

Leveraging Modern Technology for the Inheritance and Dissemination of Intangible Cultural Heritage: A Case Study of Shaanxi, China

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Abstract

With the rapid development of modern technology, the inheritance and dissemination of intangible cultural heritage (ICH) faces both opportunities and challenges. Taking the intangible cultural heritage of Shaanxi as an example, this study explores the dilemmas and strategies of ICH preservation and promotion in the digital era. By analyzing the current problems of survival, public awareness, and insufficient publicity in ICH transmission, this paper proposes several innovative strategies that utilize modern technology. These strategies include establishing thematic museums, integrating ICH into film and television productions, utilizing media platforms and live streaming, developing intelligent software applications, and creating digital websites. These approaches aim to enhance public engagement, expand the reach of ICH, and ensure its sustainability. The findings suggest that modern technology, if effectively utilized, will significantly contribute to the preservation and dissemination of ICH, thereby enhancing cultural identity and national soft power.

Keywords: intangible cultural heritage, modern technology, cultural inheritance, digital dissemination, Shaanxi
Intangible cultural heritage, cultural preservation

1. Introduction

Intangible cultural heritage (ICH), as an important part of the cultural diversity of humankind, carries rich historical, cultural, and social values. With the acceleration of globalization and modernization, the safeguarding and transmission of ICH is facing unprecedented challenges. Especially in China, a country with 5,000 years of civilization, the protection of intangible cultural heritage is not only related to the continuation of cultural diversity but also an important manifestation of cultural self-confidence. In recent years, the Chinese government has actively promoted the protection and transmission of ICH through a series of policy initiatives, such as the system of “representative inheritors of ICH” and “ICH in schools” (Xie, 2021). However, despite the significant progress made at the policy level, the transmission and dissemination of ICH still face many difficulties, especially in the context of modernization and globalization, how to effectively combine modern technological means to promote the transmission and dissemination of ICH has become an important issue in current research.

As one of the important birthplaces of Chinese civilization, Shaanxi has rich resources of intangible cultural heritage, such as Shaanxi folk songs, Qinqiang, shadow plays, traditional crafts, and so on. These intangible cultural heritages not only have a profound historical and cultural heritage but also reflect the unique regional cultural characteristics of Shaanxi. However, with socioeconomic development and changes in modern lifestyles, ICH transmission in Shaanxi faces multiple dilemmas, such as the aging of the inheritors, the lack of interest among young people, and the insufficient transformation of economic value (Zhang & Sun, 2022). Although some studies have been conducted to sort out and analyze Shaanxi’s intangible cultural heritage, For example, Zhou (2021) focuses on the historical evolution and stylistic characteristics of Northern Shaanxi folk songs, while Chen (2024) provides a cultural overview of Qinqiang Opera but does not analyze the challenges of inheritance in the modern context. These studies provide valuable background but remain at the level of resource introduction and historical analysis and lack a dynamic analysis of the inheritance dilemmas.

Globally, the rapid development of modern technologies has provided new opportunities for the preservation and dissemination of ICH. The application of technologies such as digital technology, social media, artificial

intelligence (AI), virtual reality (VR) and augmented reality (AR) is changing the way ICH is disseminated (Xu, 2023). For example, through social media platforms, ICH can be presented to the younger generation more vividly and intuitively, enhancing their cultural identity. Meanwhile, the application of artificial intelligence and virtual reality technologies makes it possible to digitally preserve and display ICH, greatly improving the breadth and depth of its dissemination (Zhong et al., 2021). However, despite the progress made in the application of modern technologies in the safeguarding of ICH, the exploration at the practical level is still insufficient, especially in terms of application cases and systematic evaluation in specific regions, in-depth research is still lacking.

Taking Shaanxi as an example, this study explores the inheritance dilemmas faced by intangible cultural heritage in the context of modernization and globalization and examines how to promote its inheritance and dissemination through modern technological means. Specifically, this study focuses on the following two core questions: first, what are the unique inheritance dilemmas facing intangible cultural heritage in Shaanxi in the context of modernization and globalization? Second, how can these dilemmas be resolved, and the transmission and dissemination of ICH be promoted through modern technological means? Through in-depth interviews with inheritors of Shaanxi's ICH, cultural administrators, and technologists, this study aims to reveal the core challenges of Shaanxi's ICH inheritance and to propose feasible strategies for the application of technology, to provide theoretical support and practical guidance for the preservation and dissemination of ICH.

