A Look At The New Humanity: Metaverse and Metahuman

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Abstract: - This study explains the Metaverse and the concepts associated with the Metaverse. While explaining the development process of technologies that will directly affect our lives in the future, the effects of these technologies on the present are also mentioned. Metahuman is a technology that will appear as its digital twin in the future. Metahuman becomes a new form that will represent us in virtual universes. When viewed from the perspective of the Metaverse, there are also other virtual universes. It is mentioned in Omniverse in this study. Technologies that enable interaction with virtual universes gain importance from this point. Augmented Reality, Virtual Reality are some of these technologies. Other technologies gaining importance with Metaverse include Blockchain, Non-Fungible Token (NFT), and Web 3.0. Blockchain represents large immutable networks, while NFT is a unique identifier. Web 3.0 represents a decentralized Web. In this study, these concepts are examined in detail. In addition, in this study, these concepts are also discussed from the perspective of artificial intelligence.

Key-Words: - Metaverse, Metahuman, Digital Twin, Omniverse, Blockchain, Non-Fungible Token (NFT), Web 3.0, Artificial Intelligence, Augmented Reality, Virtual Reality.
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1 Introduction

Metaverse is a rapidly developing new technology today [1]. The metaverse briefly represents a virtual universe. However, the term virtual universe is insufficient to describe the Metaverse. The metaverse is a new reality. It is the universe where people can be included in an artificial physical environment through technological devices. Metaverse is an integrated and simultaneous virtual world that provides many opportunities such as collaborations, cultural and intellectual activities, and economic production.

With these possibilities provided by Metaverse, many new concepts have begun to emerge. Metahuman, Blockchain, and NFT are a few of them. In addition, the concept of Web 3.0 has started to gain significant importance. Metahuman is simply a digital twin of us that will allow us to exist in virtual universes. Blockchain is a largely transparent and unalterable network that will enable transactions to be recorded and assets to be tracked. NFT stands for Non-Fungible Token. It is a digital asset that only belongs to its owner, not a copy, that is, only one. NFT is a unique identifier that proves ownership of products.

Web 3.0, on the other hand, means a decentralized digital technology with its general definition. It is a groundbreaking innovation that they are created by platforms that can be trusted

by anyone who is not under the control of a company or organization.

2 What is the Metaverse?

The term 'Metaverse' was first coined in a speculative novel named Snow Crash, written by Neal Stephenson in 1992 [2]. There is no standard and universal definition of the Metaverse yet. In addition to having many different meanings, it can be said that it is a virtual universe with digital representations. It can be noted that the Metaverse is the next stage of the internet. You can experience many different things with Metaverse. With Metaverse, many topics like the business world, social life, and cultural events began to change.

Industries and companies have started to adapt to the Metaverse change. Many companies have announced their Metaverse strategies, and the number of companies that announce these strategies is increasing day by day. For companies, Metaverse has become a virtual business operation space. Many companies hold meetings with their remote workers on Metaverse. Employees can attend these meetings with their digital avatars and participate in meetings interactively. In addition, when examined on a sectoral basis, many business meetings can be made with customers.

The metaverse effects in the social and cultural areas seem more attractive. We can meet up with our friends and attend a virtual exhibition. We can go to concerts held in the Metaverse or browse and shop the stores in the Metaverse. For example, the Travis Scott Fortnite online concert held in 2020 was simultaneously watched by 10.7 million people [3]. This value does not include the number of viewers on Twitch and Youtube platforms. Brands such as H&M and Gucci have announced that they will open stores in Metaverse. As can be seen, many brands have started to implement their strategies in this area.

In education, the Metaverse began to play a significant role. Lesson topics are more explanatory and understandable with their 3D visual representations. The students started the learning process not only by listening to the subject but also by establishing a 3D interaction. This experience created a much more understandable effect for students and accelerated the learning process.

This change will continue to increase. Companies and governments will continue to explain their strategies in this process and start implementing them as soon as possible. For this reason, it will be very advantageous for everyone to adapt to this process as quickly as possible. An image of the metaverse is shown in Fig. 1.

