New Digital Culture Metaverse Preparation Digital Society for Virtual Ecosystem

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Abstract. The advancement of digital culture in human life presents a new life that can be lived virtually. The phenomenon of metaverse becomes a new concept to combine the physical and digital worlds in society. The development of this metaverse will present many new opportunities in the future, especially in virtual work. The characteristics of this metaverse result in automation, telework, and also management algorithms, this can have the effect of replacing the work done by humans. It will also appear new job in the metaverse world certainly requires new skills in society, this requires the preparation of an integrated and digital-based educational role. This research is descriptive of skill development and education in the virtual metaverse world, with a qualitative method based on an analysis of the six pillars of the virtual ecosystem (avatar, content creation, virtual economy, social acceptability, security and privacy, trust and accountability). The result of this research is a future job in virtual ecosystem sustainability scheme, by linking the sustainability design dimension – virtual ecosystem – future job and skills need for society. Indonesian people need to adapt to advances in digital technology with academic development that is ready with digital technology.

1. Introduction

The real world where humans live today seems not enough to accommodate the achievements of creativity and social interaction in an unlimited range. The real world, of course, has time and distance limitations. Even through the impact of the pandemic has limited the physical life of humans, one of the concept ideas to expand the range of human life without the limitations of space and time is Metaverse.

Metaverse is not a new concept, but already existed in 1992 it is expressed based on the prefix "meta" which means beyond "universe". This word is expressed in a fictional part of the novel entitled Snow Crash, by Neal Stephenson. Stephenson describes the metaverse as a virtual environment connected to the real world, where each individual interacts digitally using an avatar. Metaverse can be defined simply as the integration of the physical and digital worlds, facilitated by the power of the internet in extended reality (XR) [1]. Extended reality has digital and real-world integration, some examples of such applications include; augmented reality (AR), mixed reality (MR), and virtual reality (VR). Individuals who enter this metaverse will have an avatar as the physical form of the user in the digital world [2].

In October 2021, Mark Zuckerberg changed the name of Facebook to Meta and made a large investment in the Metaverse project. Many people eventually saw the idea and concept of this metaverse and it started to become popular. This is certainly a new phenomenon in business development, global technology companies are competing to develop this digital world as a new opportunity in the future [3]. The metaverse combines all element of digital to bring an immersive experience, and human interaction in a digital world can be new opportunities for future revenue. Microsoft has planning to create new digital workspaces, even in online videogame fortnite holding Ariana Grande for digital concert. It seems limitless for this digital world, the market opportunity estimated over $1 trillion USD in yearly revenue. Future prediction about this data give companies entering the metaverse with a different approaches like; Walmart, Nike, Gap, Verizon, Hulu, PWC, Adidas, Atari and Others. Data for opportunity in this digital world offers: Transact Every year, $54 billion is spent on virtual goods. Socialize 60 billion message sent daily on Roblox. Own Non-fungible tokens (NFTs) $41 billion. Experience 200 partnerships with The Sandbox, including Warner Music Group launch music themed for the virtual world [4].

In today's technological era, a lot of automated work has started to boost productivity, efficiency, and economic growth. Technology also changes the nature of work, creates new jobs, or even replaces old jobs. The following is an analysis report on the impact of technology on the economy, business, and society based on sample data from Indonesia [5]:

- 23 million jobs will be replaced by automation
- 27 million – 46 million new jobs created
- 10 million jobs is an unprecedented job

In particular, workers who use the internet make the digital economy have a big impact on the progress of the

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country's economic growth. The digital economy also greatly affects individual interest in the world of work, this is evidenced by those who work using the internet have a working period of more than a year compared to those who do not use the internet. Another factor, of course, is education which is the basis of this digital economy. [6] In addition, during this COVID-19 period, the majority of people have used internet technology, which completely changed the work pattern of people who use telework has taken place in the metaverse office. Telework is a new work system that is carried out online using virtual media within the scope of ICT (Information Communication Technology). In the virtual world the presence of the individual feels the same in the real world with avatar. Zigbang's metaverse office, avatars can interact with other avatars to talk in text or video conversations [7]. This virtual office enables global work interactions to be much more effective and efficient in the future.
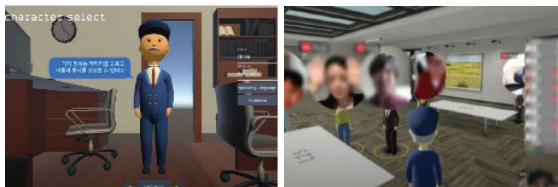

Fig. 1. Zigbang's metaverse office [7]

In addition to telework, metaverse technology also provides automation and management algorithms. Automation is the development and application of technology automatically at work with the aim of producing and providing services by reducing the work done by humans. Management algorithms are generated with AI (Artificial intelligence) capabilities aimed at collecting data, processing data, and using data to take over human decisions [8]. This phenomenon has largely replaced conventional work to the automation of some examples; vending machines, driver apps, industrial robots, etc. Data is also one of the strengths of AI in knowing the preferences of individuals to decide to buy goods or services.