The significance of this study lies in the fact that it not only fills the lack of attention paid to the transmission and dissemination of intangible cultural heritage in specific regions in existing studies but also provides new perspectives on the application of modern technology in the preservation of intangible cultural heritage. By combining the theory of cultural sustainability and the perspective of cultural ecology, this study not only explores the dynamic adaptation of ICH in modern society but also analyzes the role of modern technology in its ecosystem. The results of the study not only provide actionable insights for policymakers but also practical strategies for ICH bearers to apply technology, which is of great theoretical and practical significance.

This paper is structured as follows. Section 1 introduces the background, objectives, and significance of the study. Section 2 reviews relevant literature on the current situation of intangible cultural heritage (ICH) protection and the application of modern technologies. Section 3 outlines the research methodology and data sources. Section 4 presents the main findings regarding the inheritance dilemmas and technological strategies for ICH in Shaanxi. Section 5 discusses the implications of the findings in light of existing literature and theories. Finally, Section 6 concludes the study with key insights, limitations, and suggestions for future research.

2. Literature Review

2.1 Current Status of Macro Research on the Protection and Transmission of Intangible Heritage

The Convention for the Safeguarding of the Intangible Cultural Heritage adopted by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 2003 provides a theoretical framework and policy guidance for the global safeguarding of ICH. The Convention emphasizes the living transmission of ICH and considers ICH to be the product of continuous re-creation by communities, groups, and individuals as they adapt to their environment and interact with nature and history (UNESCO, 2003). In recent years, UNESCO has promoted the safeguarding of ICH on a global scale through mechanisms such as the Representative List of the Intangible Cultural Heritage of Humanity and the List of Intangible Cultural Heritage in Need of Urgent Safeguarding (Sun, 2012). In addition, international scholars have also explored the significance of ICH safeguarding from the perspectives of cultural diversity and sustainable development, and believe that ICH is not only a vehicle for cultural transmission but also an important resource for the sustainable development of society (Giliberto & Labadi, 2021).

Since China acceded to the Convention for the Safeguarding of the Intangible Cultural Heritage in 2004, it has gradually established a protection system centered on the system of "representative bearers of intangible heritage". This system ensures the intergenerational transmission of ICH skills through the identification and funding of inheritors (Hu et al., 2024). In addition, the policy of "ICH in school" cultivates the younger generation's awareness of and interest in traditional culture by integrating ICH into the school education system (Wang et al., 2022). Tourism-oriented development of ICH has also become a hot topic in recent years, which enhances the economic value and social influence of ICH by combining ICH resources with the tourism industry (Petronela, 2016). However, most of the existing research focuses on the level of policy formulation and government management and pays insufficient attention to ICH practices in specific regions.

2.2 The Current Situation of ICH Resources and Inheritance in Shaanxi

As one of the important birthplaces of Chinese civilization, Shaanxi has rich ICH resources in each city (Figure 1), and the representative ICH categories include Shaanxi folk songs, Qinqiang, shadow puppets, and traditional crafts (e.g., paper-cutting, blueprints). These ICHs not only have a deep cultural heritage but also reflect the unique regional cultural characteristics of Shaanxi (NetEase, 2023). For example, Shaanxi folk songs, as a kind of oral traditional art, integrate the dialect, music, and folk stories of the northern Shaanxi region and have distinctive local characteristics (Zhou, 2021). Qinqiang, as one of the oldest Chinese operas, is not only widely circulated in Shaanxi, but also has an important influence throughout the country (Chen, 2024).

