

# Ethics of the metaverse: effects of multi-user virtual reality on user autonomy

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## 1 INTRODUCTION

In recent years, entrepreneurs and big multi-nationals have been trying to incorporate virtual reality into social media. In October of 2021, CEO-leader Mark Zuckerberg announced a name change of his social media company "Facebook Inc" to "Meta". Besides improvement of the companies external perception, the name change revealed the transition of the company's focus towards a virtual environment called metaverse [1]. As metaverse is a portmanteau that translates to "Beyond the universe", this technology combines physical reality, online gaming, augmented reality, virtual reality (VR) and cryptocurrencies to enable users to interact in a realistic parallel virtual world. Through the use of headsets, users can access a virtual world supported by AI, blockchain, edge, cloud, computing and 5G networks [2].

As of today, Meta and other big tech companies like Microsoft are investing billions a year in the metaverse project and predict its market size to reach \$800 billion by 2024 [3]. That market size would put the metaverse on a 6st place of largest companies by market cap. The societal impact of the metaverse is further emphasised by the prediction of its number of users. Although current developments like Meta's Horizon Worlds do not have a large audience yet, researchers foresee a possible exponential growth in the users of the technology[9]. They base this expectation on the high amount of current users of social media. They expect users to make a smooth transition from current social media platforms to the future metaverse. As of 2020 social media platforms have c.a. 3 billion users [5], with 3 billion potential users the societal impact will be enormous. VR technology stands at the base of the metaverse and is a technology that causes more addiction than the internet and gaming. [14] We expect the risk of addiction to be similar if not higher for the metaverse. With Facebook being scrutinized for integrity about user autonomy before [6] and the reduction of user autonomy through addiction [7], we deem an ethical analysis of the users

autonomy in the metaverse essential.

We pose the following research question:

**How and to what extent might an individual's autonomy be affected by immersion inside the metaverse?**

In order to answer this question, we start of with a technology description of VR and the metaverse. This shows the intricacies of the technology and indicates the boundaries that the technology has in terms of possibilities to debilitate autonomy. Subsequently, the framework through which the research question is answered is elucidated. In order to answer the research question, we make use of the rights-based ethics framework. This framework states that assessing whether an action is ethical or not is determined by the extent to which the action promotes and not degrades individual's rights [15]. As autonomy is a basic human right, we find this framework suitable. We then ethically analyse the extent to which the right of autonomy can be compromised by the metaverse. This part decomposes autonomy into its three components: knowledge, authenticity and freedom. For each of these aspects the implications and risks of the use of metaverse are mentioned, elaborated and explained. We then go through the possible positive effects on individual autonomy that the metaverse brings. We base our ethical analysis on the work already done by Tromp et al [8] that presents a good overview of how autonomy is affected by VR. Lastly, in order to draw a conclusion we take the results of the analysis of the three aspects of autonomy and determine how and to what extent an individual's autonomy is affected by additional immersion in the metaverse.

More solid description of conclusion. We conclude if autonomy is respected by the technology or not.

## 2 TECHNOLOGY DESCRIPTION

As we write this paper, the metaverse does not yet exist. We define the metaverse to be a 3D Internet comprised of a single, universal virtual world that is facilitated by the use of virtual and augmented reality headsets.[4] Researchers say that platforms like Facebook's Horizon Worlds will eventually transform into the metaverse after they become open-source [4]. Tromp et al [8] call platforms like Horizon Worlds Multi-user Virtual Reality (MU-VR), they refer to it as 'the convergence of social media networks and virtual reality systems'. Within a MU-VR users can meet, interact and socialize with each other. Users can be recognized by their avatar, which is their virtual embodiment. Users are immersed into the virtual environment by means of virtual reality headsets. Current applications of a MU-VR are categorized into two groups: recreational videogames, and work-related collaboration tools. As a work-related collaboration tool, a MU-VR removes the need for people to travel to get to meetings.

## 3 RIGHT BASED ETHICS FRAMEWORK

In order to assess the ethical implications of additional and more advanced immersion in the Facebook's Horizon, we choose to apply the rights-based ethics framework. In a rights-based ethical approach it is suggested that: "The fulfilment of human rights... should be viewed as fundamental moral rights and central objectives of national and global development processes, programmes and arrangements" [15]. Out of the 30 basic human rights, we expect autonomy to be compromised most. In fact manipulative agents could particularly pose a significant threat to the autonomy of users. In all such discussions, the concept of autonomy is source of attention since it is an ontological aspect of the human race that characterize their moral agency. Hence being a central value in the kantian tradition of moral philosophy, autonomy refers to the ability to independently make plans and form goals. Autonomy can be further decomposed into three main components. First, autonomy requires an access to relevant information, namely knowledge in order to make choices. Second, authenticity must be present, that is to say that people must be able to choose for themselves rather than having their own values and thought processes dependent on manipu-

lative external forces [8]. Third, the amount of constraints should be limited to make the concept of autonomy valid. Thus the agent requires freedom to have autonomy.

