

Exploring the Impacts of Digital Implantation on ICH's Inheritance and Development with Empirical Study

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Abstract

In the process of digitalization, intangible cultural heritage (ICH) projects face both opportunities and challenges. On the one hand, digital technology is transforming the inheritance and development of ICH projects; on the other hand, it also poses a risk of these projects disappearing. Regardless, digital technology is becoming a new means of showcasing ICH projects. This study collects quantitative data through questionnaires, employs descriptive analysis techniques, and is complemented by qualitative research methods. It aims to explore the impact of digital implementation on the inheritance and development of ICH projects through empirical research.

Keywords: Digital implantation; ICH; inheritance and development; VR.

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1.0 Introduction

Digital implantation of ICH refers to the process of converting the real information characteristics of ICH into data and transforming that data into visual forms. China is rich in ICH due to its five thousand years of civilization history. However, ICH in modern civilization is facing issues, and its inheritance and protection are becoming increasingly challenging. This is partly because most ICH is passed down through oral or behavioral means, leading to the risk of it disappearing (Yang & Xu, 2024).

Emerging technologies such as artificial intelligence (AI), virtual reality (VR), and cloud computing are changing how information and knowledge are disseminated, and they are penetrating and influencing the way people live and think. ICH is facing challenges and opportunities in the process of digitalization in contemporary times (Yang, 2023).

In 2003, UNESCO came out with the Convention for the Safeguarding of Intangible Heritage. As a State party to the Convention, China has actively fulfilled its responsibility and obligations mentioned in the Convention to protect ICH. China issued the Opinions on the Protection of Intangible Cultural Heritage two years later. In 2011, the Law of the People's Republic of China on Intangible Cultural Heritage was enacted and came into effect. Gradually, China has perfected the construction of its intangible cultural heritage legal system, which provides a solid legal basis and referable code of conduct for ICH protection (Shao, 2023),

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In recent years, states worldwide have been paying more and more attention to the protection of the ICH (Luo, 2022). ICH protection has become a topic of international concern. However, little research has been done on the role of new technologies, advanced digital technology, in ICH preservation and transmission (Alivizatou *et al.*, 2017).

Digital technology is becoming a new way to display ICH all-round. Digital technology is achieving high-quality communication effects of the historical value, social value, economic value, and aesthetic value of ICH. With the advances in technology, digital technology has become one of the approaches to protect ICH. It has been proved that digital implantation of ICH has an excellent effect on the preservation of ICH (Yan & Li, 2023).

ICH has rich themes and art forms, such as drama, folklore, art, music, and dance, which can be integrated into the digital creation. Through digital technology, it is possible to integrate ICH with tourism promotion and scenic tours to create interactive scene-roaming digital creation in tourism. Through digital technology, it is possible to integrate ICH with films and museum exhibitions. The digital creation can restore its historical background in addition to the original state of ICH (Yang & Xu, 2024).

2.0 Literature Review

2.1 Status Quo of Foreign Research

Western countries have begun applying digital technology to ICH. Libraries, museums, and archives in Western countries have made significant efforts to protect ICH effectively by using digital technology. With the continuous development of digital technology, in particular 3D modeling, static image rendering, and 3D algorithms, the digitization of ICH has developed rapidly, with various types of digital implantation, such as games and animation. The recent foreign research on ICH digitalization mainly focused on digital processing, restoration, and display of ICH (Yan & Li, 2023). It was revealed that modern society has problems with the dissemination and understanding of ICH, and digital marketing in the new generation was a necessary condition for the ICH's sustainable development (Cerquetti & Ferrara 2018).

2.2 Status Quo of Domestic Research

In the information age, how to protect, inherit, disseminate, and develop China's outstanding intangible cultural heritage through the development of digital technology and digital media has become an important issue facing the society (Tan & He, 2021). China's digital protection of ICH started late and is still in the process of continuous exploration. However, some progress has been made. The existing literature research on the digital protection of ICH focuses on the development, renewal, and application of simple digital technological means or the application of digital technology in a single intangible cultural heritage. China is introducing a series of policies to promote the development of the digital implantation of ICH, including broadcasting restrictions and tax incentives to support the digital implantation of ICH.

