Misconceptions of metaverse: from etymology to technology

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ABSTRACT

The emergence of the metaverse in society is followed by certain confusions, whereas the line between virtual reality and the metaverse remains unclear. Ironically, this has affected the development of the metaverse itself, focusing more on virtual reality while being one of its side components. This has led to the concept losing popularity compared to artificial intelligence technology. This research is a qualitative study that aims to explore the issues at the root of misconceptions and reconstruct the true meaning of the metaverse itself. This research indicates that the misconception already existed when the term was first used alongside virtual reality technology. The term "meta" refers to a higher reality, whereas the terms "digiverse" or "virtuverse" can be used, considering that the terms "digital" and "virtual" can refer to realities lower than the universe.
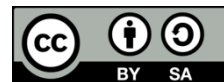
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1. INTRODUCTION

The COVID-19 pandemic has limited in-person interactions, which is one of the reasons why the recently established metaverse concept has gained a lot of attention in technical circles. Even on post pandemic, the Department desire among people to reduce direct physical interactions remains high, proofing that metaverse is still legible for potential. This was proof by the widespread belief among researchers that work can be more efficiently conducted from home through the mechanism of remote work or work from home (WFH) [1]. Nevertheless, this situation is not evenly distributed among all employees. In some cases, working from home actually leads to a loss of freedom in work and gradually diminishes its existence in the industry, meaning employees lose their social status in the workplace [2]. This certainly raises questions, considering that WFH is often perceived as a coveted work mechanism by the public, offering flexible working hours.

According to Jean-Paul Sartre, freedom is essential for humans. As stated, a free individual is someone who can organize, choose, and give meaning to reality [3]. Nevertheless, remote working forces people to confine their activities to their home and find themselves unable to experience the vast reality. Their reality is confined to six-square-meter spaces, as they can only interact with the outside world through two-dimensional media. Therefore, metaverse played an important medium to overcome this upcoming problem. Metamesta itself is popularized as a new generation of the internet, so the interactions within it are crafted to resemble those in the real world [4]. This has subsequently positioned the metaverse as something eagerly anticipated to address the shortcomings of virtual interactions previously faced by employees who were engaged in WFH.

At this moment, the popularity of metaverse has not yet reached its peak. Some European countries, such as Poland, France, Germany, and Belgium, are still unfamiliar with the metamesta concept. In several countries, the public is more acquainted with virtual reality (VR) technology compared to metaverse technology [5]. A different study also mentioned that media and researchers in South Korea are still mainly interested on specific areas of the metaverse, such as education, marketing, and the economy [6]. This indicates that the public's knowledge of the metaverse concept is not yet comprehensive. It is clearly shows in how communities are more familiar with the supporting technologies for metaverse, such as VR technology, and the implementation of it in specific sectors. This includes how these technologies assist humans in reducing direct interaction activities, both in education and the economy.

The desire to develop the metaverse for the benefit of the education and economic sectors must be accompanied by a profound understanding of the metaverse concept itself. The lack of familiarity with the metaverse concept, coupled with misconceptions about the metaverse in society, necessitates further exploration to provide explanations to the public regarding the definition of the metaverse and the evolving supporting technologies that accompany its increasing popularity. This article seeks to uncover the true meaning of the metaverse based on its developmental history and how the concept is manifested through the technologies that have matured in recent times. High reality, or what is better known as the fourth dimension.

Basically, there have been several studies that have attempted to research the concept of the metaverse, including studies on how the concept of the metaverse was first introduced in the novel Snow Crash [7]. However, these studies still focus on the initial definition of the metaverse and have not yet delved into the realm of etymological definitions or definitions based on the development of current technology [8]. Studies that define the metaverse based on current evolving technology are also highly diverse. These studies are not only based on technical aspects but also on other supporting aspects in constructing the metaverse [9], [10]. The research attempting to gather definitions from various experts has indeed been conducted, but there has not yet been further analysis regarding the misconceptions that arise and the possible reconstruction of meanings that may occur concerning the concept of the metaverse [11]. This research seeks to go further by connecting etymological definitions with definitions based on what was depicted when it first appeared in the novel Snow Crash, and also comparing it with definitions of the metaverse conceptualized based on the latest technological developments. The relationship between these three definitions will reveal any misconceptions that need to be corrected, in order to provide a comprehensive understanding of the metaverse concept.

