



A Study on the Improvement Plan of Citizens' Park Through Metaverse Convergence Focusing on the Case of Busan Citizens Park

Weisen Gao¹, Huimin Yang², Seo¹, Chang Bae^{3(✉)}, Pengfei Zhang⁴, Jie Hao⁴, and Jinxin Zheng⁵

¹ Doctor of Chinese Studies, Pukyong National University, Busan, South Korea
gaoweisen@naver.com

² Doctor of Marine Design Convergence Engineering, Pukyong National University, Busan, South Korea

³ Professor of Chinese Studies, Pukyong National University, Busan, South Korea
rainmarker@pknu.ac.kr

⁴ Doctor of English Language and Literature, Pukyong National University, Busan, South Korea
nataliamzhang@mail.ru

⁵ Master of Economics, Pukyong National University, Busan, South Korea

Abstract. Since 2021, the Metaverse has witnessed explosive development. With the investment of capital, the application scenarios of the Metaverse are gradually enriched. This paper aims to improve the attraction, economic power and international influence of Busan Citizen Park by integrating it with the Metaverse. Based on the analysis of the five characteristics of the Metaverse, namely, sociability, immersion, openness, economy and compatibility, as well as the practical application cases of the Metaverse, the paper puts forward the scheme of constructing the online Metaverse platform of Busan Citizen Park, setting up immersive interactive devices and releasing the park NFT. This paper provides a theoretical basis for exploring the practical application of the Metaverse in the future and a constructive scheme for the development of Busan Citizen Park.

Keywords: Metaverse · Busan Citizens Park · Immersion · Economic Effect · Tourism

1 Introduction

In 2020, due to the global epidemic, the transformation from offline to online accelerated, and it was during this period that the concept of metaverse came to our attention.

Roblox's metaverse game's successful launch in March 2021 in particular immediately attracted a lot of investors' attention to the idea of the metaverse [1].

According to Fig. 1, the major global technology companies will design the hardware and software in 2021. The current popular cognition of the use of the metaverse is limited to online software like games because of the capital layout direction in 2021. The "metaverse" idea has revolutionized everything from technology to concepts because

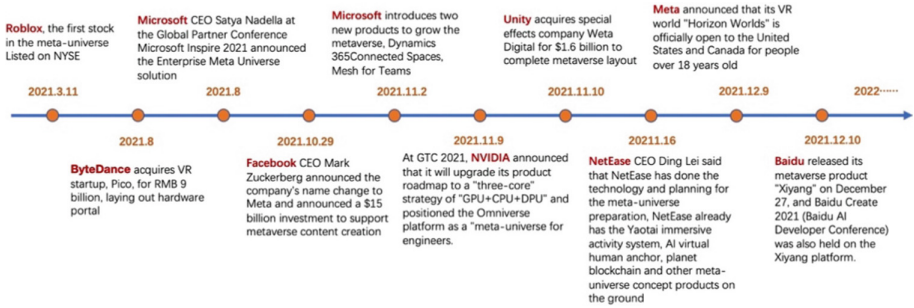


Fig. 1. The process of global tech giants has accelerated the layout of the metaverse since 2021 [2]

it is permeating every industry in the world so quickly [3]. The idea of the metaverse is still being developed, and various participants are adding to its significance in various ways [4].

Through our study, first of all, we'll examine the idea of fusing Busan Citizens Park with the metaverse to develop a brand-new attraction for the park from a variety of angles, attract more visitors to boost its viability economically, and develop a tourist destination with international appeal. Second, it will serve as a theoretical foundation for further investigation into the practical use of the metaverse. Finally, it is hoped that the research will increase the potential for market application scenarios in the metaverse and advance R&D of the metaverse industry indirectly.

Field surveys and case studies were used as the two research techniques in our research to analyze. The research is conducted using the fundamental data from Busan Citizens Park, which was field-surveyed multiple times and then combined with the case study. Considering that the metaverse is a novel idea, the scope of analysis will be broadened including cases of metaverse characteristics on the one hand and cases of metaverse reality applications on the other.

