

# The 3D Metaverse: An Online Virtual World Which Incorporates Blockchain, Artificial Intelligence(AI), Virtual Reality (VR), and 3D Avatar, An Analysis of How It Will Revolutionize the Cultural Creativity Field

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**Abstract:** This study comprehensively analyzes the key technologies that support the development of the metaverse, including VR, Blockchain, AI, and 3D avatars, and their roles within the metaverse. By researching these technologies, it examines how the metaverse disrupts the field of cultural creativity. The study aims to provide future guidance for the cultural creativity field, Whether it's for creative companies or artistic creators, it's crucial to stay ahead of the trends and make preparations to transition from traditional domains to the 3D metaverse in a timely manner.

**Keywords:** Metaverse; VR; AI; Blockchain; NFT; 3D Avatar; Cultural and Creativity

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## 1. Introduction

Metaverse is a 3D virtual world as pioneering theorist and venture capitalist Matthew Ball and professor Shenyang of Tsinghua University explain, a network that integrates a variety of new technologies such as blockchain, and AI technology, it gives an immersive experience using advanced technology and connects everything together. It has the power to revolutionize every industry and function.

The development of the Metaverse can be divided into three key moments:

The first moment, spanning from 2016 to 2018, marked a low point for the Metaverse. The initial excitement in the VR/AR industry was short-lived, primarily because technology was still in its early stages, focusing on basic immersion.

The second moment, in 2019, saw the Metaverse recovering as VR/AR technology and 5G deployment progressed. Products like Oculus Quest and Valve Index, especially the Oculus Quest by Facebook, significantly enhanced the user experience, revitalizing the Metaverse.

The third moment, in 2021, marked the true beginning of the Metaverse Era. The concept gained widespread recognition, and Roblox's listing on the New York Stock Exchange generated excitement, earning it the title of the "first stock of the Metaverse." This event ignited the tech industry, attracting capital and internet giants. Companies like NVIDIA and Epic Games announced their metaverse initiatives, and Facebook's transformation into Meta solidified its commitment to investing in and shaping the Metaverse .

However, by 2023, the Metaverse faced a turning point. Some tech giants, like Microsoft, chose to dissolve their metaverse departments. Conversely, cultural creativity within the Metaverse is expected to stabilize in 2023, marking the true emergence of a culture, tourism, and Metaverse era.

### Research Questions

What kind of key technologies support the metaverse to develop?

What role does 3D Avatar play in Metaverse?

How does the metaverse affect the cultural creativity industry?

What kind of attributes are needed to develop a successful metaverse platform ?

## 2. Methodology

The research conducted using the qualitative research method will be focused on. To gain a deeper understanding of the research topic and obtain firsthand expert opinions and professional perspectives, interviews were conducted with five representative experts. A series of open-ended questions were raised during the interviews to allow the experts to elaborate on their viewpoints, experiences, and insights. Furthermore, a literature analysis was performed by selecting five representative articles, which had been screened and evaluated from the research literature in this field, to gain in-depth insights into the research topic and the views of other researchers, thereby providing valuable references for this research.

### 2.1 Primary Data- Expert interviews

**Profile of Interviewees.** This study invited a total of five experts for interviews who possess in-depth research and forward-looking insights on the metaverse. The following is a brief introduction to the backgrounds of the five experts.

**Mr. Jie Xing:** The author of the first set of four bestselling books on the metaverse.

**Mr. Qingzhu Dai:** Founder of Sesame Credit in Alibaba Group.

**Mr. Ruiliang Bai:** An independent scholar who holds a Ph.D.

**Mr. Lifeng Zhang:** A venture capitalist (VC) investor focusing on high-tech companies in Silicon Valley.

**Mr. Faxing Wang:** Co-founder of HaMeta in the metaverse field.

## 3. Key findings

### 3.1 VR, AI, Blockchain and 3D Avatar are the Key Technologies Supporting the Development of Metaverse

VR provides an immersive 3D space for the Metaverse. Virtual Reality (VR) is a computer-generated simulation environment, this implies that VR technology provides a virtual computing 3D space, enabling users to immerse themselves in a simulated environment. The immersive nature of VR enhances the user experience. Users can engage with the virtual environment, promoting virtual social interaction, and facilitating virtual creation and expression<sup>[1]</sup>. The virtual three-dimensional space offered by VR technology plays a crucial role in driving the development of virtual commerce and economy. This means that without this virtual 3D space, all aspects of the metaverse would not exist, this technology has the potential to revolutionize various fields, especially in cultural and creative industries.

AI is the technical driving force for the development of Metaverse. Metaverse expert Jie Xing said AI plays a role in the metaverse equivalent to the role of all technology in our current society. Without technology, our society cannot be considered a modern civilization. In the metaverse, AI represents the force of technological advancement, as it greatly amplifies human intelligence to oversee and govern all operations. It permeates all levels, modules, and systems of the metaverse, making it omnipresent. Its importance is comparable to the functioning of a society.

