The metaverse and its influence and transformation on human society

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ABSTRACT

In 2021, the metaverse was born, becoming a stimulant in the capital market and the focus of heated discussions in academia. However, there are different opinions on how to define the metaverse. This study defines the metaverse as: supported by the Internet, artificial intelligence, and blockchain technology, the virtual world and the real world are coupled together through information and communication technology and smart devices, and a realistic mirror world that integrates virtual and real is constructed and recreated according to one’s own subjective imagination. Compared with traditional cyberspace and physical space, the metaverse has distinctive features such as technological superposition, fusion of virtual and real, embodied immersion and real-time interactivity. Just like the birth of the Internet more than 30 years ago, the metaverse will profoundly influence and change human society and form a new form of human civilization. In order to ensure that the metaverse can play the role of “benefiting” in human society rather than instigating the crisis of “alienation”. Refinement and improvement of the underlying technologies to ensure the smooth implementation of the metaverse and energy-saving applications, and the establishment and consolidation of the top-level system to prevent the metaverse from violating morality and laws are important issues and mission responsibilities that the metaverse builders should consider.

Keywords: metaverse; virtual world; new form of civilization; artificial intelligence; human society

1. Introduction

The advancement of science and technology can turn human fantasy into reality, whether it is the flying sky of ancient Chinese fantasy or the fantasy of Verne in “Twenty Thousand Leagues Under the Sea” 200 years ago, all dreams have come true. In the eyes of many people, the metaverse that will erupt in 2021 is also a fantasy, thinking that it is just an enhanced version of virtual reality, a stimulant for the capital market, and an “advanced stage of cyberspace”[1]. However, more scholars believe that with the help of artificial intelligence, big data, cloud computing, and blockchain, virtual reality, augmented reality, and mixed reality technologies will make it possible for the metaverse to become a reality soon, running in parallel with the real universe. The virtual universe may even become a new form of human civilization, profoundly affecting and changing human production methods, living conditions, and ecological patterns, and then affecting and...
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changing our thinking methods, cognitive patterns, and behavior habits. Just like the emergence of the Internet 30 years ago, it brings both challenges and opportunities: Internet addiction and cybercrime are the challenges brought by the Internet, and improper responses will endanger the health of young people and affect social stability. The convenience and efficiency of the Internet are the opportunities that the Internet has given us. The sharing economy, epidemic management, and online learning allow us to build a new development pattern calmly. Seize the opportunity to live, lose the opportunity to die. General Secretary Xi Jinping asked us to “be good at nurturing opportunities in crises and opening new situations in changing situations”[2], the metaverse may be a “crisis” or a “change”. If people plan the layout in advance, they can take the initiative and take the lead in the new form of civilization, the metaverse, and open a new situation.

2. The connotation and characteristics of the metaverse

In March 2021, the game company Roblox went public with the “first share of the metaverse”, and its market value soared tenfold, triggering investment Ben frenzy[3]; in October 2021, Mark Zuckerberg renamed Facebook to Meta and announced a full-scale entry into the metaverse[4]; in January 2022, Microsoft acquired Activision Blizzard for $68.7 billions[5]. The metaverse instantly became the focus of the world’s attention. The term “metaverse” is not new. The person who first appeared and used “metaverse” was Neil Stephenson. In his novel “Snow Crash” in 1992, he outlined the use of avatars in the virtual world. A picture of the creation of living territory and social interaction in the world[6]; As early as 1990, Chinese scientist Qian translated Virtual Reality as “spiritual realm” to refer to the virtual space corresponding to the real world[7]; after that, “Minecraft” and “Fortress Night” Phenomenal games such as Fortnite realize the related concepts of the metaverse in the game world[8].

