



Research on the Inheritance and Development of Hubei Traditional Wood Carving Art Based on Digital Manufacturing Technology

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Abstract: This study aims to summarize the successful application cases of digital technology in the field of art and culture, combine the advantages of digital technology with wood carving art in Hubei, put forward the digital inheritance and promotion strategy, and help the benign development of intangible cultural heritage of wood carving art in Hubei. Through field research and literature study, to clarify the types and characteristics of wood carving art in Hubei, to analyze the advantages and disadvantages of digital manufacturing technology in traditional wood carving art, to synthesize the demands of cultural and economic development of Hubei and the inheritance and development of wood carving art, to put forward the digital application strategy of intangible cultural heritage of wood carving art in Hubei from the perspective of inheritance and promotion, to explore new digital application strategy of the protection, inheritance and promotion of the traditional wood carving art in Hubei, and to explore new digital application strategy of the protection, inheritance and promotion of traditional wood carving art in Hubei. It explores new digital development paths for the protection, inheritance and promotion of traditional woodcarving art in Hubei, and provides reference for the digitalization practice of other intangible cultural heritage.

Keywords: digital manufacturing; Hubei woodcarving; intangible cultural heritage; traditional handicrafts

1. Introduction

In today's digital era, the integration of traditional crafts and modern technology provides new opportunities for the protection and inheritance of intangible cultural heritage. As an important part of China's intangible cultural heritage, wood carving art in Hubei region carries rich historical and cultural information and unique regional characteristics. However, with the changes of the times, this ancient art is facing the double challenges of inheritance fault and market shrinkage. How to use modern digital manufacturing technology to inject new vitality into Hubei wood carving art has become an urgent problem.

2. Overview of the characteristics of wood carving art in Hubei

At present, in Hubei region has a lot of excellent wood carving art and culture into the intangible cultural heritage protection list, including Wuhan wood carving ship model and Tongshan wood carving was included in the national intangible cultural heritage list, Wuhan wood carving, Qianjiang wood carving, Jingsha mortise and tenon wood carving, boxwood wood carving, Lichuan wood carving and was included in the provincial intangible cultural heritage list.

2.1 National wood carving types and artistic characteristics

Among the national intangible cultural heritages in Hubei, Wuhan wood carving ship model and Tongshan wood carving have their own characteristics. Wuhan wood carving ship model takes the ship as the carrier, integrates the elements of architecture, characters, stories, etc., adopts the carving technique of "hollowing out the fine shuttle", mainly uses cypress and boxwood, and its works such as the "Chinese dragon" show a strong visual impact. Tongshan wood carvings, on the other hand, take architecture, furniture, furnishings and religious articles as carriers, adopt the technique of combining round carving and relief carving, and use balsam camphor wood as the main material, pursuing the natural beauty of simplicity and simplicity and embodying the inheritance of carving art since the Tang and Song dynasties.

2.2 Provincial wood carving types and artistic characteristics

Hubei woodcarving art in provincial intangible cultural heritage shows diversity. Wuhan woodcarving is mainly based on historical figures and mythological portraits, adopting round carving and relief carving techniques, focusing on the expression of character, with a unique regional style. Qianjiang wood carvings are mainly architectural wood carvings, furniture wood carvings and decorative handicrafts, adopting yin carving and yang carving techniques, with simple contents, often using plane decorative patterns, and enjoying lacquer or gold to enhance the value of the works. Jingsha mortise-and-tenon

woodcarving is characterized by its “mortise-and-tenon joint” process, which is flexible in form and facilitates fine carving of local details. Poplar woodcarving, on the other hand, started in the Song and Yuan dynasties and flourished in the Ming and Qing dynasties, originating from Yueqing, Zhejiang Province, and spreading to Xiangyang, Hubei Province, is divided into traditional, root carving and split carving categories, which utilize the natural texture of poplar wood to carve intentionally, all in accordance with nature, without fine carving, demonstrating the diversity and innovativeness of the art of woodcarving!