2.   RESEARCH METHOD

In this study, to provide a thorough understanding of the metaverse concept, we used a three-stage comparative technique in conjunction with a systematic literature review (SLR) as the data collection method. The three main aspects are: tracing the historical timeline of the metaverse; interpreting word definitions from various sources; and comparing initial conceptions with current realities. The complex history of the metaverse concept is tracked from its earliest days to the present in order to understand its evolution. Significant milestones in its development are then highlighted, such as Neal Stephenson's conceptualization in the novel "Snow Crash" and the emergence of Second Life in 2003, up to recent efforts in developing more advanced and integrated metaverse platforms.

Finally, the concept of the metaverse is then reinterpreted based on definitions found in literature and other sources. Various definitions, including Stephenson's understanding, virtual reality (VR) technology, and related scientific literature, are then analyzed and compared based on similarities and differences. After that, relevant literature and case studies are then reviewed to highlight how this concept has evolved and changed over time. With this comparative approach, the research aims to provide a deeper understanding of the metaverse concept while also highlighting the disparities between expectations and realities in its development. Carefully selected references to support the comparative analysis have been included to ensure the accuracy and reliability of the presented information.

3.   RESULTS AND DISCUSSION
3.1. Misconceptions in the definition of metaverse

The current definition of the metaverse is a futuristic space that connects virtual, augmented reality, and blockchain. However, when viewed from an etymological perspective or the origin of the word, metaverse itself is derived from two words, where the term "meta" comes from the Greek language, meaning beyond, and "verse" represents the totality of something [12]. The word "verse" itself is often seen in the term "universe," so if we refer to its etymological aspect, the concept of the metaverse should ideally refer to a universe or reality that surpasses the universe we currently know. This implies that the concept of the metaverse does not solely originate from the novel "Snow Crash" but can be traced back much further, to around 10,000 years ago, when humans first held beliefs in alternate realities [13].

The concept of the metaverse, which introduces higher reality, or what is often known as the fourth dimension, has been a subject of interest for scientists and philosophers since ancient times. It is also stated in Plato's allegory that humans are trapped in a reality perceived through their senses until ultimately realizing that there is a truer reality beyond what meets the eye [14]. On the contrary, the use of the term "metaverse" itself is rather inappropriate when referring to man-made realities that are inherently more artificial compared to the reality created by God. This further misleading concept has been present since the term metaverse was first announced. In 1992, when Neal Stephenson introduced the concept in one of his novels titled "Snow Crash" [7], the metaverse was portrayed as a world that provides humans access to do anything just as they would in the real world, unintentionally degrading the quality of life. Another common example was the famous Steven Spielberg movie titled Ready Player One. The story portrays how addictive the virtual world is, although, at the end of the narrative, no matter how bad reality is, this is where one can find true happiness [15]. If we refer to the thoughts of ethical philosophers e, happiness is a complex integration of human life in the real world, which certainly cannot be obtained from lower reality [16]. Ironically, this misconception persisted when the term was introduced by Mark Zuckerberg a few years ago.

The emergence of the concept seemed raw, considering what is referred to as the metaverse is often misunderstood and equated with static virtual reality, whereas the metaverse should be an active and dynamic space supported by artificial intelligence [17]. The term "virtual reality" itself is considered more appropriate when referring to what is currently known as the metaverse, but this term has been used to denote one of the supporting technologies for the metaverse. Virtual reality itself currently refers to computer technology that enables humans to create and interact with three-dimensional virtual objects [18]. It is understandable if someone is still confused between these two concepts (the metaverse and virtual reality), considering that the universe and reality are synonymous concepts. The development of technology has subsequently caused these two concepts to no longer be synonymous. The virtual world, which was once envisioned as a collection of three-dimensional objects, has now evolved into a dynamic digital world that can develop on its own without human intervention.