The digital implantation of ICH first emerged in Dunhuang and the Forbidden City in Beijing. Fan, K. K. *et al.* examined the current development situation of the animation culture industry in China. After a full analysis of the industry chain, cultural aspects, and other dimensions, the authors put forward specific suggestions such as perfecting the industry chain and integrating cultural resources to promote its stable development.

3.0 Methodology

Both qualitative and quantitative research methods were applied in this research. The qualitative data were primarily collected from existing literature and analyzed using thematic or content analysis techniques. Qualitative research methods complement the quantitative research methods, exploring the market demand for the digital implantation of ICH, characteristics, and differentiation of the digital implantation of ICH, methods for digital implantation of ICH, and future challenges and issues in digital implantation of ICH.

4.0 Findings

4.1 Market demand for Digital implantation of ICH

With the popularity of streaming platforms worldwide, the demand for ICH's digital implantation will continue to grow. It provides a development space for the creation and digital implantation of ICH. The digital implantation of ICH has achieved remarkable results in the market. Generally, the digital implantation of ICH appeals to a diverse audience of all ages. The questionnaire survey showed that those aged 31-45 were the key age segment, accounting for 39.29. In addition, those aged 23-30 and those aged 46-60 were also important age segments (Figure 1). Regarding occupation, those who engaged in teaching services and the employees in private enterprises were the target group of the digital implantation of ICH (Figure 2). Regarding the education level, undergraduate and graduate students were the main customers of the digital implantation of ICH (Figure 3). The questionnaire survey also showed that 67.86% of participants knew about ICH while knowing much about ICH accounted for 10.71% (Figure 4). 55.86% of participants agreed that the digital implantation of ICH has a definite communication effect, and 24.32% strongly agreed with the digital implantation of ICH (Figure 5). That is to say, more than 75% knew about ICH, and more than 80% supported the digital implantation of ICH. The MAG (Manga, Anime, and Games) is the backbone of the development of the digital implantation of ICH. The MAG market has a stronger competitiveness due to older audiences and stronger consumption power. Most of the post-95 and post-00 generations are influenced

by MAG culture and have a higher demand for the digital implantation of ICH (Zhiyan Consulting, 2024).

