iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 12 **Issue:** III **Month of publication:** March 2024

DOI: https://doi.org/10.22214/ijraset.2024.59639

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 12 Issue III Mar 2024- Available at www.ijraset.com

An In-Depth Exploration of the Metaverse and Its Effects on Humanity

Govind Vishwakarma
Sonopant Dandekar Arts, V S Apte Commerce & M. H. Mehta Science College Palghar

Abstract: ***Thanks to their revolutionary developments, Virtual Reality (VR) and Augmented Reality (AR) have revolutionised the technological landscape and captured the attention of people worldwide. These technologies have paved the way for a plethora of forthcoming innovations that will find widespread use in various domains to improve user experiences. As time goes on, more and more firms are incorporating these innovative technologies to improve their goods and services. The "Metaverse" idea has gained traction in mainstream media, which has led to an extraordinary increase in interest in VR and AR recently. The active pursuit of metaverse development by major corporations indicates a notable shift in focus. This review aims to clarify the notion of the metaverse, trace its historical origins, and investigate its benefits. It attempts to dispel people's doubts about the metaverse and provide insight into its possible effects on people's mental, physical, and psychological health through a comprehensive survey. This paper's analysis is a useful resource that provides insights to help people get ready for the implications of these new technologies. It also offers companies guidance in their quest to create seamless metaverse environments.***
Keywords: Virtual Reality, Augmented Reality, Technologies, Metaverse, Virtual Environment, Artificial Intelligence.

I. INTRODUCTION

The Metaverse is a virtual environment that skilfully combines fantasy and reality. It creates a different universe where users can explore new experiences by assuming virtual identities using a variety of current technologies. By combining the prefix "meta-" (which denotes transcendence) with the word "universe," the term "Metaverse" refers to a synthetic setting that is inextricably linked to the real world [1]. Users can perceive a virtual landscape and immerse themselves in captivating experiences by using virtual reality headsets or augmented reality goggles. Lately, the idea of the Metaverse has attracted a lot of attention from around the world, leading many businesses to create a new storyline in an attempt to build their own metaverses and provide customers with engaging and engaging experiences. The Metaverse offers businesses and enterprises an exciting tool for delivering interactive services, in addition to improving virtual interactions for individuals. It transforms virtual communication and offers an incredible platform for meetings, gaming, travel, adventures, and more. But this increase in Metaverse adoption raises an important question: do we really understand the potential psychological and physical effects of the Metaverse on our individual lives, and are we really that close to fully embracing it? This research paper's later sections will go into greater detail to clarify the theoretical underpinnings of metaverses while also illuminating their psychological, mental, and physiological effects. The findings of this study are intended to improve consumer perceptions of the threats associated with the Metaverse and advance our understanding of the Metaverse from their point of view. Companies that want to understand and solve problems can benefit from this information, which can help to create perfect metaverse environments.

II. LITERATURE SURVEY

Metaverse (2.1. 1e). Ever since Tim Berners-Lee [3] created the World Wide Web (www) [2] in 1989, the Internet Developments in Human-Computer Interaction Volume 2022, Page 11; Article ID 3247060 The evolution of https://doi.org/10.1155/2022/3247060 has been exponential. The "Metaverse" is a more modern invention that makes use of the Internet. Author Neal Stephenson [4] first mentioned it in his science fiction book Snow Crash [5], [p. 26], published in 1992. Stephenson coined the term "metaverse" in his book to refer to a computer-generated three-dimensional world that is seen through goggles [5], [p. 31]. The word "metaverse" is formed by combining the word "universe" with the prefix "meta," which suggests transcending. Second Life, the first online virtual world, was designed and developed in 2003 by Phillip Rosedale and his colleagues at Liden Lab. [6]. Ever since, advancements in the virtual realm have persisted in their evolution. Following the invention of Blockchain Technology [7] in 2009, Decentral and [8] made use of the technology to establish a decentralised virtual world website in 2015. The following year, in 2016, Niantic launched Pok ¨mon ´ Go, a virtual environment overlaying a real-life setting, for mobile devices globally in partnership with Nintendo and the Pokemon Company [9].