Technology is changing and evolving work, it is interesting to examine how to prepare society for the metaverse. Indonesia needs to prepare its workforce to prepare for new jobs in the digital economy. In continuity for the preparation of the workforce in Indonesia, education with the integration of science and technology is needed [9] These new skills in technology integration will provide creativity and problem solving in new jobs. A high percentage of education accompanied by the readiness of appropriate materials will produce great opportunities for the community to be ready for technological developments. This is a new challenge for the education sector in Indonesia. Through this paper the author will discuss how to see the potential and preparation of employment opportunities in Indonesia in academic preparation, this is discussed based on the metaverse phenomenon. The final result of this research is the application in academia.

2. Literature Review

In this section we will look at the potential results of the metaverse in human life so that it can be a case study in creating job opportunities in Indonesia. There are several essences in human life that require the role of sustainability in it, the dimension of sustainability itself has three dimensions known as the three bottom line (Economy dimension, Social Dimension, and Environmental dimension) [10]. Metaverse itself is created in the digital world, but in its role it can certainly become a new essence of sustainability in human life. The following are examples of cases of economic, social and environmental dimensions in the metaverse that can describe the future potential for human life.

Economy Dimension, this dimension refers to the role of the metaverse in improving the community's economy. In the metaverse, there are many new terms in currency exchange; Bitcoin and NFT have become popular in recent times. NFT Bored apple on opensea can earn more than $250,000 USD. Even selfie photo phenomena such as Ghozali Everyday NFT also generate 3 trillion rupiah [11]. This is certainly a new standard for the government to anticipate blockchains in this digital world so that it becomes a new opportunity to increase the sustainability of state revenues[12].

Social Dimension, the dimension in which there is an interaction between the community, organization, government, or more broadly. Metaverse presents the potential for interaction between individuals in virtual media, the following are examples of cases from the social dimension: The Covid-19 pandemic has completely changed the learning system of society. This presents the term E-learning whether it is done face-to-face through digital media, or independent learning by students. Virtual learning in this metaverse presents a new simulation of how to interact in learning [13].

Environmental dimension, one example of the case in this section is the creation of digital archives of society cultural heritage that can be preserved for a long time. This has been widely applied in the creation of virtual museums to preserve historical objects, such as the reconstruction of the Piazza di Porta Ravegnana, mediaval Bologna - Italy [14]. This metaverse reconstruction process can also be applied in Indonesia in making historical objects more detailed.

Metaverse is a new method in today's society to increase the role of sustainability in human life, therefore society needs to be ready for this digital change so that it can enter into its three dimensions. The discussion of this research is how to prepare society to adapt in the metaverse.

3. Research Method

This study uses a qualitative method, with data collection based on literature and case examples obtained on the internet. The discussion will be carried out based on the six pillars in the virtual world that have been discussed by Hang LEE et al. [1], which will then be discussed in a descriptive manner that can be applied to student learning interests academically. The six pillars of

the virtual ecosystem consist of; avatar, content creation, virtual economy, social accpetibility, security and privacy, trust and accountability. After the discussion of the six pillars is described descriptively, an analysis of students' academic interest in the virtual ecosystem is carried out based on a case study of literature data.

4. Results and Discussion

XR is known as X Reality, where the letter X represents the spatial future of technology using computers. The design combines augmented reality (AR), mixed reality (MR), and virtual reality (VR) to produce spatial digitally in a virtual world [15]. Basically, the metaverse has three stages in its creation, the digital twins are the initial stage of making physical forms into the virtual world. Each user will also have a virtual form that is used while interacting in the digital world. After the virtual world is formed, the interaction between the real world and the virtual world is called the metaverse [16]. The following is a schematic depiction of the metaverse:
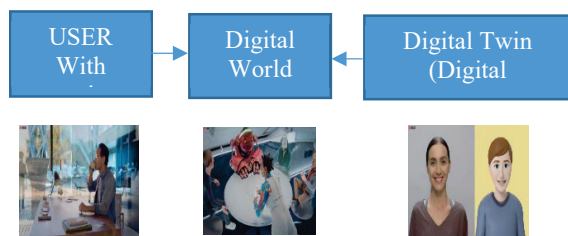

Fig. 2. Metaverse [17]

The discussion of a metaverse in technology scope consists of Extended Reality, user interactivity, computer vision, Artificial intelligence, Robotics / IOT, Edge / Cloud, Network, Hardware Infrastructure. However, to discuss the community contained in the metaverse, to see opportunities of the digital economy. So it is necessary to look at the discussion of what ecosystems build this metaverse. Ecosystems in the metaverse are connectivity that occurs between the real and virtual worlds, this becomes a social connection between each user in it. The layers in the metaverse ecosystem consist of: 1) User Generated Content (UGC is any form of content created by users in the virtual world: Example NFT, online video, digital assets, etc.), 2) Economics (Factors that make the ecosystem run, where in the metaverse there will be Decentralized Finance, based on digital contacts and Fungible Token FT), and 3) Artificial Intelligence (AI as a facility for the physical life of every digitally connected user) [18].