2 Metaverse

2.1 Metaverse Concept

The 1992 science fiction book < Snow Crash > introduced the idea of the metaverse. It represented a parallel virtual reality universe created from computer graphics, which users from around the world can access and connect through goggles and earphones [5]. In light of this, the term "metaverse" as it is currently used refers to a persistent multi-user environment that combines physical reality and digital virtualization. It is based on the fusion of technologies that allow for multisensory interaction with digital things, people, and virtual environments. The term "metaverse" is defined differently depending on the context [6]. In our study, the term "metaverse" will be used more broadly to refer to an independent space created to enable users to interact sensory through electronic information technology.

Articles	Sociality	Immersion	Openness	Perpetuity	Economy	Real-time	Compatibility	Civilization
<The 2022 Metaverse Industry Development Trend Report>	●	●	●				●	
<Metaverse 2022 - The Power of Accumulation>	●	●	●	●	●			●
<A Brief Analysis of the Metaverse>	●		●		●	●	●	
<The Education Metaverse: Characteristics, Mechanisms and Application Scenarios>		●				●	●	
<Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy>		●	●		●			
<The Transformation of Technology and Civilization - A Conceptual Study of the Metaverse>		●						●

Fig. 2. Expressions of Metaverse Features in 6 Documents (Self-painted)

2.2 Metaverse Properties

With the gradual improvement of the metaverse theory system, its properties have also become diversified. In order to understand the characteristics contained in the current metaverse concept, we refer to < The 2022 Metaverse Industry Development Trend Report > [7], < Metaverse 2022 - The Power of Accumulation > [8], < A Brief Analysis of the Metaverse > [9], < The Education Metaverse: Characteristics, Mechanisms and Application Scenarios > [10], < The Transformation of Technology and Civilization-A Conceptual Study of the Metaverse > [11], < Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy > [6], the 6 major literature are attached.

The literature is shown in Fig. 2 below.

We can know from Fig. 2, the metaverse has five characteristics: Sociality, Immersion, Openness, Economy, and Compatibility. Our research will examine the metaverse case using these five characteristics.

3 Current Situation of Busan Citizens Park

3.1 The Overall Description

Busan Citizen Park is located in Busan South Korea. The park contains five activity themes: Memory, Culture, Happiness, Nature, and Participation. The grassy plaza is about 40,000 square meters and the park is planted with 1,108,077 trees, built with 6 plazas, 9 children’s play facilities, 902 parking lots, 3 cafes, 2 convenience stores, and 22 restrooms. Busan Citizen Park has been striving to become a world-class park popular among foreigners as well as Busan citizens and Koreans [12].

3.2 History

During the Japanese colonial era, Busan Citizens Park served as a horse racing track and a military training facility. After Korea was liberated in 1945, it served as the headquarters of the U.S. Army base in Busan. The base was shut down in 2006, and the construction of Busan Citizens Park began in earnest in 2011 with the official ground-breaking ceremony. The park still has artifacts from that era today to preserve past history [12].

Table 1. Rental of facilities in Busan Citizens Park (2022.10 - 2022.12) [12]

Facility	October	November	December
Seminar Room	78	47	10
Gallery	97	98	110
Practice Room	50	48	33
Concert Hall	14	1	5

3.3 Main Facilities

Visitors to Busan Citizen Park may reserve the park’s new gallery, seminar room, practice room, concert hall, and plaza park, which provide a range of cultural activities. The following table details the availability of park amenities at Busan Citizens Park during the months of October, November, and December 2022[12].

Table 1 shows that galleries are now the most leased facilities in Busan Citizens Park, followed by lecture rooms and practice rooms, plazas, and concert halls. The gallery is mostly hired for photography and art exhibitions, whilst the seminar room is primarily utilized for conferences and lectures.

4 Case Study of Metaverse

4.1 Illustrating Five Properties of the Metaverse

4.1.1 Sociality

The biggest social networking platform in the world, Facebook, made the official announcement that it would change its name to “Meta” in October 2021 and that Horizon Worlds would be released in December of that same year. According to Meta, users will be able to design their own avatars with unique faces and attire to represent themselves in the virtual world. a representation of the user. After logging in, users can move around using VR equipment and motion controllers, visit other users, and engage in metaverse social interaction [13].

