manage, for instance, the behavior of users. It is out of the scope of this thesis to determine which option would have the best outcome, but one could cautiously conclude that either option could be justified when good governance has been implemented in the Metaverse. Moreover, the focus group sessions revealed that the participants had a lot of questions regarding their knowledge of the Metaverse. For example, questions about data ownership and uncertainty could be prevented by providing consumers with more information about these topics, possibly solving some topics on which ethical issues can arise. Last, the results brought light to the importance of technology acceptance, since low user acceptance can constrain a successful implementation of the Metaverse.

The Metaverse is an emerging subject in recent studies in the social sciences and business domain, to which this study contributes to. This study contributes to the academic field by triangulating previous studies with empirical evidence, of which this study is one of the first to deliver empirical evidence on how the Metaverse is experienced in practice. This study provides a basis for scholars to extend the empirically explored most prominent topics on which ethical issues can arise by researching them in-depth. Moreover, as this study is one of the first in the research domain to conduct a VR experience after which a focus group discussion was held, the execution of the research design can be adopted by other scholars, as this study shows it was a sufficient method of data collection for this subject.

Moreover, this study contributes to practice by providing the developers of the Metaverse, currently at least 37 big tech companies, the most prominent topics on which ethical issues can arise that engage among users. In order to successfully implement the Metaverse, users are a crucial aspect of its success since they are the ones that are going to use the Metaverse. Companies involved in the design of the Metaverse can use these topics to implement precautionary actions or repressive measures in the design or provide more knowledge to consumers to meet their needs for being informed, increasing the trust from consumers. For example, this study revealed the topic of uncertainty, in which users have the need to be informed about the development, the outcome, and the time span of the Metaverse. The findings of this study could result in being one step closer to the realization of the mainstream Metaverse, which could have great opportunities for society.

7.2   LIMITATIONS

The interpretability of the results should be done carefully, as this study has some limitations, against which measures have been taken as far as possible. First, the generalizability of the results. The sample size of one focus group was limited to six participants. A measure that was taken to collect a reliable amount of data was executing two focus group sessions, expanding the sample size to twelve participants. Second, half of the second focus group experienced motion sickness. The maximum duration of ten minutes for the VR experience was a measure taken against motion sickness, resulting in that the nausea quickly disappeared, allowing the participants to continue the focus group discussion. Last, a disadvantage of the Gioia method could be that the individual quotes, concepts, and themes were generalized into one of the aggregate dimensions. This could result in the loss of important data. The quotes of the participants were used in the results to view the context of the topics on which ethical issues can arise discussed in the focus group sessions to prevent the loss of data or generalization of a topic.

7.3   FUTURE RESEARCH SUGGESTIONS

In response to this study, future research could expand the available knowledge on this subject, of which several suggestions for future research could be defined. First, in response to the previously named limitations, the same research could be repeated with a larger sample size or another sample group to improve the generalizability of the results.

Second, future research could extend the provided findings with precautionary actions and repressive measures in the form of technical and design aspects or law and regulation. In addition, scholars could extend the topics of this study with ethical perspectives. For example, Kant's deontology, Mill's utilitarianism, or Aristotle's virtue ethics. Kant (1785) argued that an act is morally right if the actor acts with good intentions, no matter the outcome of that action. According to Kant, "good will" depends on common human reason, universal law, and doing your duty (AK: 4:402). While deontology is based on doing your duty no matter the consequences, Mill's utilitarianism does focus on the outcome. Mill stated that the right thing to do is an act that results in the greatest overall happiness (de Colle & Werhane, 2008). Aristotle (1999) argued that a morally right act depends on the actor's virtue. Virtue is something humans develop (or not), which can be used in the determination of doing the right thing in any situation (de Colle & Werhane, 2008).

Third, knowledge in this research domain could be expanded by researching other aspects of the Metaverse in-depth with theoretical and empirical evidence. For example, future research could look into the Metaverse in terms of the risk matrix approach (RMA). The risk matrix approach explores risks and classifies them from neglectable to critical, possibly helping the designers of the Metaverse prioritize potential risks (Ni et al., 2010). In addition, future research could look into the Metaverse in terms of the Technology Acceptance Model (TAM). The Technology Acceptance Model can help predict whether consumers are going to accept or reject a new technology by exploring user adoption behavior (Venkatesh & Davis, 2000). In fact, the focus group sessions revealed the importance of technology acceptance. Based on previously implemented new technology, the participants stated that the

mainstream Metaverse is not going to be used if there is no technology acceptance. This stresses the importance of scholars to look into the technology acceptance of the Metaverse. It could, for example, be beneficial for the designers of the Metaverse to work on the aspects of technology acceptance that are crucial for a successful implementation of the Metaverse. Moreover, future research could benefit from looking into the Uncanny Valley theory of Mori (1970), which was also mentioned in the focus group sessions. It says that the graphics, immersiveness, and realness of a new technology will be accepted, up to a certain point where humans develop an aversion to the technological advancements (Ho & MacDorman, 2010).