Furthermore, it must be mentioned that individual autonomy is meant as an intrinsic trait that individuals can exhibit relative to any aspects of their lives and thus be a right in itself. As a result, the rights-based framework has been deemed suitable for our ethical analysis, because violation of rights seems one of the main reasons why there is doubt and/or concern regarding the ethicality of AI-technology. Consequently by applying this particular rights framework it is possible to make a quite concrete ethical assessment on the threats on the components of autonomy, namely freedom, knowledge and authenticity imposed by the substantial immersion in multi-user augmented virtual reality.

## 4 ETHICAL ANALYSIS

As stated by Tromp et al, autonomy can be decomposes into its three components: knowledge, authenticity and freedom [8]. This section elaborates on the effects of the metaverse on each of these components of user autonomy. First discussing the potential harm on each component and then discussing the potential enhancements.

### 4.1 Knowledge

The amount and type of knowledge presented to the user influences users autonomy. The available knowledge influences users behaviour, caused by the choice of which information is presented. Knowledge can be purposely steered and accordingly presented to the user, leading to a tunnel-vision on views to the user putting them at risk. [8]

**Filter bubble** The threat of a filter bubble arises when someone almost exclusively uses the metaverse for receiving information about the real world. This is mainly the cause of the application of AI-technology, which analyses a persons preferences based on their online behaviour. The AI suggests specific articles and themes that are being presented to them based on this analysis [8]. We expect that this problem is much more likely to increase in the metaverse due to additional immersion.

Firstly, since there is more immersion, we expect there are more parameters to track by the AI and hence the suggested articles will better suit your personality and thus limit your 'world vision bubble' even more. Secondly, it is much harder to get away from the stimuli from the metaverse when you are in that environment. Currently, when you browse social media you can look away from your screen and see something like a news paper that broadens your bubble, but with the metaverse you can get away from it much less easily since you are much more immersed in it.

Moreover, important and relevant information for the user might not be presented, also known as **cyber-balkanization** or **gate keeping**. As a result, this intensified personalised online experience can help users in finding information that only further confirm their already established views [8]. We expect that this problem will increase due to the same reasons of the filter bubble threat, namely the additional immersion and the additional parameter tracking.

#### 4.2 Authenticity

Authenticity inside VR games with multiple users is effected as users are presented with a world that is simpler and hence is more close-minded and less diverse than real-life. This creates less room for identity development, making users more shallow and close-minded [8].

**False sense of agency** One way authenticity is threatened is by means of a false sense of autonomic agency due to the fact that information that are presented to users are outside of their awareness. This relates back to filter bubbles from the previous section. People therefore do not act based on their own values and ideas, but instead become a product shaped by the virtual reality environment. This means authenticity is impaired by the technology. It is another reason to limit how a multi-user virtual reality system influences authenticity is by the immersion in combination with a close-minded world.

We believe that a false sense of agency can emerge as the user associates the avatar's body to his/her own body, while the avatars body is influenced. The user might think to be in control, while the algorithm can manipulate the user's behaviour, all while the user attributes the behaviour to itself.

**Social conformity** The second threat that can arise in terms of authenticity is that of social conformity. This is the phenomenon of changing your opinion or beliefs merely to fit and adapt to the circle your living in. [13]

Research has already shown that this is an existing problem in current social media [12]. However, we expect that this threat will increase more in the metaverse. Rationale for this, is that the people are also much more exposed in the metaverse due to the additional immersion. Hence they are therefore also more vulnerable for insults. Furthermore, the additional immersion makes for a higher degree of connection and thus makes people more careful in their expression. Reason for this is that it may have repercussions on their image, which people form more easily due to the extra immersion. Hence, we expect social conformity to increase in the metaverse.

#### 4.3 Freedom

Lastly, freedom is effected as behaviour of the user is steered into a specific direction, purposefully or not, and can be conscious or unconscious to the user. Freedom risks concerns risk on agency of the user: the user can become addicted, create a false sense of agency from its actions, be manipulated or nudged into certain behaviour, and might conduct self-censorship by suppressing behaviour when the user knows its behaviour is being recorded.

