EXPLORATION OF THE INTEGRATION OF DIGITAL TECHNOLOGY AND TRADITIONAL CRAFTMANSHIP OF ZIBO GLAZE

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Abstract

The purpose of this paper is to discuss the application of digital technology in the protection and inheritance of intangible cultural heritage, and to analyze the role of digital technology in improving the design innovation ability of glaze, optimizing the production process, and broadening the market communication channels by taking the traditional craft of Zibo glaze as an example. Through case studies, technology comparisons, and field research, this paper reveals how digital technology can help rejuvenate the traditional craftsmanship of Zibo glaze and promote the integration of cultural heritage and modern design. At the same time, the paper also discusses the challenges and coping strategies in the process of integration, which provides a reference for the integration and development of traditional craftsmanship and modern technology.

The research results are as follows:

1.Through computer graphics and computer coloring and other processes, it can efficiently and accurately convey the creativity of glass art creators, and guide the processes of carving, batching, and color fixing.

2. Under the large-scale production mode, the manufacturing process of glaze utensils has changed from manual to semi-automatic or fully automated production, reducing the cumbersome steps of manual operation. At the same time, the improvement of the process formula makes the glaze more stable, higher strength, and more versatile, which opens up a larger creative space for glaze art.

3. The integration of digital technology has made the glazed works have more possibilities in terms of color expression and modeling design. Different metal oxides can give the glass a rich color and show a unique color beauty after being fired at high temperatures. In addition, combined with lighting and other means, the artistic effect of glazed works can be further enhanced.

Keywords: Digital technologies; Zibo glaze;Traditional crafts; Integration and innovation; Cultural heritage

Introduction

With the rapid development of information technology, digital technology has been widely used in various fields, providing a strong impetus for the transformation and upgrading of traditional industries. As a treasure of traditional Chinese arts and crafts, Zibo glaze carries a wealth of historical, cultural and artistic value. However, in the face of the impact of modernization and globalization, the traditional craft of Zibo glaze is facing challenges such as difficulty in skill inheritance, insufficient product innovation, and limited market expansion. Therefore, it is of great significance to explore the integration path of digital technology and the traditional craft of Zibo glaze to promote cultural inheritance and stimulate industrial vitality.

Research objective:

(1) This paper analyzes the process overview of Zibo glaze, and discusses the application of digital technology in it.

(2) Explore the integration path of digital technology and the traditional craftsmanship of Zibo glaze

(3) Evaluate the integration effect and discuss its significance in promoting the inheritance of Zibo glaze culture and stimulating the vitality of the industry