2.1. Connotation of the metaverse

Wikipedia defines the metaverse as “a collective virtual shared space created by the fusion of virtual augmented physical reality and physically persistent virtual space, including the sum total of all virtual worlds, augmented reality, and the Internet”. But the academic community has not yet reached a consensus on how to define the metaverse. From the analysis of semantic structure, the metaverse is a combination of the words “Meta (outside, beyond)” and “(Uni)verse (universe)”[9], so the metaverse can be understood as a virtual universe that transcends and breaks through the natural universe. Hu believes that this “transcendent universe” refers to the digitally generated world, which is a comprehensive digital media system based on network aggregation. Through this system, an alternative form of economic operation, social organization model, and cultural production style can be created, the way of human existence can occur[10]. Huang also believes that the metaverse refers to a digital virtual universe constructed by people outside the natural universe through digital technology that mirrors the natural universe but can provide people with free creation space, and through the exploration of the digital universe, we can fully understand and utilize the natural universe[11]. At the technical level, Yu believes that the metaverse is “an open-source platform that is highly interconnected between virtual and reality, and is constructed by a closed-loop economy”[12]. “The metaverse is the future integration of all elements of the Internet, such as the Internet, virtual reality, immersive experience, blockchain, industrial Internet, cloud computing, and digital twins”, metaverse is the culmination of various digital technologies such as blockchain technology, interactive technology, video game technology, artificial intelligence technology, network and computing technology. It is the ultimate digital medium that integrates and integrates all digital technologies now and in the future. It will realize the connection revolution between the real world and the virtual world, and then become a new type of world beyond the real world and higher dimensions. In essence, it depicts and constructs the vision form of the future society[13]. Foreign scholars believe that
the metaverse is a 3D shared virtual world for people to carry out activities under the services of Augmented Reality and Virtual Reality technologies[14], and it is the next generation of human centered embodied computer operating systems[15]. Shenyang believes that the metaverse is a new type of Internet application and social form that integrates a variety of new technologies. It provides an immersive experience based on extended reality technology, and digital twin technology generates a mirror image of the real world, connecting the virtual world with reality. The world is closely integrated in economic systems, social systems, identity systems, and allows content production and world editing for each user. The metaverse is not an independent kingdom that is parallel to reality and can replace reality, but a symbiotic world intertwined with real life; the road to the metaverse is not an alternative choice of "removing the real to the virtual", but "complementing the real with the virtual", the new scenarios, new productivity and creativity derived from the metaverse will create a new production system and creation system, which will feed back the productivity improvement and the innovation of production relations in the real society[16].

Based on the current academic understanding of the metaverse, this study believes that the metaverse is supported by the Internet, artificial intelligence, and blockchain technology, and integrates the virtual world and the real world through information and communication technology and smart devices. A mirror world of reality that is constructed and recreated according to one’s own subjective imagination. Although the metaverse is a virtual world constructed by human beings based on their own subjective imagination, it is not completely illusory. It may be the replica of the real world in the virtual world[17], which is the mirror projection of the real world superimposed on the future world that human beings expect and long for. The metaverse will realize the human society that is currently unattainable in reality in the digital world, and it is possible to realize what Marx called “human society or socialized human beings” first in the virtual world, and develop towards the “combination of free people”[18].

2.2. Characteristics of the metaverse

The development of the metaverse has to go through three stages: digital twin, virtual native and virtual reality fusion[19]. Baszucki, the CEO of Roblox, proposed that the “metaverse” has eight basic characteristics such as identity, friends, immersion, low latency, diversity, anywhere, economic system and civilization[20]. Compared with cyberspace, cyberspace and real space, the metaverse has its distinctive features.

Technology superposition

Computing power and data are the foundation of the metaverse, the “ABCD” based on 5G, A is artificial intelligence, B is Blockchain, C is Cloud, and D is Big Data[21]. Unlike data space, cyberspace and other visions that can be realized by relying on a single technology[11], the metaverse itself is not a technology, and it cannot realize program startup and form display under the independent support of a single technology. On the contrary, the co-development and joint application of multiple software and hardware technologies gives the metaverse the possibility to generate and operate. For example, VR, AR, and MR provide virtual reality scene reconstruction and immersive experience, artificial intelligence and digital twins ensure content production and identity construction, and blockchain technology guarantees value and rights realization.