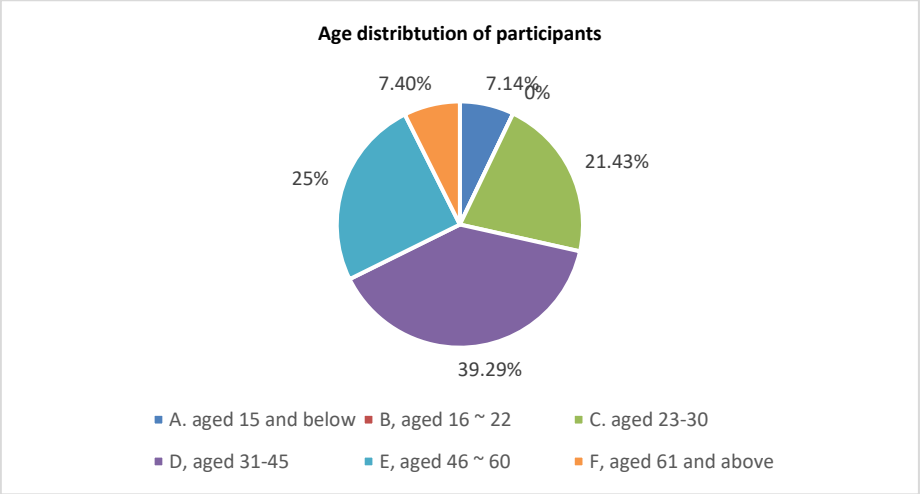


Figure 1: Age distribution.
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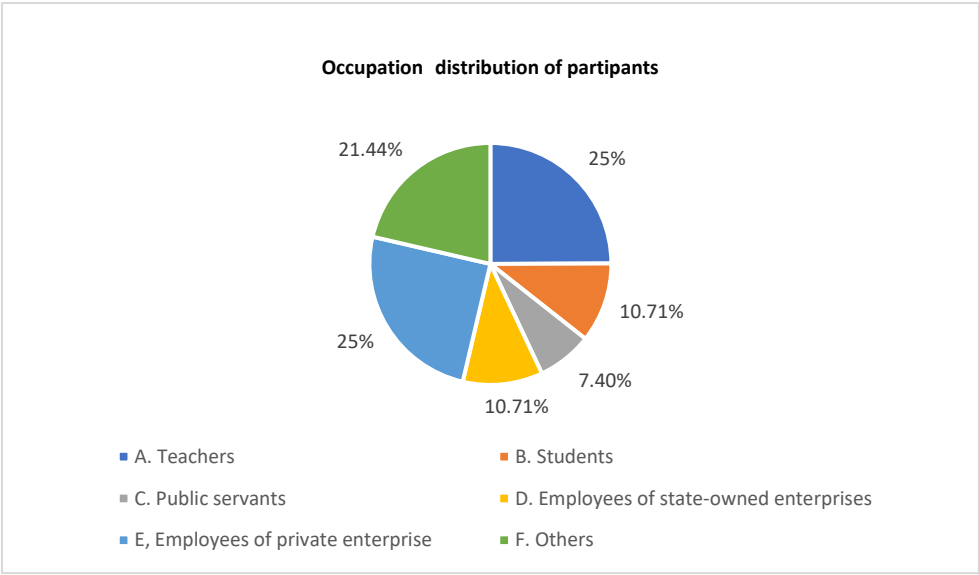


Figure 2: Occupation distribution.
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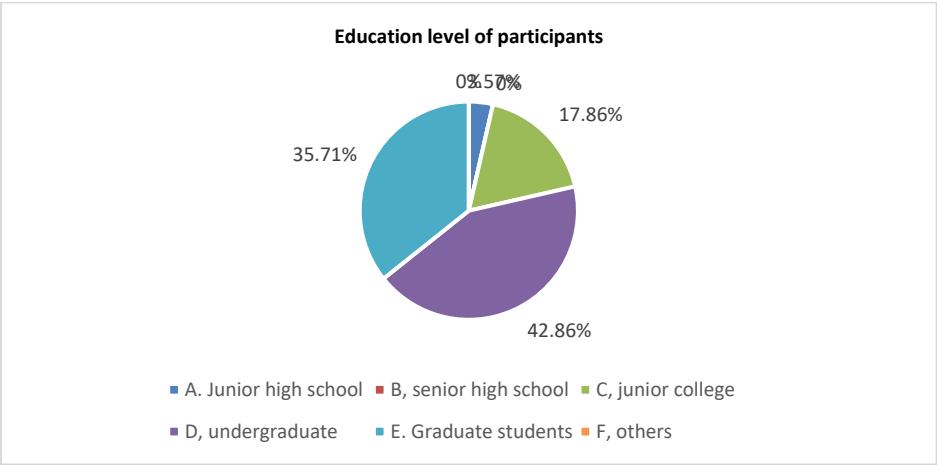


Figure 3: Education level distribution.
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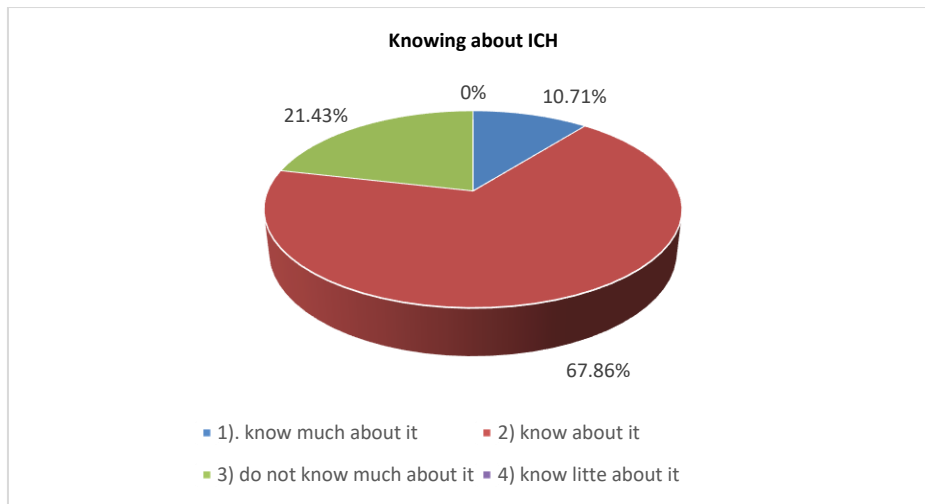