To summarize, Hubei regions wood carving art form a wide range of practical construction wood carving and furniture furnishing wood carving, such as beams and pillars, arches, lintels, and tables and chairs counters, etc., but also more decorative craft wood carving, such as statues of gods, candlesticks and so on. The richness of wood carvings and the variety of skills in Hubei also reflect the characteristics of Hubei as a transportation hub in the central region of China, emphasizing the integration, inclusiveness and diversity of Hubei culture, which also means that the non-heritage culture in Hubei lacks the characteristics of unity, which is extremely challenging for the inheritance, dissemination and promotion of wood carving non-heritage culture in Hubei.

3. The application of digital technology in the art of wood carving

Digital manufacturing technology, integral to modern manufacturing, encompasses digital design, processing, and assembly, enhancing efficiency, quality, and market responsiveness. Its application in traditional wood carving art primarily involves additive and subtractive manufacturing.

Additive manufacturing, primarily 3D printing, converts wood into powder for fused printing, offering advantages such as increased production speed, reduced costs and time for artisans, and high inclusivity for complex organic forms, expanding creative possibilities. However, it may compromise wood’s natural attributes like color and texture.

Subtractive manufacturing includes CNC machining and laser processing. CNC is valued for precision, efficiency, and automation but is costly and requires skilled operation. Laser processing is favored for its versatility, non-wearing tools, and high efficiency, yet its high power consumption and equipment costs limit material applications and demand higher user expertise. While CNC can handle various carvings, its high cost and lack of depth hierarchy detract from the artistic value. Laser engraving is suited for surface decoration but lacks depth, often reducing the charm of wood carvings.

4. Hubei wood carving art development strategy based on digital manufacturing technology

4.1 Lowering the technical threshold and cultivating new-age woodcarving talents

The inheritance of Hubei traditional wood carving art needs a constant injection of fresh blood, for the new generation of young people, the threshold of traditional wood carving art is high. The cultivation of artistic aesthetics, the training of carving techniques, the investment of time costs and the exercise of their own patience are unavoidable compulsory courses. Digital manufacturing technology can be added to a certain extent to reduce the threshold of wood carving art learning, so that the traditional wood carving non-heritage art heritage learning is no longer prohibitive. For example, 3D printing technology can fully realize the creator’s artistic ideas in a short period of time, and the sense of achievement can bring confidence to learners. At the same time, 3D printing is not limited by the form of traditional wood carving, young people’s innovative ideas for traditional wood carving art has brought a new path to inspire the traditional old craftsmen’s artistic inspiration, to achieve the common progress of inheritance and development.

4.2 Enhance work efficiency and respond positively to market changes

The production cycle of traditional wood carving works of art is long and expensive, and the response to market changes is not timely enough. The intervention of digital technology can improve the working efficiency of wood carving practitioners, shorten the production cycle of wood carving works, and reduce the investment of labor cost and time cost. In the face of changing market demand, the efficient working condition can respond to the market needs in time, follow the market hotspot, can not affect the traditional wood carving art creation at the same time, complete the market demand for the production of goods, so as to bring the inheritance and development of the traditional wood carving art in Hubei, a good market and economic foundation.

4.3 Unify the characteristics of Hubei woodcarving and promote the dissemination and promotion of Hubei woodcarving

Hubei wood carving techniques are rich, the subject matter is diverse, all kinds of wood carving have their own charac-

teristics, the lack of uniformity, for Hubei wood carving art dissemination and promotion is very challenging. Digital manufacturing has the characteristics of high precision, digital processing after the creation of artisans, the output of the finished product will not be due to personal creation errors lead to different presentation effects, although to a certain extent, the sacrifice of the natural texture of the wood carving and artisan handmade creation of charm, but in some of the publicity works can be done to promote the unity of the artistic style, which will help the masses for the formation of the overall impression of the art of wood carving in Hubei, the promotion and dissemination of wood carving in Hubei has good advantages. The promotion and dissemination of Hubei woodcarving has a good role.

5. Concluding Remarks

This paper discusses in depth the application of digital technology in the inheritance and promotion of intangible cultural heritage of Hubei woodcarving art. Through field research and literature analysis, we put forward strategies to reduce the technical threshold, improve work efficiency, and unify artistic styles, aiming to provide new ideas for the protection, inheritance and innovation of woodcarving art in Hubei. In the future, through continuous research and practice, we will further explore the integration and development path of digitization and traditional woodcarving art, and contribute to the protection of intangible cultural heritage in Hubei and even the whole country.

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