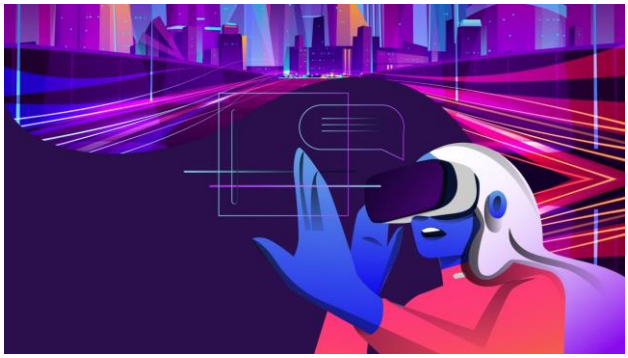

Fig. 1 A representative image of the metaverse [4].

3 Augmented Reality: Door To The Future

Augmented Reality (AR) is a technology that has emerged in recent years and is used in many fields. Augmented Reality is the blending of virtual objects with real images using the object recognition feature of the devices. Objects are superimposed on existing objects, thus increasing the reality. In other words, the real and virtual worlds are not completely inseparable from each other but rather an intertwined reality. To benefit from this technology, Internet access and devices (smartphones, smart glasses, or tablets) are required to define augmented reality in the environment.

Virtual Reality (VR) can be called computer-simulated reality. It offers an immersive

experience that replicates a real environment or creates an imaginary world. VR technology is a step into a completely virtual world. Everything that is felt is a computer-generated 3D world. The user in this virtual world becomes convinced that the real world is disabled. It has a real-like experience.

AR/VR technologies present enormous potential, raising unique considerations [5]. AR technology aims to increase the shopping experience in the e-commerce industry. AR technology is an essential change in e-commerce to enable the customer to experience the product in 3D instead of looking at the product photos while purchasing a product. Metaverse has become the focus of companies at this point. Metaverse technology, which can interact with AR technology, has become an area that companies want to be in. For this reason, many companies have started to open their virtual stores on Metaverse. In this way, customer experiences began to increase. Fig. 2 shows an exhibitor posing at Seoul VR AR Expo 2021.

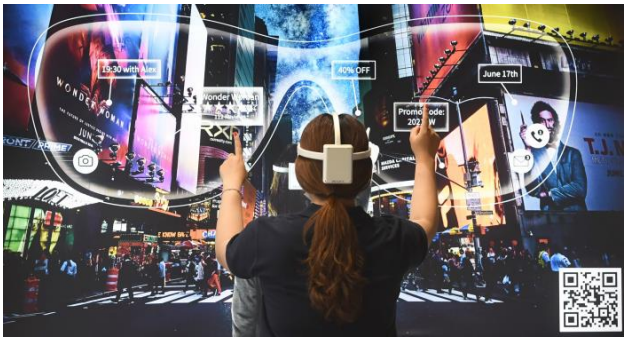

Fig. 2 A participant posing at the Seoul VR AR Expo 2021 [6].

4 Your Digital Twin: Metahuman

To be a metahuman means to move past the limitation constructed by the mind and enter a new state of awareness where we deliberate and concrete access to peak experiences that can transform people's lives from the inside out [7]. Today, we use the avatar name for our virtual identities on the Internet. While using the Internet for many years, a transition to a new stage has been made today. This new phase is Metaverse. In Metaverse, our avatars will no longer be enough. We will use 3D virtual people, called Metahumans, who can perceive our bodies and movements in real-time, much more realistic than avatars.

These digital people will reflect our feelings. Since they are digital copies, even if we adjust their appearance, they will continue to reflect our facial expressions and personal characteristics with machine learning algorithms. This feature is the most significant feature that separates Metahuman from avatars.

4.1 Metahuman in the Game Industry

Metahuman was initially developed to contribute to the game industry. A cloud-based application called Metahuman Creator was implemented to design realistic models in games more easily and quickly. In Metahuman Creator, which is developed in integration with the Unreal Engine [8], the game engine of Epic Games, very realistic digital people can be created as desired. These digital people can be used for games and animations easily and quickly. Fig. 3 shows Metahumans developed in Metahuman Creator.

Fig. 3 Metahumans [8].

You can make yourself a 3d game character. You can model your loved ones, yourself, or the people you admire in 3D and use them as a character in the game. At first, you need to choose a face line closest to you. You can create your avatar by designing facial features, eye color, haircut style, body shape, clothes, weight, and even cheek, forehead, and under-eye lines. You can add animation to the 3d designed character, move it in the game and adapt it to the game.