4.1 Virtual Ecosystem

In the discussion [1] describing the virtual ecosystem contained in the metaverse, the following is a virtual ecosystem schema in the metaverse:
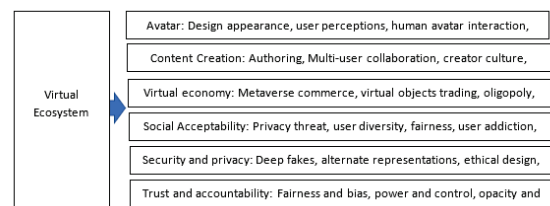

Fig. 3. Virtual Ecosystem [1]

- Avatar: is a Hindu concept in which humans and animals are represented in a virtual world [19]. Each individual can create shapes and forms that want to represent them in the digital world with systems that have been created by metaverse developers [20] such as meta companies etc later. Through programming from computer science technology, and visual animation from communication design, we can represent the virtual world in 3D spatial form. [21].
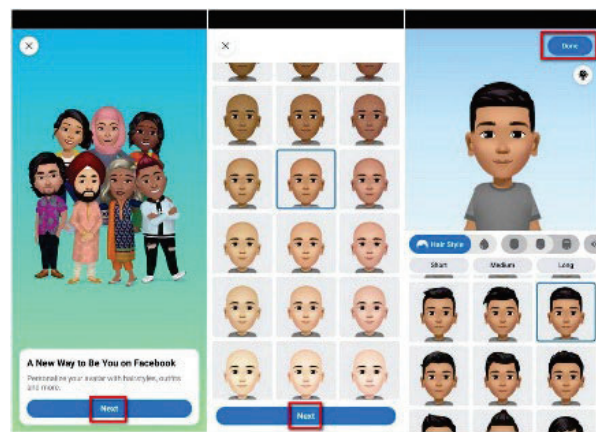

Fig. 4. Facebook Avatar

- Content Creation: The scope of content contained in the metaverse is XR, which consists of VR, AR and MR. Making digital forms in VR, AR and, MR are called an authoring system. These tools and platforms aim to create content within the boundaries of technology, which results in a virtual representation of the world [22]. In addition to creating, there is also the collaboration between each user to create new content in the metaverse, each user who uses an avatar can interact to produce content.
In addition to the physical form that can be developed by content creators, there are also aspects that need to be considered when creating content in the virtual world. The first is censorship, this is generally to limit ideas or information submitted to individuals or groups. Especially things that do not match the objectivity of the virtual world or are dangerous [23]. A new culture for virtual content creators where there is content that can be produced collaboratively, but there is also content that has exclusivity that cannot be used together, such as NFT or original works placed in virtual museums [24].
- Virtual Economy: The discussion of economics virtually has several structures that can serve as case examples. The virtual economic structure can be

classified as follows; economic governance, oligopolistic market, metaverse commerce, and virtual object trading.

- Economic governance – Policies that can be made to support cryptocurrencies and market regulation from the government, thereby opening up economic opportunities within the country through a virtual economy. How to make a fair measurement algorithm within the government against the virtual value of money [25].
- Oligopolistic market – Every major company is competing to direct their concentration towards the market in the metaverse. They think that the virtual world that they will create later is better than other developers. Among them are companies; epic games, microsoft, meta (facebook), amazon, netflix, and alphabet. This will certainly produce a large quantity of labor absorption in the metaverse [26].
- Metaverse commerce – Like the concepts found in the real world, in the virtual metaverse world there is a system that can be used for transactions. Transactions can be made from user to user, there is also a system available for business companies to users. Virtual world commerce is the same as e-commerce.
- Virtual object trading – trading system and ownership of virtual objects in the virtual world. Many ways can be done to have ownership of virtual objects, either by trading or giving in the agreed currency. The exclusive level of the object will be a high selling point for the buyer or collector [27]. In other words, the rarer the NFT in the virtual world, which distinguishes it from other individuals, the more valuable it becomes [28].
- Social Acceptability – The ecosystem aspect of the community's social acceptability means how the community can accept the metaverse as a platform that can be used for life. Several factors surrounding society's acceptance of the metaverse include;
- Privacy threats, user diversity, fairness, user addiction, cyberbullying, other social factor. Privacy threats: all devices used by users must be protected from misuse of traded data for any reason [29].
- User diversity: metaverse must cover all communities including race, gender, age, and religion, even children and adults also have a variety of different content to convey so that the representation of the virtual world can be accepted by all users [30]
- Fairness: Algorithms that measure fairness in behavior in digital society need to be applied in the metaverse, so that justice occurs in the behavior of digital society. For example in conveying text, sound and so on [31]
- User addiction: this also needs to be a concern for every user, because the metaverse could be an escape to avoid life in the real world. This section needs a psychological role to avoid addiction for users so that the mind, body and physical environment remain a priority [32].
- Cyber bullying: refers to the act of sending messages, posting, or sharing negative, harmful, untrue, or malicious content to victims in a virtual world [33]
- Other social factor: Other social factors of course need a deeper observation of issues in society, of course this