The release of Epic Games' Fortnite [10] signalled the beginning of the metaverse's ascent to prominence and set the stage for online performances and tours, opening up a world of limitless opportunities. Owing to the COVID-19 global pandemic [11], Lockdowns were imposed in every nation to stop the virus's spread [12]. Consequently, all events—such as lectures, conferences, meetings, consultations, and more—were moved into Researchers are therefore strongly motivated to explore the virtual world and evaluate the efficacy of virtual communications as a result of the virtual sphere. As a result, the demand for virtual platforms with a small but active user base skyrocketed, sparking in-depth study into augmented and virtual reality as well as the potential of metaverses. Mark Zuckerberg recently released a press statement discussing the rebranding of Facebook's parent company to "Meta releases, interest in the metaverse increased dramatically. The spike in metaverse-related searches is shown in Figure 1, which was obtained from Google Trends Data [15]. Numerous other businesses have also indicated interest in building and developing their metaverse, including Nvidia, Unity, Roblox, Tencent, and many more. The available metaverse information in the aforementioned sources focuses on describing metaverses and their advantages, However, the risks associated with excessive metaverse use for people's mental and physical health remain poorly understood. Consequently, there was a growing demand for this study because it's important to comprehend the disadvantages of metaverses before people start utilising them. Inspired by [16], Figure 2 shows the chronology of events that culminated in the creation of the metaverse.

2.2. Virtual Reality (VR). With the aid of various VR devices, users can interact with a simulated virtual environment through the use of a graphical user interface (VR). It employs the ideas of the 3D graph, high-resolution display technology [18], and multisensory interaction technology [17] to create a virtual environment that simulates a 3D environment [19]. Users interact with a virtual environment that is so immersive that it produces a surreal experience, leading them to believe that they are physically present in the simulated world and that all of the interactions occurring there are happening in real time. Virtual reality technology makes use of specially made input devices, such as wired gloves, body suits, VR headsets, 360 VR treadmills, wands, and motion trackers, which replicate user movements within a virtual environment. Virtual reality (VR) technology has been widely used by the gaming industry since its launch to produce exciting games, including Second Life [6], Batman: Arkham VR [21], Half-Life: Alyx [20], and many more. As demonstrated by [22–25] and [26], these technologies are gradually being introduced to help in the fields of sports, mental health therapy, medical training, education, and the military after demonstrating their viability in the gaming community. correspondingly. A concept sketch of the VR headset, which is needed to see and interact with the virtual world, is shown in Figure 3 below.

2.3. The third is augmented reality (AR). As opposed to VR, which mimics a Augmented Reality (AR) is a virtual environment that uses computer-generated graphics to enhance and enhance real-world objects, creating an interactive user experience. The most well-known application of augmented reality in the modern era is the phenomenon known as Pokémon Go [9], a Niantic game [27]. It gave users the ability to explore their city and catch Poke´mon, virtual animals that spawn in their actual surroundings. Through a display, augmented reality (AR) allows users to see real-world objects come to life in a holographic fashion. It is possible to scan and view objects. via a smartphone or even AR smart glasses that have been specifically designed [28, 29]. With the aid of these tools, a user can engage with an actual object as though it were alive. As shown in Figures 4 and 5, the user obtains all the information about the object they view once it has been viewed. To sum up, the metaverse is the result of the fusion of technological, cultural, and economic factors, and it has the power to change the way people engage with technology and one another. Its revolutionary influence extends to a variety of fields, including urban planning, healthcare, and education in addition to entertainment. But in order to fully utilise the metaverse, difficult issues pertaining to technology, morality, and society must be resolved. We can bring the power of the metaverse to bear in building a more just, inclusive, and sustainable future for humanity through promoting interdisciplinary collaboration, ethical innovation, and inclusive design principles.

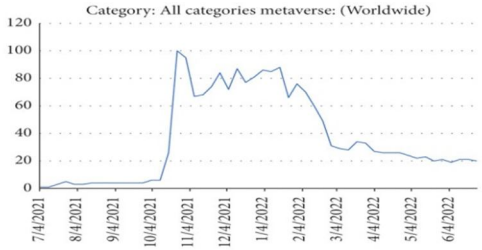


Fig.1. A graph showing how many searches for "Metaverse" there were on Google over the previous 12 months. This data can be found in [15] and was obtained from Google Trends Data. (e)October saw a sharp rise in searches as a result of press releases from Microsoft and Facebook.

