Study on Value Improving Strategy to Digital Collection Empowered by Meta-verse

Yifei Kang

Architecture and Design college, Nanchang University, Nanchang, China

1329106524@qq.com

Abstract. Museum collections usually are vulnerable. With the application and popularization of meta-universe technology, digital collections have a certain remedial effect on the protection and inheritance of cultural relics. This paper reveals the value of digital collections and finds that they are able to provide innovative protection strategies for collections in terms of physical protection, media communication, and value construction. This research, while analyzing the problems it faces, proposes to promote the development of digital collections by using optimizing brand construction, strengthening copyright protection, or maintaining asset management.

Keywords: Digital Collections; Metaverse; Value; Practice.

1. Introduction

Museum collections have their vulnerability, while the development of digital technology may play a significant role in making up for their protection and inheritance. The "digital collections" collected by digital museums are mostly in text, sound, image, or other data information saved by digital form, with them mainly including two types, one is digital physical museum collections, and the other is generated by digital creative behavior with a certain significance. A pessimistic view of digital collection technology depicts that digital information of collections would be able to only approach infinitely, but it cannot completely replace the collection entity with all. Physical collections contain almost unlimited information, which is difficult to be fully interpreted.

In the development process of digital collections, the design of NFT provides a basis for digital collection transactions. The full name of NFT is non-fungible token, as an important medium for digital art buyers, NFT is an encrypted digital file. Under metaverse, NFT applies to any digital works (Belk, Humayun & Brouard, 2022), not only physical art and design works, but also painting, video, songs, or other non-physical works. NFT digital collection is a kind of digital art form with a special way of existence. The interactive art experience it creates refers to the content of communication, thus the research around NFT is believed to be beneficial on analyzing art collection from the perspective of communication strategies.

The opinions, issued by the General Office of the CPC Central Committee and the General Office of the State Council in 2022, emphasized that more efforts should be made to promote the construction of digital cultural consumption scenes, while digital collections may usher in new opportunities. At the same time, meta-universe technology is also in a critical period of starting development, which will inevitably have an impact on some new technological produce, including digital collections. This research starts from the development of digital collections, which adopts the meta-universe technology to catch the future development direction of digital collections, and predicts the impact of digital collections on related industries. On human behaviour under meta-verse, supportive interactions in the metaverse reduces feelings of loneliness by enhancing social self-efficacy(Oh, Kim, Chang, Park & Lee, 2023).

This paper makes a general and combined analysis on the current situation of China's digital collections, which believes that the establishment of the meta space provides a feasible scheme for digital collections. This paper summarizes the problems faced by the innovation and development of China's digital collections through the current situation analysis on digital collections, which proposes specific protection methods, including physical protection of digital new publications, giving play to the media communication function, promoting cultural communication of digital collections. The

audience has changed from a "passive receiver" to a role with multiple identities. The basic narrative framework has been reconstructed, while the audience is able to intervene or become an active narrator.

This study believes that the copyright protection in the future requires an in-depth analysis of the issues on the product side, or an understanding of the technical procedures and operations of the chain, which is going to optimize and upgrade the value protection to digital collections. Digital collections, as the product of emerging technologies, represent the inheritance of cultural digitalization and intangible cultural heritage technologies. This paper believes that we should further guide the meta-universe technology to be embedded in the issuance and protection of digital collections, which may coordinate the development of digital collections in multiple dimensions. This research has a certain value for the rational use of digital collections which is able to provide some practical strategies for the development of digital collections under the framework of the meta-universe technology, or provide positive support for the development of the digital collection industry in the future.

2. Literature & Review

2.1 Meta-universe

The concept construction of the meta-universe cannot be separated from the technological change from Web 1.0 to Web 3.0. Before 2021, the meta-universe is still a science fiction concept that stays at the level of imagination. At present, the research on the meta-universe generally starts from the two aspects of technology and humanity, which focuses on the technical application value of the meta-universe, or analyzes the technical risk avoidance of the meta-universe. The establishment of the universe is based on the three core technologies on "artificial intelligence, extended reality, and blockchain". Its technical logic is to build a virtual world parallel to the objectively real world, while the boundaries of the two are able to be immersed into each other. One of the core purposes of the meta-universe is to create an interactive immersion. At present, the scene constructed by immersive radio and television and network audio-visual is the prototype of the meta-universe. In the future, the meta-universe will complete the imagination and extension of the real world through technological innovation.