3.2. Virtual reality as a part of metaverse

The primary difference between virtual reality and the metaverse lies in how they are defined. Virtual reality is a concept that refers to a technology that is well-known and widely understood by the public. In contrast, the concept of the metaverse itself remains unclear. Mark Zuckerberg himself describes it as a new generation of the internet, allowing humans to "live" within it. On the other hand, Microsoft states that the metaverse is a digital ecosystem formed by replicas of people, objects, and environments existing in the real world. However, one thing that can be certain is that the metaverse is not solely shaped by virtual reality [19]. Other technologies, in fact, have emerged significantly at present, although some of them have not been widely applied in the development of the metaverse.

Referring to the definition, virtual reality is only a small part of the metaverse, where the world is constructed not only based on three-dimensional objects but also by artificial intelligence (AI) and the internet of things (IoT). Both AI and IoT are present in the metaverse to create a dynamic virtual world, connecting it to the real world through IoT technology. Subsequently, artificial intelligence is utilized to make predictive decisions based on existing data. Furthermore, the world will be supported by blockchain technology to enhance data security and 5G internet connectivity that enables fast data transfer [17], [20]. All of these technologies are aimed at constructing a parallel universe between the digital and the real world; therefore, humans can engage in activities there without needing to worry about the underlying systems that propel that world.

The misunderstanding between the concepts of virtual reality and the metaverse itself is something common considering that virtual reality technology is most closely associated with the metaverse. This is further reinforced by the concept of virtual reality, which if defined etymologically also has a definition that is identical to what is depicted by the metaverse when it was first introduced in Snow Crash. Virtual Reality can also be considered as the first technology that conceptually was known earlier compared to other technologies. Technologies like blockchain were not imagined by society when Snow Crash was first published; Virtual Reality was more acceptable to society since at that time people were already familiar with television, video games, and even computers. The metaverse envisioned at that time cannot be compared to the current metaverse, which has comprehensively encompassed various advanced technologies that enable a more "real" reality.

The world that has been built with various technologies is also supported by not only a well-functioning social system, but also includes social reality within it. Therefore, many aspects still need attention in the development of the metaverse. First is the governance aspect, where the metaverse as a collective digital space requires regulations, rules, norms, and implicit agreements that differ from those in the real world. Second is the economic aspect, where the metaverse is also shaped by an economic system

integrated with the real world. Third is the political system, which differs from the real world. In the early generations of the metaverse, service providers became the regulators of the metaverse system. Next is the legal aspect, where social, economic, and political life requires agreed-upon regulations. The socio-cultural aspect also needs attention, considering that in the metaverse, there are no longer differences based on race and ethnicity. Lastly, it is essential to consider the psychological aspects of users who are affected by the continuous use of virtual reality technology [10].

The metaverse fully becomes a Metaverse when human involvement is more dominant in governing the activities within it, rather than merely regulating the physical ecosystem that unfolds within. The course of the ecosystem and the changes occurring within it are automated based on input data from internet of things (IoT) technology and decisions made by artificial intelligence. Natural phenomena, such as natural disasters, can be simulated based on input from sensor systems placed in the real world to provide responses within the Metaverse mirroring those found in the real world [21], [22]. In this condition, the metaverse has evolved into a parallel universe constructed based on the actual universe. Humans are solely focused on how to engage in activities within the metaverse without considering the workings of the ecosystem and potential technical constraints that may arise within it. This also occurs in the universe; the universe operates on its own without any intervention from living beings. Living creatures, such as humans, are merely engaged in activities to fulfill their individual lives.

3.3. Misconceptions in metaverse implementation

Previous design-based studies also use the term metaverse to refer to designs utilizing virtual reality technology. From the exploration conducted by scientists from Indonesia, some use the term metaverse referring to websites with a three-dimensional space appearance, where the output of such research is in the form of a three-dimensional learning website [23]. Several studies have also referred to at least the use of augmented reality and virtual reality in their design activities, although they have not yet referred to the use of other metaverse-supporting technologies [24], [25]. The use of third-party applications that also identify themselves as metaverse platforms has also been utilized in one design-based study in Indonesia, for example using the Spatial or Roblox metaverse platforms [13], [26].

