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The Concept of Metaverse, Its Future and Its Relationship with Spatial Information

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ABSTRACT

The word Metaverse, which is described as the fictional universe, is formed by the combination of the words "meta" and "universe". This concept can also be expressed as a parallel universe where all digital media are integrated, in other words, everything that can be done on the internet is gathered on a single platform. In this study, detailed information about the concept of metaverse is given and evaluations are made about its future. In addition, detailed information about the relationship of spatial information with the metaverse, the place of Virtual Reality (VR) and Augmented Reality (AR) concepts in this process, territory/land purchase/sale in the metaverse environment, and the relationship of the metaverse with GIS are presented.

1. INTRODUCTION

Recently, many different technology companies in the world have invested in this field and it is mentioned that the future of the world will be shaped on this platform. As a word, metaverse also comes up with a meaning like “Metaverse” by combining the words “meta” meaning “after, beyond” in Greek and “universe” meaning “universe” in English (Teknosablog, 2022). However, the metaverse, which often means virtual universe, is also expressed as the perceptual universe that people feel completely mentally with augmented virtual reality devices without any physical effort. This universe; It enables human consciousness to be included in an artificial physical environment with the help of computers, android devices and 3D devices (Bilgile, 2022). Today, one of the most remarkable metaverse investors in the world is Facebook, which bought one of the companies working on virtual reality devices (Oculus) for 2 billion dollars (Arena, 2022). This concept has come to the fore even more with the beginning of Facebook's interest in the subject. Facebook, which has a huge data repository, has the metadata of millions of people. This gave rise to the concern that an artificial world based on artificial intelligence would threaten the individual borders of people (Bilgile, 2022). The company has changed its name to meta and has made cooperation agreements with important software companies such as Microsoft in this field. In addition, game platforms such as Roblox are making large R&D investments in this field (Bilgile, 2022). The metaverse is not fully implemented, but some platforms include metaverse-like elements. The closest experience to the Metaverse is currently offered by video games. Developers have expanded the concept of gaming by hosting in-game events and creating virtual economies (Binance Academy, 2022).

Metaverse promises to create a virtual public space. Virtual currencies of this public sphere are already traded in the cryptocurrency market today. In this respect, the concept of metaverse is seen as the future of the internet. The first city to enter this virtual universe called Metaverse is the city of Seoul. If this technology is sufficiently developed, people will have the opportunity to do many activities such as working, meeting with friends, shopping, going to the movies, spending time in cafes without any physical effort thanks to the virtual reality devices they have acquired (Kuş, 2021; Bilgile, 2022). Web 2.0 and Web 3.0 technologies that will enter our lives in the near future enable people to interact and communicate with each other in the virtual world (Teknosablog, 2022). Sometimes these two concepts seem to be the same, but they contain some differences.

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Because the concept of metaverse aims to move the dimension of interaction in this virtual world to a different place. With Metaverse, it is aimed to bring people into the digital universe created using Virtual Reality (VR) or Augmented Reality (AR) technology (Teknosablog, 2022).

Some researchers explain that Metaverse is taking up more and more space on the agenda with the effect of COVID-19 on digitalization (Kuş, 2021). It is stated that COVID-19 accelerates the transition to the digital world, which offers solutions regardless of the physical world and different variables (Kang 2021). Lee (2021) attributes the rise of the Metaverse to the continuity of non-face-to-face communication during the COVID-19 pandemic. On the other hand, although the pandemic is considered as a factor that can accelerate the transition to Metaverse, it should be noted that the technologies that form the basis of Metaverse have been in a natural development process for a long time and technology companies invest in technologies that can be used in the Metaverse universe (Kuş, 2021).