4.2 METAHUMAN AND OTHER INDUSTRIES

Metahuman systems will change many facets of how we think about organizations and work. They will push information systems research in new directions that may involve revising the field's research goals, methods, and theorizing [9]. With Metaverse, many companies have started to explain their Metaverse strategies. Companies can open virtual offices in Metaverse, publish company advertisements, and hold their meetings virtually. Some companies have begun to announce their future projects. One of them belongs to the company Niantic. Niantic announced in November 2021 that they had developed a planet-scale AR engine called the "Lightship" [10].

With metahumans, we will be found in many virtual environments realistically. We will be able to visit virtual cities. We will attend events such as theatre, concerts, and sports and meet our friends. It is thought that metahumans will contribute the most to the business world. Because we will be able to attend our meetings with our own Metahuman, we will interact in this way with our digital copy, transferring our gestures in real-time. With too many such features, Metahumans are effectively coming to the fore in the business world.

4.3 METAHUMAN AI

Today, high-tech artificial intelligence causes innovations and developments in many areas of our lives. Artificial intelligence has made significant progress in health, medicine, military, space, informatics, communication, industry, and similar fields [11]. Artificial intelligence is a field where the most severe and intensive studies are carried out globally [12].

Metahumans ushered in a new AI era in the 2020s. There have been countless opportunities with artificial intelligence models, but it has brought up the issue of controlling artificial intelligence, which has been talked about for a long time. It is not yet predictable to what level the artificial intelligence technology of metahumans will advance in the future. Still, these artificial intelligence models will significantly impact our future lives and change our lives [13].

5 Omniverse: Another Virtual Universe

Omniverse is a metaverse populated by Industrial Digital Twins, autonomous (virtual) robots allowing a company to create in the virtual space with all the constraints and details of the physical space [14]. Omniverse was developed for industry operations. It is used in the business world. It appears effectively in subjects such as entering the business field, understanding the process, and designing services. It is a platform created for people who want to collaborate virtually. It is a working environment created by physically simulating real-time. As shown in Fig. 4, we will attend meetings with our very realistic digital people with Omniverse avatars. This avatar, which has many features, can simultaneously speak in different languages [15].

Fig. 4 Omniverse Avatar [16].

6 Blockchain: Large Network That Cannot Be Changed

Blockchain technology enables functions in networks to be performed in a decentralized manner and at lower costs. Blockchain is a database system made up of interconnected blocks. Any information involving a transaction

can be processed into this database. New transactions are added to the previous block, and a new block is created. These blocks are linked chronologically. In this way, the new incoming block also increases the security of the records by verifying the information in the previous blocks. Everyone in these blocks is encrypted and therefore has a distributed structure. Thus, this change becomes almost impossible as changing historical records in this network requires modifying other users' records. The larger the network, the more individual records it has, and the more secure it becomes. This eliminates the verification and auditing costs mentioned above and provides an accountable and reliable structure.

To put it more simply, let's think of the blocks in the blockchain as ledgers. Have a copy of these notebooks distributed to everyone on the network. Each new transaction is recorded in these books simultaneously, so the records of the transactions are kept in many places, not in one or a few places. Since there is only one record in a central structure, it is a severe cost to ensure the security of these records. However, since it is impossible to change all records in the decentralized blockchain structure, a more secure system is created [17]. The representation of the blocks is shown in Fig. 5.

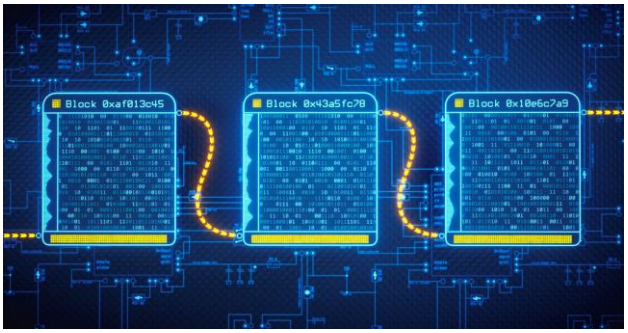

Fig. 5 Representation of blocks [18].

7 NFT: Unique Identifier

NFT, which can also be expressed as a type of crypto money, can represent a valuable asset, unlike other crypto money types, apart from classical definitions. For example, goods that exist in the digital environment and belong to a person can be classified as NFT. In this sense, NFTs view value as a commodity or product rather than a cryptocurrency. One of the main reasons for their similarity with cryptocurrencies is that NFTs are tied to a blockchain-based structure like Bitcoin or Ethereum. NFTs are items that are mostly considered collectibles. For example, playing cards, which were very popular in the past, can be seen as NFTs in the digital environment. Another difference between NFT from cryptocurrencies is that it has a digital signature that cannot be copied; it is a unique work of art. It stands for 'originality' in the digital world [19].