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9. APPENDICES

9.1 APPENDIX 1 LIST OF ARTICLES SYSTEMATIC LITERATURE REVIEW

Authors	Article Title	DOI
Allam et al. (2022)	The Metaverse as a Virtual Form of Smart Cities: Opportunities and Challenges for Environmental, Economic, and Social Sustainability in Urban Futures	http://dx.doi.org/10.3390/smartcities5030040
Bibri (2022)	The Social Shaping of the Metaverse as an Alternative to the Imaginaries of Data-Driven Smart Cities: A Study in Science, Technology, and Society	http://dx.doi.org/10.3390/smartcities5030043
Bibri & Allam (2022)	The Metaverse as a virtual form of data-driven smart cities: the ethics of the hyper-connectivity, datafication, algorithmization, and platformization of urban society	https://doi.org/10.1007/s43762-022-00050-1
Bibri & Allam (2022)	The Metaverse as a Virtual Form of Data-Driven Smart Urbanism: On Post-Pandemic Governance through the Prism of the Logic of Surveillance Capitalism	http://dx.doi.org/10.3390/smartcities5020037
Bibri et al. (2022)	The Metaverse as a virtual form of data-driven smart urbanism: platformization and its underlying processes, institutional dimensions, and disruptive impacts	https://doi.org/10.1007/s43762-022-00051-0
Chen (2022)	Exploring the application scenarios and issues facing Metaverse technology in education	http://dx.doi.org/10.1080/10494820.2022.2133148
Dwivedi et al. (2022)	Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy	http://dx.doi.org/10.1016/j.ijinfomgt.2022.102542
ENISA (2008)	VIRTUAL WORLDS, REAL MONEY SECURITY AND PRIVACY IN MASSIVELY-MULTIPLAYER ONLINE GAMES AND SOCIAL AND CORPORATE VIRTUAL WORLDS	http://www.enisa.europa.eu/doc/pdf/deliverables/enisa_pp_security_privacy_virtualworlds.pdf
Falchuk et al. (2022)	The Social Metaverse: Battle for Privacy	https://doi.org/10.1109/MTS.2018.2826060
Farahmand et al. (2013)	Risks and uncertainties in virtual worlds: an educators' perspective	http://dx.doi.org/10.1007/s12528-013-9067-5
Fernandez & Hui (2022)	Life, the Metaverse and Everything: An Overview of Privacy, Ethics, and Governance in Metaverse	https://doi.org/10.48550/arXiv.2204.01480

Hennig-Thurau et al. (2022)	Social interactions in the metaverse: Framework, initial evidence, and research roadmap	http://dx.doi.org/10.1007/s11747-022-00908-0
Jaung (2022)	Digital forest recreation in the metaverse: Opportunities and challenges	http://dx.doi.org/10.1016/j.techfore.2022.122090
Lee (2009)	Understanding Security treats in Virtual Worlds	http://aisel.aisnet.org/amcis2009/466?utm_source=aisel.aisnet.org%2Famcis2009%2F466&utm_medium=PDF&utm_campaign=PDFCoverPages
Lee et al. (2021)	All One Needs to Know about Metaverse: A Complete Survey on Technological Singularity, Virtual Ecosystem, and Research Agenda	https://doi.org/10.48550/arxiv.2110.05352
Masrani & Husain (2022)	Digital environment: An evolutionary component in environmental health	http://dx.doi.org/10.1177/22799036221103125
Mystakidis (2022)	Metaverse	https://doi.org/10.3390/encyclopedia2010031
Ning et al. (2021)	A Survey on Metaverse: the State-of-the-art, Technologies, Applications, and Challenges	https://arxiv-org.ezproxy2.utwente.nl/pdf/2111.09673.pdf
Park & Kim (2021)	A Metaverse: Taxonomy, Components, Applications, and Open Challenges	http://dx.doi.org/10.1109/ACCESS.2021.3140175
Rosenberg (2022)	Regulation of the Metaverse: A Roadmap	https://doi.org/10.1145/3546607.3546611
Sra et al. (2022)	Situated VR: Toward a Congruent Hybrid Reality Without Experiential Artifacts	http://dx.doi.org/10.1109/MCG.2022.3154358
Wang et al. (2023)	A Survey on Metaverse: Fundamentals, Security, and Privacy	https://doi.org/10.1109/COMST.2022.3202047
Zallio & Clarkson (2022)	Designing the metaverse: A study on inclusion, diversity, equity, accessibility and safety for digital immersive environments	http://dx.doi.org/10.1016/j.tele.2022.101909

9.2 APPENDIX 2 TIME PLANNING

Month	February			March				April				
Activity/task	3-01	3-02	3-03	3-04	3-05	3-06	3-07	3-08	3-09	3-10	4-01	4-02
Complete concept proposal	█	█	█	█	█							
Complete proposal						█	█	█	█	█		
Complete systematic literature review	█	█	█	█	█							
Ethical approval											█	█
Register Mobility Online/Inform BOZ											█	█
Find participants								█	█	█		
Set up demo				█	█	█						
Set up focus group session				█	█	█						
Prepare for focus group session									█	█	█	█
Continuously rewriting/adapting thesis											█	█

Month	May			June				July				
Activity/task	4-03	4-04	4-05	4-06	4-07	4-08	4-09	4-10	4-11	28	29	30
Focus group sessions	█											
Transcribe recordings	█											
Data analysis	█											
Continuously rewriting/adapting thesis	█	█	█									
Write Results chapter		█										
Write Discussion		█										
Write Conclusion		█										
Finalizing draft			█	█								
Write abstract				█								
Green light meeting				█								
Finalizing thesis					█	█						
Colloquium							█					
Extra								█	█	█	█	█

9.3 APPENDIX 3 PREPARATION FOCUS GROUPS

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	End
Collect six Meta Quest 2 headsets	Make six guest accounts, including a random avatar	Create instructions for the participants considering the Meta Quest 2	Charge all the headsets for group 1	Charge all the headsets for group 2	Return the VR headsets to the University of Twente
Collect two Meta Quest Pro headsets	Connect the six guest accounts and two moderator accounts through a party	Collect informed consent of all participants	Log in all the headsets for group 1	Log in all the headsets for group 2	Transcribe the focus group recordings
Create checklist theoretical ethical issues	Install Meta's Horizon Worlds on all headsets	Collect participants	Set up Meta's Horizon Worlds on each glass for group 1	Set up Meta's Horizon World on each glass for group 2	
Collect participants [a]	Test the workings of the VR experience				
	Collect participants				

[a] Assuming that all other tasks are completed within phase 1, phase 1 will be completed if the minimum requirement of four participants per focus group session has been reached. The further collection of participants will continue throughout phase 2 and phase 3.

