Chapter 9
The Metaverse and the Real-World Universe

Mankind will migrate into the metaverse in the future, leaving reality behind for a world that we create and govern entirely.

— Mark Zuckerberg

There are two paths in front of human beings, one is outward, leading to the sea of stars; the other is inward, leading to virtual reality.

— Cixin Liu

Metaverse is undoubtedly a hot word in industry and academia since 2021, and has become a hot new concept in the global technology field recently. At the beginning of 2021, the pre-IPO campaign of the game company Roblox and Epic Games' investment of $1 billion to create a "metaverse" made the concept of "metaverse" popular. Especially after the Facebook company in the United States changed its name to Meta [1], the Metaverse was instantly popular all over the world.

Since we believe that the evolutionary laws of the universe and the various intelligent phenomena that follow are to make the universe more stable, then some people will ask what is the relationship between the metaverse and our current universe?

We believe that the metaverse could drive the stabilization of the real-world universe with greater efficiency across a wider range of dimensions. And the metaverse itself will evolve in a more stable direction.

In this chapter, we briefly introduce the background, characteristics, technology and evolution of the metaverse.

9.1 Background of the Metaverse

Literally, the Metaverse originated in the 1992 novel *Snow Crash* by science fiction writer Neal Stephenson [2].

The novel describes a twenty-first century American society on the verge of collapse, replaced by various chartered states dominated by conglomerates. The

F. R. Yu, A. W. Yu, *A Brief History of Intelligence*,
https://doi.org/10.1007/978-3-031-15951-0_9

Library of Congress became the CIA database, and the CIA became the CIA. The government exists in only a few federal buildings, heavily guarded by agents armed with guns, ready to resist attacks from the street crowd.

In this decadent and chaotic real world, there is a virtual world that allows people to experience the perception feedback of the real world through various high-tech devices, that is, to create a parallel and perceptible virtual world outside the real world. In the real world, we have our own bodies, and in the metaverse we also have our own virtual avatar "Avatar", which has a virtual world that simulates reality and parallels reality. In this world, geographically isolated people can communicate and entertain through their respective "avatars", and have a complete social and economic system.

The protagonist, Hiro, is just a trivial pizza delivery guy. But in the Metaverse, he's a brave samurai, a hacker second to none. When the deadly virus "Avalanche" begins to wreak havoc, Hiro takes on the task of saving the world...

"Avalanche" is regarded as one of the greatest science fiction novels of all time, writing a magical prophecy about the future world for mankind. It has been read and talked about repeatedly by readers for nearly 30 years after its publication. Of course, although the word metaverse comes from "Avalanche", in the history of science fiction with as many stars as possible, similar concepts have been explained by science fiction writers more than once. For example, "Neuromancer", "The Hitchhiker's Guide to the Galaxy", "Brave New World", "Ender's Game" and other science fiction novels.

9.2 Concept and Characteristics of the Metaverse

The metaverse is a virtual space parallel to the real world. Since it is still in development and improvement, different groups have different definitions. But in general, there is a relatively unified view on its function, core elements and spiritual attributes that embody realistic emotions. From a functional perspective, it can be used for open social virtual experiences such as games, shopping, creation, display, education, and transactions. At the same time, it can be used for virtual currency transactions and converted into real currency, thus forming a complete virtual economic system. Its core elements include the ultimate immersive experience, a rich content ecology, a super-temporal social system, and an economic system of virtual and real interaction. In addition, because the Metaverse can carry out an immersive interactive experience, it can entrust the emotions of real people and give users a sense of psychological belonging, so it also has the function of carrying the spiritual back garden of real people.

Based on the concept and functions of the metaverse, it mainly has the following characteristics: sociality, rich content, immersive experience, and integrity of the economic system.

Sociability is manifested in that the metaverse can break through the boundaries of the physical world, form more relevant groups and ethnicities based on new

identities and roles in the virtual world, and interact with social interaction in the real world.

The richness of content is shown in the fact that the metaverse may contain multiple sub-universes, such as education sub-universe, social sub-universe, game sub-universe and so on. In addition, the user's in-depth free creation and continuous content update make its connotation constantly enriched, thereby promoting self-evolution.

The immersive experience is manifested in the fact that Metaverse is based on rich interface tools and engines, which can generate a real sense of immersive experience while ensuring low user access standards. In addition, the R&D and application of related experience devices, such as VR/AR/MR, have developed rapidly, which can further enhance the immersive experience of the Metaverse.