Figure 4: Knowing about ICH.
(Source:) Self-created

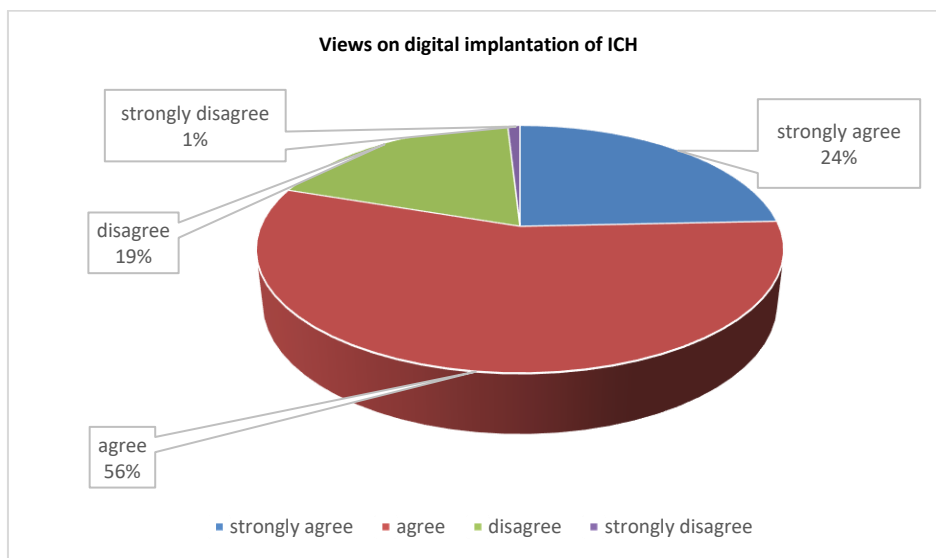


Figure 5: Views on digital implantation of ICH.
(Source:) Self-created

4.2 Characteristics and Differentiation of the Digital Implantation of ICH

Traditionally, ICH is often mainly transmitted orally and orally, and it is difficult to fully express through text or images and transmitted to the audience. Nowadays, digital technology, such as 3D models and VR technology, are used to shape the image and connotation of ICH. The questionnaire survey showed that Cultural connotation (92.86%), Aesthetic (75%), Practicality (64.29%), and Collection value (57.14%) were the product characteristics of the digital implantation of ICH (Figure 6). ICH contains rich cultural connotations and is the result of ancient Chinese wisdom, with rich history, religion, life, traditional skills, and other aspects of the content. The introduction of digital techniques in digital ICH creation has revolutionized an entire technical universe and suggests new aesthetics, according to Luz (2010). Under the context of "digital science and technology innovation," the protection and inheritance of ICH gradually appear the characteristics of digitalization, that is, the virtual and real intangible cultural heritage forms are generated through integrating ICH content with virtual reality, graphic visualization, 3D modeling and other new technologies (Liu, 2023).

A compelling differentiation strategy is the key to gaining audience affection. The three core issues of "diversification of intangible cultural heritage themes," "openness of content forms," and "younger audience thinking" have been continuously used to improve the creation of the digital implantation of ICH (Bi & Zhang, 2023). With the market's prosperity, the digital creation with ICH themes is increasingly rich, but consumers are also faced with difficulties in choosing. To stand out in the market, ICH digitization needs to pay attention to the differentiation of product competition through innovative design and selection of ICH types or ICH themes. The questionnaire survey showed that the following were traditional drama (52.25%), folklore (49.55%), traditional medicine (43.24%), Quyi (37.34%), folk music (35.68%), folk dance (35.24%), traditional craftsmanship (27.38%), folk art (25.40%), and acrobatic competition (11.71%) favored by participants. Traditional drama (52.25%) was ranked at the top, followed by folklore (49.55%) and traditional

medicine (43.24%) (Figure 7). Digital implantation of ICH can enhance audience engagement and interest in ICH through which the audience can interact with characters in digital creations through clicks, controls, and other means, experiencing the charm of ICH.