The fusion of reality

Metaverse can use digital twin technology to completely and accurately mirror the geographical and human landscapes in the real world into the virtual world, forming a replica of the physical world. This virtual world is also a world composed of “people”, but in this world, “people” are not specific “people”, but virtualized digital avatars. Digital avatars give real people a “second identity”, people use “second identity” to map real activities into the metaverse, build virtual communities in virtual space, shape the “virtual civilization” of the metaverse, and
form a new form of human civilization\textsuperscript{[22]}. The fusion of the virtual and the real in the metaverse is embodied in the “real body” in the real world, the “avatar” in the virtual world, and the “three-in-one” of the simulated “fake body”. The real body is the id, the avatar is a virtual digital human corresponding to the real body, and the fake body is a robot corresponding to the real person constructed through the simulation robot technology. The three have unity in identity and commonality in cognition, emotion, and interactive experience\textsuperscript{[19]}. \par \textbf{Immersive}\par Since the traditional Internet only puts text, video and other information on the electronic screen and sound system of PC terminals and mobile terminals, people and information are usually in a state of binary separation. The metaverse will change that. With the development from virtual reality (VR) to augmented reality (AR), mixed reality (MR) and even extended reality (XR), when people use wearable smart devices to enter the metaverse, they will be surrounded and wrapped by information, so as to observe the scene and participate in the activity in an immersive way with immersive and multi-sensory linkage. Moreover, this kind of immersion is from deep immersion to full-body immersion. This “body” refers not only to the body, but also to the comprehensive and in-depth intervention of the sense and perception that integrates vision, hearing, touch, and kinesthetic, even in the virtual world. It gives people a strong sense of presence and authenticity, and makes people feel that they are completely separated from reality and fully integrated with digital avatars. \par \textbf{Real-time interactivity}\par The rapid development of interactive technology provides users with a more comprehensive and three-dimensional interactive mode and a more immersive interactive experience, and provides the metaverse world with a comprehensive and seamless connection from the physical world to the biological (psychological) world, from the real space to the virtual space\textsuperscript{[13]}. The metaverse can break through many barriers to reality through software and hardware technologies and bring people together in an online digital space. In addition, the metaverse allows people to create and share scenes and resources that must be used to carry out collective activities with the help of tools according to their own needs, so as to facilitate multi-person actions such as education and teaching, business negotiation, and leisure and entertainment. At the same time, the metaverse pursues low latency, and will gradually compress the time period of “sending a signal waiting for a response-getting a response”, thereby ensuring that people can enjoy real-time communication and interaction. \par \textbf{3. The metaverse reconstructs the new field of human existence in space and time}\par The universe is the time and space of matter, all things exist in the universe, and human beings are only a part of the universe. The metaverse will expand from a single natural universe to a dual universe of virtual and real coexistence. As the twin form and extension of the real world, the metaverse extracts and integrates the evolutionary context and representational features of the real world, and at the same time relies on the powerful and heavy scientific and technological power to realize the landing of imaginative imagination and the demolding of Nanke’s fantasy, reconstructing the new field of time and space for human existence. \par \textbf{3.1. Humans will subjectively feel the time elasticity and resilience increase}\par While physical time still evolves according to the laws of nature, the metaverse changes people’s perception of time from the three dimensions of history, present, and future. \par \textbf{The metaverse can recreate history on a virtual level}\par According to the principle of entropy increase, the degree of disorder in the system is always increasing, just as the original highly ordered complete cup falls from the table to the floor and breaks into
disordered fragments, it is impossible to automatically form a complete cup and jump back to the table, human beings also cannot go back to the past. Stephen Hawking used the above example to vividly illustrate the one-way progression and irreversibility of time[23]. Although the metaverse cannot get rid of the principle of entropy increase and become a “time machine” that reverses the arrow of time in the physical world, the metaverse can become a “transporter” that “transplants” history into the virtual world. With the help of digital twin technology, artificial intelligence technology and human-computer interaction technology, people will realize the reconstruction of historical scenes and the re-enactment of historical events in the metaverse. “Public History” will resurface in the metaverse. “Public History” uses text, audio and video records, archaeological excavations and scientific research as the means of induction. It is a public history that aims to describe to the public the changing process of natural conditions before and after the appearance of people, the activities of social group portraits, and the merits and demerits of important figures. In the metaverse, people can, with the assistance of technology, project the content recorded in the real historical materials of “public history” into the virtual world in a three-dimensional and panoramic manner, and simulate the climatic conditions, geographical features, natural conditions of different historical periods biology, material production, human landscape and society are contradictory, so after a few years, they approach, learn and understand history as the “authority” who is in it. “Private History” can also be reproduced in the metaverse. The private memory and experience accumulated by individuals in the process of participating in family life, study, work, and social interaction are far less than the number of informed audiences, the scope of dissemination, and the effectiveness of their influence. Individuals do have irreplaceable significance. After entering the metaverse, people will have the rights and tools to edit the world, and virtual human technology will mature in the future. People can use the memory fragments stored in the mind and the old records that can be seen on the carrier as the basic blueprint, and the system will be able to recover. Engraving past scenes, carefully imitating past activities, accurately creating past atmospheres, creating virtual human beings characterized by broken connections and deceased relatives and friends, and using pre-programmed methods to implant them to ensure that they can respond to people in the past. “Code Thought”[24] that responds to the signals sent out under the guidance of “Flesh Thought”, thus transforming distant memories into close “reunions”