Platforms that identify themselves as metaverse fundamentally still do not fulfill all components of the metaverse. Some of them are not even accessible using the virtual reality feature. One study indicates that several social virtual reality platforms reveal inadequate provisioning as a result of their inability to allocate servers close to end users. Some platforms also still somewhat neglect the appearance of user avatar characters and only support static virtual backgrounds [27]. Attention to visual aspects indeed has both positive and negative sides. On the other hand, it enhances the user experience [28]-[31] and also increases bandwidth requirements [27], consequently impacting the accessibility of the metaverse to users. For example, the Roblox platform may offer a less realistic experience, but in terms of accessibility to users, it reaches various levels of users with diverse types of devices [13].

Some studies conducted in other countries seem more prepared for developing the metaverse than what is offered by existing metaverse platforms. For example, research conducted by Jangwon Lee developed a metaverse-based physical fitness service by conducting deeper studies and utilizing more metaverse-supporting technologies in his research. This design activity not only utilizes virtual reality or augmented reality alone but also considers the use of cameras as a sensor system [32]. Other studies have also utilized sensor systems in metaverse spaces to create digital twins of objects existing in the real world [33]. Both studies also demonstrate that the understanding of some academics is one step ahead in developing metaverse technology, although some still have certain limitations in implementing metaverse-based technologies. However, there are still several studies regarding virtual classroom spaces in the metaverse that remain focused on the use of virtual reality, as in some studies conducted in Indonesia [34], [35].

The utilization of several metaverse platforms by researchers also demonstrates their confidence in using metaverse-based technologies developed by the industry. This should be welcomed by metaverse platform developers, who should continue improving their platforms to realize the ideal metaverse. The potential for collaboration is also evident from several studies that have been able to design systems that are one step closer to the metaverse; thus, collaboration between metaverse platform developers and academics becomes something that will be beneficial, both for both parties and for the community that benefits from the existence of metaverse platforms.

Recently, the enthusiasm of Indonesian society regarding the metaverse has been demonstrated by the involvement of many public figures and local companies actively participating in its development. Unfortunately, until now, there has been no Indonesian metaverse platform ready to enter this industry. Some metaverse companies are still focused on the application of supporting metaverse technologies in particular, such as several studies in Indonesia focusing on the application of technologies like virtual reality and augmented reality to solve specific problems. This is not fundamentally a major issue, but researchers still

hope for directed metaverse development, thus realizing an ideal metaverse in line with the latest technological advancements available today.

3.4. Redefining the metaverse

The evolving studies of the metaverse with technological advancements necessitate a meaning that not only follows technological developments but also aligns with the essence of the metaverse itself. In terms of technological advancement alone, the definition of the metaverse has been thoroughly elucidated by various studies. Recent studies define the metaverse as a digital virtual world that allows users to engage in various life activities. However, this definition may shift regarding recent technological developments, where the metaverse not only provides users with space for learning but also offers holistic ways to enrich users through learning experiences [9]. That definition is also not sufficient considering that, in essence, the use of the term "metaverse" itself is already inaccurate, thus requiring a redefinition based on the roots of misconceptions and the development of supporting aspects and non-technical aspects.

The more extreme definition even states that the metaverse is a post-reality universe [36]. This definition seems exaggerated given how the reality of the metaverse is still constrained by human perspective. Definitions like this can emerge because many people are still stuck on the word "metaverse" and how people in the past defined it. If we refer to recent developments, it's clear that this definition cannot simply be accepted. In this context, replacing the concept of the metaverse with another concept might be necessary to avoid misconceptions caused by the word "metaverse" itself.

The term "metaverse" could potentially be replaced with the term "virtual reality"; however, unfortunately, this term is already used to refer to something different. The term "virtual world" could be used since it refers to a simulated environment that meets the prerequisites to be considered a world— a shared space formed by its inhabitants. Experiences and interpretations of these experiences are not fixed but mediated through physical bodies and psychological responses. Through our physical bodies, we navigate around the shared space, interacting with objects and others. In this context, there is, of course, a distinction between the virtual world and the physical world in terms of physical experience [37]. This difference will continue to exist even though efforts to connect the real world with the metaverse continue to be made up to the present by providing social activities within it [38].