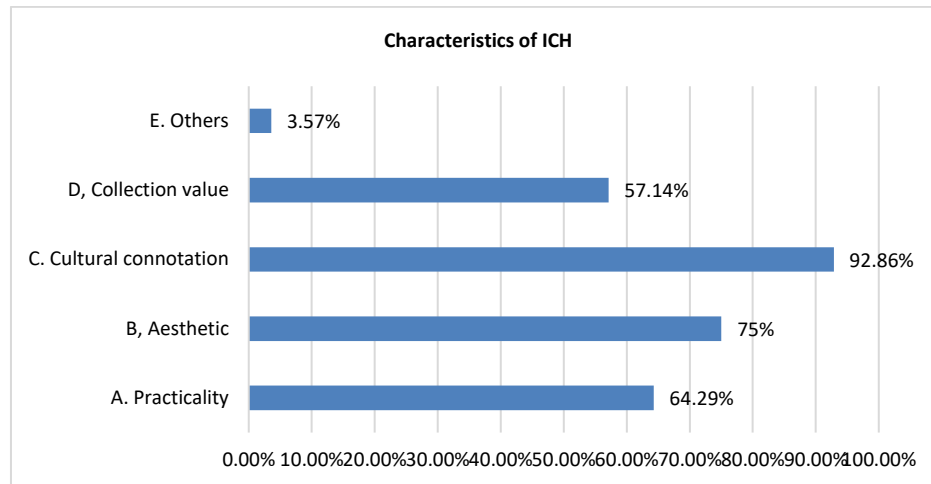


Figure 6: Characteristic of ICH.
(Source:) Self-created

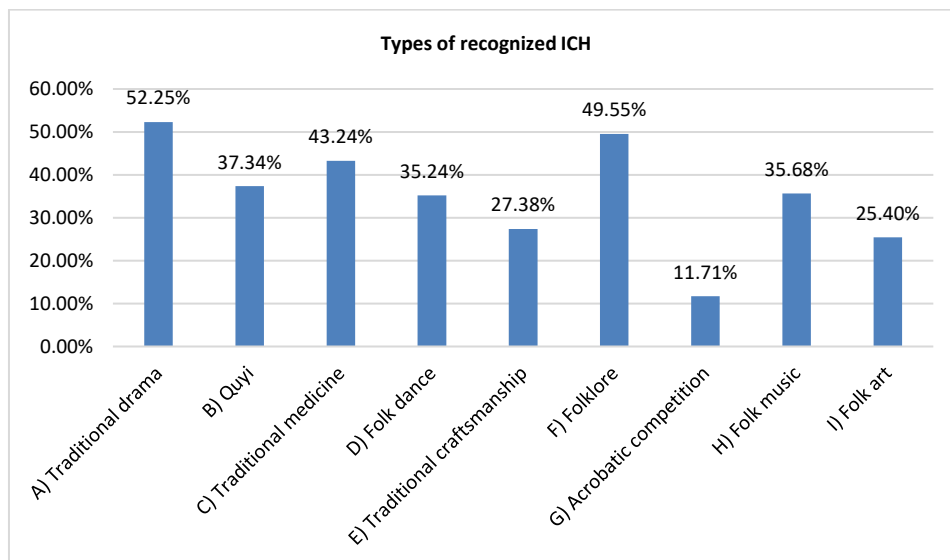


Figure 7: Types of recognized ICH.
(Source:) Self-created

4.3 Creation methods and marketing channels for the Digital implantation of ICH

The questionnaire survey showed that digital museum and digital exhibition (71.43%), ICH programs (mobile app), documentaries and mini video (67.86%), animation and games (58.57%), creative advertising (42.86%), digital TV media (25%), live online ICH activities (21.43%), online magazines or newspapers (21.43%) are the main type of digital-implantation of ICH. Through the use of digital technology, new media installations, a digital literature library, and a digital image library can be constructed, where the uniqueness and historical value of ICH can be shown with digital technology, either in the form of animations or non-animations. In addition, ICH inheritors and related cultural practitioners can broaden the audience coverage of ICH dissemination through live broadcasts, short videos, and other forms. Conveying more professional knowledge about ICH through online interaction with audiences and creating relevant new media content based on their interest points in the form of digital creations, such as a digital anime game or animation. Furthermore, these digital creations could be designed to allow players to take on the role and immerse themselves in the storyline of the ICH themes. In digital anime games or animation, audiences can interact with animated characters by clicking, manipulating, and other ways to experience the charm of ICH. According to the "Big Data of Tiktok Intangible Cultural Heritage" released by Tiktok in 2020, among the 1,372 national intangible cultural heritage projects, Tiktok covers 1,318 items, with a coverage rate of 96%. "The most intuitive expression of the new cultural style of ICH in the context of short videos is the production and presentation of ICH. For the same ICH project, different narration, shooting, and editing techniques can present completely different effects on TikTok. The re-creation ability of ICH media content is an important factor determining the communication power of ICH in the all-media era.

