

# *Research on the Digital Protection and Development Strategy of Jingdezhen Ceramic Cultural Heritage*

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**Abstract:** Ceramic culture is an important part of traditional Chinese culture. The sparkling and smooth glaze of porcelain, the solemn and graceful shape, the implicit decoration, the atmospheric and steady charm, and the inner beauty of being clever in clumsiness and moving in stillness endow it with unique qualities. It is one of the earliest commodities traded between China and other countries, and has become a bond and bridge of friendship across Eastern and Western cultural exchanges. 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 single and systematic traditional methods of protection and development, various traditional ceramic techniques have not been effectively preserved and databases have not been established, resulting in fragmentation problems and hindering the protection and development of Jingdezhen ceramic cultural heritage. It is worth considering and practicing how to combine digital technology, digital media and other digital means to innovate the protection and development of Jingdezhen ceramic cultural heritage under the background of “digital economy”.

## 1. Introduction

Cultural heritage embodies the unique spiritual connotation of the Chinese nation, and is a vivid manifestation of the continuous vitality and innovation of the Chinese nation. *The Notice of the State Council on Strengthening the Protection of Cultural Heritage* clearly states that protecting cultural heritage and maintaining the inheritance of national culture are important cultural foundations for connecting national emotional bonds, enhancing national unity, and maintaining national unity and social stability. They are also prerequisites for maintaining world cultural diversity and creativity, and promoting the common development of mankind. As the porcelain capital with a thousand year history of porcelain firing, Jingdezhen’s ceramic intangible cultural

heritage condenses technology and art, culture and economy, and is a model of ceramic civilization in China and even the world. 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. Therefore, it is worth considering and practicing how to innovate the protection and development of Jingdezhen ceramic cultural heritage based on digital technology, digital media and other digital means under the background of the “digital economy”.

## **2. The Current Status 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 and printing techniques, and unique artistic patterns. They are loved 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.

### **2.1 Characteristics of Jingdezhen Ceramic Cultural Heritage**

Firstly, the ceramic cultural heritage of Jingdezhen is widely distributed, with a large number of kiln remains are preserved in the urban area of Jingdezhen and in the basins of the Donghe, Nanhe, and Xiaonanhe rivers. These kiln sites highlight the prosperity of Jingdezhen’s ceramic industry in history. The archaeological excavations at the Imperial Kiln Site, Luomaqiao Site, and Guanyin Pavilion Kiln Site have revealed the historical changes of the Imperial Kiln during the Ming and Qing dynasties, as well as the development trajectory of the town’s civilian kilns from the Southern Song Dynasty to modern times. Secondly, the types of ceramic cultural heritage are also very diverse. There are both the kiln remains that belong to material cultural heritage and the traditional crafts, customs, myths and legends, sacrificial rituals, folk beliefs, ceramic industry terminology, place names, etc., that belong to intangible cultural heritage. The handicrafts represented by Jingdezhen ceramics have the characteristics of “intangible cultural heritage”. Folk ceramic handicrafts are still mostly passed down orally, and the survival of the skills often depends on the survival of the inheritors. The artistic ceramic handicrafts in Jingdezhen reflect the wisdom and sparks of Jingdezhen’s folk pottery makers through processes such as glaze preparation and processing methods, including casting, shaping, painting, glazing, firing, and decorative techniques. Their pottery craftsmanship carries the cultural traditions passed down from generation to generation. Finally, its connotation is very rich. Jingdezhen ceramic culture not only reflects the rich traditional craft culture, artifact culture, institutional culture, and folk culture, but also reflects the changes in people’s aesthetic psychology of the times, the commercial culture and spirit of traditional society. It also reflects many characteristics of traditional Chinese society from one aspect and plays a huge role in foreign cultural exchanges and showcasing Chinese culture.

### **2.2 Distribution of Jingdezhen Ceramic Cultural Heritage**

The composition of Jingdezhen’s ceramic material cultural heritage resources includes cultural

relics, historical sites, industrial heritage areas, etc. There are a total of 770 immovable cultural relics, including 81 ancient sites, 52 of which are ancient porcelain kiln sites, a large ceramic culture site area of about 20.87 square kilometers, 9 ancient tombs, 476 ancient buildings, 16 grotto stone carvings, 188 important historical sites in modern times, and 243 cultural relics protection units at all levels. The composition of Jingdezhen's ceramic intangible cultural heritage resources includes traditional handicrafts, folk art, folk customs, folk music, folk literature, and other categories. There are a total of 52 intangible cultural heritages, including 2 selected for the national intangible cultural heritage list and 21 provincial-level intangible cultural heritage projects.