**The metaverse can expand the present on a virtual level**

Marx and Engels clarified that, when the productive forces have not reached a very high level, due to differences in “sexual behavior,” “natural talent,” and “needs,” people “spontaneously” enter into different fields of labor division[25]. Under the conditions of this natural division of labor, the corresponding social relations such as labor cooperation, product distribution and class division are formed between people, which further leads to, within a certain period of time, the scope of people’s daily activities, the way of absorbing benefits and the accumulation of wealth. The situation is relatively stable. Therefore, in the physical world, which is the original body of the metaverse, for individuals, factors such as physiological characteristics and social status lead people to be confined to a relatively monotonous life experience in the life span of decades to more than a hundred years. The metaverse is committed to helping people to enrich the types of experiences and expand the breadth of knowledge while following the conventional life arrangement within a limited time. When people act in the metaverse, they need to rely on one or more incarnations to achieve personality expression and facilitate communication and interaction. Although the actual manipulator behind the avatar is a human, the avatar used by a human is not a re-molding of the physical image, nor is it a rubbing copy of the actual identity. On the contrary, people can freely set and change the gender, age, race, skin color, appearance, class, income and hobbies of their incarnations according to their own desires and demands, and es-
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tablish communication, cooperation and companionship with other incarnations. Choose and invest in different scenarios, participate in special activities belonging to different nationalities, accept work challenges from various industries, and simulate behaviors derived from unfamiliar cultural communities. In the metaverse, people will have the opportunity to simulate and experience the life process of other species such as flowers, birds, insects and fish. The metaverse can help people make full use of the limited life time and obtain multidimensional life experiences that are inconsistent with or even completely different from real life.

The metaverse can shape the future virtually

The emergence and truthfulness of idioms such as “prepare for a rainy day” and “be prepared for danger in times of peace” indicate that making assumptions and predictions about the future is an important habitual tendency of human beings. In the metaverse, technology, experience and imagination can work together to “shorten” the time period from the present to the future, so that the “future” arrives earlier, which is mainly manifested in the following aspects: first, people can try in advance to experience, adapt and transform the alternative living place in the future. Due to the excessive activities of human beings, natural resources are increasingly depleted, and environmental pollution is overflowing everywhere, and the habitability of the earth cannot be guaranteed for a long time. Some scientists believe that in the future, when the carrying capacity of the earth reaches a critical point, immigrating to Mars, which has a similar living environment to the earth, may become a feasible solution. And the metaverse promises to be a testing ground for human immigration. With the support of digital twin technology, people can use Martian soil and water samples and other scientific data obtained through space exploration to prepare a simulated experience for the living environment and living conditions of Mars, and explore the needs of human beings in it. The strategy of transforming Mars for the anchoring direction and regulating human behavior based on the characteristics of Mars. Second, people can witness the realization of future goals at the virtual level. The metaverse contains many materials and tools for people to edit the world. With its help, people can build and experience the goal life in the virtual world that has not yet been formed in real life according to their own vision for the future. It follows that the future, which has not yet become a fait accompli in the physical world, can accelerate to the station in the metaverse.

3.2. Human beings will subjectively feel that the increase in the thickness and breadth of space, the metaverse will promote the physical world, social world and conscious world to open space at the virtual level

The holographic mirror space of the metaverse lifting and splicing the physical world

With the support of digital twin technology and precise scientific data, physical spaces such as natural and cultural landscapes distributed in different administrative divisions and geographical locations, as well as outer space forms far away from the earth, can be mirrored into the metaverse to form their own digital twins. In addition, the metaverse will dilute and erase the geographical boundaries of the virtual world that prevent people from completing quick and convenient spatial displacements in real life, thereby generating a set of high-precision and high-density physical space scene puzzles in the virtual world. On this basis, when a person enters the metaverse in the form of an avatar, he can, with the help of tools, click on the location link sent by other avatars, or even by manipulating his mind, to be immersed in it and feel mobilized. Experience the scenery and activities of different spaces, and realize the random entry, exit and switching of the space. In short, in order to achieve the goal of space transfer to travel around the world, people originally needed to rely on walking, driving, and flying to sew up the gaps between different geographical spaces. Displacement signal—waiting for displacement response—complete displacement task” man-machine coordination process.

A simulation supplementary space for the metaverse to add and extend the social world
There is a long-standing contradiction between the fixed total amount of space supply in terms of natural attributes, the limitations of space creation and production in terms of social attributes, and the infinite demand of human beings for space\(^29\). The metaverse can realize the re-expansion and redistribution of space through technological means. In the current life, it has become the norm for many spaces and places that serve social collective affairs to be closed or used, and the knowledge learning, skill acquisition, political meeting and business negotiation that people need to rely on in order to realize their development demands have a great influence on the sense of atmosphere. Social activities that put forward extremely high demands are not satisfied with the interactive mode of dichotomy between electronic screens and audio equipment, so it is urgent to open a new holographic sharing space. The digital twin technology inherent in the metaverse has the openness to allow people to edit the world and produce content. Moreover, open-source technology will spread in the metaverse. After the consensus on the open source standard protocol is reached, after the community governance structure and the tools of the dispute resolution system are established, and under the clear and fair policy of the metaverse administrator, hundreds of millions of users use open source code to maintain their own communities in the metaverse, and open source code has therefore become the basic spatial construction for digital residents to carry out social co-construction, boundary expansion and social activities in the metaverse\(^10\). Under this premise, after entering the metaverse, with the assistance and guidance of high-speed network, scientific data and space protection consensus, according to the type, characteristics and demands of social activities, people can actively copy, create and maintain the corresponding space and scenes, so as to extend and increase the virtual space available for use and trust in the unfavorable situation that some social activities are suspended due to the shortage of physical space, so as to ensure the smooth progress of social activities.