The research achievements of domestic and foreign scholars around the "meta-universe" have shown a blowout trend in recent years. The academic research on the topic of the meta-universe can be summarized in the following three aspects: first, as far as the generation mechanism of the meta-universe is concerned, the meta-universe is often studied as a new technological or economic phenomenon. Its core areas focus on digital creation, encryption assets, and digital markets. The product of the meta-universe is regarded as a new economic form based on blockchain technology, It conforms to the shift of industrial focus of the digital economy from "production in space" to "production in space" in the network era. The meta-universe not only has broad commercial application prospects but also has certain risks at the application level. Secondly, as far as the social impact of the meta-universe is concerned, the emergence of the meta-universe will accelerate the transformation of social governance to digitalization, technicalization, and virtualization. In terms of some radical technology practitioners, a virtual civilization can even be born. The meta-universe may not only be a beneficial supplement to the development of real society, but also a virtual technology trap threatening human beings. Thirdly, as far as the media attribute of the meta-universe is concerned, news and communication scholars are willing to regard the meta-universe as the "ultimate digital media" integrating digital communication technology, or "meta media". At the level of technical design, the meta-universe is able to maximize the integration of virtual and reality, reshape the possible prospect of future media, and realize the transformation of media experience from one-way input to interactive immersion.

With the capitalization of digital collection based on NFT increasingly developing, a new type of digital economic system has been established, driving some virtual platforms to finish the orderly transfer of media transactions, asset transactions, and others into the virtual world. It is expected that

after 2030, a complete set of standard protocols will gradually be formed among various virtual platforms, while all sub-universes will converge to form a real meta-universe. All walks of life will flow into the meta-universe track, which jointly open the boundary between virtual and real. In this view, it is necessary to predict them in advance, when the impact of meta-universe technology on the development of digital collections or other industries would be calculated well.

2.2 Development of Digital Collections

In recent years, relying on the development of "meta-universe" or "NFT", the popularity of "digital collections" has been increasing for long time. However, with the increase in popularity, questions about its real value are constantly emerging. How to enhance its value and how to make use of its value which have become topics worthy of in-depth study. "Digital collections" are also related to art design, digital media, or other industries. Therefore, the research on this issue is also of practical significance.

The research of Chinese scholars around "digital collections" is relatively rich, while the available literature reveals that the theoretical circle has mainly carried out relevant research from the following aspects: (1) The value of digital collections is questioned: while digital collections are becoming increasingly popular, their market valuation is more difficult due to their complex characteristics. In terms of doubts about value, a more in-depth study on the value promotion of digital collections would be done by using the methods of literary research, function analysis, case study, or experience summary. In the research, the author found many other problems in digital collections, including the positioning of planning and distribution being unknown, the collection being mixed, the lack of classical works, and the lack of originality. The author achieved the goal of further increasing the value of digital collections from the perspectives of positioning, integration of virtual or real design, with them promoting the healthy development of the digital collection industry. (2) High degree pursuit of digital collections: There are many kinds of digital collections. With the increase in their popularity, digital collections of different categories are popular in the market. For example, the development trend of digital collections could be further proved by case analysis based on the popularity of media digital collections. Through an in-depth analysis of the digital collections, it is believed that media organizations should reasonably use the trend of digital collections to develop their businesses.

Digital collections are a special product that is not able to be ignored under the historical conditions of the continuous development of big data. The research on digital collections will also be regarded as an effective entry point for an in-depth analysis to the currency. Digital collections are the product of emerging technologies and the carrier of innovative culture. They are characterized by scarcity, richness, identity, and asset. However, due to the immature new digital copyright ecology, there are some of uncertainties. Around the methods to embody the value of digital collections, scholars have carried out a detailed analysis of the essence of digital collections and the specific form of digital collections. From the above literature, although scholars have conducted relatively macro research on the value improvement of digital collections, there are still deficiencies in the research on the specific design, release, and transaction specifications of digital collections.

