

The Metaverse: Exploring Its Uses, Applications, and Drawbacks

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I. INTRODUCTION

“Hype? Hope? Hell? Maybe all three. Experts are evenly split about the likely evolution of a truly immersive ‘metaverse’. They expect that augmented and mixed reality enhancements will become more useful in people’s daily lives” (Anderson, & Rainie, 2022, p.1). The concept of the metaverse has garnered significant attention in recent years, capturing the imagination of technologists, entrepreneurs, and enthusiasts alike. This virtual realm, which blends the physical and digital worlds, holds promise for a wide range of uses and applications. However, as with any groundbreaking technology, it also brings with it a set of potential drawbacks that need to be carefully considered. In this essay, we will delve into the uses, applications, and drawbacks of the metaverse, shedding light on its potential impact on society. People talk, discuss or often debate if not disagree about metaverse and Artificial Intelligence, in short AI. What is interesting is that the ones who are against or in disagreement, they are the ones who sue it quite a lot. Research shows that the more affluent people and communities are, the less enthusiastic and involved with metaverse they become. Metaverse is the evolution and novel consequence of internet. It is the virtual experience that allow users to interact, communicate on virtual environments, and experience multi-sensory interactions with other users, in many ways such as Facebook, which is the social platform of metaverse; Roblox, Fortnite and Minecraft which are video games in the metaverse; Sandbox which is a real estate component of metaverse (Mystakidis, 2022).

Although most associate metaverse with Facebook and Instagram, the reality is that many other corporations such as Microsoft, Google, Nike, and Apple engage in activities utilizing and applying metaverse functions. For example, Microsoft has designed and activated the game Activision Blizzard, which is a video game which specializes in the metaverse allowing of having an investment of more than 68 billion US Dollars. At the same time, Apple is in the Research and Development of new Artificial Reality glasses. Meanwhile, Nike collaborated with Roblox to create the Nikeland, which has Avatars as the main characters playing sports in residential areas. (AIU, 2023). What is Metaverse? “It represents a convergence of digital technology to combine and extend the reach and use of cryptocurrency, artificial intelligence (AI), augmented reality (AR), virtual reality (VR), mixed reality (MR), spatial computing, and more” (McKinsey, 2022, paragraph 4). Artificial intelligence (AI) is software and hardware systems which are designed to “act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal (Samoili, Cobo, Gómez, De Prato, Martínez-Plumed, & Delipetrev, 2020, p. 9).

AI methods may adjust their behavior through the process of environment analysis of the current state of the environment or how it is affected by various actions and changes as well as the use of symbolic and/or numeric models, applications, and rules (Samoili, Cobo, Gómez, De Prato, Martínez-Plumed, & Delipetrev, 2020). Augmented Reality (AR) uses technology in order to add or increase an individual’s interpretation on reality through a computer-generated representation while being “physical and virtual” at the same time. AR uses 5G as well as cloud storage which allows it to deliver huge volumes of data while delivering a virtual experience which simulates realistic outcomes (McKinsey & Company, 2022). Virtual Reality (VR), contrary to AR, does not replicate the physical world. Contrary, it uses computer-generated images, although the interaction that takes place, assimilates real world examples (McKinsey & Company, 2022). Mixed Reality (MR) is a combination of components arising from both the AR and VR where users can interact and network between the real and the virtual worlds and environments (McKinsey & Company, 2022). Metaverse stretches above and beyond the perception of people that it is a place where they meet and interact, online. Additionally, it is characterized by three features, which are: a sense of immersion, real time interactivity, and user agency, while it includes platforms and devices that function in alignment, the ability of numerous hundreds of individuals, collaborating simultaneously and the availability of uses and applications which is endless and far beyond gaming (McKinsey, 2022). Metaverse has many applications and uses. It is undoubtedly more than one platform or one application.

Therefore, it would be inaccurate to ponder that one definition will express, define, and describe the spectrum of metaverse in its entirety (Buchholz, Florian, Oppermann, Leif and Prinz, Wolfgang, 2022).

II. USES AND APPLICATIONS OF THE METAVERSE

A. What does Metaverse consist of?

Metaverse is comprised of ten different tiers which fall under four categories: content and experiences, platforms, infrastructure and hardware, and enablers.