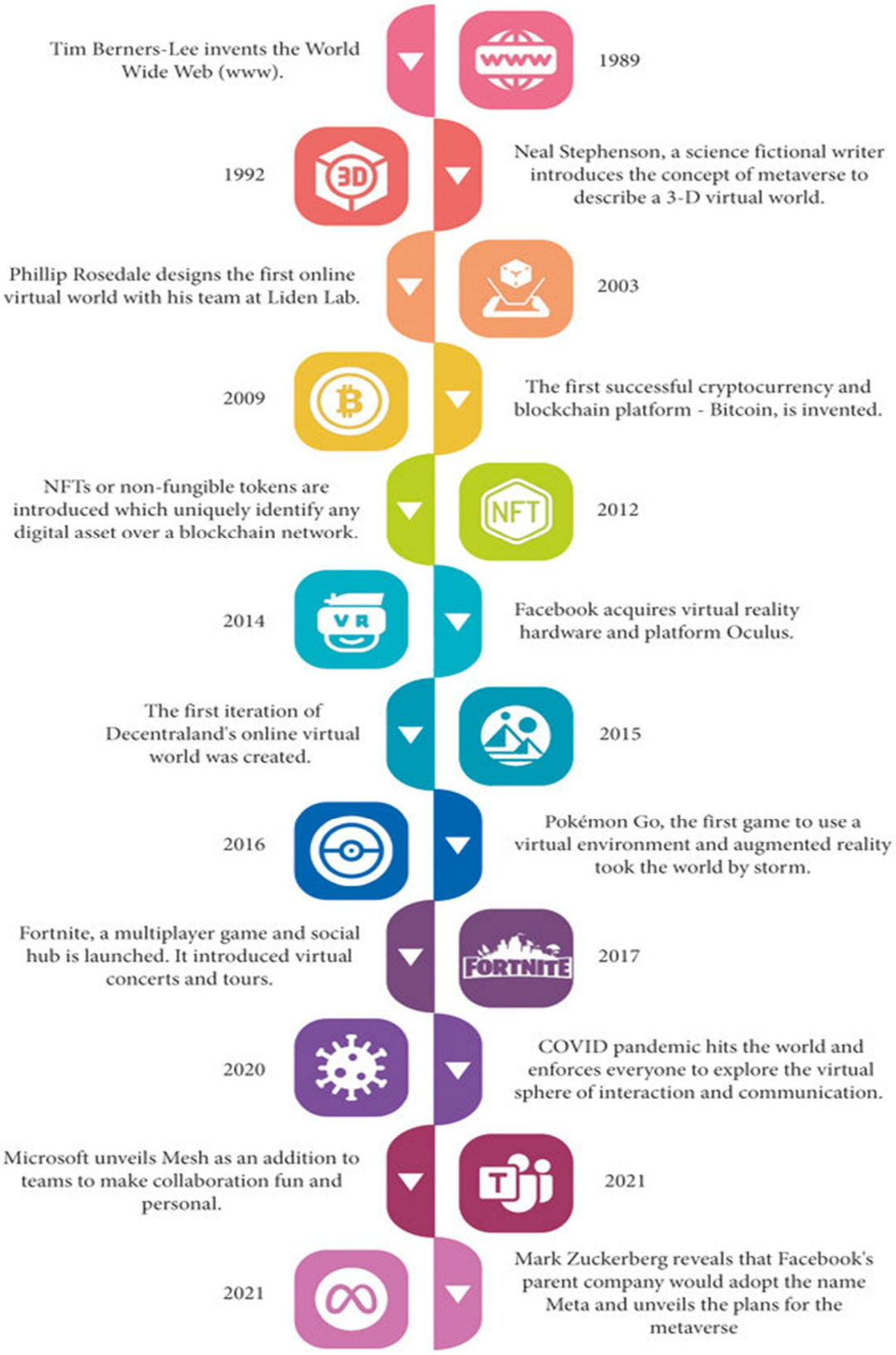


Fig.2. Historical occurrences that paved the way for the metaverse's creation

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 12 Issue III Mar 2024- Available at www.ijraset.com

III.RESULT

A. *Results of Research*

1) The Metaverse's excitement. In the course of the survey, the participants were asked if they found the idea of the metaverse exciting. A majority of the responses, or 57% of the sample, indicated that they would be enthusiastic about exploring a virtual universe, as shown in Figure 10. There may be a variety of causes for this. Furthermore, of the 250 responses, 31% were unclear as to whether or not it excited them. Just 12% of respondents said they were not excited about the idea of a metaverse, which suggests that they either didn't understand it or had reservations about it. could have a significant impact on how people act, present themselves, and conduct conversations when they are face-to-face.