### **2.3 The Value of Jingdezhen Ceramic Cultural Heritage**

The rich ceramic cultural heritage of Jingdezhen has profound cultural value. Jingdezhen has exquisite ceramic production techniques, including handmade porcelain making skills, which are listed as intangible cultural heritage by UNESCO. Jingdezhen's ceramic handicrafts are renowned for their exquisite shapes, delicate textures, rich colors, and unique decorative styles. The ceramics fired cover various styles from ancient blue and white porcelain, famille-rose porcelain to modern art ceramics, creative ceramics, etc., reflecting the artistic aesthetics and cultural connotations of different periods. At the same time, Jingdezhen has formed a complete and orderly system of ceramic culture, including the remains of raw material production areas, workshops, kilns, roads, docks, shops, and residential buildings. These cultural relics reflect the unique ceramic cultural ecology of Jingdezhen and are important resources for studying ancient Chinese ceramic culture<sup>[1]</sup>.

At the same time, the ceramic cultural heritage of Jingdezhen also has significant social and economic value. The needs of society constitute the foundation of economic value, mainly manifested in the public's demand for material and spiritual cultural life. The rich ceramic cultural heritage of Jingdezhen plays a role in enriching the public's spiritual world and enhancing their cultural literacy. Therefore, with the increasing demand of the public for social and cultural life, the cultural heritage of Jingdezhen has attracted a large number of tourists and promoted the rapid development of Jingdezhen's tourism industry.

### **3. Digital protection strategy for Jingdezhen ceramic cultural heritage**

Digital economy has become an important engine for national strategy and economic growth. Digital economy includes cloud computing, big data, Internet of Things, industrial Internet, blockchain, artificial intelligence, virtual reality and augmented reality. New cultural formats based on the Internet and digital content emerge in endlessly. The new economic environment has brought new inspiration to the protection and development of Jingdezhen ceramic cultural heritage. Jingdezhen's ceramic cultural heritage should make full use of the Internet, 5G, artificial intelligence, virtual reality and the advantages of digital technologies such as augmented reality (AR) to enable the creation of cultural heritage databases, online promotion platforms, performance display platforms, online learning platforms, and derivative product sales platforms, achieving multi-dimensional and multi-level protection and inheritance.

#### **3.1 Implementing digital collection of information on ceramic cultural heritage**

The digital protection of ceramic cultural heritage is a long-term project that involves cross disciplinary and diverse participation. Its sustained and long-term maintenance characteristics require the establishment of a sound protection and management system<sup>[2]</sup>. Therefore, it is particularly important to establish a digital daily management system for historical and cultural

heritage. It is necessary to adopt a comprehensive strategy, taking into account the specific content, forms of expression, and unique attributes of digital technology of ceramic cultural heritage. Also, it is significant to develop reasonable protection and management systems, guide relevant personnel to systematically carry out digital protection and management activities of historical and cultural heritage, and ensure the systematic and effective digital protection and management of ceramic cultural heritage.

In the digital protection of ceramic cultural heritage, the digital collection of historical and cultural heritage information is the foundation of the work, and the quality of information collection directly affects the subsequent digital protection and management of historical and cultural heritage. We should start from multiple perspectives such as technology and processes, actively promote the digital collection of ceramic cultural heritage information, lay a solid foundation for the digital protection and management of ceramic cultural heritage, and provide strong support for big data analysis. For example, 3D scanning technology can be used to collect information on ceramic cultural heritage. With the help of high-definition imaging technology, accurate and objective data can be obtained, and a comprehensive and diverse cultural resource database can be constructed to achieve permanent digital preservation of historical and cultural heritage, providing important reference for future research and restoration work of historical and cultural heritage.