9.4 APPENDIX 4 GIOIA METHOD FOCUS GROUP 1

Quotes	1st-order concepts	2nd-order themes	Aggregate dimensions
"I think another thing is privacy" (Participant 6) "We know this Metaverse is owned by Meta which has some major leaks in data information and personal information" (Participant 6) "If I say something to my friend, like something private "are you going to the gym tomorrow?", I don't want Meta to have this information that I'm going to the gym tomorrow" (Participant 6)	Personal information	Information	Privacy
"What do they do with such discussions? Are they recorded? Are they on servers? How do they manage that?" (Participant 6) "It can be dangerous for a third party, like using this data" (Participant 6) "Is Meta recording our conversations, what are they're doing with that data?" (Participant 3)	Use of data		
"How do you know who is listening in on the conversation? Which again brings up that you can't really see who is talking to you" (Participant 3) "You see an avatar and a name, but it could be someone on the other side of the room that's listening in on the conversation" (Participant 3) "I didn't see if anyone heard me" (Participant 3)	Others listening		
"Something is already now starting. Because now in China all the cameras are being monitored. But now in the Netherlands it's still not that much. But we are a little bit monitored" (Participant 4) "I guess you still want to have your freedom and use some things and not that everyone can track or trace it" (Participant 4) "I guess in that world you will be able to track everything" (Participant 4)	Monitoring	Control	Authority
"There should be more democracy" (Participant 3) "It shouldn't be controlled by a company" (Participant 3) "If you really want to adopt Metaverse, I think maybe governments should develop it, and not necessarily tech companies, who already have such control with all the data they own" (Participant 3)	Democracy		
"You already notice that on Twitter, there are bots who are steering political behaviors or thoughts of people" (Participant 3) "I think in the Metaverse it could be more amplified.	Influence		

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Because it gets like, if its' a tweet, it may have impact on you and steer your political beliefs. But if it's someone who is closer to a person, it's still an avatar, but it's closer to you or I guess it influences you more. So, if you then have all these AI bots roaming around then it could be real danger"			
"I think it would be difficult to make a decision and for the decision to be legally valid" (Participant 2) "Is it valid when decided there? Does the company accept it?" (Participant 2) "If a company decides on doing meetings in the Metaverse. What's the legal terms? Are there any laws behind it? Or can you force someone to participate in the Metaverse?" (Participant 3) "I'm imagining they have to make a decision; I don't know sign a document. Is it a digital signature? How valid is it?" (Participant 2) "Since we don't know and see the person exactly signing it, if he was coerced or not? And that kind of stuff" (Participant 2)	Legally valid	Governance	
"Regarding these questions, harassment and such. Will there be like polices in the Metaverse?" (Participant 2) "Who decides what? The community? The moderators?" (Participant 2)	Regulation		
"That really brings up the question, who's enforcing it?" (Participant 3) "Because Meta itself is enforcing its own environment. Then it's a bit weird. Because they would like as many users as possible. So, they're less likely to ban people" (Participant 3) "You actually need independent parties doing that or the community" (Participant 3)	Enforcement		
"If a company is running the Metaverse. Would the company decides which laws would apply there?" (Participant 2) "What law applies? If you're in the Metaverse" (Participant 3) "Is it just the Metaverse laws? Or real laws?" (Participant 2) "Or the country you are in?" (Participant 3) "I touched the topic of harassment and all that stuff. Could that be judged legally in the real world?" (Participant 2) "Today we have cyberbullying and all those laws regarding this subject. But how would they apply to the Metaverse?" (Participant 2) "As we're being told, probably kind of everything	Laws		

will be monitored at the least. So, can that be used as evidence? Can it not? And how does that work? Can you prove that it's a certain person behind the [glasses]?" (Participant 2)			
"I think that's hard for some young people" (Participant 1) "At a certain age, that could be an ethical thing. Do you really want kids to be in touch with people who are saying those kinds of things?" (Participant 3) "But is that really a Metaverse issue? I mean, if you're gaming on your Playstation, you can come across the same language" (Participant 3)	Young people	Human development	Health
"Something that concerns me, especially for young adolescents and young children. How will this affect their psychological being?" (Participant 2) "Especially cause now we can see the kids spending more and more time at home playing games. This would only encourage them to spend more time at home" (Participant 2) "But I don't think that may cause behavior of problems" (Participant 2)	Psychological being children		
"I think people from like a psychological condition may go there to vent out. And that can also lead to a lot of problems there" (Participant 2) "They have free access to a lot of people to vent out their frustration. And that can be, it's hard to say dangerous because nothing physical can happen to you, but it could be psychological dangerous" (Participant 2)	Psychological problems	Well-being	
"Could it affect your eyes as well?" (Participant 3) "I mean these glasses; you will have them on for eight hours a day" (Participant 3) "Physical inconvenience" (Participant 4)	Physical problems		
"In terms of people's health, the Metaverse could also be very bad I would say. Because you don't have to move at all" (Participant 2) "Basically you could just stay at your place, at your couch, or in your bed, or your room. And spend the whole day there. You can travel the world in a room. Which is good in a way, but at the same time it can be bad" (Participant 2) "Sometimes I got lost in the room and in the VR too. I was like what's going on?" (Participant 1)	Movement		
"This is definitely better than being locked at home and not having any contact with other people from their age. But at the same time, I don't think this will substitute human contact and human	Human contact		