The channels of digital implantation of ICH are essential, as they are related to its exposure. It is necessary to choose the right channel according to its own characteristics and positioning. The questionnaire survey showed that the internet platform, mobile phone platform, and new media platforms were the main channels to market the digital implantation of ICH (Figure 8). These platforms were ranked the top, accounting for 64.29%. The field visit, including the research activity and museum presentation, was ranked the top, accounting for 60.71% (Figure 9). Moreover, word-of-mouth marketing was also an important channel for the digital implantation of ICH, and it is supported by 28.57% of participants. Furthermore, the digital implantation of ICH could be incorporated with games, using games as a channel. 10.71% of partisans chose to learn about ICH through games and animation.

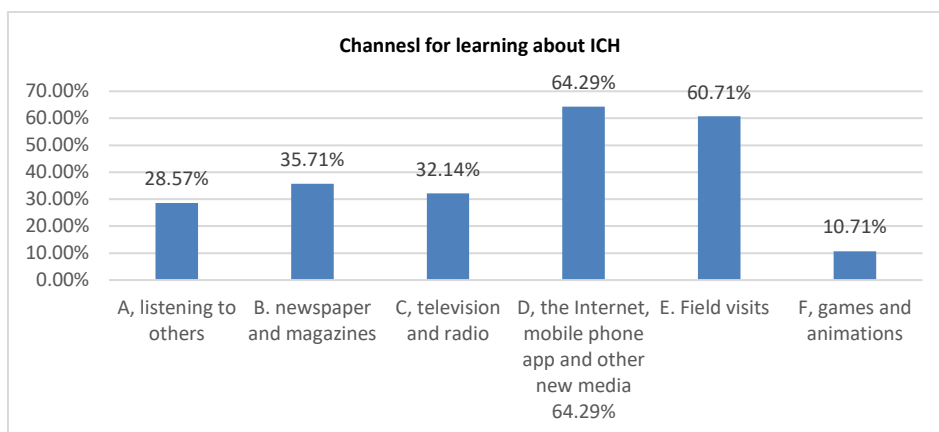


Figure 8: Channels for learning about ICH.
(Source:) Self-created

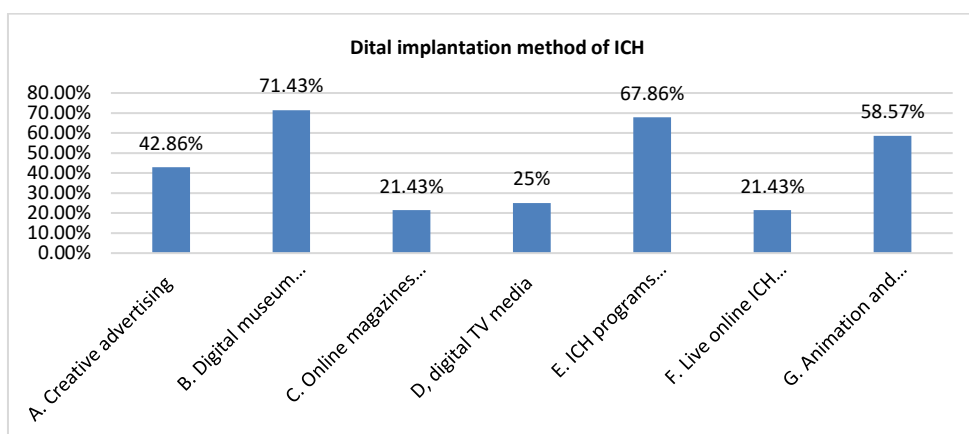


Figure 9: Digital implantation methods of ICH.
(Source:) Self-created

4.4 Future challenges and issues in the Digital implantation of ICH

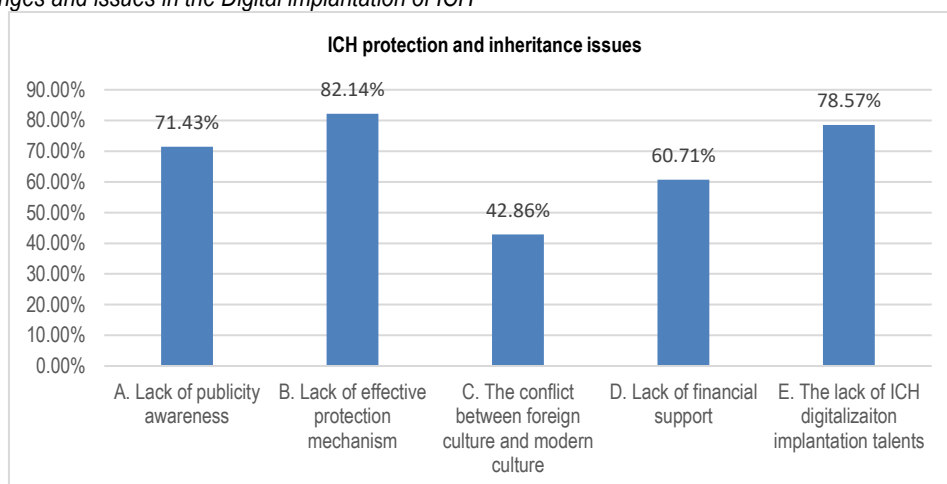


Figure 10: Challenges and issues.
(Source:) Self-created

There are also some challenges in creating the digital implantation of ICH, such as the integration of traditional content and modern aesthetics of intangible cultural heritage and the balance between native culture and modern market demand (Zhang & Zeng, 2019). The questionnaire survey showed that a lack of effective protection mechanism (82.14%), a lack of ICH digitalization implantation talents (78.57%), a lack of publicity awareness (71.43%), a lack of financial support (60.71%) and conflict between foreign culture and modern culture (42.86%) were the challenges in the digital implantation of ICH creation (Figure 10). The application of digital technology may change the original form and connotation of ICH, resulting in the loss of cultural value (Liu, 2018). Secondly, digital communication can intensify the homogenization of ICH and weaken its uniqueness and regionality (Wang, 2020). Thirdly, the application of digital technology requires a large amount of financial and technical support, and many regions and organizations may not be able to afford the associated costs (Li, 2021). These existing studies have confirmed the findings of the questionnaire survey.