4.1.2 Immersive Attractions

Interactive technologies, such as virtual reality, augmented reality, mixed reality, and extended reality, are primarily responsible for achieving immersion [14]. The “Vincent van Gogh Multi-Sensory Exhibition” uses digital technology to create a separate space to achieve real-life immersion [15].

4.1.3 Openness

Roblox, the first business to mention the metaverse idea in its prospectus, is also the most representative of openness. The platform also gives creators access to simple tools and technologies like Client, Studio, and Cloud, which create an ecological cycle. Users

can socialize through the game, earn a virtual currency known as Roblox that can be exchanged for dollars, and create their live game universe using the free development tools that are already integrated into the game. The formation of the game platform ecology is depicted in the figure below [8].

4.1.4 Economic Effect

A non-fungible token (NFT) is a unique digital identifier that cannot be copied, substituted, or subdivided, recorded in a blockchain, and used to certify authenticity and ownership [16]. When “Everydays: The First 5000 Days” by the artist known as Beeple sold at Christie’s for an astounding \$69.3 million in 2020, the NFT market started to expand quickly [17].

4.1.5 High Compatibility

The metaverse is compatible and can accommodate people and things of any size. In the metaverse, anyone, any group, anywhere can create digital assets that can be used for circulation in the metaverse [18]. This feature can be demonstrated in both the Horizon Worlds and Roblox games mentioned above, where anyone can come together in a digital world from any location through the platform.

4.2 Cases of Metaverse Using Real-World

4.2.1 Function of Walking Navigation Using AR

Apple Maps has launched AR walking navigation in Japan, based on virtual overlay layers to navigate real-world environments, similar to the Google Maps Live View feature, which allows users to simply follow a series of virtual navigation arrows displayed on the map to reach their destination [19].

4.2.2 Experimental Demonstration of Japan Shibuya Recreation Technology Promotion Project

On September 12, 2019, Japan announced that the “Shibuya Entertainment Technology Promotion Project” will begin as part of “Renewing the City with Entertainment and Technology” in order to increase Shibuya’s appeal. The idea is to gradually infiltrate the virtual into the real by overlaying virtual content with AR/MR in well-known real-world scenes, blending the real Shibuya with the digital Shibuya [20].

4.2.3 Exhibitions Using Metaverse

“Yuanju Technology”, a Chinese technology company, has created the Metaverse platform, which can create 3D websites, exhibition halls, painting exhibitions, etc. Visitors can immerse themselves online and browse 3D pavilions to realize synchronized online with multiple characters, real-time voice communication, view works, and other content on display. 3D online museums are also known as online virtual pavilions [21].

5 Conclusion and Reflections

5.1 Conclusion

Regarding several cases, the following proposal for the development of the Busan Citizens Park Metaverse is proposed.

Development of “Busan Citizens Park Metaverse Online Platform”. The platform is a 1:1 replica of Busan Citizens Park, which allows users to view the park through the electronic equipment. The platform develops mini-games for users and provides physical consumption coupons for winners to promote consumption behavior from online to offline. The platform develops Metaverse exhibition and painting space to provide more choices for consumers who rent venues, increasing the economic benefits of the park while increasing the impact of the event. AR technology is used within the platform to achieve AR navigation and reality digital park to enhance the fun of the park. Because the metaverse has compatibility features, it enhances the user’s experience while greatly increasing the park’s international influence.

Set up an immersive interactive installation in the park. The “Vincent van Gogh Multi-Sensory Exhibition” is a digital media immersive space that can be used for art exchange, education, and history sharing. On the other hand, it will increase the diversity of the park’s future projects and increase the economic benefits.

Release of “Busan Citizen Park-NFT”. By applying various digital formats such as video, graphics, and meta-festival displays to the branded content of Busan Citizen Park, and releasing it in NFT format. In addition to being a new park souvenir, large-scale publicity of the park can be carried out in this way to improve its international reputation.

5.2 Implications

Although the concept of the metaverse is currently limited by the infrastructure technology development, the content and qualities expressed by metaverse are the objects we can refer to, and the precise and effective use of the characteristics of metaverse can create more economic and social value.

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