2) This effect is evident in the social media platforms that are currently in use; while they facilitate virtual connections and socialisation, some people argue that they also encourage antisocial behaviour. Individuals find it easier to converse virtually online but find it more difficult to communicate in person. Along with 47% of respondents, about 38.2% of people thought it might be possible for interactions between people in a metaverse to be negatively impacted. Just a tiny percentage of respondents to the survey (14.3%) thought there would be no impact of metaverse on interpersonal communication.

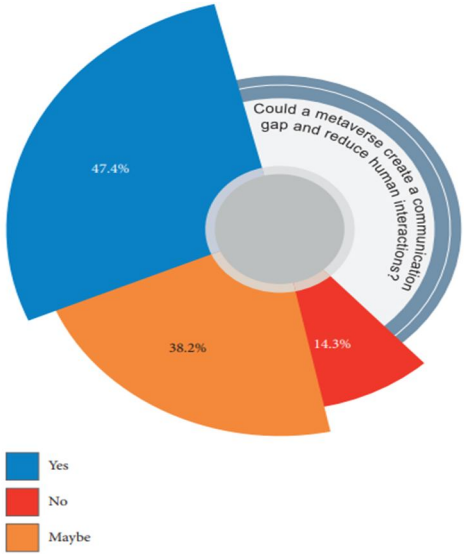


Fig.3. An overview of the answers given to the question of whether or not a metaverse would hinder communication and decrease in-person interactions.

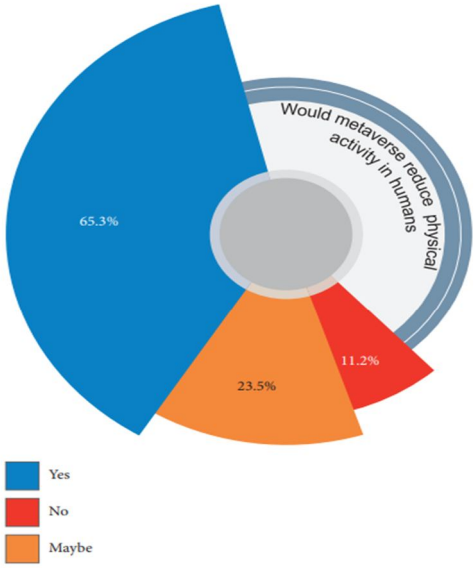


Fig.4. An overview of the answers given to the question of whether a metaverse would make people less active.

3) People Engaging in Less Physical Activity. There is a strong correlation between a metaverse and a virtual universe that lets you experience different locations and activities without having to physically go out in the real world. potential that it might have an impact on people's physical activity. Individuals would be more confined to their houses or rooms, which would reduce their propensity to engage in physical experiences like going for an evening stroll outside. When asked during the survey, a sizable percentage of participants (65.3%) concurred that there would be a decrease in human physical activity in a metaverse. (Figure 12). It brings up a significant health concern because the absence of physical In the long term, activity can be extremely detrimental to people. Businesses building metaverses must act responsibly to prevent this outcome. Individuals who use it also need to monitor their health and how much time they spend in the metaverse. Drawing a thin line between the two worlds is necessary to allow people to lead healthy lives.

4) Will Abuse and Harassment Increase in the Metaverse? Since the early days of social media, there has always been serious concern about online bullying and harassment. media. No matter how hard the companies try to stop the problem, abusers always find their way back to these platforms. This raises the question of how businesses intend to keep an eye on these problems in the metaverse, where users would actually spend a lot of time and have more intimate experiences. When we asked respondents to the survey whether they thought a metaverse would serve as a New Haven for abusers and lead to more online harassment and abuse, we got an unexpected response: only 36.3% of respondents said they thought so. to the problem. 41.4% of respondents believe that this could happen and make cybercrimes worse. Of those who answered the survey, 22.3% disagreed with this assertion (Figure 13).