5.0 Challenges and Issues

5.1 The value of Digital implantation of ICH

With the help of digital form and virtual space, the ways to realize the value of ICH are expanded, and its social and economic benefits are obtained. Moreover, it increases the potential power of protection and inheritance. Furthermore, it will provide material resources and creative power for digital native culture, and provide the spiritual framework, knowledge system, aesthetic style, and other references for the construction of virtual social culture in the network. ICH is an important part of traditional culture, and it is necessary to pass it on from generation to generation. However, it is slowly being forgotten, and the inheritance and promotion strategy needs to be re-formulated. Digital implantation of ICH can contribute to the ICH protection (Wei, 2020). Digital creation of ICH or digital implantation of ICH as a cultural medium plays a promotional role in the inheritance and dissemination of ICH (Luo, 2022). With the development of digital technology, the digital implantation of ICH provides a new form of cultural carrier for its transmission and dissemination (Yang & Xu, 2024).

It can enhance the initiative of intangible cultural heritage dissemination. The dissemination of intangible cultural heritage is carried out through the digital implantation of ICH. In the process of digital implantation of ICH, the producer will handle the content according to the preferences of modern people, which can make the text content smoother, more humorous, and sensitive, and the visual picture more vivid and attractive. The design, related characters, and scenes are more cartoonish, and such creation is more attractive. Through the second creation, the intangible cultural heritage can be displayed in many aspects and from many angles. The communication mode has the advantages that the traditional communication mode does not have and can highlight the initiative of disseminating intangible cultural heritage. To disseminate ICH utilizing digital implantation, it is necessary to introduce folk music, traditional drama, traditional folk art, and other art forms, realize the artistic combination of sound and picture, and display the contents of intangible cultural heritage so that the dissemination of intangible cultural heritage will be stronger (Liu & Zhang, 2022).