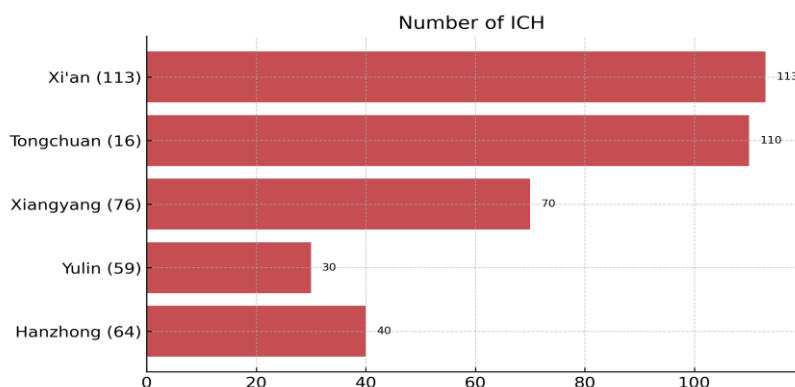


Figure 1. Map of the number of ICH in each city of Shaanxi province

Despite the richness of Shaanxi's non-heritage resources, its inheritance faces many difficulties. First, there is a serious problem of aging of ICH and a lack of interest in traditional skills among young people, leading to difficulties in the intergenerational transmission of ICH (Zhu & Mao, 2025). Second, the contradiction between modern lifestyles and the learning of traditional skills is becoming more and more prominent, and young people are more inclined to choose modern occupations than to engage in the learning and transmission of traditional skills (Huang, 2024). In addition, the economic value of ICH is insufficiently transformed, resulting in a lack of motivation for inheritance. Although many ICH programs have high cultural value, their economic returns are limited, making it difficult to attract young people to participate in the inheritance (Huang, 2024). Finally, the traditional oral teaching method is difficult to adapt to the needs of a fast-paced society, and the efficiency and quality of ICH inheritance are challenged (Xue & Long, 2020). In this regard, some scholars have studied the reality of Shaanxi's ICH, but they mostly stay at the level of introduction and historical analysis of Shaanxi's ICH resources and lack the dynamic analysis of the inheritance dilemma. Moreover, the existing researches focus on macro issues and lacks detailed research on the practice of ICH inheritance in specific areas. In addition, the existing research lacks the solution of combining modern technological means and fails to make full use of modern technological means to promote the inheritance and dissemination of ICH.

2.3 Research Progress on Modern Technology and ICH Communication

Digital technologies play an important role in the organization, visualization, and knowledge management of intangible cultural heritage (ICH) resources. Fan (2023) points out that the retrieval efficiency and relevance of ICH resources have been significantly improved through the semantic web and knowledge graph technologies. For example, 3D visualization modeling technology can accurately capture the details of traditional dance movements and handicrafts, providing a high-precision solution for the digital preservation of ICH (Skublewska-Paszowska et al., 2022). In addition, digital libraries and museum platforms (e.g., the "Digital Museum of China's Non-heritage") not only reduce the risk of cultural loss due to the aging of inheritors by centrally storing multiple data such as text, images, and 3D models (Liu, 2022), but also promote the open sharing of ICH resources (Yan & Li, 2023).

Social media platforms (e.g., Shake, Shutter, B Station) have become the core position for ICH dissemination. Data from the DouYin platform shows that by 2023, its ICH-related videos will have been played more than 1.3 trillion times, covering 99.74% of national-level ICH programs (Yang & Li, 2024). Such platforms break the time and space constraints through short videos and live broadcasts, reconstructing the youthful expression of ICH with "lightweight" communication (Guangming Daily, 2018). For example, paper-cutting artists in northern

Shaanxi show their creative process through live broadcasts, and viewers participate in real-time discussions of their skills through pop-up interactions (Wang et al., 2022). However, existing studies mostly focus on the breadth of dissemination, and the exploration of the mechanisms of in-depth user participation (e.g., community co-creation, cultural identity construction) is still insufficient.

Artificial Intelligence (AI) technologies are reshaping the digitization paradigm of ICH. Through motion capture and machine learning, AI can digitally record and analyze ICH techniques such as traditional dance in three dimensions, improving the accuracy and comprehensiveness of the records (Skublewska-Paszowska et al., 2022). In the field of innovative design, AI can deeply analyze ICH elements and provide designers with innovative inspiration to incorporate into modern design (Chen & Qu, 2024). At the same time, AI technology can innovate the display form of ICH and enhance audience immersion and interactive participation through technologies such as virtual reality (VR) and augmented reality (AR). For example, AR technology is used in ICH exhibitions and museums to enhance the audience's interactive experience through augmented reality effects (Li et al., 2021)

Despite the significant progress made in the application of modern technology in the preservation of ICH, there is still a lack of exploration at the practical level. Most of these studies focus on how to make ICH “visible” to more people through technology, but less on how to make audiences “participate” in it. There is a lack of user-generated content (UGC) incentive mechanism and community-based dissemination model (Zhao et al., 2023); at the same time, the economic feasibility of the technology dissemination model has not been fully considered, such as the exploration of commercialization paths focusing on the integration of culture and tourism (Du et al., 2024), but there is a lack of empirical analysis of the new media profit model, such as short-video bounty and digital copyright trading; in addition, how to use big data, artificial intelligence, and other technologies to promote the development of ICH? Using big data, artificial intelligence, machine learning, and other technologies to optimize the dissemination of ICH, such as personalized recommendation, data analysis-driven content optimization, etc. also needs to be further deepened.