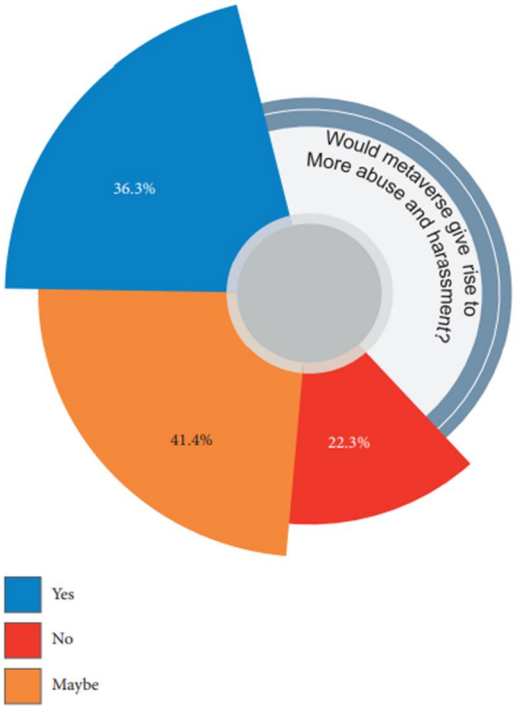


Fig.5. An overview of the answers given to the question of whether a metaverse would make the issue of online harassment and abuse worse.

B. Adverse Effects of the Metaverse.

A metaverse has many uses, but it is far from ideal, as was evident from a close examination of the survey results. Customers have numerous worries about the potential impact of metaverses on their lives. Health experts who offered a deeper and more comprehensive understanding of how these concerns were pertinent and significant for people's health and wellness also validated these worries.

The various difficulties presented by metaverses and their detrimental effects on people are explained in the section that follows. To build a faultless metaverse, these challenges must be addressed by metaverse developers, who also need to include a sound solution. The issues that are presented in this section will enable us to understand the impact.

1) Insufficient face-to-face correspondence. As was already mentioned, during the COVID-19 pandemic, individuals were restricted to a small area of their own houses or rooms and were required to work, learn, and communicate exclusively virtually, avoiding any face-to-face interactions. Individuals began utilising video conferencing apps such as Zoom, Microsoft Teams, Cisco WebEx, People's confinement to virtual communication during the pandemic and their exposure to the virtual world has already resulted in a significant communication gap between people. People have become more aloof from face-to-face interaction as a result, which could have negative long-term effects. Nowadays, people are less likely to start or maintain in-person interactions but are more willing to engage in fictitious interactions in virtual environments. Although a metaverse might seem like a more appealing alternative to virtual communication, in-person interactions are sacrificed in the process. People who spend a lot of time in a metaverse may become disconnected from real-world interactions, which could lead to major mental health issues. The decline in human-to-human interactions is a serious danger to our future. who would worsen mental health conditions and be more drawn to their virtual bubble.
2) Dependency on the Virtual World. According to the well-known adage, "necessity is the mother of all inventions," people are prone to embracing new technologies that offer a better way of doing things or a fresh approach to solving problems. Over time, people's inclination to embrace new ideas and apply them to their everyday lives has altered how they think and behave. To help visualise things better, let's use smartphones as an example. For a variety of reasons, people's reliance on smartphones has grown. The same smartphones were considered a luxury a while ago. These days, the majority of people consider smartphones to be essential, as their reliance on them has increased dramatically. Many of the smart devices on the market exhibit a similar trend. While smartphones are incredibly useful for people, the Being overly reliant on anything is alarming. The same issue may soon apply to metaverses. Considering that a metaverse might be an open universe with countless options, individuals choosing to make the altered reality their new home could be a future issue. There is a significant likelihood that individuals may acquire a dual or pseudo personality. There are moments when it seems as though there is a stark contrast bridging the real and virtual worlds. For instance, if someone is grieving in the actual world, but has a positive world in virtual space; the mental impact of this difference between the two worlds may be profound. As a result, it's critical to either reduce the chance of developing this dependency or use it in a way that won't be harmful to the mind.
3) Lack of Physical Activity. Through the use of cutting-edge virtual reality technology, metaverses, like the one depicted in Figure 14, could allow users to engage in any kind of activity inside the actual virtual environment. These could be a boxing match with the legendary Mike Tyson, a long evening stroll with friends, or even a virtual game of cricket. People who would rather spend more time in a virtual setting than in the real world would be drawn to the immersive revolution [39]. Mobile phones are a good example, as they have already decreased children's physical activity. Nowadays, instead of playing outside in a park, kids would much rather play mobile games. Their health is seriously harmed, and there may be long-term consequences. The idea of virtually travelling to any location in the world without ever leaving the comforts of one's own room is also combined with metaverse. Technology used in the metaverse provides a captivating and engaging experience, but at the expense of having users experience everything in a constrained space. It could enclose its users in a virtual bubble, preventing them from engaging in any physical activity.
4) Cybercrime, Abuse, and Harassment. Social media has facilitated the connections between millions of people over the years. Despite all of its wonderful advantages, it has a notorious reputation for being a haven for harassment and abuse. This is due to a small number of miscreants who ruin the entire social the users' experience. The amount of cybercrime has increased to the point where a new department of crime had to be established. Technology meant to unite people will inevitably lead to abuse and harassment. Abuse and harassment would also increase in a metaverse because it is intended to be an immersive technological experience with a surreal feel. The metaverse may present a novel opportunity for online predators to intimidate and mistreat people. In the absence of strict measures to combat cybercrime, metaverses may prove to be fatal for individuals and cause or worsen mental health conditions in others.
5) Information and confidentiality. As global Internet users' concerns about their privacy and personal data grow, businesses are focusing on their Building user trust is another difficulty for metaverse. This is a major challenge because it's a major reason why social media is disliked by a lot of people worldwide. Despite the assurances made by companies regarding the security of their users' data, there have been numerous cases of data breaches. Numerous times, either on purpose or accidentally, user data has been compromised. Even some businesses use this data to boost their own profits. raises more questions about the strategy they would use to develop their newest technology, the metaverse. Because metaverses make use of augmented and virtual reality, users would develop into the virtual environment's data centre. As promised to users, every move they made, every interest they had, and even their location would be continuously monitored in order to give them an exciting social experience.