interaction" (Participant 2) "I think, so far, we are still the same humans than we were from 5 thousand year ago. That needs human contact, see how humans express themselves, and see other people's faces. So that's a problem that I see here" (Participant 2)			
"For elderly people, there's no way they're going to use this" (Participant 3) "There will be a form of exclusion but it's a problem that affects more technological advances" (Participant 3) "I don't think, as we're saying old people wouldn't participate in this, but they are a group they are together as I would say" (Participant 2) "I feel like the elderly of now would be excluded, but the elderly in 20 years might be more perceptive" (Participant 5)	Elderly people	Exclusion	Social context
"I think if you're talking about exclusion, maybe people living in the countryside, or maybe in Africa where there is no internet connection. They will be excluded from this whole Metaverse" (Participant 3) "But again, everyone in a certain country will have a certain area that don't have access to the Metaverse, so they would anyway connect together with themselves. They're excluded from the Metaverse but it's not like social exclusion" (Participant 3) "There will be exclusion, so not everyone can join" (Participant 4) "It still can. Because also in the Netherlands, I guess these equipment are quite expensive, so not everyone can buy it" (Participant 4)	Accessibility		
"The Metaverse is more about inclusion than exclusion" (Participant 2) "I think it can include more people because you can, as you said, have people from all over the world. All you need is an internet connection" (Participant 2)	Inclusion		
"When things like a virtual environment or robots, when it becomes more apparent as a human, it becomes more humanlike, we are more likely to reject it" (Participant 3) "It actually says that when the Metaverse becomes more advanced, like graphics become better and it resembles more as a person, the avatar you're seeing, could actually lead to us rejecting the	Rejection		

Metaverse. And not wanting to adopt the Metaverse" (Participant 3)			
"You will interact differently because normally you would build up relationships with people and you interact with them" (Participant 4) "If you don't like someone online you can just block them, or you just say, "I will kick you out". So, then in real life you wouldn't say that. So, I guess those interactions will change" (Participant 4) "The normal will change" (Participant 2) "The question is whether it's a problem. If we're really all going to move to the Metaverse then, not necessarily" (Participant 3) "If a majority of the people move to the Metaverse, it's useful for people to know how to interact" (Participant 2)	Interaction	Communication	
"If we still have 50/50, I would say, co-existence with the real world, which I kind of hope we will have. It's still important that, it should be the same like, you can do something, but you should also try everything else and so" (Participant 2) "I think we can still go out and play to all those things" (Participant 2)	Co-existence with real world		
"This connects a little bit to the community you talked about before and that they can vote out people. So, let's say we are all in one certain political spectrum. We can also decide to kick out everyone in the public room, just because we feel like it, right?" (Participant 5) "This could be an issue. If I enter a room and get kicked out immediately, just because they are trolls" (Participant 5)	Trolling	Negative behavior	Violation
"It is easier to mess with people. When we were in the house, somebody was pointing something at me" (Participant 5) "I knew I was in a safe space, but still, I didn't know how to make it go away. Because if we were in real life, I would just slap it out" (Participant 5) "I didn't know what to do. And I can imagine, instead of the balls, someone in the common space would throw something else at me. I would feel weird, and I wouldn't know how to make them stop" (Participant 5) "I felt like, I don't want to say threatened, but vulnerable let's say" (Participant 5) "It was easy to pick on people, stare at them, with these big ass avatars" (Participant 5)	Easy to pick on people		

"If we don't speak much, it doesn't have to be ourselves there. So, it can be someone else" (Participant 2) "Someone else can take over our person and go there basically" (Participant 2) "I don't think we had to do any identity checks. Like, in the future, you can have AI bots just roaming around there" (Participant 2) "I guess the thing with the AI bots, that's a serious consideration" (Participant 3)	Identity	Anonymity	
"I didn't understand who was talking" (Participant 5) "When we were with the "others" I couldn't recognize who was speaking and who was saying what" (Participant 5) "If someone starts to harass me, I wouldn't really know from who it would come from. So, who to act against, to like blocking or I don't know" (Participant 5) "How do you know in which country someone is? Are they using a VPN?" (Participant 3)	Unrecognizable		
"I guess sometimes you have these kids fighting in chats and games. And I guess when it's in the Metaverse then it comes closer to reality" (Participant 3) "There is actually a group of people who may be shouting at you, who are making arguments. Which could hit you differently than just seeing someone typing in the chat" (Participant 3) "Actually having a group of people standing there shouting at you, making arguments with you, I guess that could actually hurt you more than just seeing something in the chat. So, I guess that's the thing, it amplifies it" (Participant 3)	Affect differently	Physical aspect	
"You know culture is really important in our society, but with one place where everybody can be together and speak one language, English, how will this impact culture? How would this impact education?" (Participant 6) "I think this has also a more societal roots, so it could also become an ethical issue on personal growth and international culture" (Participant 6)	International culture	Globalization	Globalization
"I think that if the Metaverse will become implemented in our society, we will also lose a part of our culture" (Participant 6) "We are arising in a world with Americans I think and I think this can have a negative impact on culture" (Participant 6)	Cultural loss		

