

# STUDYING THE METAVERSE EFFECT ON ITS USERS

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**Abstract** - This research is set to answer the question how Metaverse can be a dangerous space for its users. Metaverse is a collection of Meta applications such as Facebook, Instagram, WhatsApp and Oculus that is integrated into virtual reality (VR) and augmented reality (AR). To answer the question, different issues that were undertaken in the history of Meta and its CEO, Mark Zuckerberg, was taken into account to see the potential negative effects it will have on end-users.

The potential issues Metaverse can have includes issues with uneven power distribution, issues with cyber security and privacy threats, and negative impact on the user's mental health. An interview was conducted and the results supported the prior claims, with an emphasis on the dangers of lack of security and privacy leaks and breaches, followed by mental health concerns, then lack of regulations, followed by spread of misinformation and abuse of power. The solutions to these issues consisted of adding and adopting better regulations, integrating a monitoring system, and including a function for tracking and limiting end-user's screen time. Alas, technology and the internet are ever-changing and needs constant evaluation and regulations, especially if it is from a big tech-company such as Meta. A company is useless without its customers, so keeping them safe should always be a top priority.

**Keywords** - Metaverse, VR, Dangers.

## I. INTRODUCTION

In the 28<sup>th</sup> of October 2021, the CEO of Facebook, Mark Zuckerberg, announced during a virtual event that the company is set to rebrand itself as “Meta,” thus every application and software that run under Facebook such as Facebook itself, Instagram and WhatsApp will be integrated into the “Metaverse” operating system of Web 3.0. According to Salvador Rodriguez [1], the concept of “Metaverse” is referred as an extension of the real world turned virtual [1,2,3,4].

The idea of living out a virtual life sounds intriguing at first, but the more you think about, the more you start to doubt the direction the team at Meta is heading. One of the main problems with the initiation of the Metaverse is trust, security and privacy. Mark Zuckerberg, and Facebook, are no strangers to user information and data leaks, spreading misinformation, uneven power distribution/biasness in users and privacy breaches [5].

It is important to take account and consider every aspect of Metaverse – the good and the bad – and try to determine if Metaverse is actually dangerous and harmful to end-users. It is natural to be cautious with anything that is related to Zuckerberg and his affiliation due to their track records, but the questions are *how cautious should one be?* and *how can Metaverse be a dangerous space for users?* The approach used to answer the prior questions is through conducting qualitative research with a grounded and narrative research approaches, along with methods of observation, interviews and secondary research from existing data related to the scandals Facebook (Meta) and Zuckerberg have previously faced.

The basic results of this research suggests that there is an unarticulated and inferred doubt people have with Metaverse along with concern for their safety and privacy. Thus, this paper will provide suitable suggestions for the team over at Meta that could be integrated to reduce worry and increase user-interference such as adding regulations, improving monitoring systems, and tracking and limiting end-user screen time.

## II. PROBLEM DEFINITION

Precisely define the problem you are addressing (i.e. formally specify the inputs and outputs). Elaborate on why this is an interesting and important problem.

To define a problem, one must first determine and specify the outputs, followed by the inputs of the topic at hand. In the case of this research paper, the problem output of the topic is through the end-users; Whether will take off or not will both heavily impact the lives of the end-users, so acknowledging the possible problems they would face is important. The possible problems that this paper predicts in terms of issues and concerns for end-

users include biasness, chances of getting their privacy violated through security breaches and data leaks, and an increase of mental health cases such as addiction and personality disorders like inferiority complexes, and depression due to lack of human interaction and the rise of cyberbullying and doxing. Whereas in terms of the company itself, there are issues regarding power of monopolization, control and moderation, along with the safety of their customers.

The inputs include an identification of the source data, so the usage of secondary data from articles, news reports and web pages surrounding the concept of Metaverse along with the issues Meta have faces will be accounted for, in addition to conducting an interview with 5 recipients who are end-users of any Meta applications.