3. Method

This study adopts a qualitative research method, centered on the in-depth interview method, to explore how modern technology promotes the transmission and dissemination of intangible cultural heritage in Shaanxi. Based on the theory of cultural sustainability (Izadi et al., 2024) and the perspective of cultural ecology (Steward, 2016), this study reveals the inheritance dilemma of Shaanxi's ICH in the context of modernization and globalization and explores the potential of the application of modern technology through interviews with different stakeholders. The cultural sustainability theory, which emphasizes the dynamic adaptation and long-term survival of cultural heritage in modern society (Sedova, 2021), provides a theoretical framework for understanding the dilemma of ICH inheritance in this study, whereas the cultural ecology perspective focuses on the evolutionary process of culture in the context of the interactions of different social, technological, and policy factors (Brooks et al., 2017), helping to analyze the role of modern technology in the ICH ecosystem.

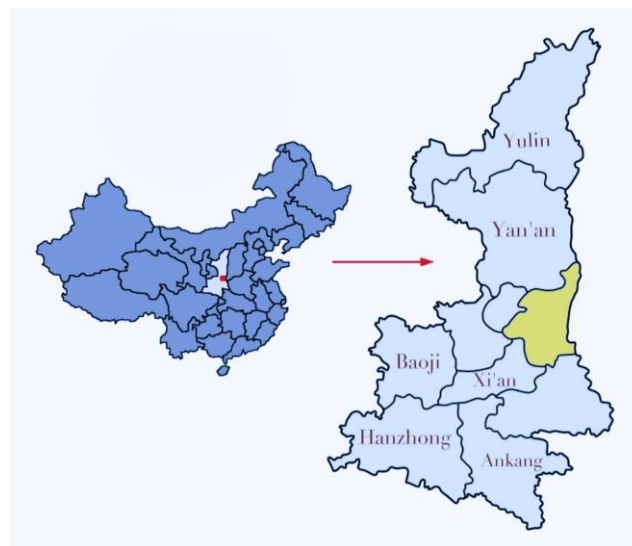


Figure 2. Distribution map of interview data in six urban areas of Shaanxi

This study interviewed a total of 20 respondents from six urban areas in Shaanxi (Figure 2), covering the two core groups of ICH inheritor, cultural managers and technologists. The number of interviews with ICH inheritors was 10, aiming to understand the dilemma of skill inheritance and digitalization adaptation; the number of interviews with cultural managers and technical experts was 10, mainly discussing topics such as government policies, digitalization protection measures, and technical support. The interviews were in the form of semi-structured interviews. The specific content of the interviews was used to respond to the specific questions of this study: 1. What do you think are the unique inheritance dilemmas faced by Shaanxi's ICH in the context of modernization and globalization? 2. What do you think should be done to solve the inheritance dilemmas of Shaanxi's ICH through modern technological means?

Table 1. Key Informants for the study

Name	Gender	Birth Year	Site	Role	Positional Title
Key informant1	Male	1988	Yulin	Cultural Manager	Director of Shaanxi Folk Song Museum
Key informant2	Female	1988	Yulin	ICH inheritor	Singer of Northern Shaanxi Folk Song Museum
Key informant3	Male	1970	Yan'an	Technical Expert	Handicraft producer at Yan'an Cultural Center
Key informant4	Female	1977	Xi'an	Technical Expert	Director of Xi'an Paper-cutting Institute
Key informant5	Male	1974	Bao'ji	ICH inheritor	Member of Shaanxi Arts and Crafts Association
Key informant6	Female	1989	Hanzhong	ICH inheritor	Hanzhong Cultural Museum librarian
Key informant7	Male	1960	Ankang	Cultural Manager	Deputy Director of Ankang People's Art Museum
Key informant8	Male	1952	Ankang	ICH inheritor	Singer of Ziyang Folk Songs Training Center

During the data collection process, each interview lasted approximately 60 to 90 minutes and was conducted using a combination of face-to-face and online video interviews to ensure data integrity and authenticity. All interviews were audio-recorded transcribed and coded during the subsequent analysis phase.