There would only be pseudo privacy with this extensive user tracking, and it's unclear how businesses would use this information.

IV. CONCLUSION

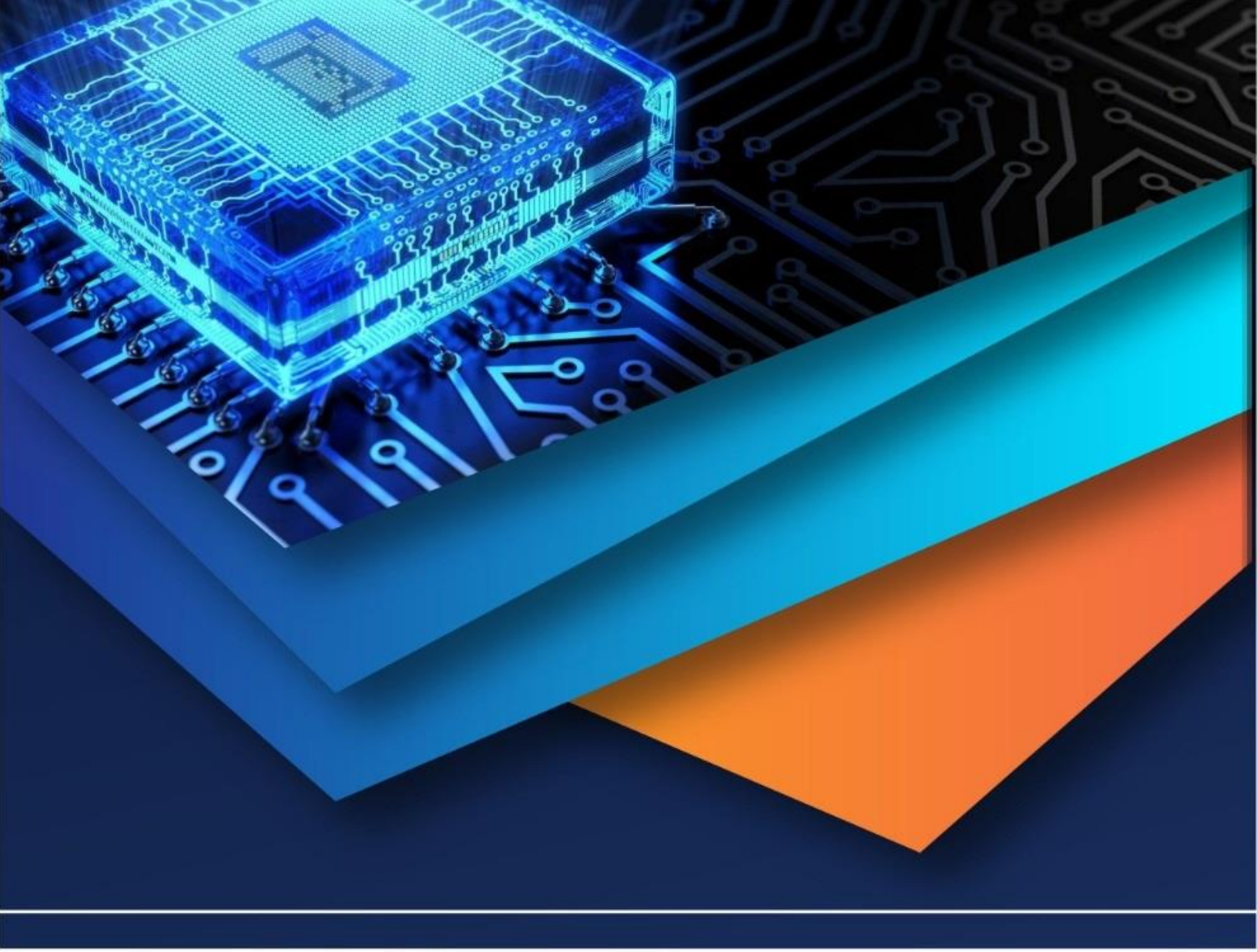
The term "metaverse" refers to a new concept that creates a sophisticated tool by fusing various technologies such as blockchain, augmented reality, virtual reality, Internet of Things, artificial intelligence, and telecommunication. Because it offers users a personalised and immersive experience, businesses are compelled to create their own metaverses and rethink how they interact with their clientele. But as the survey and medical professionals' views indicate, prolonged use of a metaverse can be harmful to one's physical and mental well-being.