To recap, the problem being addressed in this report surrounds the dangers of integrating Metaverse on end-users. The problem is rather interesting due to its nature being completely virtual and deals with technological issues and ethical dilemmas on Meta's end of the bargain. It is important to nitpick the concept as it deals with human lives. It has been proven time and time again that social media and the Internet has negative affects on humans from un-solicitations to breach of privacy and data leakage, especially when it involves Zuckerberg and Meta.

### III. PROPOSED SOLUTIONS

The technique used to address the problems at hand was to take each one of the issues with common solutions and group them up. A lot of brainstorming and fact checking was taken accounted for, especially when most of the solutions are theoretical yet logical if one takes a step back to see the full picture. The following image will illustrate the different problems and connect them to a simple solution that fits its purpose as a framework:

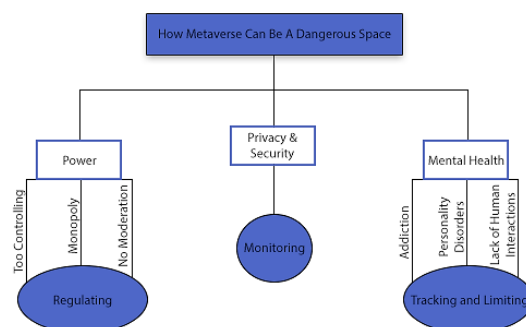
#### A. Regulating

A better regulation is required due to the imbalance of **power** the company has against its end-users. In a sense, the end-users are vulnerable against corporations like Meta who have full power over the user's data and information. Social media platforms have control over third parties that are integrated to user's data from personalized ads to selling information to other companies. Metaverse is a monopoly, in which the goal is to combine all of the Meta applications into one shared system, which would be worrisome since it implies if one account got hacked then every other account that are linked are vulnerable to getting hacked as well. In addition, moderating is quite difficult for one platform so having to overlook multiple ones at once would be near impossible.

Thus, the solution to the lack of moderation, monopoly and too much control over end-user's information would be to have constant and consistent **regulations**. Most people are concerned that Metaverse is a way for Zuckerberg to attain complete control and power over modern-day technologies, thus it is most logical to redistribute the power amongst democratic officials that have been elected by the board of directors or form a parliament. That way, Zuckerberg will not have sole control over user information and monopoly. In addition, to add more moderation, there should be regular regulations online to make sure some users are not breaking any laws or are committing hate crimes either through verbal or non-verbal acts, and sexual assault [51,52,53].

#### B. Monitoring

Implementing a **monitoring system** that detects leak and breach patterns is essential in any technological corporations, especially when dealing with the Cloud. Because Metaverse is heavily reliant on virtual reality, it would be even more dangerous for users if any of their information got leaked with the possibility of them getting doxed online, especially since the usage of VR would suggest recordings of the user's physical appearance, their movements, speech patterns and voice, and even recording what room they are in and tracking their locations. The only issue is Meta's track record [54,55,56,57,58]. The company has been included in various cases and scandals regarding security and privacy being leaked, that it has people questioning whether the company will ever learn



from their huge and life-threatening mistakes. Would rebranding really help? Or is it too late to patch up the wound they created for themselves?

According to Kost [7,84,85,86,87], there are various ways large corporations like Meta could prevent possible

*Figure 1: Flow chart*

leaks and security breaches and it starts with evaluating the risk of third-parties, then monitoring all network access, identifying all sensitive data, securing all endpoints, encrypting all data, evaluating all permissions, and lastly, monitoring the security posture of all vendors.

*C. Tracking and Limiting*

To reduce the chances of end-users developing serious mental illnesses such as addiction, anti-social personality disorders, depression, and inferiority or superiority complexes, along with feeling out of touch with reality due to lack of physical human interactions, **tracking and limiting** the end-user screen time to make sure that users are spending a healthy amount of hours online and not over-doing it, along with limiting what contents should be visible to the general public and what should not. An example of something that should be limited and not be seen as a trend is the unhealthy and unrealistic beauty standards. In most cases, you would have a celebrity or an influencer that is A) very rich and can afford a personal trainer and health meals, B) got work done on their persons, and C) promoting false ideologies of what a perfect body should look like due to sponsorships that almost seem like pyramid scams and fads than scientific like the popularization of detox teas [59,60,61].