will differ between approaches in each country and society in the real world. This is certainly influenced by social, economic and cultural factors.

- Security and privacy – Devices connected to the internet will be able to know the preferences of users through the power of AI in every virtual world construction. This is indeed used to collect user preference data so that it can be used by companies to convey the user's preferred market. A simple way to maintain user privacy is to make the avatar display different from the user's appearance in the real world [34]. In the design ethos, there needs to be a patent for the design contained in the metaverse, the creation of digital twins (digital assets in the metaverse) requires a patent in the digital blockchain so that its authenticity and ownership of assets can be recognized [35]. Biometric data in this virtual world is also important, all records made by user avatars have a history of actions that are not in accordance with regulations can be recorded in the metaverse [18].
- Trust and accountability – The trust of each user in using XR technology, in data and confidence in conducting virtual transactions. Accountability is the process by which every program and user experience in the metaverse works well. Auditors control data flow and data ownership in the metaverse[36].

4.2 Future Job in Virtual Ecosystem

Characteristics of new jobs in the metaverse consisting of; automation, telework, and algorithm management, this will certainly be a big threat if people are not prepared to adapt in the digital world. It aims to produce sustainability in the digital economic, social and environmental dimensions.

There are six pillars that have been discussed from the virtual ecosystem contained in the metaverse, through the six pillars that make up the ecosystem in this metaverse it will be classified into skills that can be developed as follows:
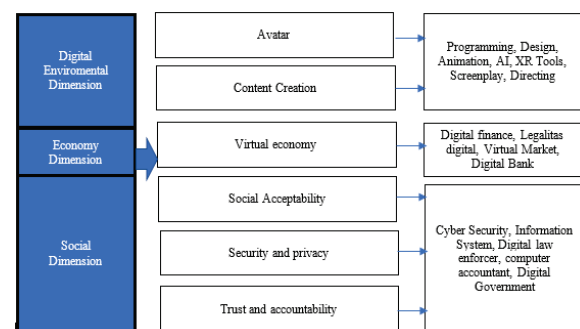

Fig. 5. Sustainability Future Job in Virtual Ecosystem

From the above scheme, it can be seen that the work can be adapted to the ecosystem in the virtual world. In the virtual world development section, the physical appearance of the virtual world and its contents. It consists of avatars and content which is a representation of physical form in the digital world and the content of life in the metaverse. Therefore, the development of the world

of work that can be used as a reference if individuals want to work in this section is; programming, design, animation, AI, Hardware tools in XR, storytelling of concept ideas through the screenplay, and directing. The schematic describes three design principles of three bottom line dimensions sustainability that will maintain the continuity and future development of work in the metaverse.

In the virtual economy, the concept is in the same as the conventional market. In the market there are sellers and buyers, only in this case what is being traded sometimes does not have a physical form. Such as NFT digital assets, proof of ownership of digital objects, and so on that cover ownership in the digital metaverse world. Therefore, basically the management of the work of the digital market is the same as the conventional market, but there needs to be development and practical understanding that adjusts the size of the transaction value in this virtual world. The following is the development of jobs that are compatible with the virtual economy; digital finance consultant, digital legality, virtual marketer, digital bank. In maintaining social life, security and privacy, as well as trust from users, it is necessary to have regulations that maintain life in the metaverse. The following are jobs and skills that can maintain the pillars of the ecosystem in terms of social accpetability, security and privacy, trust and accountability; cyber security, information system, digital law enforcer, computer accountant, and digital government.

5. Conclusion

Today's digital culture is impossible for us to avoid, especially ideas and phenomena that can emerge through the rapid progress of this digitalization era. Through this research, it can be understood that society needs to adapt in the future to new or lost jobs due to technological advances, especially in the metaverse. Adapting to technological developments requires academic development in preparing the community to be ready for digital technology. Therefore, academics in Indonesia need to be strengthened with equitable digital readiness so as not to lose opportunities in this era. This research is limited to sample test data on the readiness of ordinary people to digital metaverse technology that can be carried out for further research.

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