Jingdezhen has launched the construction of the “Ceramic Culture Digital Innovation Pilot Zone” and plans to complete the comprehensive digital filing of core cultural heritage by 2025. This kind of protection is not simply about technology transplantation, but about reconstructing the production, dissemination, and experience of ceramic culture in the digital dimension, so that the millennium kiln fire can be revitalized in digital civilization.

### **3.2 Promoting the dynamic display and efficient dissemination of ceramic cultural heritage**

With the advent of the era of artificial intelligence, digital technologies such as VR and 3D modeling can achieve a three-dimensional and vivid interpretation of ancient cultural relics, bringing visitors a new visual experience of cultural heritage in a more intuitive and vivid way. For example, through VR technology, visitors can immerse themselves in the ancient ceramic production scene; through AR technology, tourists can scan ceramic artifacts to obtain their historical stories and cultural connotations behind them. At the same time, in order to spread ceramic culture knowledge to tourists in a relaxed and fun way, some interactive game activities with ceramic culture themes can be carried out, such as ceramic puzzle games, ceramic knowledge quiz games, etc., setting up interactive game areas in ceramic culture exhibition halls or theme parks can allow visitors to learn about various aspects of ceramic culture by participating in games.

The Taoxichuan Cultural and Creative Zone in Jingdezhen has established a virtual real linkage digital workshop, using digital twin technology to construct a metaverse of Jingdezhen’s real scenes in virtual space, and establish dynamic twins of important landmarks and facilities. Tourists can travel through time and space in the Ceramic Metaverse Museum using holographic projection, object recognition, and other technologies to visit the ancient Jingdezhen kiln site and witness the entire process of ancient ceramic production firsthand. In the Ceramic Metaverse Pavilion, visitors can also experience traditional porcelain making processes such as molding, drawing, shaping, and glazing through virtual reality technology, as if they were personally involved. This immersive historical experience not only allows tourists to experience the profound cultural heritage of ceramics, but also stimulates their interest and love for traditional culture<sup>[3]</sup>.

With the help of digital media and new media platforms, multilingual promotional videos can be produced and widely disseminated through overseas social media, video platforms, etc. For example, short videos such as ceramic production process and ceramic culture stories are released

on platforms such as Tiktok and YouTube. It is necessary to develop digital content related to ceramic culture, such as virtual exhibitions, online courses, etc., break the limitations of time and space which allows more people to understand ceramic culture, cultivating ceramic brands with international influence, such as “Hongye” and “Changnan”, and enhancing the visibility of Chinese ceramics in the international market. By collaborating with international media and hosting international ceramic culture exhibitions, we invite ceramic artists, scholars, collectors, and others from around the world to participate and showcase the charm of Chinese ceramic culture, further promoting the "going global" of ceramic culture and enhancing its international dissemination.

### 3.3 Integrating digital dissemination and operational approaches for cultural heritage

In the current rapidly developing digital economy, we should integrate digital communication channels, create digital operation, improve digital display effect, expand the interesting communication channels of ceramic cultural heritage, promote through the popular online media platforms such as Tiktok, Kwai, Toutiao, etc., string together the history of ceramic cultural heritage into fresh stories, guide the daily and social interests of ceramic cultural heritage with simple, creative, short and smooth communication methods, and carry out resource linkage inside and outside the platform, so as to realize the positive energy transmission on the network. At the same time, VR technologies such as virtual digital museums and virtual experience centers can be utilized to deepen the audience's experience, innovate scene based and virtual experience dissemination paths, provide immersive services for users, combine digital display and interactive experience of archaeological and ceramic cultural heritage with cultural and creative industries, carry out intelligent innovation and reshaping, enhance integrated interactive experience in digital communication, and truly integrate ceramic cultural heritage into people's daily lives.

## 4. Conclusions

In summary, utilizing digital technology to protect and develop the ceramic cultural heritage of Jingdezhen is of great significance for exploring the deep connotations of Jingdezhen's ceramic cultural heritage, as well as its unique historical, cultural, aesthetic, and technological values. The digital inheritance and protection of ceramic cultural heritage can enable people to fully appreciate the unique charm of ceramic culture, awaken people's love for excellent traditional culture, and strengthen our cultural confidence. Therefore, we need to constantly explore new paths and channels to make the ancient ceramic cultural heritage shine with new brilliance.

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