When it comes to the number of hours spent online, Meta could implement a system like the playtime feature that was adopted in recent FIFA gaming series to reduce chances of addiction that can lead to anti-social behaviors [13]. The playtime feature allows the end-user to track and set limitations to how much time they spend online [29,30,31,32,33].

#### IV. RELATED WORK

Along with this research, there are various other works that have similar point of views as this paper. A New York Times article written by Sheera Frenkel and Kellen Browning [2] discussed and theorized how the Metaverse has a dark side when it comes to harassment and assault from personal experiences (a 29-year-old woman got sexually harassed in a virtual lobby). The NYT article relates to the research as it discusses the lack of moderation and monitoring in the Metaverse, which are some of the issues that this paper predicted [62,63].

Another article that discusses the negative effects of Metaverse on users comes from an article written by Jeon Joo-Eun [3]. The article's methodology includes taking a sample of Metaverse-platform users and integrated a multiple regression to test the impact of the respondents' commitment and relationship with each Metaverse platform [64,65,66,67]. This research will also take into account Metaverse users and their opinions and experiences while using Metaverse prior and after the rebranding. [13,14,15]

#### V. RESEARCH METHODOLOGY

The following sections will elaborate on the methodology used in supporting this research along with a discussion on the methodology's results [68,69,70]:

*A. Methodology*

To start off the methodology, one must first determine what criteria should be used to evaluate the methods being used. In this instance, since this research is heavily based on qualitative research methods and relies on interviews as its main source of data, then the criteria to evaluate the method would be [16,71,72,73,74]:

- What information is needed to emphasize on the topic and issue?
- How reliable and truthful will the information be?
- Will the information collected be of use or relevant to the topic?
- How flexible will the research be?
- Will there be any biasness? If so, will it affect the results?

The research question is "How can Metaverse be a dangerous space?" And because it is a qualitative research based on findings and not relying on testable data, then a hypothesis would not be included but rather a proposition would be more suitable. [19,20,21,75,76] The following are the research's claims based on the research question:

- The biggest issue, if not most dangerous, is the security and privacy issues.
- Metaverse will affect the end-user's mental health negatively.
- Regulation will be more difficult with Metaverse's integration.

To prove the claims made above, an interview was conducted to see any correlations with the responder's answers to the claims made about Metaverse and how or if they were affected by any controversies that Meta was

in based on either the regulation issues, mental health issues, or the security and privacy issues, or all of them combined [22,23,24,25].

Because the research is qualitative in nature, an exploratory design was used to fit the purpose of the claims made above. An in-depth interview was conducted to collect the respondent's feelings, thoughts and opinions of the matter at hand. The **interview questions** surrounded around the research question to examine if there are any correlations between the research question and the claims made. The interviewees consisted of a businessman, a student, a parent, a streamer, and an influencer. In addition to the in-depth interviews, a **Likert scale** analysis was used to determine which issue felt the most important to least in the eyes of the interviewees [26,27,28].

Starting off with the Likert scale data analysis, the table below illustrates the results of the scale based on what issues each interviewee felt was most important to cover [77,78,79,80]. Each issue is rated from 1 to 5, 5 being the most important and relevant [29,30,31,32,34,35]:

Table 1 shows that privacy and security issues tallied up the most points with 22 points out of 25. The runner-up is mental health issues with 21 points, followed by the lack of regulation with 17 points, while spread of misinformation comes in close with 15 points. Power abuse came in last with 10 points out of 25. In total, the majority feel like there are dangers and concerns that come with accepting Metaverse with 68% of the votes [36,37,38,39].