3. Physical Protection, Media Communication and Value Construction of Digital Collections

Digital collections mainly include digital pictures, music, video, electronic tickets, digital souvenirs, 3D models and other forms. Each work maps a unique serial number on a specific blockchain, of which the serial number is not able to be changed. Different from traditional collections, digital collections are richer in content, not only including the preservation of intangible cultural heritage, but also the innovation in the form of collection protection and dissemination.

3.1 Physical Protection: A New Digital Publication

First of all, digitization of the collection is going to reduce the chance of accidental damage during the circulation and protection of the collection, which could achieve effective preservation of the collection. In the general logic of museology, calligraphy, painting, porcelain, and other collections are vulnerable, more special attention should be paid to the management of collections in storage. Some preventive protection of cultural relics has been deeply analyzed. For example, based on the analysis of the health status of the cultural relics in the museum collection, *Tianshui* Museum in Gansu Province adopted the wireless sensor detection system to monitor the environmental indicators of the library collection room in real time, which have practiced the concept of preventive protection before. In addition, the establishment of duplicates for paper documents has been practiced for many years. At the beginning of its construction, the Beijing Lu Xun Museum paid great attention to the preservation of collections and the construction of warehouses. It made duplicates for most of Lu Xun's collections, replacing components with the circulation of duplicates, which not only realized the value of cultural relics but also protected the original collection.

Moreover, new digital publications are less affected by weathering, corrosion, and other external forces during the preservation process. The preservation of bronze and jade has been well prepared, while stone artifacts are not as "delicate" as other types of collections, but long-term exposure, weathering, and immersion will also affect their surfaces. The loss of cultural relics will not only affect their value but also cause irreversible losses due to the loss of written content. The National Museum of China's protection of such precious cultural relics as *Siyang Fangzun, Rhinoceros Zun, He Zun, Dayu Ding, Eagle Ding, Drum Raping Figurine, Huanzi Mengjiang Pot*, *Yangling Tiger Talisman*, etc. relies on laboratory science and technology to carry out future-oriented cultural relics protection.

Thirdly, the digitalization of the collection is able to effectively avoid the reduction of the collection value caused by external forces and realize the protection of the collection value. Digital museums closely related to digital collections have become an important guarantee strategy for the protection of cultural relics. As a new business, the digitalization of collections not only completes the protection but also provides the possibility of global communication. In the process of immersive experience, the audience understands the digital museum through non-sharing and repeated filing, who more understands the impact of virtual reality technology practice and application on museum collections. The fact that the cultural value of collections are able to be fully stimulated after digitization, which has been preliminarily verified in the Internet space.

Finally, the digitalization of culture and the inheritance of intangible cultural heritage are one of the main contributions of digital collections. The sale of museum collections is considered to be an effective and controversial collection management tool. The emergence of digital collections provides a new way to solve the dilemma of collection sales. The return of specific collections are expected to follow the established return principles, follow the return procedures, fully comply with the return policy, and retain the interchangeability of collections. The service project of the Museum Assessment Program of the American Museum Alliance used the digital collection program earlier, which not only helps museums reduce the collection burden to achieve the collection purpose, but also helps some collections to be returned and sold, with them promoting the realization of public interests.

3.2 Media Communication: The Cultural Function of Digital Collections

On the one hand, the connection between digital technology and traditional museum collections has an obvious trend of integration under the catalysis of the media environment. As a technical means, the application of hyperlinks has become one of the normalities of network social life. Digital collections are not simply the digitalization of cultural relics, but a functional expansion. Digital collections use hyperlink technology to cultivate new audiences, activate the value of digital collections, which could disseminate and explain the multiple values of collections. The Metropolitan Museum of Art in New York has improved its service methods for different audiences while

improving its visual design. The digital museum has also set up a learning section with different types of resources. At the same time, digital museums are also linked with mainstream social media to promote interactive information exchange. Through the above means, the digital museum has deepened the audience's understanding of the collection, which also enhanced its value of the collection.

On the other hand, the intermediary nature of traditional museum collections shows its value concerning time and space under the participation of digital technology. The nature of human communication depends on the "mode of information flow". During the transmission of digital collections, the audience has changed from a "passive receiver" to a multi-identity role. The basic narrative framework has been reconstructed, and the audience can intervene and become an active narrator. The Museum of Science and Industry Chicago always takes the audience's sense of participation and experience as an important guide in the design of its digital museum homepage. In its digital museum, multimedia technology, virtual reality technology, while 3D display technology are widely used to display various cultural relics, and learning games for cultural relics and historical knowledge are also launched. It enables the audience to gain a strong sense of participation and promotes the transformation of audience identity.