The metaverse provides and spreads the imaginary projection space of the conscious world

According to the dialectical relationship between matter and consciousness, it can be seen that after receiving the information stimulation generated by participating in activities such as labor production, school education and social interaction, people will conceive, describe and build in their minds that are born out of objective reality but do not completely coincide. Based on the content of people, things, scenes and events in objective reality, the world of consciousness and imagination that is brewing, hidden and inflated in the human brain is built. Many literary and artistic works with the theme of science fiction and magic are the products of people’s objectification and extension of imagination. In contrast, the metaverse can provide people with a more free and experiential imagination coloring canvas and casting space. When people enter the metaverse, they can use the consciousness stored in their minds as a principle guide and reference certificate, and use the editing tools and creation equipment built into the metaverse platform to create, witness and dominate the laws of physics, laws of nature and appearance. An imaginary space that is completely different from the real world in terms of form and other aspects, so that on the basis of using technical means to replace the conscious world from an implicit state to an externalized state, it can be integrated with each other.

4. The metaverse forms a new way of human social life

Marx and Engels pointed out that the productive forces “continuously develop with the continuous progress of science and technology”\(^30\), and that science and technology promote the development of productive forces, enabling the bourgeoisie to use “more and more productive forces than all the productive forces created in all previous eras.” “The productive forces change people’s production, consumption, transportation and religious concepts\(^25\). Science and technology are the “behind the scenes” that promote the transformation of human life style.
As an integrated product of several advanced technologies closely nested and working in the same direction, the metaverse will profoundly affect and change human labor, consumption and spiritual life, and form a new style of human social lifestyle.

4.1. Virtual labor has become a new form of labor and life

Marx believed that in the advanced stage of communism development, “Labor is not only a means of earning a living, but itself is the first need of life!”[31] With the progress and development of society, labor will become the first need to meet a better life. The metaverse may be the key variable that facilitates this major change in labor from earning a living to needing, or the largest increment that guides this major change. After the metaverse has landed, the changes in labor production methods are mainly reflected in the following two aspects: first, the application of simulated production and services may be more extensive. Benefiting from digital twin technology and digital mainline technology, the metaverse era makes real production processes more optimized, cost-saving, and labor more efficient through simulated production. Digital twin technology is the technology of copying and pasting real things into the virtual world, and digital mainline technology is the technology of analyzing, measuring and simulating the digital mirror image of real things in the virtual world. With the support of these two technologies, before the official production starts, relying on the metaverse, the “simulation production (service) process and process - simulating product (service) experience - making product (service) experience feedback - simulating improvement has been launched many times in advance. The whole process of “production (service)” simulates the production (service) mechanism, providing experience and data reference for formal production (service). Second, virtual labor may be recognized and loved. Marx believed that in a society with great material abundance, labor would become a luxury and a privilege. Artificial intelligence is rapidly increasing productivity, robots are accelerating the replacement of repetitive human labor, and Marx’s prediction that labor becomes a privilege is becoming a reality. The metaverse has brought new labor opportunities to human beings—Virtual labor has become a new form of labor, and like real labor, it has become the carrier of life value. The metaverse “holographic twin” replicates the real society and recreates a virtual society that integrates reality and reality, providing people with a lot of opportunities for virtual labor. As an open world with no complete script set, every individual can participate in it to carry out content creation, meaning production and environmental maintenance. The metaverse not only expands the space of labor, but also extends the time of labor, and enriches the value and meaning of labor. The metaverse will have a legal and ethical system that is consistent with the real world. When people enter the metaverse and rely on technical tools to produce and transmit texts, audio and video, video, event scenes, virtual characters and game plans, they can obtain intellectual property protection, thus realizing legal confirmation of their own originality. Metaverse is committed to building an economic system that is interconnected and integrated with the real world, and formulating rules for the exchange of digital currency and real currency. The virtual rewards earned by people can be exchanged for real currency. Residing in virtual space and engaging in virtual labor may be an important way of human social life in the future.