This study used thematic analysis to systematize the interview data. First, the interview recordings were transcribed verbatim into text and open-coded to identify keywords and phrases relevant to the study. Second, similar concepts were categorized through axial coding, and core themes, such as "heritage dilemma", "technology application potential", and "policy support and social participation", were extracted. Finally, the themes are further interpreted from the perspectives of cultural sustainability theory and cultural ecology, and their implications for the research questions are explored.

4. Results

Through in-depth interviews with 20 intangible heritage inheritors, cultural managers, and technologists, this study conducted a systematic analysis of the core dilemmas facing Shaanxi's ICH in the context of modernization and the application of modern technology. The study adopts the thematic analysis method, and through open coding, axial coding, and selective coding, three core dilemmas and five main technology application strategies are finally summarized.

4.1 Core Challenges of Shaanxi's ICH

The study found that Shaanxi's ICH mainly face three major dilemmas: survival problems, cognitive problems and publicity problems. In terms of survival problems, interview data show that 80% of ICH inheritors believe that changes in the market environment have led to a significant decline in the economic returns of traditional skills, making young people reluctant to inherit traditional crafts. One Northern Shaanxi Folk Song inheritor mentioned, "In the past, our folk songs were very popular in the village, but nowadays young people prefer pop music, and there are fewer and fewer opportunities for traditional folk songs to be performed." In addition, 70% of cultural managers said that changes in market orientation have made it difficult for traditional ICH programs to adapt to modern consumer demand, while 65% of respondents believed that government funding support flows mainly to well-known ICH programs, while smaller, local ICH programs have difficulty in obtaining long-term support.

Cognitive problems are another major obstacle to ICH. According to the interview data, 75% of the interviewees believe that there are biases in the public's perception of ICH, resulting in its cultural value not being widely recognized. Some young people view ICH as an "outdated culture", while 60% of cultural managers pointed out that knowledge of ICH is underrepresented in the primary and secondary education system, making it difficult for the public to gain an in-depth understanding of its historical origins. One cultural manager said, "Most young people's knowledge of ICH only stays at the level of tourism, and they will not take the initiative to learn about

it.” The interviewees generally agreed that the lack of systematic cultural education has gradually weakened the sense of ICH identity.

In terms of promotion, the interviews showed that 80% of ICH lacked digital communication skills and found it difficult to utilize new media to expand their influence. A shadow puppeteer confessed, “We are better at stage performances, but we don’t know how to edit videos or how to promote them on short video platforms.” In addition, 50% of cultural managers believe that the government’s promotion of ICH still relies mainly on policy documents and lacks precise communication strategies for young audiences, resulting in limited publicity.

Table 2. Three major dilemmas facing Shaanxi’s ICH and coding frequency

Primary code	Secondary code	Tertiary code	Specific content	Percentage of data	Frequency of coding
Survival Problem	Survival issue 1 Declining economic returns due to changes in market conditions	Reduced income from traditional skills affects willingness to pass them on	Significant decline in economic returns from traditional skills and reluctance of young people to inherit traditional crafts	80% (perspective of ICH inheritor)	16
	Survival issue 2 Difficulty in adapting to modern consumer demand	Market orientation changes the development of ICH projects	Changes in market orientation, traditional ICH projects are difficult to adapt to modern consumer demand	70% (cultural manager’s perspective)	14
	Survival issue 3 Insufficient financial support for small-scale local ICH projects	Uneven distribution of funds hinders the development of small-scale ICH	Government funding support mainly goes to well-known ICH projects, small local ICH projects are difficult to get long-term support	65% (view of respondents)	13
Cognitive Problem	Cognitive issue 1 Public cognitive bias towards ICH	Public perception affects the recognition of cultural values of ICH	The public’s cognition of ICH is biased and the cultural value is not widely recognized	75% (view of respondents)	15
	Cognitive issue 2 Low weighting of ICH knowledge in the primary and secondary education system	Lack of education system affects the depth of knowledge of ICH	Knowledge of ICH is under-represented in the primary and secondary education system, making it difficult for the public to gain an in-depth understanding of its historical origins.	60% (cultural manager’s perspective)	12
Dissemination issues	Dissemination Issue 1 Lack of digital communication skills among ICH	Skill Shortage Limits New Media Promotion of ICH	Lack of digital communication capacity of ICH, making it difficult to utilize new media to expand their influence	80% (perspective of ICH inheritor)	16
	Publicity Issue 2 The government lacks precise communication strategies for the promotion of ICH	Single-purpose communication affects the reach of young audiences	The government relies on policy documents to publicize ICH, and lacks precise communication strategies for young audiences, which results in limited publicity.	50% (cultural manager’s perspective)	10