"It basically stimulates even more globalization, which could lead to the loss of cultural values" (Participant 3)			

9.5 APPENDIX 5 GIOIA METHOD FOCUS GROUP 2

Quotes	1st-order concepts	2nd-order themes	Aggregate dimensions
"Dan is het natuurlijk wel een goede bron voor dataverzameling als ze kunnen volgen wat jij daar in de Metaverse allemaal doet" (Participant 6) "Dan is dat een extra stap in hoe jij je gedraagt, qua beweging en taal" (Participant 6) "Je geeft een heel deel van je persoonlijkheid, uit je bij hun op het platform en dan kunnen ze dat koppelen aan wat je al doet op Whatsapp en Facebook" (Participant 6)	Tracking	Collecting	Privacy
"Als het open access is dan weet je al wel waar het verdienmodel ligt. Het wordt dus of data binnenhalen of een marketplace" (Participant 6) "Dat zou voor mij wel een dingetje zijn, dat als voor hun is dat een hele mooie stap om extra data van je te verzamelen" (Participant 6)	Collecting data		
"Privacy is denk ik wel een dingetje" (Participant 2) "Tegenwoordig kun je volgens mij, weet iedereen alles van je. Dus dat zal hierbij denk ik ook wel zijn" (Participant 2) "Tegenwoordig kunnen ze heel veel, ze weten heel veel" (Participant 2) "Ik denk dat dat in dit geval eigenlijk ook zo heel veel over je te weten kunnen komen" (Participant 2)	Much information	Information	
"Er zijn niet echt regelgeving of iets" (Participant 4) "Ja, maar hebben ze dat hier? Dat ze een soort van gedragscode als het ware hebben" (Participant 4) "Je kan wel zeggen "ik moet dit gaan doen", maar bijvoorbeeld met scholen, pesten moet gestopt worden, dat is al ik weet niet hoeveel jaren bezig. Maar daar gebeurt helemaal niks mee" (Participant 5) "Maar ze weten niet dat iemand anders je neerslaat en dus verkeerde dingen aan het doen is" (Participant 6) "Het is ook een beetje onzin als jij wordt lastig gevallen, dat jij naar een safe space moet. Terwijl eigenlijk diegene dan mag blijven" (Participant 4)	Regulations	Maintain order	Authority

"Ik denk dat een moderator dat wel in toom kan houden toch?" (Participant 5) "Er was iemand die aan het wijzen was en iets over de moderator erbij halen of zoiets. Dus er zal wel iets zijn" (Participant 5) "Als je de Venues inging heb je wel een blaadje dat je kon lezen van dat er iemand rondliep of weet ik veel wat" (Participant 4) "Je moet dan maar net weten wie dat is. En die moet er dan maar net zijn en die moet het dan maar ook net als vervelend ervaren als dat jij dat vindt" (Participant 4) "Het lijkt mij ook wel moeilijker in zo'n virtuele wereld dat 24/7 open zou staan" (Participant 3) "Je moet er ook wel heel veel hebben" (Participant 4) "Je moet een nummer hebben dat je kan bellen inderdaad en niet alleen een safe space. Naar een moderator ofzo" (Participant 3) "Dat je dan in die safe space dan tegen iemand kan zeggen inderdaad, dat je zo wordt doorgestuurd. Dat kan ook nog" (Participant 3)	Moderators		
"Ik vraag mij af in hoeverre, als je er nu instapt of vroeg erbij bent, in hoeverre zij je dan binnenboord kunnen houden" (Participant 6) "Of ze echt invloed op je hebben op een gegeven moment, omdat je daar dan een personality hebt. En misschien online vrienden en dan komt straks ook nog een platform" (Participant 6) "Dan kunnen ze best wel druk op je uitoefenen misschien" (Participant 6) "Je kan bij Instagram heel veel volgers hebben en je zegt, ik ga nu naar Tiktok. Dan ga je bij de één weg en naar de andere toe. Instagram heeft best wel een bepaalde macht in wat zij doen met wie er onder de aandacht komt" (Participant 6) "Als het aan je Facebook gekoppeld is, als het echt van Meta is, dat ze dan ook nog helemaal specifiek, net zoals nu op Facebook doen, al die advertenties is een algoritme" (Participant 4) "Dat ze je misschien op de één of andere manier toch stiekem gaan proberen te sturen" (Participant 4)	Influence	Control	
"Je kunt zeggen dat mensen zich minder vrij voelen of misschien juist vrijer. Omdat er nu nog geen regels zijn" (Participant 6) "Dat moet je aan de ene kant ook niet hebben, want je moet wel iets van een gevoel van vrijheid	Freedom		