4.2. Virtual consumption has become a new fashion for consumption choices

Virtual consumption first began with the sale of virtual goods such as online game equipment. The separation of some players’ time, ability resources and game equipment, just like the separation of production materials and labor products in the real world, has spawned virtual commodity producers who specialize in boosting accounts and playing equipment. The virtual consumption of games by global players has exceeded US$100 billion for three consecutive years[32]. The metaverse may promote the rapid growth of virtual consumption due to its advantages of mobilizing holographic immersion. From the perspective of the types of virtual con-
sumption, the virtual consumption of the metaverse mainly focuses on the purchase of virtual means of production, virtual assets and virtual services. One is the consumption of virtual means of production. The premise of producing UGC in the metaverse to share or sell profitably with the platform is the close integration of physical strength and intelligence with key virtual production materials including equipment, tools and materials, and such virtual production materials are generally provided by the platform. For the accumulation and realization of wealth, purchasing virtual means of production is an inevitable choice. The second is virtual asset consumption. Decorations such as and avatars are equivalent to people’s “facades” in the metaverse, and it seems reasonable to invest money to dress up avatars. Virtual land, virtual real estate and digital collectibles may be new consumption growth points. The third is virtual service consumption. Judging from the current virtual emotional services such as online psychological counseling and counseling, virtual lovers chatting, etc., there is a certain sense of alienation between the server and the served, and the shared atmosphere of the metaverse can promote empathy between the server and the served. In addition to virtual emotional services, virtual entertainment services such as holographic real-time mapping of concerts, dramas and sports events in the metaverse are also likely to be sought after. With the help of blockchain technology and metaverse payment rules, metaverse will build an efficient, secure and transparent payment ecosystem, which will further strengthen people’s willingness to spend virtual.

4.3. Virtual culture becomes a new form of spiritual life

Marx and Engels pointed out: “Just as the reflection of an object on the retina is directly generated from the physiological process of people’s life,” it is the life as an “original” that determines the consciousness and spirit as an “image”. The metaverse and the new modes of material production and life that arise from it will drive the wheel of spiritual life change. First, in terms of entertainment and leisure, people can use tools to edit and set game scripts, game rules and game scenarios in the metaverse, and get rid of the paradigm of traditional online games where the content is dominated by the design side; people can see the digital twins of geography and human features around the world, as well as outer space scenes, without the need for travel and travel. Second, in terms of social interaction, metaverse can expand the scope of online friendship and increase the space for online gatherings, incarnate “face-to-face interaction” to stimulate people’s “heart-to-heart collision”, and promote “acquaintance intimacy” and “familiarity with strangers”. In addition, virtual humans based on data and code as the basis for generation and operation will “influx” into the metaverse in large numbers with the support of technology. When a person sends a signal to the virtual human, the powerful computing power will ensure that the human can interact with the virtual human in a real-time manner, and generate physical sensations and enhance psychological feelings. From this, it is not difficult to foresee that many people will buy or independently edit virtual relatives, virtual lovers and virtual friends according to their own demands, which may lead to and strengthen the phenomenon of emotional attachment of “physical humans” to “virtual humans”. The third is in the understanding of values. In the metaverse, the use of technological means can virtually bridge geographic barriers, level age boundaries, dilute racial differences, and condense and condense all people into digital space. Therefore, people can break through the restrictions of the times to stay in historical scenes, switch places at will to experience different customs, and actively customize characters to simulate fresh life. For foreign countries, they no longer watch fires from the shore, but are exposed to them, which makes it easier to accept multiple values. Fourth, in terms of learning, digital twin technology is used to generate a fully functional digital simulation place in the metaverse. The learner enters the metaverse to start learning tasks, holographically places himself in the learning scene, stimulates the learner’s neurons with multiple senses, and realizes the true sense of
learning, deep learning. These virtual cultural lives enrich the spiritual culture of human beings, and may become an important way for the new form of human civilization.

5. The metaverse shapes new characteristics of human thought and behavior

Marx and Engels pointed out: “The production mode of material life restricts the whole process of social life, political life and spiritual life.”[33] The natural conditions that set up obstacles for human material activities or provide resources, and the living conditions such as product production, material distribution, and class division formed by the development and development of human material activities jointly determine the communication paradigm, thought orientation and behavior orientation. Therefore, when the metaverse and the new contents, new forms and new habits of life that emerge and develop from it become a ubiquitous social existence, people’s thoughts and behaviors will undergo shocks and changes.

5.1. Outward exploration and inward involvement in the game under the sensory set

The metaverse will bring about changes in the mechanism of human sensation generation. The process of feeling in real life is: The stimulus acts on the sensory organs, causing the sensory organs to produce nerve impulses; Nerve impulses are transmitted to the cerebral cortex along the sensory nerve pathway, and are transformed into human sensations after comprehensive analysis.[34] However, after entering the metaverse through devices such as smart glasses, smart helmets, and brain-computer interfaces, the functions of sensory organs will be replaced by digital signals directly sent to the human brain, this means that one can feel in a meta-universe state without receiving real stimuli from inside and outside the body. In addition, the metaverse benefits from the digital twin technology, which can sublimate the natural and humanistic things in the real world in the virtual world in the form of mirror reproduction and close arrangement. The human brain types digital signals, which allows people to transcend the limitations of time and space and individual characteristics, and experience the comprehensive stimulation of sight, hearing, touch, smell and taste. These feelings may, on the one hand, reinforce the sharp contrast between the grandeur of the physical world, which is the original model of the metaverse, and the limitations of people’s subjective cognition, thus giving birth to people’s desire to explore the unknown; on the other hand, if people take the lead in acquiring a specific feeling of satisfying their own demands in the metaverse rather than in the real world, then some people may have the illusion that the metaverse is placed in front of the real world, and thus voluntarily become involved in the virtual world, retreat from places equipped with virtual world entrances, weaken active observation of the real world, and detach from real life. The conflict of outward seeking and inward involvement caused by this feeling may lead to profound changes in the way of human cognition.