Cryptocurrencies, which have been popular from time to time in recent years and are still discussed, continue to be talked about extensively on the metaverse. Because, cryptocurrencies suitable for metaverse technology are starting to be created and it is stated that they will come to an important place in the metaverse in the future (Teknosablog, 2022). Blockchain applications like Metaverse allow people to earn money. Axie Infinity is a game played by many users to earn more income. Other successful examples are Second Life, which offers users a 3D virtual environment to socialize, learn and do business, and Decentraland, an online digital platform that combines social elements with cryptocurrencies, Non Fungible Tokens (NFT) and virtual real estate, with VR applications in the blockchain world. (Binance Academy, 2022). NFT is essentially a cryptocurrency. But in this definition, money can be any asset that has value outside of the definitions we know. That is, an NFT is a digital asset that has a value and can be collected. Assets that can be considered as NFTs; It can be any artwork, video, tweet, a web page, images, stories you create on social media and many more (İşbank Blog, 2022). NFTs are also used for LAND, which are 16x16 meter parcels of land that users can purchase with the MANA cryptocurrency on the Decentraland platform. In this virtual world, users purchase plots that they can later navigate, build on and earn money on (Bitlo, 2022). The combination of all this creates a complex crypto economy. The lands that connect the concept of metaverse with geographical location can be bought and sold on many different platforms such as Decentraland, The Sandbox, Somnium Space, OVR, SuperWorld and Axie Infinity, Bloktopia, Nexth Earth (Kılınç, 2022; Eryılmaz, 2021).

Decentraland: Decentraland, where Samsung has also opened its own store in the metaverse environment, is a platform consisting entirely of virtual lands. Here, the value of the lands generally increases as they get closer to Genesis Plaza, which is the central location. However, the size of the land, the buildings on the land and the objects it contains also increase the value of the land. (Kılınç, 2022).

The Sandbox: The Sandbox, the biggest competitor of Decentraland, is a digital platform where players create and sell their own plots just like Decentraland. The lands on The Sandbox also have different values according to the assets they contain (Kılınç, 2022).

Somnium Space: Unlike Decentraland and The Sandbox, Somnium, which offers VR support, allows you to create and design a land and buy and sell land, as in both games. The prices of the lands here also vary according to their location on the map and the value of the asset on the land (Kılınç, 2022).

OVR Land: This platform aims to bring the metaverse to the real world by separating itself from platforms such as Decentraland and The Sandbox. The lands taken on the platform, where a copy of the real world is created, can be shaped on the real world. The prices of the lands generally change according to the location of the land in the real world (Kılınç, 2022).

SuperWorld: Just like OVR, SuperWorld has brought a replica of the real world to the virtual world. The working logic of SuperWorld and the valuation of the lands take place just like in the OVR (Kılınç, 2022).

Axie Infinity: Axie Infinity, one of the most popular metaverse platforms, hosts developable plots that you can rent or buy. After owning one of these lands, the land can be traded by developing the land. The value of the lands here also varies according to the assets in the land, as in other platforms (Kılınç, 2022).

Bloktopia: Bloktopia, like other metaverse platforms, is built on the game and has much more advanced visuals than common metaverse games such as Decentraland and Axie Infinity. Acquiring real estate within the system also means being included in advertising revenues. This highlights the Bloktopia Metaverse platform as an important investment tool for the future. There are plots and billboards in Bloktopia. These plots and boards are being developed to be purchased with Blocktopia's own token, "Blok", and to shape and customize their land (Eryılmaz, 2021).

Nexth Earth: Next Earth is a global-scale physical world-based ecosystem that will evolve in four distinct phases. Land purchases are made. Next Earth is a blockchain-based metaverse community where users can buy and sell real-world places as land in a virtual world (Erel, 2022). Next Earth wants to bring a new groundbreaking frontier to the Metaverse. While several crypto projects are currently using VR/AR technology to create their own versions of the Metaverse, Next Earth aims to develop a fully Decentralized Autonomous Organization (DAO) controlled, interoperable and fully democratic Metaverse where users have real digital ownership over their avatars (Erel, 2022).

2. METHOD

In this study, information about the concepts of VR and AR as well as the concept of Metaverse is presented. Then, evaluations are made about the land/land relationship with the Metaverse and the geographical location of the land, as well as what spatial information means in terms of the metaverse. In recent years, we have witnessed rapid technological progress, the development of computer technology, and new digital

devices, tools and applications being developed almost every day. Rapid technological advances in hardware miniaturization and processing power are leading to the development of attractive devices that allow users and consumers to experience new "types of reality" (European Commission, 2017; Shen et al., 2022).