Interviewee, expert Qingzhu Dai said AI is most commonly applied in the metaverse to provide technical support for intelligent characters. In the metaverse, many characters are not directly controlled by humans but operate autonomously. These characters need to interact and communicate with human-controlled characters, requiring the use of artificial intelligence as the driving force. Additionally, certain scenes within the metaverse may require intelligent elements, such as intelligent environments or intelligent objects. Finally, there is a need for logic-based intelligence to govern the rules and operations within the metaverse. These three aspects - character intelligence, scene intelligence, and rule intelligence - are essential components where AI finds extensive application within the metaverse.

Blockchain is a fundamental technology to build the economic and governance system in the metaverse. Blockchain technology ensures the trust and security of the metaverse through its decentralized nature. It is the economic and governance system in the metaverse<sup>[2]</sup>. As expert Lifeng Zhang mentioned blockchain technologies make many possibilities for ownership, governance, and transactions in 3D virtual environments. Expert Ruiliang discussed Blockchain technology as indeed one of the fundamental pillars of the metaverse. Expert Faxing Wang expressed that If a metaverse does not have

blockchain technology, it may face various data trust issues. Your account can be banned by the platform at any time, and the value of your "assets" is completely affected by the platform's pricing and circulation.

3D Avatars serve as digital representations of users in the metaverse. Users through avatars can customize their appearance, choosing unique features, outfits, and accessories to reflect their personalities or desired virtual personas. Avatars empower individuals to transcend physical limitations, enabling them to be whoever they want to be in the metaverse. They can adopt various forms, from human-like representations to fantastical creatures, enabling a wide range of creative possibilities<sup>[3]</sup>.

## **3.2 Revolutionize in the Cultural Creativity Field**

In the previous section, the key technologies in the Metaverse were analyzed. In this section, the transformative impact of these technologies on the creative and cultural industries will be primarily examined.

### **3.2.1 Rebirth of Traditional Culture after Digitization**

Traditional industries such as tourism, live performances are on the brink of profound transformation. In terms of tourism, the metaverse provides people with the opportunity to visit traditional cultural sites around the world without the need for actual travel. Through virtual reality technology, people can immerse themselves in historical sites, ancient buildings, and cultural landmarks using avatars.

In the performing arts field, the metaverse brings a whole new way of presenting traditional culture. Through virtual reality and augmented reality technologies, people can participate in virtual performances and concerts, interacting with virtual performers.

Exhibitions have also undergone a tremendous transformation within the metaverse. Traditional exhibition formats are often limited by space and time constraints, but in the metaverse, these limitations are broken. People can visit virtual exhibitions and appreciate art pieces, cultural displays, and historical artifacts, whether they exist in reality or have already disappeared.

### **3.2.2 Innovation in Digital Cultural Content Production**

Due to the development of AIGC, revolutionary and disruptive changes have emerged. Firstly, the entire production cycle has been significantly shortened, leading to a tremendous increase in production efficiency. Secondly, AIGC amplifies imagination further by enabling users to effectively create content in virtual-physical environments. This is achieved by providing prompts and indicating the shape and position of generated objects.

During interview, expert Jie Xing said Previously, the creative tools available to cultural creators were relatively outdated, resulting in a lengthy time cycle for transforming imagination into reality. For example, several years would pass from the inception of an idea to the final production of a movie. However, in today's era, with the assistance of AIGC (Artificial Intelligence in Graphic Creation), this time can be compressed to a matter of months, weeks, or even days for completion.

### **3.2.3 Immersive and Gamification Experience**

The metaverse transcends the boundaries of physical reality, Breaking the constraints of time and space, providing artists, designers, and creators with an immersive and limitless digital canvas to explore and showcase their work. The metaverse offers more than just immersive experiences; it also has the potential to integrate gamification elements, fostering audience engagement and promoting active participation. As an illustration, virtual scavenger hunts and quizzes can be implemented to evaluate visitors' familiarity with cultural and creative content, while virtual rewards can be granted to individuals who successfully conquer these challenges.

### **3.2.4 New Business Model**

One of the key new business models in the metaverse is the sale and ownership of virtual assets known as NFTs. NFTs are unique digital assets that represent ownership or proof of authenticity for items like artwork, music, videos, and virtual real estate. Unlike cryptocurrencies, NFTs cannot be exchanged equally, and each NFT holds distinct value and

characteristics. Ownership and transaction history are recorded on a blockchain, offering transparency. This model creates a new marketplace for artists and creators, providing new revenue sources and enabling the monetization of digital creations.

## References

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