

Research on Multimodal Communication of Lacquer Art from the Perspective of Digital Humanities

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Abstract: This study explores the practice, challenges, and opportunities of multimodal dissemination of lacquer art from the perspective of digital humanities. It begins by reviewing the development of digital humanities, emphasizing its application in art and cultural studies, particularly in the field of lacquer art. Through case studies, the article examines the multimodal expression and dissemination of lacquer art in digital environments, such as the use of 3D modeling, virtual reality (VR), and augmented reality (AR) technologies. These technologies not only enhance the interactivity and experiential quality of lacquer art education but also facilitate its international dissemination. The study also highlights the technical and cultural challenges faced in promoting traditional art through digital means, including high costs, technical barriers, maintenance requirements, and the difficulty of preserving cultural authenticity while ensuring effective dissemination. Additionally, the role of social media and online platforms in modern lacquer art dissemination is discussed ^[1]. These platforms provide extensive visibility and communication channels for artworks, fostering a multicultural community of lacquer art enthusiasts and opening new avenues for global dissemination and cultural exchange.

Keywords: Digital humanities; Multimodal dissemination; Lacquer art; Virtual reality

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1. Current status of digital humanities development

1.1. Definition and development of digital humanities

Digital Humanities is an interdisciplinary field that integrates computer science and humanities methods, focusing on the digitization and analysis of cultural heritage. Its history can be traced back to the 1960s, with an initial focus on the digital processing and statistical analysis of texts ^[1]. During this period, researchers mainly used simple computational tools to encode, store, and retrieve textual data for the study of literature and historical documents. With the development of computer science and advances in information technology, the

field of digital humanities has gradually introduced more complex and powerful tools and methods.

After entering the 21st century, digital humanities has developed into a global research field. Its research objects are no longer limited to literature and history, but have also expanded to multiple humanities disciplines such as art, music, drama, philosophy, etc. This expansion is due to the widespread application of digital technology, which enables scholars to process and analyze various multimodal data ^[2].

1.2. Digital technology and traditional handicrafts

The combination of digital technology and traditional handicrafts not only opens up new areas of research and creation but also greatly enhances the accessibility and expressiveness of traditional art forms. In the field of lacquer art, this fusion is manifested on multiple levels, from artistic creation to educational promotion, and then to cultural preservation; each aspect has been innovated and developed as a result. 3D modeling provides unlimited possibilities for modern design, allowing artists to freely experiment and modify designs in a digital environment, creating shapes and patterns that traditional craftsmanship cannot achieve. Digital drawing boards and professional drawing software enable designers to draw complex patterns and colors more accurately, achieving fine effects that traditional manual techniques cannot achieve ^[3].

By digitizing the images, production process, historical background, and relevant literature of lacquer artworks, a comprehensive digital archive can be established, providing valuable resources for researchers and the public. This not only contributes to academic research but also provides a solid foundation for the protection and inheritance of lacquer art culture. Through online platforms, lacquer artists can share their knowledge and experience with global enthusiasts, while also drawing inspiration from other cultures and technologies.

2. Overview of multimodality and applications

2.1. Concept of multimodality

Multimodality is a method of using multiple sensory modes when studying, communicating, or expressing information. These modes include text, images, sound, video, as well as other sensory channels such as touch or action ^[5]. The core of multimodal research lies in exploring how to optimize the transmission and reception experience of information by integrating these different forms and expressions of data ^[4].

Multimodal applications are not limited to education and academic research, but are also widely used in fields such as art, advertising, corporate communication, and media production. Multimodality is not only an effective way to achieve multi-level and multi-angle communication of information ^[5].

2.2. Multimodal application categories

The application of multimodal technology in the field of digital humanities not only deepens the integration of technology and culture but also spans multiple practical fields, greatly expanding the ways of information transmission and reception. In addition to education, museums, and artistic creation, multimodal technology is widely used in various fields such as media, advertising, and user interface design. In the field of media and advertising, multimodal technology makes content creation and information dissemination more attractive and effective ^[6].

Multimodal technology greatly enhances the attractiveness and dissemination of information by providing rich sensory experiences and interactivity. With the continuous development of technology and the expansion of application fields, multimodal technology will play a greater role in future digital humanities research and

practice, bringing new opportunities and challenges to traditional fields ^[7].