4.2 Application of Modern Technology in the Protection of ICH

In the face of the above dilemmas, the interviewees generally recognized the potential of modern technology in the protection of ICH and proposed five main strategies for the application of technology, namely, the construction of thematic venues, the promotion of film and television productions, the promotion of the media, the development of intelligent software and the construction of digital websites.

First, the digitalization of thematic venues has become an important means of ICH dissemination. 70% of cultural managers suggested using technologies such as VR (virtual reality) and AR (augmented reality) to create digital ICH museums to enhance the public’s immersive experience. For example, an ICH exhibition center in Xi’an has already adopted AR technology to showcase traditional embroidery techniques, allowing visitors to

view every detail of the embroidery up close via mobile devices. A technology expert noted, “If multimedia interactive technology can be combined, the attractiveness of ICH venues will be stronger, especially for the younger generation.”

The communication role of film and television works is also highly recognized by the interviewees. The interview data show that 70% of the interviewees believe that film and television works can effectively enhance the social awareness of ICH. For example, after the broadcast of the documentary “Voice of the Yellow Earth” on Shaanxi folk songs, the number of broadcasts on social media exceeded 3 million times, which significantly enhanced the social attention of the folk songs. The film and television producer said, “If it can be combined with modern film and television techniques, such as the combination of animation, documentaries, and situational skits, it will make the ICH more vivid.”

In terms of media promotion, short videos, and live-streaming platforms are becoming an important tools for the dissemination of ICH. 60% of ICH said they were unfamiliar with live-streaming technology and had difficulty adapting to the new media environment. A Guanzhong shadow theater artist mentioned, “Live broadcasting is a new thing for us, but we don’t know how to use it to promote shadow theater.” Experts suggested that an “ICH anchor training program” should be established to help inheritors master live broadcasting skills, and cooperate with short-video platforms to launch a special ICH live broadcasting section.

In addition, the application of intelligent software is changing the way of dissemination of ICH. 80% of technical experts also agreed that intelligent software can enhance the depth of cultural dissemination of ICH. For example, the “Zhuge Xiaoyao” intelligent guide APP has been running on a pilot basis in some scenic spots in Shaanxi, and users can scan the QR code to get a detailed introduction to ICH items. A cultural manager pointed out, “We hope to develop a province-wide ICH APP so that tourists can experience many ICH skills in Shaanxi online.”

The construction of digital websites is regarded as an important foundation for the future dissemination of ICH. 90% of the interviewees believe that the establishment of an official ICH digital platform is the key to the promotion of ICH. However, Shaanxi has not yet formed a unified digital resource base for ICH, and many ICH materials are scattered across different websites, making it difficult to access them systematically. One cultural administrator suggested, “The government should take the lead in building an ICH data platform that integrates ICH programs from all over Shaanxi and provides online display and learning resources.”

Table 3. Strategies for the application of modern technology in the preservation of ICH

Application Strategy	Specific Content	Relevant Case	Suggestions or Opinions	Approval Ratio
Theme Venue Construction	Utilizing VR and AR technologies to create digital ICH museums	A certain ICH display center in Xi’an uses AR technology to showcase traditional embroidery skills	Combining multimedia interactive technology to enhance venue attractiveness	70% of cultural managers suggest
Film and Television Promotion	Enhancing the social awareness of ICH through film and television works	The documentary “Echoes of the Loess Plateau” on Shaanbei folk songs achieved over 3 million views	Combining modern film and television techniques such as animation, documentaries, and situational short dramas to make ICH more vivid	70% of respondents agree
Media Promotion	Short videos and live streaming platforms have become important tools for ICH dissemination	A Huayin Old Tune inheritor from Shaanxi performs live on the Douyin platform, attracting thousands of viewers per session	Establish a “ICH Live Streaming Host Training Program” and collaborate with short video platforms to launch ICH live streaming columns	60% of ICH inheritors are unfamiliar with this technology
Intelligent Software Development	Intelligent software enhances the depth of ICH cultural dissemination	The “Zhuge Xiaoyao” intelligent tour guide app is piloted in some scenic spots in Shaanxi	Develop a provincial ICH app to allow tourists to experience ICH skills online	80% of technical experts agree
Digital Website Construction	Establishing an official ICH digital platform	The ICH section on the official website of the Shaanxi Provincial Department of Culture and Tourism provides a convenient online window for the public to understand Shaanxi’s ICH	The government takes the lead in building an ICH data platform to integrate ICH projects from various regions and provide online display and learning resources	90% of respondents agree