Methodology

Through an in-depth analysis of the application status of digital technology in the traditional craft of Zibo glaze, the effective path of the integration of the two is explored, so as to provide new ideas and new methods for the inheritance and development of Zibo glaze. The specific research contents include: combing the historical evolution and technical characteristics of Zibo glaze, and analyzing the problems faced by the current development; Investigate the application status of digital technology in Zibo glaze process, and evaluate its effect and impact; Combined with case analysis, this paper discusses the innovative mode and strategy of the integration of digital technology and Zibo glaze technology. Finally, the challenges and coping strategies are put forward to provide reference for future integration practice. The main conceptual framework of this study adopts the following mind map:
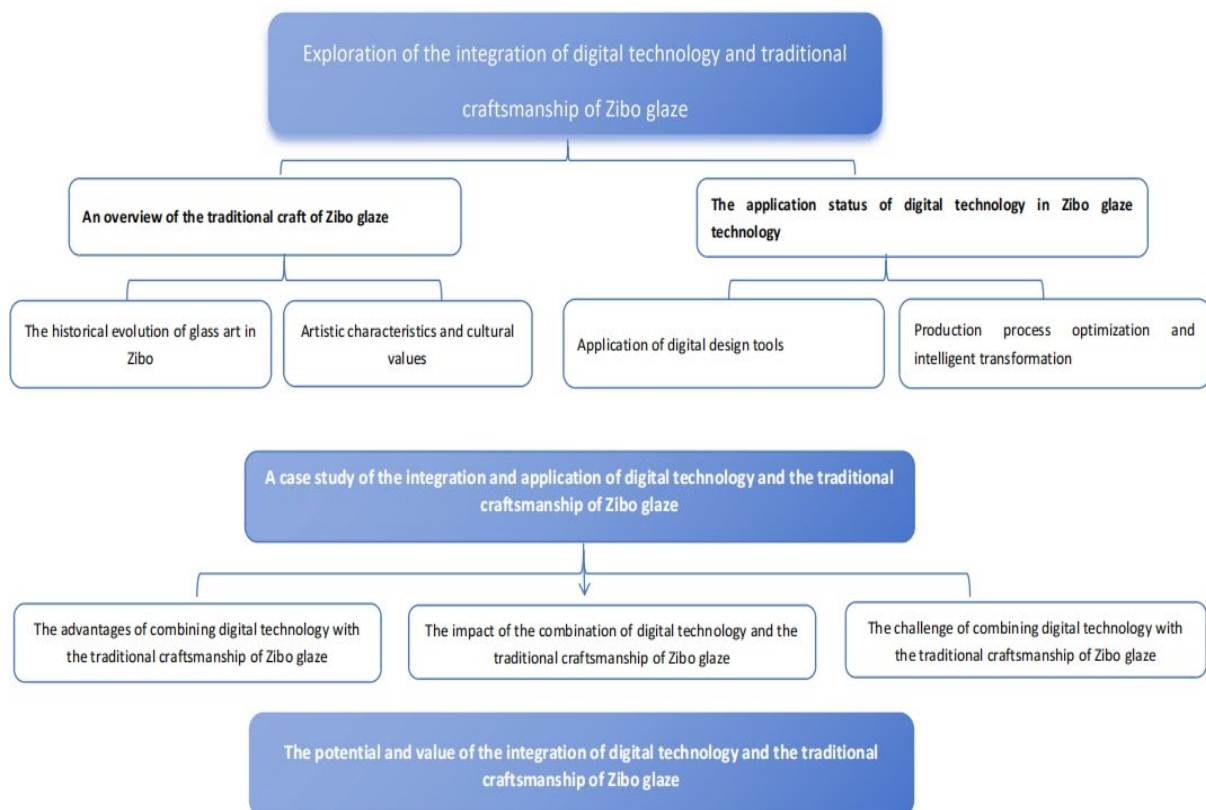
1. Research methods

(1) Through group discussions, relevant information was gathered and the role and impact of the integration of traditional crafts and modern technology were discussed.

(2) Conduct a systematic analysis of the collected data through the following

(a) The intrinsic significance and interrelationship between Zibo glaze and digital technology;

(b) The application of digital technology in Zibo glaze to evaluate its integration degree and effectiveness;

(c) The adaptability and uniqueness of Zibo glaze in different cultural backgrounds and markets

(3) Analyzes the application of digital technology in the design innovation of Zibo glaze

(4) Analyze the application of digital technology in Zibo glaze production

(5) Analyze the case study of the integration of digital technology and traditional culture

(6) Conclusion and Outlook

2.An overview of the traditional craft of Zibo glaze

2.1 Zibo glaze is derived from the glaze products of Boshan District, Zibo City, Shandong Province, which was first discovered in China, with a history of thousands of years Zibo glaze has a long history and profound cultural heritage, with the following characteristics:

2.1.1 There are many types: Zibo glaze mainly has glazed vases, ornamental flower balls, Shandong painting smoke bottles, "chicken liver stone", "chanterelle yellow", golden red, turquoise green, nesting carving, material bead ornaments, imitation jade, imitation agate glaze and lamp glaze, etc. According to its use, it can be roughly divided into five categories: ornaments, daily necessities, interior furnishings, stationery and toys.

2.1.2 Exquisite craftsmanship: Zibo glaze technology mainly includes large furnace technology, round furnace technology and rice bead furnace technology. The large furnace technology is to smelt various raw materials into glass, and can be made into various finished and semi-finished products; The circular furnace technology uses the various color strips produced by the furnace as raw materials for further processing; Rice bead furnace technology is specialized in the production of "rice beads".