It is not uncommon for some words to simply merge by taking partial letters from the original words [39]. This also applies to the word "metaverse," redefinition as we can use parts of the words "virtual" and "world." One example is "virtuworld," which is widely used in various popular cultures, although this word is not officially recognized in academic contexts. We can also use the terms "digiverse" or "digiworld," derived from the word "digital" this term has also been widely used in some writings, similar to the term "virtuworld". Regardless of the term, the direction of metaverse development should be aimed at becoming a supportive universe for the real universe. This is intended to prevent humans from considering the metaverse reality as far superior to the real world. Like any technological existence, the Metaverse is a human creation, and it should be directed to support human life in the real world rather than the opposite. The potential dangers highlighted in Snow Crash and Ready Player One can serve as lessons for building a metaverse that is safe and does not distract human awareness from reality. The new concept also should not automatically oppose the initial definition of the metaverse idea so that the future new technology remains within the same paradigm as the metaverse in the Snow Crash.

Understanding what the metaverse is and understanding the potential that can be developed is far more important than updates to the concept of the metaverse. New concepts as replacements for the metaverse concept itself will not significantly alter the development of metaverse technology. This will only have an impact if users understand that there is a difference between the definition of the metaverse when it first emerged and the definition that evolves over time. It is this dynamic definition that is desired so that technological development can continue to soar without being limited by understandings stuck in the past.

4.   CONCLUSION

Misconceptions about the term "metaverse" have existed since its first introduction. Given that the term "metaverse" currently refers to the artificial universe made by humans, the prefix "meta" in the word is deemed excessive. Long before the concept was introduced as a digitally created world using computer systems, humanity had been acquainted with other realities, often referring to higher realities, as seen in Plato's allegory. Furthermore, the advent of virtual reality technology is causing more confusion in distinguishing between these two concepts. This research attempts to bridge the gap between them while providing multiple alternatives to replace the term "metaverse" by proposing new terms derived from various words such as digital, virtual, world, and universe. The new idea will be dynamic, with the ability to adapt

with future technological advancements. It must also have a definition that is etymologically consistent and not contradictory to the original definition of the metaverse.

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Calvina Izumi received her bachelor's degree in the business management field at the Ciputra University of Surabaya. She has 3 years of experience in editing and formatting the university journal and has been working closely with her professor and colleagues on publishing papers regarding workplace ostracism, cyberloafing, and contraproductive work behavior. She is also an active entrepreneur and passionate about teaching. She received a top-five award in the Mangga Muda Petro Kimia Gresik Competition in 2022 and has also been teaching alongside her final year at the university as an assistant lecturer for the financial management subject. Currently, Izumi is pursuing her own way in the corporate industry while teaching music in a private school. She can be contacted at email: calvinaizumi01@gmail.com.

Dwi Sugianto informatics graduate from Amikom University Purwokerto and currently pursuing postgraduate education in computer science, focusing on the metaverse, data mining, and AI. With a relentless drive for innovation, Dwi's research endeavors aim to explore the transformative potential of the metaverse, harness the power of data mining techniques for valuable insights, and advance the development of ethical and beneficial AI technologies. Beyond academia, he actively engages in collaborative projects and community initiatives, poised to make a significant impact in the ever-evolving landscape of technology. He can be contacted at email: dwisugianto@outlook.com.

Soeltan Abdul Ghaffar is a Bachelor of Science who successfully obtained a degree in Marine Information Systems from the Universitas Pendidikan Indonesia. His expertise in research on Carbon Reserves, Metaverse, Disaster Mitigation, and Mangroves has demonstrated his dedication to the field of Research and Development. Although he has not received official recognition, Soeltan has been actively contributing to social activities and is involved in the mangrovejakarta.id community. With a vision to become an expert in the field of Carbon Business. He can be contacted at email: soeltan027ghaffar@gmail.com.