1. Content and experiences have the following subcategories or tiers:

- a. Content which is generated by creators, developers, and users to develop and enhance metaverse practices.
- b. Applications which are connected to exclusive metaverse situations and uses such as education or events.
- c. Virtual worlds which are groups of users who connect to interact and perform.

2. Platforms fall under two subcategories:

- a. Platforms which enable the access and location of relative content, practices, and functions to users.
- b. Platforms which are designed by developers to instigate 3D experiences to users.

3. Infrastructure and hardware:

- a. Individuals interact in the metaverse through personal devices such as laptops, operating systems (OS), and accessories which are designed to give relative access.
- b. Metaverse is designed with the relative infrastructure which can be the cloud computing software, various networks, and so on.

4. Enablers

- a. Privacy, security, and governance are significant for metaverse to function securely and fairly for all users.
- b. Tools and applications which are available to manage and dictate user digital identity.
- c. Tools available for payments of services on the metaverse cloud (McKinsey & Company, 2022).

Immersive Gaming and Entertainment: One of the primary uses of the metaverse lies in its ability to modernize the gaming and entertainment platforms and industries. Already, the emergence of virtual reality (VR) and augmented reality (AR) games offer players immersive experiences unlike any precedence. These experiences extend beyond traditional gaming, allowing individuals to fully engage themselves in dynamic, interactive worlds. The metaverse could steer in a new era of gaming, blurring the lines between reality and virtuality. The first computer games were first introduced in the 1970s. Since then, they have undergone transformational changes as well as the level that they impact people's lives and the level of involvement during their leisure time has increased to colossal numbers. Although there is lack of consensus on the level of engagement in gaming by different ages of users, many researchers agree that engagement is considered as a synonym for enjoyment in the gaming world (Boyle, Connolly, Hainey, & Boyle, 2012).

Remote Work and Education: Remote work was greatly affected by COVID-19 and has increased considerably in some countries like the USA by as much as 50%. Even though there were the researchers who were skeptics regarding the fact that the level of productivity of remote work would decrease, research findings and data analyzed present quite the contrary (Ozimek, 2020). Moreover, metaverse has the potential to reshape remote work and education. With the rise of flexible work arrangements, virtual office spaces within the metaverse could replicate physical workplaces, cultivating teamwork, creativity, and engagement. Similarly, during the global pandemic educational institutions were called upon to switch from face-to-face instruction to virtual teaching and learning. "All educators were to conduct synchronous and asynchronous instructional meetings with their students to deliver content, according to the curriculum as well as, scope and sequence, per grade level and subject area", often challenged by the degree of accessibility, the quality of connectivity, and the level of digital literacy capability of the individual student and teacher (Green, Burrow, & Carvalho, 2020; Grigoropoulos, Arnold, & Rocha, 2021, p. 370). This collective experience that educators underwent globally could influence the metaverse designers to create immersive learning environments, enabling students and their educators to explore subjects age and level appropriate, through interactive replications and practices.

Social Interaction and Collaboration: Another captivating application of the metaverse is its potential to redefine social interaction and collaboration. Virtual reality platforms such as Facebook's Horizon Workrooms showcase the power of shared virtual spaces, where people from across the globe can convene, collaborate, and engage in meaningful and purposeful discussions. This not only transforms the way we conduct business meetings but also offers an innovative way to connect with friends and family, bridging geographical distances. Moreover, real-time multisensory social interactions (RMSIs) are new approaches to connect people in real time through avatars, synchronously while involving multi-sensory engagement contrary to the 2D involvement of Zoom and Skype (Van der Land, Schouten, & Feldberg, 2011).

III. DRAWBACKS AND CHALLENGES

“The metaverse ensures a digital environment with a shared, open, and durable connecting communities, manufactured goods, digital solutions, content creators, user entertainment, workplaces, e-commerce, and a variety of other human real-world elements” (Jaber, 2022, p. 4).

A. Privacy Concerns : As with any digital environment, the metaverse raises serious concerns about privacy. Users' interactions within the metaverse can be monitored, evaluated, and theoretically manipulated driven by unlawful intentions and for several reasons. The accumulation of enormous volumes of personal data within this digital terrain requests for vigorous and thorough privacy measures in order to safeguard individuals' rights and that the latter are regarded while protected. Privacy concerns include but are not limited to security risks, identity theft, and personal data extraction (Jaber, 2022).