Metauniverse and other technological derivatives act as relational space-time, providing a basis for the storage, protection, and dissemination of digital collections. The State Hermitage Museum uses virtual reality technology and panorama technology to restore the historical winter palace scenes and uses multimedia technology to vividly display the collection resources. The collection was disseminated and restored employing technology, while the audience gained a real and vivid viewing experience.

Digital technology makes museum collections "invisible and ubiquitous", which could truly release cultural functions in the technical space. The Louvre Museum of France has introduced virtual roaming in its digital museum and has provided the "careful observation" function for the collection. By using digital means, the audience is able to get an immersive tour experience, so that the audience can more intuitively contact and understand the museum and its collections.

3.3 Value Construction: Digital Collections as the Product of Technology

The circulation of commodities has always been one of the important indicators to measure their value in economics. Whether the digital collections that condense the undifferentiated human labor can be circulated is one of the important factors to judge whether technological products could continue to develop. The transaction rules of the NFT China Trading Platform, established in 2021, are relatively special. In circulation, it is stipulated that consumers is able to obtain the copyright of corresponding digital collections after purchasing digital collections, which shall be freely circulated or traded twice. The blockchain technology in the transaction rules of NFT China's trading platform is based on the public chain and EHT, and its creators' participation is unlimited. A transaction mode with blind box issuance, auction, while pricing as the core has been overestimated. In resale or transfer, RMB is used as the transaction currency, while all rights belong to the buyer, without paying royalties to the creators, to ensure its liquidity.

At the beginning of the birth of digital collections, some scholars have studied the issue of "counterfeits". Therefore, the specific performance of digital collections in terms of using technical means to enhance the anti-counterfeiting ability and enhance the value of collections still needs further analysis. Alibaba Auction Digital Auction Zone was established in 2022, mainly relying on blockchain technologies including public chain conflux, alliance chain, intellectual chain, new version chain, etc. Blockchain technology is designated by the settled enterprises, and the creators only invite enterprises to settle in, not individuals. Its trading mode is relatively simple, mainly including an auction. In the course of a transaction, RMB is the transaction currency. In the process of resale or resale, the information network transmission right of a single work does not include other copyright rights. If the seller has different commitments in the resale mechanism, the copyrighted

work cannot be resold. If it is stipulated that 90 days after the transfer, it can be transferred again by auction through Alibaba's auction digital auction channel.

The copyright protection of digital collections is related to their value construction. It is not only the re-confirmation of its value but also the prevention of possible copyright disputes to a certain extent. Many new concepts have emerged in the transaction and circulation of digital collections, and relevant laws and regulations have also exposed many limitations in this process, unable to effectively protect the interests of all parties in the transaction of digital collections; In addition, to attract investment and earn service fees, the digital collection trading platform ignores the copyright review, and the potential risks brought by the concealment and anonymity in the digital collection trading, the copyright protection of digital collections still faces many difficulties. Employing improving the existing laws and regulations, refining the review responsibilities of the trading platform, and establishing a "relatively anonymous" trading system, we should not only make the trading of digital collections more standardized but also enhance the value of digital collections and prevent copyright infringement against digital collections. In general, the nonhomogenous authentication (NFT) technology is still in its early stage of development, and its protection of the value of digital collections is mainly to prevent piracy and infringement risks, which is also a preventive protection measure.

4. Results

The increasing application of the universe and NFT, on the one hand, has promoted the development of digital collections; on the other hand, while the popularity of digital collections has increased, it has magnified the artistic diversity, liquidity, rapid changes in the market pattern and other characteristics of digital collections. The development of digital collections is not able to be separated from the further clarification of their value positioning: as a product of emerging technologies, digital collections represent the inheritance of cultural digitalization and intangible cultural heritage technology, which not only conforms to China's current development strategy but also promotes the development of new digital cultural and creative derivatives. At present, the popularity of the digital collection industry is activating the cultural and creative market and jointly promoting the development of the cultural industry from multiple dimensions such as economy, culture, and society.

4.1 Optimization of Digital Collection Brand Construction

In terms of brand building, digital collections are new digital cultural and creative derivatives. Different brands promote their development and digitize their products, develop different creative marketing methods, which could expand marketing boundaries, and improve digital management. At the level of technology application, digital collections advocate the comprehensive application of blockchain and other technologies, with them providing new opportunities for the management of digital collections, and stimulating the vitality of technology derivatives that digital collections should have. In general, the development of digital collections insists on "strengthening reality with falsehood" and "promoting reality with falsehood", focusing on improving the space-time value of digital collections.

The Shanghai Action Plan for Fostering the "Metauniverse" New Track (2022-2025) pointed out that in the process of the integration of the virtual and the real, the correlation between the construction of the meta-universe and the digital collection has been further strengthened. With the addition of NFT technology, digital collections have gained more powerful basic digital performance and constructed more prominent financial attributes, which further developed digital collections that meet the needs of the times, reflect attention and recognition and have better communication effects. For institutions with a large number of digital assets, NFT digital collections can conduct value mining and systematic sorting of most collections.

4.2 Strengthening Copyright Protection of Digital Collections

The copyright protection of NFT digital collections implies a hidden infringement risk. The ownership of copyright liability of the NFT trading platform and the possible hidden infringement risk call for the accelerated application of the meta-universe in this field. NFT has promoted the meta-universe to realize the transformation from a "traditional information Internet transfer function" to a "value transfer function". With the help of the general theory of communication, it has realized the re-confirmation of the right certificate. Therefore, it can be considered that in the context of the meta-universe, the users of the meta-universe can construct their digital identities employing avatar login and conveniently capture the basic information of digital collections. In the process of dealing with heterogeneous rights and interests, digital works should avoid infringing the exclusive rights owned by copyright owners. In the process of selling NFT digital works, distribution rights should be recognized as the basic copyright rights to regulate the trading of digital collections. It could be seen that the transaction of digital collections without work carriers does not necessarily bring about more legal problems.

The protection of the value of digital collections cannot be separated from the protection of copyright. As a legal issue, digital collections focus on the protection of copyright, including copyright management, infringement discrimination, and theoretical exploration. Since 2021, the attention of the industry and academia to digital collections has risen rapidly. The popularity of digital collections has benefited from the technical advantages of the blockchain platform in digital copyright protection and trading, such as the Lucky Flying, jointly developed by the Dunhuang Academy of Fine Arts and Ant Chain Fan Grain. According to the current copyright law, the ownership of the copyright of digital collections is mainly judged by the originality of the works. Whether the digital collections are original or not mainly depends on the content of the superior before they are put on the chain. The current copyright law does not protect the technical procedures or operations of "putting on the chain". In the future, for the copyright protection of digital collections, it is not only necessary to conduct an in-depth analysis of the copyright issues on the product side, but also to understand the technical procedures and operations of the chain, to optimize and upgrade the value protection of digital collections in an all-around way. By the way, metaverse only work in a limited effect on social management, despite it was regarded as a networked collection of inexpensive, self-configuring, immersive environments(Kemp & Livingstone, 2006; Jaynes, Seales, Calvert, Fei & Griffioen, 2003).

4.3 Maintenance of Digital Collection Asset Management

Because of the popularity of NFT, the state should speed up the formulation of legal documents on digital collection management, and further, emphasize that digital asset-related business activities should be strictly restricted by laws and regulations. With the further promotion and popularity of digital collections, the regulatory authorities should intervene on time to supervise the whole process of distribution, sales, and circulation of digital collections. For example, the main reason for the current piracy of digital collections is that China's current IP value evaluation standards for digital collections are still not perfect. As far as the "First NFT Case in China" is concerned, this dispute over the right of information network communication of digital collections, which took place in late April 2022, mainly revolves around the "fat tiger" series of artworks created by a well-known artist. It is understood that between Defendant B Company and Plaintiff A Company, the Hangzhou Internet Court, based on the current legal provisions, which believed that Defendant B Company could not be exempted from tort liability based on "notification deletion" obligations and other reasons.

At present, metaverse has attracted much attention on social goods, technological singularity, virtual ecosystem, or research agenda(Duan, Li, Fan, Lin, Wu & Cai, 2021; Lee et al, 2021), there is no special law to regulate the circulation and management of digital collections in China, and the digital protection of the new form of digital copyright products cannot simply be equated with the transfer of digital product copyright. NFT digital collections are in a new type of digital copyright ecology that is constantly evolving. Because they do not have a form carrier, the distribution of digital

collections and copyright infringement norms urgently need the intervention of the "meta-universe" and other emerging technologies. Taking the hidden infringement risk in digital collection transactions as an example, copyright infringement disputes arising from digital collection transactions are often characterized by concealment. In this link, the meta-universe technology will help to fix infringement evidence, identify users' identity information, and prevent the anonymity of the NFT platform from protecting infringers. At present, the digital collection market is developing rapidly, and meta-universe technology can coordinate the possible technical risks in a more efficient way of technical governance. For example, some of the current NFT platforms use blind boxes to sell products and use technology to build a relatively closed alliance chain. Users could only catch the specific content of the collection after purchasing. It is difficult for obligees to know the facts of infringement, while it is difficult to effectively safeguard their rights. Metaverse, what comes from the meta-universe, is the integration of physical and digital space into a virtual universe for sustainable transportation (Pamucar, Deveci, Gokasar, Tavana & Köppen, 2022).

5. Conclusion

With the constant popularity of NFT, an integrated network of 3D virtual worlds or Metaverse rests beyond hype varied in four areas on progress (Dionisio, III & Gilbert, 2013; Dwivedi et al, 2022), while the issue and management of digital collections have produced technical, ethical, and legal issues of varying degrees. In this regard, meta-universe technology is going to better avoid possible technical problems and risks in multiple dimensions. This research discusses the specific functions of meta-universe technology in the distribution and protection of digital collections, based on the specific practice of digital collections in the industry. This paper believes that we should further guide the meta-universe technology to be embedded in the distribution and protection of digital collections, which could coordinate the development of digital collections from multiple dimensions such as brand building, copyright protection, and asset management of digital collections.

References

[1] Belk, R., Humayun, M., & Brouard, M. (2022). Money, possessions, and ownership in the Metaverse: NFTs, cryptocurrencies, Web3 and Wild Markets. Journal of Business Research, 153, 198-205.

[2] Dionisio, J. D. N., III, W. G. B., & Gilbert, R. (2013). 3D virtual worlds and the metaverse: Current status and future possibilities. ACM Computing Surveys (CSUR), 45(3), 1-38.

[3] Duan, H., Li, J., Fan, S., Lin, Z., Wu, X., & Cai, W. (2021, October). Metaverse for social good: A university campus prototype. In Proceedings of the 29th ACM International Conference on Multimedia (pp. 153-161).

[4] Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M., & Wamba, S. F. (2022). Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. International Journal of Information Management, 66, 102542.

[5] Kemp, J., & Livingstone, D. (2006, August). Putting a Second Life “metaverse” skin on learning management systems. In Proceedings of the Second Life education workshop at the Second Life community convention (Vol. 20). CA, San Francisco: The University of Paisley.

[6] Jaynes, C., Seales, W. B., Calvert, K., Fei, Z., & Griffioen, J. (2003, May). The Metaverse: a networked collection of inexpensive, self-configuring, immersive environments. In Proceedings of the workshop on Virtual environments 2003 (pp. 115-124).

[7] Lee, L. H., Braud, T., Zhou, P., Wang, L., Xu, D., Lin, Z., & Hui, P. (2021). All one needs to know about metaverse: A complete survey on technological singularity, virtual ecosystem, and research agenda. arXiv preprint arXiv:2110.05352.

[8] Oh, H. J., Kim, J., Chang, J. J., Park, N., & Lee, S. (2023). Social benefits of living in the metaverse: The relationships among social presence, supportive interaction, social self-efficacy, and feelings of loneliness. Computers in Human Behavior, 139, 107498.

[9] Pamucar, D., Deveci, M., Gokasar, I., Tavana, M., & Köppen, M. (2022). A metaverse assessment model for sustainable transportation using ordinal priority approach and Aczel-Alsina norms. Technological Forecasting and Social Change, 182, 121778.