As for the interviews (To read full interview, see [Appendix: Interview Questions](#)), the following are some of the highlights of each interview and how they are provided as proof to the research's claims [41,41,42]:

- **Businessman:** "Metaverse is a great opportunity for small and big businesses alike, but only if security and privacy was a priority in Meta which is why I am giving it a 5. With lack of privacy and constant security issues, it could jeopardize the business." [43,44,45].
- **Student:** "From my personal experience with other Meta applications, the lack of regards to mental health of its users and lack of regulation truly and tremendously affects the users in the worst possible way." [46,47,48]
- **Parent:** "The concept of Metaverse scares me... Not for my sake, but my children's. I don't want them being exposed to a space that is known to put its users in harm's way from the lack of security to not stopping kids from being bullied and harassed online." [81,82,83]
- **Streamer:** "I am a big advocate for mental health awareness, but if we were to talk about my *professional* life and how Metaverse influences it, then I would say my biggest concern would be the privacy and security issues, along with the lack of moderation."
- **Influencer:** "Oh security and breach of privacy is definitely my major concern! I cannot afford the risk of having my information getting leaked, specially not when I use the platform as my sole source of income."

## VI. DISCUSSION

The results of the Likert scale and the interviews have supported the research's claims as they all indicate that there are major issues that comes with entrusting information and using Metaverse. The most common concern that the interviewees believed would be the most dangerous was the privacy and security issues in Meta, followed by the negative impact of the Metaverse can have on the user's mental health. Although, the other factors should still be taken into consideration such as the lack of regulation as it can related to mental health *and* security issues, along with the power control issue and spread of misinformation [49,50,77,78,79,80].

Interviewees	Power Abuse	Spread of Misinformation	Mental Health Issues	Privacy and Security Issues	Lack of Regulation (i.e. cyberbullying)	Total
Businessman	4	4	2	5	1	16/25
Student	1	2	5	3	4	15/25
Parent	2	2	4	5	5	18/25
Streamer	1	3	5	4	4	17/25
Influencer	2	4	5	5	3	19/25
<b>Total</b>	10	15	21	22	17	85/125

*Table 1 privacy and security issues.*

The only downside, or weakness, of this method of collecting data is the number of interviewees and the chances of them having similar worries and concerns. It is important to note that every individual is different and not one person can have the same opinions as others. For example, just because the parent in this interview viewed the lack of security to be their main concern and the chances of their children getting cyberbullied does not mean every other parent will feel the same way. Some may find the spread of misinformation more harmful than the lack of moderation, and so on and so forth.

Regardless of the slight flaw in the interview's biasness and coincidence, the results still stand and it confirms the claims made earlier on: Metaverse *is* a dangerous space when it comes to the issues concerning security and privacy, mental health and lack of regulation. Whether it is a concern to the users or not, making sure the users are safe and protected is still the most ethical thing to do in Meta's part.

#### VII. CONCLUSION & FUTURE WORK

In conclusion, the results from the interviews and other studies and articles have confirmed the research's initial statement that the Metaverse does and will have negative impact on human society. With the track record of the company and constant allegations and scandals, it is evident that simply rebranding to Meta will not cut it. In order to attain the trust of their customers, Meta has to repolish and rebuild their internal systems and get their moral compasses in check when it comes to situations with ethical dilemmas. The results can help improve the research by focusing on the common thread of issues (i.e., Meta's lack of care for customer safety and privacy) and do more intensive research on how tech-companies can improve with their security systems.

If we had more time, we would conduct more interviews and surveys amongst people from different countries and continents who are familiar with Meta applications, as well as reach out to victims of Facebook and Zuckerberg's scandals to further understand and learn their point of views and how the lack of security has affected them. The limitations faced during this report includes time constraint, page count constraint and subtle biasness when it comes to picking out the interviewees. The first two can be resolved by extending and expanding the requirements for the report from the University, or request an approval to continue the research as a solo project – which then would allow us to have the time and resources to reach out to more people for data and information.

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