Digital technologies such as AR and VR have gained importance and popularity in recent years with technological developments (Ye et al., 2020; Shen et al., 2022). AR/VR applications are more widely used thanks to the number of enabling elements such as technological advancement (eg, processing power of computing and image, mobile internet and devices, interactive platforms) and creating meaningful content based on better understanding (Shen et al., 2022).). Although the concepts of VR and AR are similar to each other, they also contain significant differences. These differences are listed below (Pehlivan, 2021).

- While VR aims to provide an experience completely isolated from real life (Fig. 1), AR aims to build on real life and make it more interactive (Fig. 2).
- While in VR you live in the virtual world by disconnecting from real life, in AR you still live in the real world.
- While AR applications can be used like a mobile application, VR applications definitely need equipment that will cover your entire field of view and control what you hear.
- In VR, there is a completely recreated, simulated, non-existent environment, whereas in AR, the virtual does not replace reality, but on the contrary complements it. In other words, while VR places the user in an imaginary world consisting of digital images, AR technology places digital content on top of the visible physical world.
- The advanced dimension of AR is called Mixed Reality (MR). It is a combination of virtual and physical worlds under a single reality, with the help of wearable computers and various devices, to contain all the features of VR and AR technologies.
- In VR, you can move around and look up, down, sideways and back as if you were physically there. AR, on the other hand, consists of placing an information layer containing text or images on top of the real world in front of you, which appears on your phone's camera.

Figure 1. Virtual Reality glass (Nayır, 2017)

Figure 2. Augmented Reality (Apple, 2022)

3. RESULTS AND DISCUSSION

Human beings have always acted with the motive of owning a land or a product. Today's earnings systems are also built on this basis. In the metaverse environment, people are offered the opportunity to own land in a virtual environment similar to the real world.

Maps are considered as the basic tool in many computer games. In games such as Age of Empires, Civilization, Total War, Commandos and StarCraft, maps are used very effectively and determined strategies can be realized with the help of these maps. From this point of view, there is a high level of relationship with maps and spatial information in games played through platforms such as Axie Infinity, The Sandbox and Roblox in the metaverse environment. At the same time, lands can be bought and sold in these environments.

To purchase land on the Metaverse, a digital wallet must first be created. Afterwards, the companies selling virtual land can be searched and the desired plots can be purchased with the coins on the platform that sells the land or with cryptocurrency, the local currency of Metaverse, via the virtual wallet. Even the world-famous Samsung company has opened its own store on the Decentraland platform by moving its activities to the metaverse environment. In Decentraland, a platform consisting entirely of virtual lands, the value of the lands generally increases as they get closer to the central places. However, the value of the land, similar to the real world, may increase depending on the size of the land, the structures on the land and the objects it contains. In the metaverse environment, as in many countries, transactions such as buying/selling and renting virtual land on many different platforms, especially on metaverse platforms such as Decentraland and The Sandbox, are carried out through cryptocurrencies in our country.

Nexth Earth, one of the land sales platforms in the Metaverse environment, is similar to other land sales platforms. It is aimed to inform about other similar platforms by giving examples from this platform. By logging into the system with the e-mail address and the password specified on the platform called Nexth Earth, menus that will direct you to buy and sell land are encountered. The world consists of parcels with a certain area, such as pixels, on the map and represented by a tile (Fig. 3). A selection can be made on the map for the purchase of land (Fig. 3), or the plot that is planned to be purchased can be selected from among the plots in the sales announcement (Fig. 4). In addition, by entering the geographical location information in terms of latitude and longitude into the system, the determined land location and its vicinity can be selected (Fig. 5). The

prices of these plots are presented in matic metaverse coins. In addition, when clicking on the land, similar to a simple web-based GIS application, various information about that land such as price per tile, current owner, purchased for, and total price can be accessed (Fig. 5). Again, previously purchased lands/territories can be accessed (Fig. 6).