Another argument is that metaverses are a relatively recent development in technology. Even mobile phones and cars were criticised at one point but ended up being very successful. That is to say, every new offering needs time to be understood and its fundamental principles instilled in people. Likewise, given their potential to revolutionise virtual communication, metaverses may someday prove to be an extremely useful tool. Metaverses are not perfect, just like any other scientific theory. Metaverses, however, are an innovative technology that has much to offer humanity. The fierce competition is another element that might hasten the metaverses' expansion. Numerous well-known businesses have already expressed their ambitions for a metaverse and shown a great deal of interest in the idea. This healthy competition to create the ideal metaverse may force businesses to proceed with greater caution in order to prevent mistakes when building their virtual worlds. As we have already seen, despite all its positive features, companies must work carefully and cautiously towards addressing the different concerns discussed earlier to dissolve any doubts in users. With the advent of Web 3.0, decentralisation, and blockchain technology, it will be interesting to observe which direction the development of metaverses takes in the future.

REFERENCES

[1] L.-H. Lee, T. Braud, P. Zhou et al., “All one needs to know about metaverse: a complete survey on technological singularity, virtual ecosystem, and research agenda,” Journal Of Latex Class Files, vol. 14, 2021.
[2] View at: Google Scholar
[3] S. Aghaei, M. A. Nematbakhsh, and H. K. Farsani, “Evolution of the world Wide Web: from Web 1.0 to Web 4.0,” International Journal of Web & Semantic Technology (IJWesT), vol. 3, no. 1, p. 1, 2012, Jan.
[4] View at: Publisher Site | Google Scholar
[5] S. S. McPherson and B.-L. Tim, Inventor of the World Wide Web, 2009.
[6] 2022, https://nealstephenson.com.
[7] S.. Neal, Snow Crash, Bantam Books, New York, NY, USA, 1992.
[8] 2022, https://www.secondlife.com/.
[9] M. Pilkington, “Blockchain technology: principles and applications,” Research Handbook on Digital Transformations, Edward Elgar Publishing, Cheltenham, UK, pp. 229–253, 2016.
[10] 2022, https://decentraland.org/.
[11] N. Niantic and The Pokémon Company, “Pokémon go,” 2022, https://pokemongolive.com/en/.
[12] “Epic Games, “Fortnite” Internet,” https://www.epicgames.com/fortnite/en-US/home.
[13] View at: Google Scholar
[14] World Health Organisation, “Coronavirus disease (COVID-19),” 2022, https://www.who.int/health-topics/coronavirus.
[15] D. Koh, “COVID-19 lockdowns throughout the world,” Occupational Medicine, vol. 70, no. 5, p. 322, Jul. 2020.
[16] View at: Publisher Site | Google Scholar
[17] L. Kim, “Facebook announces new name: Meta,” 2022, https://www.forbes.com/sites/lisakim/2021/10/28/facebook-announces-new-name-meta/?sh=2b44d9267f83.
[18] J. Roach, “Mesh for Microsoft Teams aims to make collaboration in the ‘metaverse’ personal and fun,” 2022, https://news.microsoft.com/innovation-stories/mesh-for-microsoft-teams/.
[19] Google Trends, “Google trends,” 2022, https://trends.google.com/trends/explore?q=metaverse&geo=IN.
[20] “CNBCTV18.com. “Explained: the history of metaverse,” 2022, https://www.cnbctv18.com/technology/explained-the-history-of-metaverse12015212.htm.
[21] I. García-Pereira, L. Vera, M. P. . Aixendri, C. Portalés, and S. Casas-Yrurzum, “Multisensory experiences in virtual reality and augmented reality interaction paradigms,” Smart Systems Design, Applications, and Challenges, IGI Global, Hershey, PA, USA, 2020.
[22] J. Xiong, En-L. Hsiang, Z. He, T. Zhan, and S.-T. Wu, “Augmented reality and virtual reality displays: emerging technologies and future perspectives,” Light: Science & Applications, vol. 10, no. 1, p. 216, Oct. 2021.
[23] View at: Publisher Site | Google Scholar
[24] B. Zhu, A. Song, X. Xu, and S. Li, “Research on 3D virtual environment modelling technology for space tele-robot,” Procedia Engineering, vol. 99, 2015.
[25] View at: Publisher Site | Google Scholar
[26] Valve Corporation, “Half-life: Alyx,” 2022, https://www.half-life.com/en/alyx.
[27] B. Warner and Interactive Entertainment, “Batman: Arkham VR,” 2022, https://www.warnerbros.com/games-and-apps/batman-arkham-vr.