5.2. The confrontation between immersion and submersion under the flow experience

Mihali pointed out that when a person is engaged in a career he loves, he will be fully focused without being influenced by others, and only feel that time flies and still be full of interest. This serious and exciting experience is called flow (Flow).[35] The three prerequisites for the flow experience to be engrossed in a task are: setting clear goals, getting timely feedback, and having the ability to accept and complete challenges.[36] The design of the metaverse is completely coupled with the conditions for stimulating the flow experience: First, the resources such as scenes, images, and tools for people to carry out multiple activities are stored in the metaverse, which can stimulate people’s curiosity and interest, and help people to set and achieve entertainment, learning and social goals; second, with the support of hardware and software technologies such as the high-computing computer to be refined, the SORAS system to be launched[37] (random optimal resource allocation system), the metaverse can provide people
with low-latency, real-time action responses and information feedback; third, when the metaverse enters the stage of digital native and virtual-real fusion through the digital twin stage, it is extremely challenging to use avatars to create and plan things and activities that are different from the real world in the metaverse, but with the help of technology, it can also challenge the success and produce a sense of conquest. These characteristics make it very easy for people to get a flow experience of self-absorption after entering the metaverse, and lead to two possible situations: first, the immersive flow experience makes people focus and fascinate. When carrying out knowledge learning, skill training, and quality improvement, it can promote the unity of “meaningful” and “interesting”, so people can be immersed in it and enjoy it; the second is to indulge in this immersive experience of the metaverse. People cannot control their behavior, control their time, and may become addicted. Just like the Internet addiction of some young people today, people escape from real life, “the more degraded the happier” in the world of the metaverse, and they sink into it and cannot extricate themselves. How to avoid the sinking damage caused by immersion is an important topic that metaverse designers and builders need to seriously consider.

5.3. Peaceful and extreme wrestling under psychological compensation

The psychologist Jung thought: “The theory of compensation is a fundamental law of mental behavior. The relationship between the conscious and the subconscious is also a compensation.”[38] Jung took reality and dreams as examples to illustrate that when people feel regret in reality, dreams will start the compensation process for reality, so that people can experience satisfaction and relief. Seeking compensation is an important flow of human spirit and emotion. However, not everyone has the powerful dream control ability depicted in the movie “Inception”. Dream compensation is sometimes absent and sometimes insufficient. Therefore, assigning a value to this relatively controllable variable in cyberspace is an action dimension for many people to relieve pain and obtain compensation. As the development trend and even the ultimate form of the Internet, the metaverse can perform compensation tasks in a more complete and proper way. Due to the constraints of physiological characteristics, family of origin, practical experience, occupational field and social identity, people usually bear the scars of emotional experiences, unfulfilled wishes and regrets that their chewing plans have failed to varying degrees. However, in the metaverse, not all events completely follow physical rules, space-time logic and common sense of life. This is tantamount to entrusting the initiative of the narrative, the decision-making power of actions, and even the writing power of fate to those who enter the metaverse and their incarnations. Under this premise, people can use the metaverse as a stronghold, prepare avatar characters, create ideal scenes and carry out desirable activities according to their own demands to compensate for regrets in real life. In this way, on the one hand, people may get opportunities for stress relief, empathy, emotional catharsis and spiritual treatment, so that they have the will and ability to embrace a more rational and peaceful state of mind; on the other hand, the compensation obtained in the metaverse will also sharpen the rift between the virtual world and the real world, which may lead to disgust when faced with the living environment, values, interpersonal relationships, etc. in the real world, rejection and hostile emotional attitudes, and even extreme action strategies.