Figure 3. Land purchase on the Nexth Earth platform (Nexth Earth, 2022)

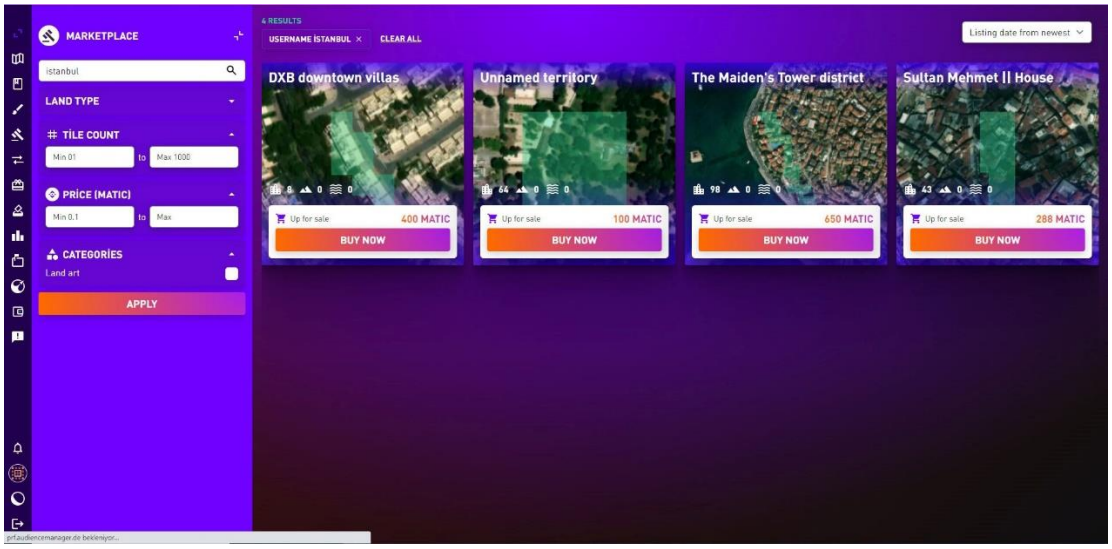

Figure 4. Land/territory for sale on Nexth Earth platform (Nexth Earth, 2022)

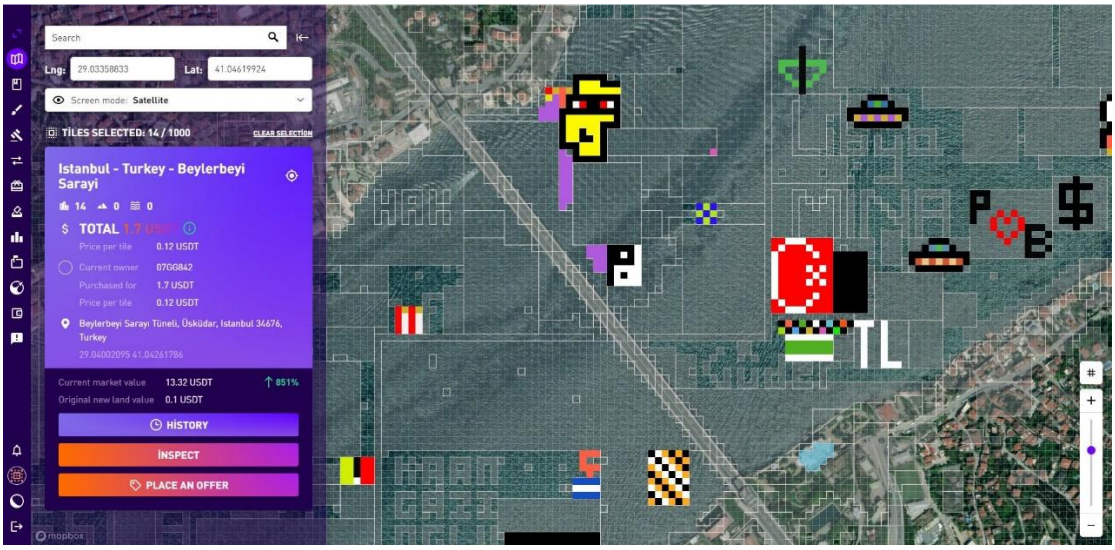

Figure 5. Access to information on land sold by query on the Nexth Earth platform (Nexth Earth, 2022)