hebben" (Participant 4) "Je moet een balans hebben" (Participant 4)			
"Bij deze hoefde je ook niet zelf te lopen" (Participant 3) "Je had ook letterlijk kunnen zitten met een stoel, voetjes omhoog en dan zit je zo" (Participant 3)	Sitting still	Physical health	Health
"Ik had net wel een beetje dat ik duizelig werd" (Participant 1) "Volgens mij waren er drie mensen die werden al een beetje misselijk na een kwartier" (Participant 1) "Hoe wil je dan acht uur gaan werken in zo'n ding" (Participant 1) "Je went er ook wel meer aan" (Participant 3) "Als je dat heel vaak doet, hetzelfde met de controllers enzo. Hoe langer je het doet, je traint jezelf ook op een gegeven moment" (Participant 3) "Maar het is maar de vraag of jij dat wil of kan" (Participant 3) "Als de camera iets smoother gaat en niet tik, tik, tik, dan zou ik het ook al fijner vinden" (Participant 3)	Motion sickness		
"Dan ga je toch ook vereenzamen als iedereen denkt "ik ga naar het concert van die en die" op je eigen kamertje" (Participant 4) "Dat is eigenlijk heel treurig" (Participant 4) "Dan doe je dat ding af en dan zit je alleen in je kamertje en dan moet je maar wachten tot je hem weer opzet" (Participant 4) "Of je zet hem gewoon nooit meer af" (Participant 4)	Loneliness	Psychological health	
"Mensen kunnen de overgang met de realiteit, als in de werkelijke wereld, een beetje gaan vergeten. Je kan er best wel makkelijk gewoon in verdwalen. En dan heb je misschien niet door dat je er misschien al uren in zit" (Participant 3) "Dat gebeurt als je in zo'n virtuele wereld zit. Je drinkt niet, je eet niet, je slaapt niet, je bent bezig" (Participant 3) "Op een gegeven moment doe je dat dan, en dan denk je "oh, de hele dag is voorbij" (Participant 3) "Aan de ene kant kun je er echt lekker makkelijk in ontsnappen, maar je kan er ook te makkelijk in verdwalen" (Participant 3) "Letterlijk alles wat je wil is daar, voor eigenlijk niks. Want je hebt één keer voor zo'n VR spel betaald en dat is het" (Participant 3) "Als je hem heel lang kan ophouden, dan geloof ik	Escaping		

wel dat je het heel leuk vindt en dat je echt dagen op dat ding kan zitten" (Participant 1) "Dat je dan toch een beetje de echte wereld een beetje vergeet ofzo" (Participant 1)			
"Dissociatie van wie je bent" (Participant 4) "Of juist heel erg overmoedig. Omdat je gaat denken kijk eens wie ik ben daar" (Participant 4) "Dan heb je weer body dysmorphia" (Participant 3) "Zometeen heb je met een avatar "dit is mijn goal" en dan ja, dan stap je eruit en dan denk je ja" (Participant 3) "Of je gaat jezelf identificeren met je persoonlijkheid in de Metaverse" (Participant 6) "Die denken van ik kom hier het vaakst. Luister maar gewoon naar mij" (Participant 3) "De avatars die daar rondliepen zijn best wel maakbaar" (Participant 6) "Je kunt eruit zien zoals je eruit wil zien, maar dat hoeft niet overeen te komen met wie je zelf bent" (Participant 6) "Je zou dan dus een persoonlijkheid kunnen creëren naast je eigen" (Participant 6) "Als je daar vrienden in maakt op een bepaalde manier. Dan denk ik dat je daar in het echte leven best wel onzeker van worden als het daar met een andere persoonlijkheid wel werkt" (Participant 6) "Als je bijvoorbeeld onzeker over jezelf bent en je kunt zo'n avatar helemaal maken zoals je zelf wil" (Participant 1) "Het nadeel is dat je dan iemand anders, dat je je heel anders voordoet dan je misschien bent" (Participant 1) "Het voordeel is wel weer, mensen zien je dan niet in het echt" (Participant 1) "Je kunt je mooier voordoen als je bent" (Participant 1)	Avatar identity		
"Voor mij waren ze ook heel erg, vonden ze het spannend van je gaat je vingerafdruk gebruiken op je pc om in te loggen of je gezichtsherkenning" (Participant 4) "Ik betaal alleen nog maar met mijn gezichtsherkenning via mijn telefoon" (Participant 4) "Je grenzen worden toch wel steeds meer verlegd" (Participant 4) "Op een gegeven moment moet je daarin wel een grens trekken in wat is nog wel acceptabel en wat is niet acceptabel" (Participant 4)	Acceptance	Societal approval	Social context

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"Dat is dan Technology Acceptance" (Participant 5) "Volgens mij zeiden we ook zoveel aantal jaar geleden "what the fuck moet je met een computer"" (Participant 4)			
"Het wordt straks natuurlijk steeds meer mainstream, in ieder geval voor bedrijven" (Participant 4) "Daar willen ze ernaartoe dat het echt parallel gaat lopen" (Participant 4) "Dan wordt het echt steeds meer mainstream en dan gaan ook bedrijven en werknemers gaan daar waarschijnlijk ook allemaal in werken" (Participant 4) "Wat je überhaupt in je dagelijks leven hebt heb je nu opeens online" (Participant 3) "Als jij dan net diegene bent die het dan weer net niet kan (Participant 4)" "Straks willen ze er misschien wel heen dat ze je gaan forceren dat je erin moet. In ieder geval met werk of weet ik veel wat" (Participant 4)	Mainstream		
"Ik neem aan dat dit populairder is in de VS" (Participant 5) "De N-word is natuurlijk wat schokkender voor ons hier denk ik dan mensen die daar leven, want dat is gewoon hun gebruikelijke taal" (Participant 5)	Culture	Diversity	
"Aan de ene kant zou het een mooie oplossing zijn voor bejaarden als ze elkaar toch nog een beetje kunnen ontmoeten als ze het huis niet echt uitkomen" (Participant 4) "Ik snap wel dat, sommige bejaarden kunnen bij wijze van spreken al geen eens een mailtje sturen" (Participant 4) "Als je dan steeds meer die wereld ingaat dan wordt het wel steeds erger" (Participant 4) "Misschien zijn wij straks wel de bejaarden die niet meekomen" (Participant 4)	Elderly people		
"De mensen die het niet hebben gaat toch veel groter zijn dan de mensen die het wel hebben dan. Lijkt me" (Participant 5) "Als je iets krijgt van, dit is eigenlijk het echte leven, je kan hier allemaal dingen doen, maar je moet wel 350 euro betalen om er überhaupt in te komen. En je weet niet eens of het wat is" (Participant 5) "Ik denk ergens ook wel dat mensen die iets minder van social media zijn of die juist wat om beginnen te draaien van "oké ik wil toch wel	Rejection	Resisting	