**Addiction** VR game addiction is seen as a big risk in literature [14]. Addiction statistics show that there are more people addicted to VR games than there are people addicted to internet or standard video games[14]. Experts believe that the addiction sensitivity of VR games is caused by the immersion of the user [14]. Until now, researchers only looked at short time intervals of VR use, but state that the effects of longer term use (order of hours) is to be expected if personal VR use really takes off. The effects of this are expected to have even worse effects, especially in children[9]. Researchers suggest options in the VR game to let the user know how long it is immersed and to employ more research on children. In short, addiction plays a big role in impeding freedom of the user while using VR in Horizon's, especially for children and longer use.

**Self-censorship** Another problem that can arise

in terms of freedom is something called 'self-censorship'. This basically means preventing oneself from the act of speaking. [8] This is an action mainly done to preserve the image one has of oneself and/or the public has of them. This is basically a mild form of the social conformity in the authenticity part. This is already a factor that is playing a significant role in contemporary social media [11]. However, we expect that this aspect will play an even bigger role in the metaverse and will thus limit freedom and autonomy even more. In the metaverse much more aspects on which someone could base the image of a person on will be available, hence people will probably feel a higher need to maintain self-censorship.

**Personal Safety** The last freedom aspect is related to safety, as harassment in a virtual world is different than in real life. The VR experience adds another layer that makes the event intense and trigger the internal nervous system and psychological responses to the same extent as in real life. An unfortunate example is from December 2021, where a woman was verbally and sexually harassed by 3-4 males avatars within 60 seconds of joining Horizons Worlds developed by Meta. Other concerns are for children being manipulated by adults. [10] This is where the designer can make choices to make the virtual environment safer by safeguards: Now Horizon has a safety zone around the user such that users cannot come too close and an option to teleport to an individual environment with a touch of a button. This however impedes the realism and immersion, making the experience of Horizon less interesting. We think personal safety is a big factor holding back freedom of the user. It boils down to a trade-off between the freedom of users to interact with each other (potentially leading to personal safety impairments) and restrictions on user-user interaction to keep users safe from each other (decreasing realism and immersion). We think personal safety is possible, creating the need for well thought out personal safety mechanisms in a game.

#### 4.4 Opportunities of the metaverse

It must be noted that the metaverse also has opportunities to decrease the threats that are being posed to people's autonomy by the technology.

**Knowledge** The metaverse can allow users from all over the globe to share knowledge. This allows users

to have access to knowledge of other cultures. As more knowledge is available, autonomy is improved.

**Authenticity** We think the threat of authenticity could also be greatly reduced. There is also a lot of possibility in this technology, since there is also much more people to interact with. This enables people to more easily widen their social circle. Thus there is actually the possibility of creating a society with a lower degree of social conformity and less self-censorship.

**Freedom** Horizon creates a big opportunity in bringing people together who before were not able to do so, increasing freedom for these groups. Examples are people with a physical disability, who can now experience locations and meet with people they could not see before and marginalised groups who do not feel comfortable interacting in real life. We think these are advantages that are worth mentioning.

## 5 CONCLUSION AND RECOMMENDATIONS

Revisiting the research question:

**How and to what extent might an individual's autonomy be affected by immersion inside the metaverse?**

Our ethical analysis shows that the right of autonomy is heavily influenced by the immersion into VR, combined with the social network aspects. Although the effects are explicit, the amplitude of the effects and the long-term effects on users are hard to predict, especially on children. This is worrisome looking at the potential exponential growth multi-user virtual reality might undergo. The case of the woman who was verbally harassed by four players in Facebook's Horizon already shows how the right for autonomy is affecting users today, in this case by jeopardizing her freedom. The vast use of Horizon by children creates an even more potentially harmful situation with regards to their right of autonomy.

Looking at this, we think that the right for autonomy is easy to be violated in metaverses, specifically Facebook's Horizons. Although there are positive aspects like opportunities for more free experiences, in many ways right for autonomy is threatened.

We recommend that the public should be made more

aware on how their behaviour can be manipulated social VR games, and how your sense of agency might be wrong. More strict rules according to the age of the user are essential to preserving the right of autonomy of younger users. Furthermore, it is important for designers of the virtual worlds to understand that the choices in their design effect the behaviour and attitudes of users.

To further analyse the implications on autonomy, we suggest more research is needed in understanding the psychological effects of the multi-user virtual reality, such as long-term immersion (order of hours). Although research is harder to conduct on younger users due to ethical constraints, we do recommend more research on this group that is ethically sound, such as surveys and interviews with children and their parents.

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