5. Discussion

The findings of the study reveal that Shaanxi's ICH faces three core problems of survival, cognition, and publicity, and that the intervention of modern technology can alleviate these challenges to a certain extent. Based on the research findings, the following section will combine relevant literature to provide an in-depth discussion of the deep-seated causes of the ICH's predicament, the potential for the application of modern technology, the economic feasibility and sustainability of the technology's application, as well as the necessity of policy support and social participation.

5.1 Deep-Rooted Causes of the Plight of ICH Inheritance

This study shows that one of the core problems of ICH inheritance is the aging of inheritors, difficulties in marketing and promotion, and insufficient public awareness. This phenomenon has also been reflected in previous studies, for example, Zhu and Mao (2025) pointed out that the intergenerational transmission of ICH skills is facing the risk of a fault line, which is mainly due to the lower willingness of the younger generation to learn traditional skills. The interview results of this study further corroborate this view and reveal that declining economic returns are a key factor influencing young people's choice to inherit ICH skills. In addition, Huang (2024) argues that changes in modern lifestyles have led to an apparent conflict between the learning cycle of traditional skills and modern career planning, a finding that is consistent with the feedback from the interviewees in this study, where some inheritors indicated that due to the high time cost of learning ICH, many young people preferred career paths that offered quicker financial returns.

At the cognitive level, this study found that the public's understanding of ICH is limited, and some young people consider ICH to be an "outdated culture" and lacking in innovative value. This problem is also reflected in the study by Xue and Long (2020), who emphasized that the public lacks systematic knowledge of the cultural value of ICH due to the insufficient proportion of ICH education in the primary and secondary school curricula. The interview data of this study showed that more than 75% of the respondents believed that the lack of systematic cultural education directly led to the decline of the social identity of ICH. Therefore, the future protection of ICH should not only rely on policy support but also strengthen the penetration of basic education to ensure that the younger generation can form a cultural identity for ICH at an early stage.

5.2 Potential Application of Modern Technology in the Preservation of ICH

With the rapid development of digital technology, the role of modern technology in ICH conservation has become more and more prominent. This study found that digital recording, new media communication, and virtual reality (VR) and augmented reality (AR) technologies show a wide range of application prospects in ICH preservation. Skublewska-Paszkowska et al. (2022) suggest that 3D modeling technology can record traditional handicrafts and dance movements with high precision, providing reliable support for a technological archive of ICH. Interview data from this study showed that 70% of cultural managers suggested using VR and AR technologies to create immersive ICH museums to enhance public experience and participation. This suggestion suggests that modern technology can not only broaden the ways of displaying ICH but also enhance its dissemination.

In addition, the rise of short video and live-streaming platforms has provided new paths for ICH communication. Respondents in this study generally recognized the influence of new media platforms, however, 60% of ICH inheritors indicated that they were not familiar enough with live broadcasting technology to effectively utilize social media for promotion. Yang and Li's (2024) study showed that short video platforms have become an important medium for ICH dissemination, and the number of broadcasts of ICH-related content on Jitterbug has exceeded 1.3 trillion times, covering almost all national-level ICH programs. The interview results of this study further indicate that although short videos can increase the visibility of ICH, the media literacy of the inheritors is still an important factor affecting their dissemination effects. Therefore, in the process of ICH promotion, new media skills training should be provided for inheritors to ensure that they can adapt to the modern communication environment more effectively.

5.3 Economic Viability and Sustainability of Technology Applications

Although modern technology offers many opportunities for the preservation of ICH, its economic feasibility remains a challenge. This study shows that 80% of technologists believe that the application of intelligent software can help enhance the depth of communication of ICH, but the current financial and technical support is still insufficient. Du et al. (2024) point out in their study that the development of ICH digitization often lacks a stable business model, and profit-making methods such as short-video cash and digital copyright trading have not yet been sufficiently verified. The interview data of this study show that although short video platforms can

provide large traffic support, the profit model of ICH projects is still immature, and some inheritors said that their short videos have high playback volume but limited realization ability. Therefore, future research should further explore the combination of modern technology and commercialization models to ensure that ICH digital projects have long-term sustainability.