minder op mijn telefoon zitten", dat begint ook steeds groter te worden" (Participant 3) "Dus misschien dat mensen zoiets hebben van nee. Dat ze daar uiteindelijk minder geïnteresseerd in zijn" (Participant 3) "Ik zie ook een steeds grotere groep komen van mensen die denkt "fuck social media, fuck internet" en ik ben er even helemaal klaar mee"" (Participant 3) "Over het algemeen wat ik zie in het bedrijfsleven is dat mensen niet heel erg fan zijn van, of mensen die niet gestudeerd hebben in technologie of van tevoren een interesse in hebben, dat die dat niet zomaar gaan doen" (Participant 5)			
"Kan je in deze Metaverse dingen kopen met geld?" (Participant 3) "Lekker geld eruit jagen bij mensen" (Participant 3) "Dat je geld moet betalen voor het concert waar we net waren" (Participant 3) "De drempel van 350 voor een headset, ik denk dat weinig ouders dat gaan doen" (Participant 5) "Zelfs al heb je bijvoorbeeld het minimumloon, denk ik ook niet dat je heel gauw gaat denken van "nou doe maar een headset"" (Participant 5)	(No) Money		
"Voor mensen die echt alleen willen zijn snap ik dat het leuk kan zijn" (Participant 3) "Het zijn juist plekken waar je kan socializen en nieuwe mensen kan ontmoeten" (Participant 3) "Soms is het wel een goede manier om vrienden te maken. Die dat moeilijker vinden sociaal, zeg maar face to face" (Participant 3) "Het is makkelijker voor mensen om mensen te ontmoeten" (Participant 3) "Mensen beoordelen je dan niet op je uiterlijk, maar echt om hoe je bent denk ik. Ze horen je stem wel, maar ik denk dat dat dan niet heel veel uitmaakt" (Participant 1)	Easier to meet new people	Behavior	Violation
"Ik had net wel iemand die achter mij aanliep. Als iemand echt heel erg bij je blijft drukken en echt vervelende dingen gaat zeggen, denk ik wel dat het invloed kan hebben op dat je je echt niet prettig voelt" (Participant 4) "Ik heb dus niet zoiets ervaren dat iemand achter me aan liep ofzo, maar ik kan me wel voorstellen dat als je dat dan hebt dat het niet heel prettig is (Participant 1)	Unpleasant feeling		

"Hetzelfde als normale social media. Zoals grooming, pesten, whatever. Dat is ongetwijfeld daar" (Participant 5) "Ik denk dat je nu misschien dan hebt dat kinderen voor 5 euro een pakje kopen en dan moet iedereen dat hebben omdat je anders buitengesloten wordt" (Participant 5) "Ik kan me wel een voorstelling bij maken. Helemaal als je aan dingen gaat denken als grooming of weet ik veel wat. Dat kan maar zo gebeuren" (Participant 4) "Dat kinderen gepest worden van "mijn kind gaat dat niet doen"" (Participant 5)	Bullying		
"Je kunt op social media kun je sowieso makkelijk, ja hier weet je niet wie het zegt eigenlijk" (Participant 2) "Je hebt wel een gebruikersnaam waarvan je ook niet weet wie het is" (Participant 2) "Je kunt van alles zeggen of doen wat inderdaad geen fijn gevoel kan geven" (Participant 2) "Het grootste nadeel lijkt mij dat je alles kunt zeggen en doen zonder dat je weet wie iemand is of dat het allemaal heel makkelijk kan" (Participant 2)	Anonymity	Lack of transparency	
"Misschien iets met deep fake ofzo? Dat ze je stem gewoon kunnen programmeren op een AI" (Participant 5) "Je kan ook allemaal oplichtingen meebrengen" (Participant 5)	Scam		
"Ik probeerde wel iemand zo te slaan, maar dat lukte inderdaad niet" (Participant 3) "Je kan elkaar wel high 5'en. Dus hij detecteert dan wel weer wanneer je elkaar aanraakt" (Participant 3) "Maar dan weten ze dus wel dat je wordt neergeslagen en dat je eruit moet" (Participant 6)	Detection	Physical aspect	
"Het deed me, je had vroeger Habbo Hotel, dat deed me beetje aan denken. Alleen toen was alles natuurlijk in de chat gewoon. Dus je kon elkaar daar beledigen, dat gebeurde daar" (Participant 6) "Als je zo in de VR wereld zit dan wordt het veel, lijkt het veel echter. Omdat je natuurlijk gewoon spraak hebt en je hoort ook andere mensen om je heen praten. Je kunt ook bewegingen maken" (Participant 6) "Dat negatieve effect van wat je bij Habbo Hotel had met de chat dat lijkt nu nog echter te worden. Of nog realistischer. En dat vind ik wel, dat zou	Realness		