2.1.3 Chic shape: Zibo glaze has a unique shape, brilliance and ingenuity. The craftsmen are highly skilled, and the works produced are lifelike, such as fruits, vegetables, insects, etc., which are colorful, vivid, and unique, and each piece is exquisitely clear and dazzling, which makes people love it.

2.2 The historical evolution of Zibo glaze:

Zibo glaze has a long history, dating back to the Warring States period. After thousands of years of development, Zibo glaze is famous for its unique artistic style and exquisite production skills, and has become a treasure of glaze art in China and even the world.

2.3 The artistic characteristics and production process of Zibo glaze

Zibo glaze is known for its colorful, crystal clear and diverse shapes. The production process is complex and fine, including material selection, melting, molding, annealing, grinding and other links, each link requires careful operation by craftsmen in order to achieve a perfect glass artwork.

3.The application of digital technology in the design innovation of Zibo glaze:

3.1 Design and Creativity

3.1.1 Digital design tools: Zibo glaze design process is gradually integrating digital design tools such as CAD (computer-aided design) and 3D modeling. These tools enable designers to more efficiently ideate, sketch, and model in 3D, allowing designs to be quickly generated and modified and optimized multiple times. This not only improves the design efficiency, but also broadens the design ideas, making the glazed products more diversified and personalized.

3.1.2 Virtual Reality Technology: VR (Virtual Reality) technology provides a new way of experience for the design of Zibo glaze. Designers can enter the virtual environment through VR equipment to observe and modify the glass products in an all-round way to achieve an immersive design experience. This technique helps designers better grasp the details and overall effect of the product, and improve the quality of the design.

3.2 Digital color management optimizes color performance

Color is an important part of Zibo glaze art. Traditional color management relies on the experience and feeling of craftsmen, and it is difficult to ensure the accuracy and consistency of color. The digital color management system can achieve accurate control of the color of the glass through accurate color measurement and correction technology. Designers can freely mix colors on the digital platform and simulate the real color effect through the system, thus avoiding quality problems caused by color deviations. Digital color management not only improves the color expression of glazed artworks, but also enhances its market competitiveness.

4. The practice of digital technology in the production optimization of Zibo glaze

4.1 Intelligent manufacturing technology improves production efficiency

Intelligent manufacturing technologies, such as automated production lines and robots, have played an important role in the production of Zibo glaze. Through the introduction of intelligent manufacturing technology, the automatic control and refined management of the production process can be realized, manual intervention and errors can be reduced, and production efficiency and product quality can be improved. For example, automated production lines can achieve precise proportioning and mixing of glazed raw materials, and robots can complete complex and delicate molding and grinding work. The application of these technologies not only reduces production costs and labor intensity, but also improves the technological level and market competitiveness of glazed artworks.

4.2 The digital management system optimizes the production process

Font management systems such as ERP (Enterprise Resource Planning), MES (Manufacturing Execution System), etc., provide a comprehensive production management solution for Zibo glaze production enterprises. Through these systems, enterprises can realize the whole process management of the formulation, execution and monitoring of production plans, to ensure the timely completion of production tasks and the efficient use of resources. At the same time, the digital management system also supports the real-time collection and analysis of production data, providing strong support for enterprise decision-making. The application of these systems helps Zibo glaze production enterprises to realize the standardization, standardization and intelligent management of the production process.

5. A case study of the convergence of digital technology and traditional culture

With the rapid development of information technology, digital technology has penetrated into all fields of social life, bringing unprecedented opportunities for the inheritance and innovation of traditional culture. As the carrier of the national spirit, the protection and inheritance of traditional culture is of great significance. However, in the wave of globalization and modernization, traditional culture is facing the danger of being marginalized, forgotten or even disappeared. Therefore, exploring the effective integration path of digital technology and traditional culture has become an important topic in the current cultural field. Digital technologies, including the Internet, big data, cloud computing, virtual reality (VR), augmented reality (AR), etc., provide strong technical support for the preservation, display and dissemination of traditional culture. Traditional culture, as the spiritual wealth accumulated in the long history, has a profound cultural heritage and unique artistic charm. The organic

integration of the two can not only make traditional culture present to the public in a more vivid and intuitive way, but also stimulate the public's interest and recognition of traditional culture, and promote the inheritance and development of traditional culture.