The integrity of the economic system is reflected in the fact that users can earn income by doing tasks or creative activities in the virtual system, and these virtual income can be exchanged with real currency to realize realization. In addition, the economic system of Metaverse is a decentralized system based on blockchain, and users' income can be better guaranteed without being affected by the centralized platform.

9.3 Main Technologies Involved in the Metaverse

Based on the key technologies involved in the metaverse, Jon Radoff, founder of social media company GamerDNA, divided its industry chain into seven levels. They are infrastructure layer, human-computer interaction layer, decentralization layer, spatial computing layer, creator economy layer, discovery layer, and experience layer. The development of the metaverse academic field can be seen from the progress of some key technologies involved.

- The infrastructure layer includes communication technology and chip technology. The communication technology mainly involves various communication technologies such as cellular network, WIFI, and Bluetooth.
- The human-computer interaction layer mainly involves multi-dimensional interactions such as mobile devices, smart glasses, wearable devices, haptics, gestures, voice recognition systems, brain-computer interfaces, etc., full-body tracking and full-body sensing. Human-computer interaction equipment is the entrance to the metaverse world, responsible for providing a completely real, lasting and smooth interactive experience, and is a bridge between the metaverse and the real world. The decentralized layer includes cloud computing, edge computing, artificial intelligence, digital twin, blockchain, etc. Cloud computing mainly provides high-standard computing power support for the realization of the Metaverse, which supports simultaneous online and virtualized operations of a large number of users, and also enables 3D graphics to be rendered on the cloud GPU, releasing the pressure on front-end equipment. While edge

computing provides computing power support, it ensures low latency. Artificial intelligence mainly brings continuous vitality to the Metaverse, and its related technical reserves such as identification, recommendation, creation, and search can be directly applied to all levels of the Metaverse, thereby accelerating the massive data processing, analysis and mining tasks it needs. The digital twin virtualizes the real world, and its applications are mainly focused on industry applications. The metaverse is not only a simulation of the real world, but can also create elements that are not in the real world, and its application is mainly personal. The blockchain mainly ensures that the virtual assets of the Metaverse are not restricted by centralized institutions, thereby effectively guaranteeing the ownership of digital assets and making its economic system a stable, efficient, transparent, and decentralized independent system.

- The spatial computing layer includes 3D engine, Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), geographic information mapping, etc.
- The creator economy layer includes design tools, capital markets, workflow, business, etc.
- The discovery layer includes ad networks, social, content distribution, rating systems, app stores, intermediary systems, and more.
- The experience layer includes gaming, social, eSports, theater, shopping, and more.

9.4 Evolution of the Metaverse

The reason why the metaverse can have such a rapid development is inseparable from its important functions and its current social environment.

The COVID-19 epidemic that swept the world in early 2020 has not yet been fully controlled, and social isolation has become the norm in people's lives, severely hindering the flow of materials (mainly people themselves). As we discussed in previous chapters, the flow of matter contributes to the stability of the universe. If the flow of matter is blocked and our universe becomes unstable, then another structure emerges to stabilize our universe.

Because the development of the metaverse matches Maslow's hierarchy of needs, that is, it can meet people's physiological needs, safety needs, love and belonging needs, esteem needs, and self-actualization needs. Therefore, in the current epidemic scenario of social shrinkage, this technology has received more attention and development. Online, intelligent and unmanned technologies are accelerated, and people are used to communicating in the virtual world. At this time, the metaverse came into being, moving from fiction to reality. The metaverse can contribute more to the stability of the real-world universe in more dimensions and with greater efficiency.

Although the metaverse is a virtual space parallel to the real world, its evolution should also follow the cosmic evolution law of our real world.

The universe in our real world is unstable from the beginning, and everything in the universe is constantly changing, making the universe gradually stabilize. It has taken more than 13 billion years to facilitate the stability of the universe at the physical, chemical, biological, and machine levels. The speed of this evolution continues to increase, much like what Kurzweil calls the law of "exponential progress".

What we can be sure of is that the metaverse is evolving much faster than the real-world universe. In addition, like our real-world universe, the metaverse develops orderly specific socioeconomic structures. It enables the rapid flow of matter, energy, information and intelligence, effectively alleviating the imbalance of matter, energy, information and intelligence, thereby promoting the stability of the metaverse and the universe in the real world.

References

1. C. Newton, Mark zuckerberg is betting facebook's future on the metaverse. The Verge (2021)
2. N. Stephenson, *Snow Crash* (Bantam Books, New York, 1992)