B. Addiction and Mental Health : The captivating nature of the metaverse could possible and eventually lead to addiction, affecting the individuals in their mental health and well-being. Being exposed to virtual reality and environments for extended periods of time, may disconnect individuals from their physical surroundings, including family and friends. This may result in a loss of real-world experience and relationships. Facing and tackling these addictive inclinations while fostering a healthy balance between the virtual and the physical worlds is significant for an individual's health and happiness (Bojic, 2022).

C. Digital Divide : The metaverse holds the promise of a technologically advanced future. However, it also highlights the digital divide that exists in society, further enhancing the social divide. Accessibility to the metaverse requires high-speed internet, advanced devices available, as well as financial resources to assure availability. Inadequate attention to tackle this divide, may intensify prevailing imbalances, making the marginalization more acute the ostracizing the individuals who have scarcity of resources allowing them to access the necessary tools and infrastructure (Zhai, Chu, Chen, Shen, & Lou, 2023).

IV. FUTURE IMPLICATIONS AND CONSIDERATIONS

What are the technological advances that will drive the development of the metaverse?

Rapidly evolving technological developments undertake the potential to release future metaverse practices and interoperation and interoperability between the two worlds: the physical and the virtual ones in the following ways:

1. The extensive usage and functioning of 5G helps and guides users to process large volumes and operations on their mobile devices.
2. Back-end operations extinguish limiting barriers while enabling users to create more advanced applications and games reaching larger audiences, experiencing fully engaging practices and outcomes.
3. Edge computing will drive the power needed for the metaverse to operate, while allowing data to be consolidated, saved, and managed within the device's available capacities and storage and instead off in the cloud. Meanwhile, this process solves bandwidth challenges, as well.
4. Hardware devices are designed in such a way that they can accommodate the applications of the physical and the virtual worlds.
5. In addition to the hardware developments, software innovations guided the metaverse application to the top of the foundations of technological advances.

As the metaverse continues to evolve, its impacts on society will become more pronounced. To harness its potential while mitigating its drawbacks, several considerations must be considered:

A. Ethical Frameworks: Ethical Frameworks are critical, which includes forming procedures for data privacy, user consent, and responsible content development and creation.

B. Education and Awareness: Education and awareness about the metaverse's benefits and risks, is crucial.

C. Inclusivity and Accessibility:

The digital divide banishment is of utmost priority. Initiatives that guarantee access to the metaverse for underserved communities and individuals can assist in the prevention of imbalances and discriminations while promote an inclusive technological potential for all users (Bojic, 2022; Jaber, 2022; Zhai, Chu, Chen, Shen, & Lou, 2023).

V. CONCLUSION

“New technologies are emerging at a fast pace without being properly analyzed in terms of their social impact or adequately regulated by societies. One of the biggest potentially disruptive technologies for the future is the metaverse, or the new Internet, which is being developed by leading tech companies. The idea is to create a virtual reality universe that would allow people to meet, socialize, work, play, entertain, and create” (Bojic, 2022, p. 1). The metaverse is defined through the description of its characteristics. In other words, it is a combination of the virtual and physical worlds, it is a social medium where people meet, interact, communicate, collaborate, and share engagement and enjoyment, it is a multi-modal participation medium where users may even change their appearance and become avatars, while all these actions and reactions can be interchanged between the digital and real worlds, influencing their outcomes (Buchholz, Florian, Oppermann, Leif and Prinz, Wolfgang, 2022).

Metaverse is here to stay although there is extensive skepticism as to its applications and effects of people's lives. However, the ongoing technological advances and the investments on the metaverse infrastructure show that it is only going to be involved and entangled in more and more aspects of the users' lives. Moreover, online commerce and marketing is becoming mainstreamed through metaverse, while the content and population reach is customer driven taking into consideration the demographics of the individual consumer (McKinsey & Company, 2022). The metaverse stands as a testament to the rapid evolution of technology and its potential to reshape the physical and virtual worlds. Its applied uses and developed applications extend beyond gaming, social collaborations, remote work, as well as education. Nevertheless, it brings along obstacles and shortcomings, including privacy challenges, addiction threats and hazards, in addition to the digital divide, which may undermine the meaningful usage, as well as the necessity for meticulous contemplation and proactive actions and processes. By addressing these challenges and fostering an ethical, inclusive approach, users, developers, and administrators can pave the way for a metaverse that enriches everyone's life, while safeguarding the individual users' values and well-being.

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