3. Practical applications of multimodal dissemination of lacquer art

As shown in **Table 1**, the practical applications of multimodal dissemination integrate text and images, video and audio, interactive media and virtual reality, as well as social media and online platforms, using various technologies and tools to innovatively enhance the educational and exhibition effects of lacquer art. These methods not only increase interactivity and immersive experiences but also effectively expand the audience scope of lacquer art, break through the limitations of time and space, and attract the interest of more young audiences.

Table 1. Analysis of practical applications of multimodal dissemination of lacquer art

Content	Specific technologies and tools	Effects and significance
Integration of Text and Images	Online image libraries, complex metadata and semantic tags, interactive timelines, virtual exhibitions, digital books, tutorials, 3D rendering technology, AR technology	Enhance the dynamics and interactivity of lacquer art dissemination; improve the efficiency of academic research and personal learning; provide vivid cultural stories of lacquer art; enrich users' learning experience; expand the audience scope of lacquer art.
Integration of Video and Audio	Documentaries, teaching videos, interactive virtual workshops, high-definition recording, audio narration, virtual reality technology, audio guides	Provide dynamic and immersive experiences; enhance the multisensory experience of the audience; promote the international dissemination of lacquer art; improve the audience's understanding and recognition of lacquer art; enhance the interactivity and interest of teaching; broaden the channels of international dissemination.
Interactive Media and Virtual Reality	Touchscreens, interactive exhibitions, digital games, virtual reality technology, Augmented Reality (AR) technology	Change the ways of lacquer art education and exhibition; provide immersive experiences and interactivity; break through the limitations of time and space; improve the interactivity and educational value of exhibits; attract the interest of young audiences; inherit the traditional skills and knowledge of lacquer art.
Social Media and Online Platforms	Social media platforms (Weibo, WeChat, Douyin, Kuaishou), short videos, story posts, live streaming, professional online platforms (Bilibili, Zhihu, Douban), e-commerce platforms (Taobao, JD.com), international shipping options, interactive comments, multilingual explanations	Improve the visibility of lacquer art; establish a cross-regional and multicultural community of lacquer art enthusiasts; promote knowledge sharing and skill improvement; expand the international market of lacquer art; enhance the audience's sense of participation and belonging; promote the dissemination of lacquer art knowledge and skills; expand the market and cultural exchange of lacquer art; provide new economic opportunities.

3.1. Application of text and images

The combination of text and images has brought unprecedented dynamism and interactivity to the learning and promotion of lacquer art in the digital environment. This diversified application not only improves the effectiveness of education and display, but also greatly expands the audience range of lacquer art. Online image libraries not only provide basic search and classification functions, but also integrate complex metadata and semantic tags that cover details such as the historical background, style features, production techniques, and cultural significance of lacquer artworks ^[8]. This deep information enables researchers and art enthusiasts to conduct more precise and in-depth queries, thereby enhancing the efficiency of academic research and personal learning.

Secondly, digital books and tutorials can automatically adjust the content presented based on the user's learning progress and interests. For example, beginners may receive more introductions to basic knowledge

and simple techniques, while more advanced learners can delve deeper into complex lacquer art techniques and cultural analysis. Combining advanced graphics rendering techniques, these tutorials can provide virtual workshops where users can “practice” lacquer art production in a controlled environment, including steps such as mixing paint, application design, and completing works.

3.2. Integration of video and audio

The combination of video and audio provides a more dynamic and immersive experience platform for the dissemination of lacquer art. By producing documentaries, instructional videos, and interactive virtual workshops about lacquer art, audiences can not only visually appreciate the beauty and exquisite craftsmanship of lacquerware but also listen to detailed explanations from craftsmen, understand material selection, process flow, and creative concepts ^[9].

3.3. Use of interactive media and virtual reality technology

The application of interactive media and virtual reality (VR) technology has completely changed the traditional way of educating and showcasing lacquer art. These technologies not only provide a highly immersive and interactive experience but also break through the limitations of time and space, allowing viewers to experience and understand the fine craftsmanship and aesthetic value of lacquer art more comprehensively and deeply. Interactive media technologies, such as touch screens, interactive displays, and digital games, make the display of lacquer art more vivid and engaging. In the exhibition, interactive screens can display the production process of different lacquer artworks, and viewers can choose to watch detailed introductions of specific crafts through touch operation.

Virtual reality technology creates a fully immersive environment, providing users with an experience as if they were in a real lacquer art workshop. In such a virtual environment, users can not only observe every detail, but also interact with objects in the environment, such as simulating various stages of lacquer art production, from preparing raw materials to painting and carving; all steps can be experienced one by one.