5.4. Effort and imaginative competition under target projection

Through the means of identity setting, object construction and scene decoration, and with the help of technology, people can realize their expected and imagined academic goals, career goals and income goals with “visualized” and “realized” digital pictures in the metaverse. In the virtual world, “zero distance” contact and experience the life style and state after the goal is achieved can inspire people’s determination to firm their ideals, the motivation to make progress, and the courage to overcome difficulties. However, there is another possibility that
cannot be ignored. Marx and Engels called reactionary religions that depict the beautiful and illusory kingdom of heaven and weaken the will to resist and struggle as “opium”[25]. The metaverse with the same addictive mechanism as reactionary religions may become a new generation of “spiritual opium”. In the real world, people need to work hard before they can gradually approach and achieve their goals. In the metaverse, people can omit the steps of “reading hard” and “working hard”, and use technical means and creative ideas to directly stimulate the brain nerves through the information input of the brain-computer interface to meet most of people’s needs, enter and enjoy the “good life” that is seamlessly connected with their own requirements. This way of motivation has a similar effect to psychoactive hallucinogens, and it is easy to cause a high degree of dependence and addiction to the metaverse. For people, this kind of “good life” is extremely confusing and attractive. Long-term cruising and immersion in the virtual world of the metaverse can easily replace the success of real life with its imagined success and glory. This kind of oriented incentive will lead people to become more and more addicted to the virtual world, which will greatly eliminate people’s will to struggle in the real world, and they are unwilling to participate in the real labor process, and do not want to experience happiness and happiness in the labor process.

5.5. The competition between innovation and dependence under information clustering

metaverse provides intellectual property protection and material incentives. In order to earn virtual rewards and realize virtual rewards, many people will strive to carry out knowledge and information innovation in the metaverse, and a new round of fission of information may occur with the development of the metaverse. The clustering of information may become the foundation of inspiration for people to realize practical innovation and idea innovation in the two dimensions of reality and virtually, thereby helping to improve the quality of offline and online life. Of course, the aggregation of information may also become an obstacle for some people to think and explore independently. Due to the surge in life pressure and increased job competition, people’s awareness of pursuing efficiency and saving time is gradually deepening, and it has become a general consensus to use the Internet to obtain information quickly and directly. After the metaverse is implemented and used, the process of capturing, comprehending and absorbing information by appealing to perceptual practical experience and integrating rational learning experience will be further simplified into the process of entering the metaverse, searching for and browsing information, and, in the metaverse, the coverage and types of information will be broader and more diverse. If things go on like this, some people may become more and more distant from systematic theoretical study and rational speculation, rely more and more on obvious existing information, and become a “hands-out party” who believes in “bringing”. It may be expected that some people will “fast forward” in the innovation of the metaverse, and some people will rely on the metaverse to “lie down”.

6. Conclusion: Opportunities and challenges in the metaverse era

The metaverse is the extension and expansion of the real physical world in the digital virtual world. It is an online digital field that integrates the mirrored physical world and the reconstructed virtual world. Relying on software and hardware technologies such as digital twins, artificial intelligence and wearable smart devices. The metaverse writes new annotations for the structure of time and space, giving people the possibility to experience and participate in historical events in an immersive way, experience multiple life types within a limited life time, and preview the possibility of future life in advance, helping people in the virtual world. In the world, the distance boundary of the physical space is removed, and the virtual space is fully supplied when the physical space is scarce, and the creative space for unleashing the imagination is opened. Metaverse plans a new runway for the social lifestyle of hu-
man beings, which promotes the combination of virtual and reality in labor production, the further popularization of virtual consumption behavior, and the deepening and enrichment of spiritual life patterns. The metaverse provides a new direction for human thought and behavior, and it drives people’s cognition and practice to experience fluctuations and changes in the conflicts between outward exploration and inward involvement, immersion and submersion, peace and extremeness, striving and imagination, innovation and dependence. In the era of the metaverse, opportunities and challenges will coexist. Human beings will not only enjoy the convenient business management mode, rich leisure and entertainment channels, broad knowledge learning prospects and various income increase channels brought by the metaverse, etc. In addition, they may suffer from the decline of physical and mental health due to being drawn indoors, the willingness to work hard due to indulging in virtual illusions, and the deterioration of the ecological environment due to the activation, operation and maintenance of the metaverse. The “immersive” experience created by the metaverse is not a “sinking” life, nor can it be an excuse for an addictive game life; the deep virtualization of social relations and interpersonal relationships in the metaverse cannot cut off the inevitable connection with the real physical world. The virtual identity, virtual product, virtual market, virtual transaction, virtual life, virtual economy, virtual life, etc. constructed by the universe cannot be separated from the constraints of ethics, morality and law. In order to ensure that the metaverse can play a “benefiting” effect in human society rather than instigating the “alienation” crisis, it is necessary to improve and perfect the underlying technologies that support the smooth construction and energy-saving operation of the metaverse, and it is also necessary to lay and consolidate to prevent the metaverse from becoming top-level rules for moral blind spots and legal black holes. Then, finding the answer to the question “How to make the metaverse stand proudly on top of powerful technology and crawl under strict rules?” is also an arduous task that metaverse builders must face head-on.

Conflict of interest

The authors declare no conflict of interest.

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