With Metaverse, an exhibition can be created where these works can be put up for sale, and NFTs, digital artifacts, can be purchased from this exhibition in which digital twins participate. Fig. 6 shows a collage by digital artist Beeple called Everydays: The First 5000 Days.


Fig. 6 Everydays: The First 5000 Days [20].

8 Web 3.0: Decentralized Web

The Internet first started with the Web 1.0 revolution, and Web 1.0 was a process that lasted from 1990 to 2005 when 90% of users were just consumers. The Internet, which started its development with Web 1.0, then continued with Web 2.0. It is the point where Internet users come to a position where they can cut off unilateral communication and change the content with Web 2.0. [21]. Web 2.0 is a process that includes today's users, where users are interactive, and this interaction is realized through platforms, where users can be both

consumers and producers. With the developing technology and emerging new requirements, the idea of making websites understandable and using them by machines has emerged [22].

Therefore, Web 3.0 is an approach that enables information to be defined and interpreted not only by humans but also by computers through artificial intelligence. Artificial intelligence is one of the most intense and intensive studies globally [12]. With artificial intelligence and technology development, it has become much easier and faster to reach the desired information by pressing just a few keys [11]. However, it is not enough to apply artificial intelligence to facilitate users' work and provide a high-performance experience [1].

Web 3.0 is a decentralized system, and means agents cannot control the data user. According to some, Web 3.0 is an application that has become smarter and faster with the introduction of artificial intelligence, and according to others, it is an application that allows processes to be managed automatically by the computer. The most crucial point here is that meta-data can be created to manage all data so that computers can make even complex queries and reach the desired correct information. Web 3.0 is a new process that we haven't fully transitioned to yet. For this reason, studies on Web 3.0 and new technologies related to Web 3.0 are critical.

In Web 2.0, applications are referred to as apps. In Web 3.0, applications are called dapp, that is, decentralized application. With these dapps, wallet logic is used instead of applications to browse the internet. In other words, only the content producer will be paid for the content produced, and no other platform or person will be able to profit from these applications.

Metaverse and Web 3.0 are highly related entities. Web 3.0 creates an infrastructure for the Metaverse. VR devices are used both for the Metaverse and can accelerate the transition to Web 3.0. In this process, some of the important methods are that the system is open source, the infrastructure is reliable and the communication is verifiable. Both institutions are important as the future of the internet world.

Fig. 7 shows the future of search. Web 4.0 is a concept that is still developing and there is no consensus on how it should be defined. Machines that can move in parallel with the human brain will create stronger interfaces and work to give the best results. To explain briefly, machines that can read and understand the content on the internet will enable us to achieve the highest quality results with the highest performance.

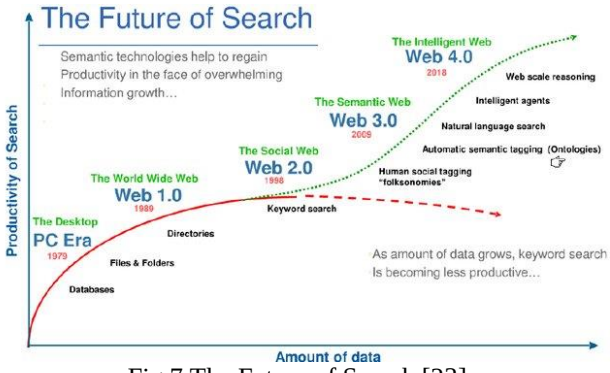

Fig.7 The Future of Search [23].

9 Conclusion

As a result, many technologies that directly affect our present and shape our future have been examined in this study. It seems clear that these technologies will be the basis of the significant changes that await us in the future. It is seen that many assets such as virtual universes, virtual digital twins, virtual values are essential, and other assets in today's world will gradually become virtual and step into a virtual universe. At this point, technologies such as Metahuman, Digital Twin, Omniverse, Blockchain, NFT, Web 3.0, Artificial Intelligence, Augmented Reality, and Virtual Reality will always be important. In addition, it is seen that we will encounter many different and new technologies in the future. While adapting to change provides an advantage in this process, it is not known exactly what disadvantages these technologies will have in the future. It is very important to adapt to these technologies in any way. The future is developing in this direction.

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