[28] X. Liu, J. Zhang, G. Hou, and Z. Wang, "Virtual reality and its application in military," OP Conference Series Earth and Environmental Science, I, vol. 170, 2018.
[29] View at: Google Scholar
[30] Y. Qiu, Kai-Hu, and X. Luo, "Application of computer virtual reality technology in modern sports," in Proceedings of the Third International Conference on Intelligent System Design and Engineering Applications, Shanghai, China, 2013.
[31] Q. Wang, B. Kang, and P. O. Kristensson, "Supporting physical and mental health rehabilitation at home with virtual reality headsets and force feedback gloves," in Proceedings of theIEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops, Lisbon, Portugal, 2021.
[32] H. Motomatsu, "Virtual reality in the medical field," UC Merced Undergraduate Research Journal, vol. 7, 2014.
[33] View at: Publisher Site | Google Scholar
[34] R. Lege and E. Bonner, "Virtual reality in education: the promise, progress, and challenge," The JALT CALL Journal, vol. 16, no. 3, pp. 167–180, 2020.
[35] 2022, https://nianticlabs.com/en/.
[36] S. Ryu, "Virtual reality head-mounted display concept," 2015, https://www.behance.net/gallery/29690951/Virtual-Reality-Head-mounted-Display-Concept/modules/191270123.
[37] https://www.freepik.com/macrovector.
[38] https://www.freepik.com/free-vector/shopping-with-virtual-augmented-reality-apps-realistic-composition-with-holding-smartphone-hand-choosing-sportswear_7378412.htm.
[39] https://www.freepik.com/free-vector/augmented-reality-concept-with-smartphone-car-interior-realistic-illustration_13804139.htm#query=augmented%20reality%20mobile&position=15&from_view=keyword.
[40] Google Earth, 2022, https://earth.google.com.
[41] https://www.vecteezy.com/vector-art/3330589-vr-tourism-to-the-beach-concept.
[42] "Microsoft ignite," 2021, https://www.youtube.com/watch?v=PraEcNDGSqY.
[43] https://www.freepik.com/free-vector/woman-vr-glasses-with-virtual-nature-stationary-bikeisometric-composition-purple_7499011.htm#query=vr&position=35&from_view=author.
[44] https://opengeekslab.com/blog/benefits-virtual-reality-in-education.
[45] A. Alaraj, M. Lemole, J. Finkle et al., "Virtual reality training in neurosurgery: review of current status and future applications," Surgical Neurology International, vol. 2, no. 1, p. 52, 2011.
[46] View at: Publisher Site | Google Scholar
[47] Lenskart, "Lenskart virtual AR experience: buying eyewear online just got easier," 2021, https://spectacular-blog.lenskart.com/spectacular-blog-lenskart-com-basic-guide-touse-lenskart-virtual-ar-tool/.
[48] https://www.freepik.com/free-vector/vr-sports-isometric-concept-with-virtual-reality-equipment-home-gym-martial-arts-games-isolated_7499008.htm#page=2&query=vr&position=1&from_view=author.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY