

Research on the Path of Empowering the Protection and Development of Jingdezhen Ceramic Cultural Heritage with Digital Technology

Yuchen Li

*School of International Culture and Communication, Jingdezhen Ceramic University, Jingdezhen, Jiangxi, China
123445928@qq.com*

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Abstract: As a renowned porcelain capital both at home and abroad, Jingdezhen has rich ceramic cultural heritage, including material cultural heritage such as cultural relics, historical sites, and industrial heritage areas, as well as intangible cultural heritage such as traditional handicrafts, folk art, folk customs, folk music, and folk literature. This is not only a precious asset of Jingdezhen, but also a crystallization of the inheritance and wisdom of national and ethnic history. However, due to the long time span and rich quantity of ceramic cultural heritage, but with a scattered distribution, there exist problems such as inadequate management, low application of digital activation technology, and lagging forms of dissemination in the aspects of protection and management. The rapid development of information technology has brought new inspiration to the protection of Jingdezhen's ceramic cultural heritage. With the advantages of digital technology, Jingdezhen can adopt digital collection and database construction, broaden display and dissemination channels, innovate design and product development, and push the deep integration of ceramic culture and tourism, to promote the interaction between cultural heritage and cultural tourism development, thus promoting the exchange and dissemination of Jingdezhen's ceramic cultural heritage.

1. Introduction

As a world-renowned porcelain capital, Jingdezhen has a long history of ceramic manufacturing and production, excellent porcelain clay resources, exquisite porcelain making skills, and unique porcelain industry customs. Jingdezhen porcelain is an important cultural symbol for the world to understand China, as well as an important carrier for China to go global and inherit excellent Chinese culture. The ceramic culture that has been passed down for thousands of years has left Jingdezhen with rich material and intangible cultural heritage, and has accumulated typical national cultural characteristics. However, due to the relatively monotonous and non-systematic traditional methods of protection and development, various traditional ceramic techniques have not been effectively preserved and a database has not been established, resulting in a fragmented situation that hinders the protection and development of Jingdezhen's ceramic cultural heritage.

Culture is the soul of a country and a nation^[1]. Only by developing culture well can a nation achieve prosperity and strength. Only by adhering to the path of cultural confidence can the great rejuvenation of the Chinese nation be realized. In this context, various regions are concentrating on utilizing their local advantageous resources to develop cultural industries. The rapid development of digital technology has widely penetrated into various industries, greatly promoting the reconstruction of the material foundation of the economy and society. The “digital economy era” has also injected new vitality into the development of the cultural industry. The development of technologies such as big data, virtual reality, and artificial intelligence has made the digital inheritance of ceramic cultural heritage a new trend.

2. The Current Status and Challenges of Protecting and Developing Jingdezhen Ceramic Cultural Heritage

Since the establishment of the Jingdezhen National Ceramic Culture Inheritance and Innovation Experimental Zone, Jingdezhen has systematically sorted out and protected 160 porcelain industry sites, 108 old alleys, modern old factories and other porcelain industry heritage. At the same time, Jingdezhen also has 113 intangible cultural heritage projects, has established the world’s first ancient ceramic gene bank, and released the first batch of 330 “City of Thousand Pavilions” creation venues.

The handmade porcelain craftsmanship of Jingdezhen has been approved as a UNESCO intangible cultural heritage project; the Taoyangli Historical and Cultural District has created an “intangible cultural heritage settlement” through measures such as authenticity protection of historical relics and dynamic inheritance of intangible cultural heritage skills, attracting a large number of experienced artists and young people to participate together.

However, despite Jingdezhen’s increased efforts in the protection and inheritance of ceramic cultural heritage and a series of achievements in ceramic cultural heritage, there are still many problems in the digital protection and management of Jingdezhen’s ceramic cultural heritage due to the large number of ceramic cultural heritage and outdated digital management methods.

2.1 The management model is relatively single

At present, the management of ceramic cultural heritage data in Jingdezhen mainly relies on manual operation and basic storage equipment, lacking a professional database for Jingdezhen ceramic cultural heritage management. The data retrieval methods and approaches are relatively single and inefficient, which increases the difficulty of management. At the same time, the protection of Jingdezhen ceramic cultural heritage mainly relies on government leadership, and the government has undertaken a lot of work in cultural heritage protection, including funding, policy formulation, and project implementation. However, this model limits the participation of social forces and markets to some extent, and the role of social forces and market mechanisms has not been fully utilized. For example, the participation of non-governmental organizations, enterprises, volunteers, and others is relatively low, resulting in the fact that the protection work is mainly concentrated at the government level. In terms of protection measures, traditional repair and protection are mainly used, and the application of new technologies such as digitization and intelligence is insufficient. For example, although a gene bank for ancient ceramics has been established, there is still room for improvement in digital display, dissemination, and management.

2.2 Shortage of composite talents

The digital protection and management of historical and cultural heritage is an interdisciplinary

and cross-industry field, involving knowledge from multiple professional fields such as history, management, and artificial intelligence. The required talents not only have a strong professional knowledge foundation, but also the ability to integrate across disciplines. Through on-site visits and research, it can be found that the number of personnel responsible for the protection of Jingdezhen ceramic cultural heritage is relatively small, and there is a clear shortage of highly educated comprehensive talents, which is in stark contrast to the vast amount of cultural heritage resources. At the same time, grassroots cultural management departments are facing difficulties such as low staffing, heavy workload, and strong personnel mobility. Part time personnel have weak sense of responsibility and professional foundation, making it difficult for them to be competent in the professional work of cultural heritage protection.

3. The unique advantages of digital empowerment in the protection of Jingdezhen ceramic cultural heritage

According to existing archaeological evidence, the history of porcelain production in Jingdezhen began in the late Tang Dynasty and gradually gained popularity during the Song and Yuan dynasties. During the Ming and Qing dynasties, with the establishment of imperial kilns and the flourishing of foreign trade in ceramics, Jingdezhen gradually became the center of Chinese porcelain production, enjoying the reputation of “Porcelain Capital”. The ceramics produced by Jingdezhen’s folk pottery craftsmanship are exquisitely shaped, with crystal clear and warm glaze, unique carving techniques and unique artistic patterns. They are loved both by aristocrats and ordinary people from all walks of life, and have created brilliant ceramic cultural heritage for thousands of years. This includes tangible cultural heritage such as cultural relics, historical sites, industrial heritage areas, as well as intangible cultural heritage such as traditional handicrafts, folk art, folk customs, folk music, and folk literature.

The rapid development of digital economy has brought new inspiration to the protection and development of Jingdezhen’s ceramic cultural heritage. Jingdezhen should actively use technologies such as 5G, the Internet VR and AR, artificial intelligence, e-commerce platforms and new protection and development models such as “Intangible Cultural Heritage+New Media”, “Intangible Cultural Heritage+Performing Arts”, “Intangible Cultural Heritage+Festival Exhibition”, “Intangible Cultural Heritage+Script Kill”, “Intangible Cultural Heritage+Study”, “Intangible Cultural Heritage+Cultural Tourism”, “Intangible Cultural Heritage+Animation” and “Intangible Cultural Heritage+Games”, etc. These new technologies and skills can stimulate new vitality in the protection and development of Jingdezhen’s cultural heritage, achieve deep integration of ceramic cultural heritage and digital technology, broaden the development market of ceramic cultural and creative industries, and drive local economic development.

4. The Path of Digital Empowerment for the Protection and Development of Jingdezhen Ceramic Cultural Heritage

With the rapid development of digital technologies such as big data, virtual reality, and artificial intelligence, the digital inheritance of cultural heritage has become an inevitable trend. Digitization of cultural heritage refers to the use of digital and network technologies to collect, store, analyze, process, display, and disseminate cultural heritage, and to transform it into a shareable and sustainable digital form through multimedia and virtual reality technologies. This new protection method can not only systematically sort and document cultural heritage, but also interpret and utilize it from new perspectives and ways.

4.1 Digital collection and database construction

By utilizing advanced techniques such as time-domain technology, high fidelity information collection can be carried out on ceramic cultural heritage, and extremely subtle features such as texture and color changes on its surface can be captured. As a result, high-definition, three-dimensional digital twin models can be formed. The Jingdezhen “Thousand Museums and Ten Thousand Ceramics” Ceramic Cultural Heritage Digital Asset Version Library has collaborated with over 30 national level arts and crafts masters to establish personal digital archives of their works, and has completed the digital collection and presentation of more than 10,000 ceramic artifacts. At the same time, building a gene bank for ancient ceramics, conducting composition analysis and data collection on ancient porcelain pieces, creating refined models and analyzing the origin, development, and changes of ceramic civilization can lay the foundation for cultural relic protection and research.

4.2 Expansion of display and dissemination channels

Building online exhibition platforms such as digital museums and virtual exhibition halls, and using VR, AR and other technologies can enable audiences to enjoy ceramic cultural heritage through the Internet, breaking through the time and space constraints. Through the construction of a smart tourism platform, the historical and cultural block in Taoyangli has upgraded its digital management and services, promoting the effective dissemination of cultural heritage. Meanwhile, by leveraging new media and digital technologies such as short videos, live streaming, and social media, exquisite promotional videos and short clips can be produced to showcase the ceramic-making techniques and cultural connotations. Through live interaction, the audience can learn about the ceramic-making process and the stories of the inheritors, thereby broadening the audience base for ceramic culture.

4.3 Creative Design and Product Development

The development of Jingdezhen’s ceramic cultural and creative industry is also driven by the digital economy. Ceramic material cultural heritage not only possesses traditional resource advantages and cultural value, but also can be integrated with the cultural and creative industry, enabling ceramic material cultural heritage to regain new contemporary significance through innovative means, thus becoming more vibrant and achieving better development and inheritance. With the development of the digital economy, the rise of e-commerce platforms has expanded diversified sales channels for cultural and creative products, allowing consumers to have a more intuitive understanding of the cultural connotations behind the products^[2]. Therefore, designing cultural and creative products with greater cultural connotations and value, and avoiding the emergence of homogeneous products, is a key issue for the development of Jingdezhen’s ceramic cultural and creative industry. Thus, we need to deeply explore the regional cultural characteristics of Jingdezhen, promote the integration of traditional ceramic culture with digital cultural and creative products. By using digital design tools, we can facilitate cross-border cooperation between ceramics and trendy toys, developing innovative and market-appealing ceramic cultural and creative products. For instance, series such as “A Thousand Li of Rivers and Mountains” and “National Beauty” have been presented as “national gifts” at the Forum on China-Africa Cooperation, while original IP cultural and creative products like “Speechless Bodhisattva” and “Yearly Duck” are deeply loved by consumers.

4.4 Industrial Integration and Market Expansion

Based on digital technology platforms, we can promote the construction of online ceramic exhibition and sales platforms such as cloud exhibitions and cloud trading, enhance the digitalization and technological level of Jingdezhen Ceramic Exhibition, and create a first-class online display platform for ceramic culture. Empowering copyright protection with digital technologies such as blockchain, we can provide unique digital identities for ceramic works, promote transparency in copyright protection and safeguard the rights of creators, thus promoting the distribution of digital collections and establishing a national ceramic art circulation and trading market^[3]. At the same time, it is necessary to strengthen cooperation between local universities, research institutions and relevant overseas institutions, jointly building an overseas ceramic development data center to collect, organize and analyze relevant data and information in the field of overseas ceramics. Through all the strategies, Jingdezhen ceramic culture will enter the international market.

4.5 Deep Integration of Ceramic Culture and Tourism

It is significant to promote the interaction and integration of ceramic cultural heritage and the cultural tourism market, stimulate market vitality, formulate policies, regulations and assistance measures, tell the Chinese story of ceramic culture well, create selected brands, promote the visibility of cultural heritage in characteristic scenic spots and resorts, innovate large-scale themed cultural performance activities and highlight cultural heritage characteristics. At the same time, it is necessary to support cultural tourism enterprises to transform and utilize idle industrial plants, inventory buildings and other facilities to establish museums, intangible cultural heritage towns, etc., and support the development of products with local ethnic characteristics and cultural connotations into a series of cultural and creative souvenirs^[4]. These activities can not only enrich the content of tourism activities, but also generate certain social benefits.

5. Conclusions

In conclusion, in the era of digital economy, the rapid development of technologies such as big data, virtual reality and artificial intelligence has made it possible to digitally protect and develop the cultural heritage of Jingdezhen's ceramics. Utilizing digital technology to protect, inherit and develop the cultural heritage of Jingdezhen's ceramics is of positive significance for exploring the deep connotation of this heritage and uncovering its unique historical, cultural, aesthetic, technological and contemporary values. Exploring strategies for the digital protection and development of Jingdezhen's ceramic cultural heritage is conducive to fully tapping into the rich cultural heritage of Jingdezhen and allowing this ancient ceramic cultural heritage to shine even more brightly in the course of social development.

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