5.1 The integration of the Forbidden City and digital technology(Figure1)

5.1.1 The Palace Museum uses digital technology to rejuvenate traditional culture.

Digital Forbidden City: Launched the "Digital Forbidden City" mini-program to integrate the Forbidden City's online digital services, allowing you to enjoy high-definition images of the Forbidden City's cultural relics, view information about ancient buildings, and participate in interactive quizzes through your mobile phone. Let people feel the beauty of the Forbidden City anytime and anywhere.

5.1.2 Virtual Reality (VR) Tour: Using VR technology to create a virtual Forbidden City experience, you will feel like you are in the palace of the Forbidden City, and enjoy the grandeur of the architecture and the beauty of the cultural relics up close. Even if you can't visit the Forbidden City in person, you can still get an immersive experience.

5.1.3 Digital cultural relics protection: The digital preservation of cultural relics through high-resolution scanning, 3D modeling and other technologies provides more accurate data for cultural relics protection and research. At the same time, it also provides a new way for the display and dissemination of cultural relics.

5.2 Dunhuang Mogao Grottoes digital display(Figure2)

The Mogao Grottoes in Dunhuang use digital technology to protect and inherit cultural heritage.

5.2.1 Digital caves: The Mogao caves are digitally collected and reconstructed to make a high-precision digital cave model. You can watch the digital cave film in the digital exhibition center to learn about the history and artistic value of the Mogao Grottoes, reduce the pressure of tourists to visit the physical caves, and protect the cultural relics.

5.2.2 Online Exhibition: An online exhibition of Dunhuang Mogao Grottoes will be held through the Internet platform, displaying high-definition pictures and detailed descriptions of Dunhuang murals, sculptures and other art treasures. Let the global audience appreciate the charm of Dunhuang culture.

5.2.3 Interactive experience: Develop interactive experience projects of Dunhuang culture, such as digital mural puzzles, virtual mural painting, etc., so that you can better understand the connotation and artistic characteristics of Dunhuang culture through participation.

Figure1. Digital artwork"Digital Treasure Pavilion"
Image source: Baidu Pictures
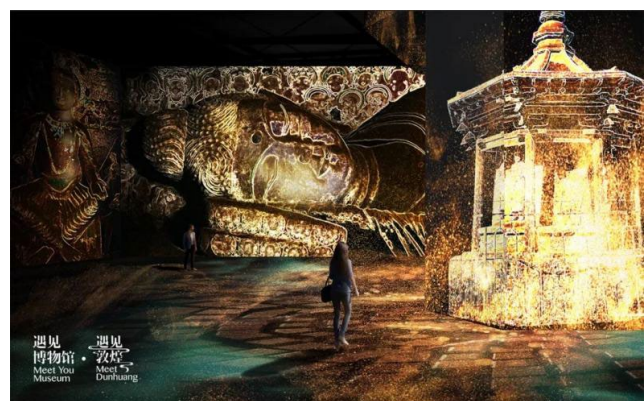
Figure2. Digital Museum"Meet Dunhuang"
Image source: Baidu Pictures

Conclusion

With the continuous development and application of digital technology, the future of Zibo glaze is full of infinite possibilities. On the one hand, digital technology will further improve the design level, production efficiency and market response speed of Zibo glaze, so that it can better meet the diversified needs of consumers; On the other hand, digital means will also provide a broader space and platform for Zibo glaze's cultural dissemination and market expansion. It is foreseeable that in the future development, Zibo glaze will pay more attention to the excavation and inheritance of cultural connotation, and actively embrace the changes brought about by digital technology, so as to achieve the perfect integration of tradition and modernity, and glow with more brilliant brilliance.

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