3.4. The role of social media and online platforms

Social media and online platforms play a crucial role in the dissemination and promotion of lacquer art, not only greatly increasing the visibility of lacquer art but also helping to establish a cross-regional and multicultural community of lacquer art enthusiasts ^[10]. Social media platforms such as Weibo, WeChat, TikTok, and Kwai allow lacquer masters and fans to show the unique charm and complex craft of lacquer art in the form of short videos, story posts, and real-time live broadcasts.

Professional online platforms and communities, such as Bilibili, Zhihu, and Douban, provide a place for lacquer enthusiasts to share and learn. On these platforms, beginners and experts can exchange skills and discuss various aspects of lacquer art, from basic knowledge to advanced skills.

With the popularity of social media and online platforms, lacquer artworks and related cultural content have rapidly spread to various parts of the world, enhancing the international community’s awareness and appreciation of this traditional art form. Through these platforms, lacquer art is not only a form of artistic expression but also a bridge connecting different cultural and historical backgrounds, enhancing international cultural exchange and understanding.

4. Challenges and opportunities in the digital humanities perspective of lacquer art

4.1. Technical and cultural challenges encountered by digital technology in the dissemination of lacquer art

Although digital technology has brought unprecedented opportunities for the dissemination of lacquer art, it also faces a series of technical and cultural challenges in practical applications. Advanced digital devices and technologies such as high-resolution scanners, 3D modeling software, and virtual reality devices are often expensive, which may be difficult for many independent artists and small studios to afford. This high cost limits the popularization and application of technology, especially in areas with limited resources. In addition to cost factors, mastering this high-tech equipment and software often requires new technical training for lacquer artisans. The complexity of digital technology requires artists to possess skills different from traditional crafts, such as computer operation and software programming abilities, which increases the difficulty and time of learning. With the increase of digital projects, how to effectively store, manage, and protect these large amounts of digital data has become another challenge. Although digital technology provides new ways for the preservation and display of lacquer art, the inheritance of traditional lacquer art largely relies on direct communication and practical learning between masters and apprentices.

4.2. Potential and possibility of multimodal propagation in promoting lacquer art

Multimodal propagation has shown great potential and possibilities in promoting lacquer art. By combining various forms such as text, images, audio, video, and interactive media, multimodal communication can more comprehensively and deeply showcase the unique charm of lacquer art.

Multimodal communication can provide a multisensory experience through rich media forms, enhancing the audience's understanding and interest in lacquer art. For example, by showcasing the production process of lacquer art through videos, accompanied by explanations from craftsmen and background music, the audience can more intuitively feel the aesthetic and artistic value of lacquer art.

5. Conclusions

This study explores the practice, challenges, and opportunities of multimodal dissemination of lacquer art from the perspective of digital humanities. By analyzing the current development status of digital humanities, the concept and application of multimodality, and the role of interactive media and social platforms in the dissemination of lacquer art, digital humanities provide new technological means and perspectives for the preservation, research, and dissemination of lacquer art. By utilizing digital technology, the digital documents of lacquer art can provide researchers and the public with broader and deeper access permissions. At the same time, the application of technologies such as 3D modeling and virtual reality provides new possibilities for the display and experience of lacquer art. These technologies not only contribute to the protection and inheritance of traditional art but also stimulate public interest and appreciation of lacquer art. Although digitization has brought many conveniences, there are also a series of technological and cultural challenges in the digital humanities application of lacquer art. The high cost and maintenance requirements at the technical level, as well as how to maintain the cultural authenticity and artistic depth of lacquer art in the digital process, are all issues that need to be taken seriously and addressed. This requires practitioners not only to master advanced digital technology but also to have a profound understanding of the cultural background of lacquer art.

In addition, the widespread application of multimodal communication has opened up new paths for the

education, promotion, and innovation of lacquer art. By combining various media such as text, images, and videos, multimodal communication enhances the interactivity and experiential nature of lacquer art education, helping to reach a wider audience, especially the younger generation. At the same time, the active use of social media and online platforms has provided a strong impetus for the global dissemination of lacquer art and promoted cultural exchange and understanding between countries. The research and practice of digital humanities in lacquer art have shown that the combination of traditional art and modern technology not only provides new opportunities for the inheritance and development of art itself, but also promotes the protection and promotion of cultural diversity. In the future, with the continuous advancement of technology and the expansion of application fields, the digitization and multimodal dissemination of lacquer art are expected to achieve greater innovation and breakthroughs, providing more possibilities and vitality for the protection and utilization of global cultural heritage.

Disclosure statement

The authors declare no conflict of interest.

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