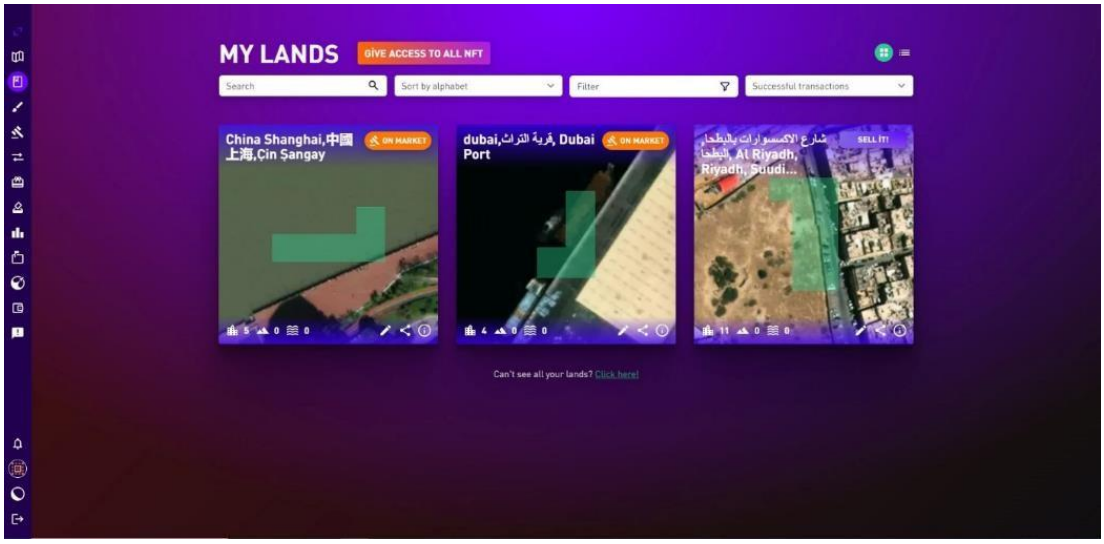

Figure 6. Land/territory purchased on the Nexth Earth platform (Nexth Earth, 2022)

Metaverse environment has started to be seen as an investment tool day by day. Lands that are thought to be valuable in the coming years by people with this mindset can be purchased in advance and invested in these areas. The optimum site selection problem is one of the most widely used analysis series in GIS applications. After the land is purchased through Metaverse land sales platforms from the regions determined using these analyzes, these investments can be profited by auction or different sales methods. Of course, this parameter alone may not be enough for gain. However, parameters such as the size of the land, the location of the land in the real world, the transportation and accessibility of the land, the right timing for buying and selling can also affect this gain.

4. CONCLUSION

The digital age, which has made a rapid transition with the COVID-19 process, deeply affects the traditional life of human beings. With the digital age, different from traditional life, concepts such as remote learning and remote meeting have begun to enter our lives. In addition to these concepts, we are witnessing more frequently that business life and socialization are moved to the virtual environment in terms of some sectors. In such a blockchain-based world, it is inevitable that the concept of Metaverse will be encountered more and more frequently. Taking part in the world that includes this newly developing concept may provide us some benefits in the coming period.

The existence of geographical information, which is used effectively in the concept of metaverse, which is the subject of this study, shows that GIS will be used effectively in this environment in the coming period. The power of spatial information can be utilized more effectively in this environment.

In this study, the concept of metaverse was examined and its relationship with spatial information and GIS was revealed. In this process, the future of the concept of metaverse and the place of spatial information and GIS in the concept of metaverse have been tried to be discussed.

Author contributions

The entire article was contributed by Tarık TÜRK.

Conflicts of interest

There is no conflict of interest between the authors.

Statement of Research and Publication Ethics

This study complies with the rules of research and publication ethics.

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