The transmission of ICH employing digital implantation can greatly enrich the transmission channels. As a digital means of communication in the new media era, the digital implantation of ICH can be connected to the Internet and spread through various media. Digital implantation of ICH itself has advantages over traditional display methods in terms of content and visual effects, and it can be used in the new media environment so that its communication efficiency is higher and the range of communication is wider. In the context of various media applications, the transmission of ICH through digital implantation can be carried out through secondary links, which is extremely fast. Relevant content can also be put on public platforms such as museums, cultural centers, and expositions, which greatly expands the channels and enriches the forms of transmission of intangible cultural heritage (Liu & Zhang, 2022).

5.2 Challenges and Opportunities

The combination of virtual reality, augmented reality, and other technologies to achieve an immersive experience will become an important means of the digital implantation of ICH. Meanwhile, the digital implantation of ICH will also face a series of challenges, such as technological upgrading, data privacy, and security issues. ICH digital resources are not all public digital resources, and there are problems of rights and interests protection. Many digital implantation ICH projects have problems such as unequal distribution of benefits, competition among peers, authenticity issues, and rights and interests protection issues (Yang, 2023).

In the creation process of the digital implantation of ICH, it needs first to take ICH as the foundation, then take digital as the medium, and later take creativity as the core. The creation process of digital implantation of ICH should add value to ICH, not undermining its public value or creating more secondary problems. It needs to inspire young people's sense of participation through the innovative digital implantation of ICH.

The development of digital technology has brought new challenges to the protection of intangible cultural heritage. For example, network security risks, data loss risks, and the replication and dissemination of digital resources threaten the cultural security of intangible cultural heritage. Therefore, it is necessary to strengthen technical prevention and management measures to ensure the authenticity and integrity of intangible digital resources (Tan & He, 2021).

Policies, regulations, and intellectual property protection for the digital implantation of ICH are another major challenge. Presently, the policies, regulations, and policies for the digital implantation of ICH are not perfect, which has a certain impact on the legitimacy and fairness of the digital implantation of ICH. Therefore, it is necessary to strengthen policies, regulations, and intellectual property protection to provide a strong guarantee for the digital implantation of ICH (Tan & He, 2021).

6.0 Conclusion & Recommendations

The mixed research methods, which combined the quantitative and qualitative research methods were used in this research. The research results showed that the digital implantation of ICH has a relatively large market population. It is favored by the middle-aged group and the learned population. Most users are concerned about its cultural connotation, accounting for 92.86%. Various types of ICH can be inherited with digital technology, among which traditional drama (52.25%) was ranked the top, followed by folklore (49.55%) and traditional medicine (43.24%). Digital museum and digital exhibition (71.43%), ICH programs (mobile app), documentaries and mini video (67.86%), animation and games (58.57%), creative advertising (42.86%), digital TV media (25%), live online ICH activities (21.43%), online magazines or newspapers (21.43%) are the main types of digital implantation of ICH. Digital implantation of ICH is faced with some issues, including a lack of effective protection mechanisms (82.14%) and a lack of ICH digitalization implantation talents (78.57%), which are ranked the top two.

Based on the above findings, some recommendations are given. Firstly, it targets the middle-aged group, especially those with a certain educational background. Secondly, it makes good use of the cultural connotation. ICH contains rich cultural connotations, including rich contents of history, religion, life, traditional skills, and other aspects. These provide rich materials for creating digital-implantation of ICH, vividly showing traditional skills, traditional customs, traditional operas, and other rich contents. Thirdly, it needs to come up with an effective protection mechanism to promote the digital implantation of ICH. The digital implantation of ICH needs political support from the government, as well as intellectual property protection for the digital implantation of ICH. Fourthly, it needs to provide training for digital implantation talents. The digital implantation involves using advanced technology, such as VR and AR. Only professional talents can perform the digital implantation of ICH.

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Paper Contribution to Related Field of Study

This study provides powerful empirical research content on the integration of digital technology (AR/VR technology) into the protection and inheritance of intangible cultural heritage and gives effective scientific research directions to practitioners in the digital media technology industry.

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