5.4 Policy Support and Social Participation

Policy support plays an important role in the process of ICH inheritance. Interviews in this study revealed that despite a series of protection policies introduced by the government, there is still an uneven distribution of financial support, and some smaller local ICH projects have difficulties in obtaining sustained support. Hu et al. (2024) noted that government funding tends to prioritize the flow of ICH projects with higher visibility, while the needs of grassroots inheritors have not been given sufficient attention. This phenomenon was further verified in this study, with some interviewees emphasizing that the lack of dedicated funding made it difficult to advance the conservation of certain ICH projects. Therefore, future policy development should be more balanced in the distribution of funds to ensure that ICH projects at all levels receive the necessary support.

In terms of social engagement, this study found that the model of “ICH + live broadcasting + e-commerce” provides new opportunities for ICH dissemination, and Shakya and Vagnarelli (2024) argue that, combined with the business model of new media platforms, ICH culture can find new space for development in the digital economy. The interview data of this study shows that 90% of the respondents believe that building an official ICH digital platform is a key initiative for ICH promotion in the future. It can be seen that the protection of ICH not only relies on the efforts of the government and academic institutions but also requires the extensive participation of all sectors of society to promote the sustainable development of ICH in modern society.

6. Conclusion

The purpose of this study was to explore the challenges facing Shaanxi’s ICH in the context of modernization and globalization and to examine how modern technology can be used to facilitate its transmission and dissemination. The study is organized around two core questions: what are the unique challenges facing Shaanxi ICH in modern society? How can modern technologies (e.g., digitization, social media, and immersive technologies) address these challenges and enhance the preservation and dissemination of ICH? Through interviews with 20 participants, the study found that ICH in Shaanxi faces three main challenges: survival challenges, cognitive barriers, and dissemination limitations. Survival challenges are manifested in the decline of economic benefits, leading to a weakening of interest in passing on traditional skills among the younger generation; this is further exacerbated by changes in the marketplace and insufficient funding for small-scale ICH programs. Cognitive barriers stem from the public’s misunderstanding of ICH, which is considered by many to be outdated or irrelevant and is closely related to the lack of ICH education in school curricula. Dissemination limitations are reflected in the fact that traditional oral transmission methods are becoming ineffective in a fast-paced digital society, many ICH inheritors lack the ability to utilize modern digital platforms for promotion, and government communication strategies are often lagging behind the times.

To address these issues, this study proposes five technological strategies: digital museum construction, film and media promotion, social media and live streaming, intelligent software development, and digital platform creation. These strategies aim to enhance the visibility, accessibility, and engagement of the ICH, especially to attract the attention of younger groups. The significance of the study’s findings lies in the fact that it provides actionable insights for policymakers to design more effective ICH preservation strategies; at the same time, the study deepens the understanding of the relationship between cultural preservation, technological innovation, and public participation, and provides lessons for global cultural sustainability. In addition, this study contributes at both the theoretical and practical levels: at the theoretical level, it proposes a framework for understanding the role of modern technology in ICH communication, emphasizing the embrace of innovation while respecting cultural authenticity; at the practical level, the proposed strategies provide ICH bearers and policymakers with practical tools for enhancing the visibility and accessibility of cultural heritage.

However, this study also has some limitations. First, the sample size is small and concentrated in Shaanxi, and the findings may not be fully generalizable to other regions or cultural contexts. Second, the study relied primarily on qualitative data, which provides rich details but lacks the statistical robustness of quantitative methods. Future studies could adopt a mixed-methods design to validate these findings. In addition, the proposed technological solutions (e.g., VR/AR and smart software) require significant financial and technical support, which may pose a barrier for small or underfunded ICH programs. Future research directions could include exploring the long-term impact of digitization on ICH transmission, especially its effect on cultural authenticity and intergenerational knowledge transfer; analyzing the socio-economic impacts of the integration of modern

technologies into ICH preservation, including the impacts on local economies and livelihoods; and conducting cross-regional comparative studies to identify best practices and region-specific strategies for ICH preservation in the digital age.

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