voor mij een gevaar zijn" (Participant 6) "Aan de andere kant ook realistisch in de zin van, het is verbazingwekkend hoe echt het is. In de zin dat je bewegingen kunt maken, een avatar kunt maken en zo" (Participant 6) "Nu kan het ook met soort van het fysieke aspect, ten opzichte van alleen tekst" (Participant 5)			
"Wat je ook veel met online dingen hebt, want je hebt heel dingen waar je online mensen kan ontmoeten of met VR, toen VR net opkwam. Ik denk ook niet dat het meer wordt gebruikt" (Participant 3) "Ik denk dat je wel even een hype hebt, maar ik denk niet dat het blijft. Want dan is er later wat nieuws om naartoe te gaan" (Participant 3) "Hoe lang bestaat VR ook al, die hype. Het is best wel even geweest, en dat is toen ook weer meteen naar beneden gekletterd. En inderdaad door de prijzen, dus" (Participant 3) "Ik denk dat als het uit is dat het niet heel lang iets blijft waarvan mensen denken "dit moet je hebben", denk ik" (Participant 3)	Hype	Expectation	Uncertainty
"Het is nog best wel onzeker allemaal" (Participant 1) "Je weet natuurlijk niet in hoeverre het gaat groeien" (Participant 1) "Je hebt tot nu toe dit, maar ik denk dat je over 30 jaar. Dan ben je weer zo anders" (Participant 1)	Insecurity		
"Ik zeg niet dat het over 5 jaar al is, of over 10 jaar en misschien als we al bejaard zijn en het toch niet meer snappen" (Participant 4) "Ik denk dat het nog wel heel erg lang kan gaan duren. Als het überhaupt geïmplementeerd wordt" (Participant 5) "Die CEO ging er gewoon omheen, die gebruikte het al helemaal niet" (Participant 5) "Dat zijn toch de mensen die dit soort beslissingen moeten gaan maken" (Participant 5) "Voordat al die lui vervangen zijn door mensen die echt denken "nou we gaan nu in de Metaverse wat doen", denk ik dat we wel heel erg veel verder zijn" (Participant 5) "Dat is ook van in het begin met de computers, dat waren toen echt loodsen vol aan computers. Dus voordat dat samen, korter kon, en kleiner kon en echt bruikbaar wordt voor mensen die het naast bedrijven konden gebruiken" (Participant 5) "Ik denk alleen dat je best wel voorbereid kan zijn.	Future	Potential outcome	

Want ik denk dat ze wel, ik zeg niet dat het snel gaat" (Participant 4)			
"Je zag bij Twitter ook dat heeft ook niet goed uitgepakt voor Elon Musk. Maar hij heeft er wel een belachelijke som geld tegenaan gesmeten, maar het werkt ook niet" (Participant 5) "Als er allemaal grote bedrijven achter zitten zoals Facebook, ja Meta dan, en Google en weet ik veel allemaal. Ik denk dat je hun invloed niet moet onderschatten" (Participant 4) "Ik neem aan dat ze er niet zoveel geld in pompen voor "we gaan alleen even rondlopen een kwartiertje voor een concertje en dan gaan we, ik weet niet hoe die vent heet, kijken"" (Participant 4)	Influence companies		
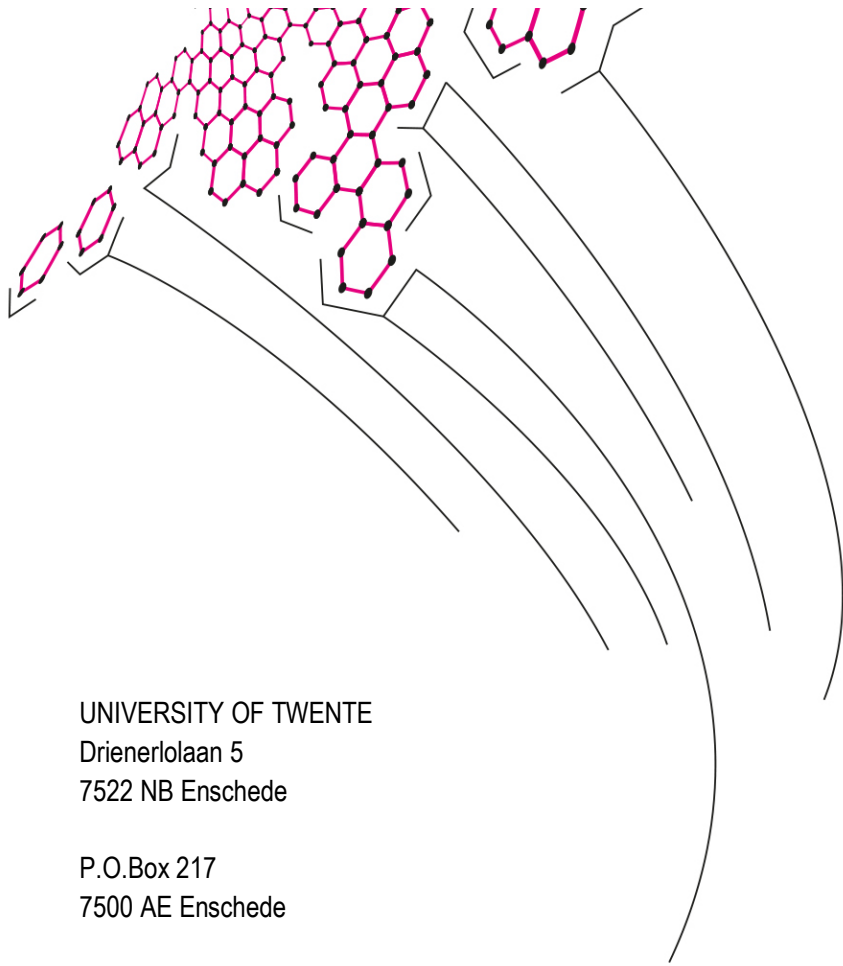
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