Research on the Interface Design of Cultural Tourism APPs Based on Intangible Cultural Heritage: A Case Study of the Concept "Millennium Intangible Cultural Heritage, Maritime Silk Bond"

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Abstract: In the wave of globalization and modernization, intangible cultural heritage (ICH), as a treasure of national culture, has become increasingly important for its protection and inheritance. However, traditional modes of transmission are often limited by geography, time, and other factors, making it difficult to effectively reach a broad audience. With the rise of mobile internet and the prevalence of smartphones, the way people access information has undergone fundamental changes, providing new opportunities for the dissemination of ICH. This paper explores the design ideas and development priorities of ICH APP products through case studies, aiming to break the limitations of traditional transmission modes and make ICH accessible to the public in a more convenient and vivid manner. Furthermore, it seeks to achieve sustainable development of ICH through commercial operations.

Keywords: Intangible Cultural Heritage; Maritime Silk Culture; Cultural Tourism APP; Interface Design

1. Introduction

ICH represents the invaluable treasures of national culture, embodying rich historical information and profound cultural value. The development of such APPs has the potential to transcend geographical and temporal limitations, allowing a greater number of people to understand, learn about, and transmit ICH. This, in turn, contributes to the preservation of cultural diversity and continuity, as well as the enhancement of national identity and cultural confidence. Maritime Silk Culture stands as a testament to ancient China's maritime trade and cultural exchanges with foreign nations, possessing significant historical and cultural value. The promotion of APPs centered around this culture can expand its popularity and influence, facilitating cultural exchanges and mutual learning between China and other countries [1].

The widespread adoption of smartphones has led to a significant change in people's information consumption habits. There has been a notable decline in the usage of traditional media such as paper books and newspapers, with digital reading gradually emerging as the dominant trend. Consequently, the development of ICH APPs is better aligned with modern reading habits and information acquisition methods, thereby enhancing the dissemination effectiveness of ICH. The continuous evolution of digital technology has provided more diverse and convenient means for cultural transmission. For instance, big data technology enables a deeper understanding of users' reading preferences and needs, facilitating the provision of more accurate content recommendations. Artificial intelligence technology empowers intelligent speech recognition and natural language processing capabilities, allowing users to quickly access the required information through voice input. AR/VR technology offers more immersive experiences for ICH exhibitions, making users feel as if they are physically present at the ICH sites. [2] In the context of growing cultural confidence and increased attention to traditional culture, the market demand for ICH is also on the rise. The development of ICH APPs can fulfill the public's desire to understand and learn about ICH, while also opening up possibilities for the commercialization of ICH. Through these APPs, users can access information about the

historical background, transmission status, and related activities of ICH at any time and from anywhere. They can also view video presentations of ICH projects and engage in online interactions.

2. Overview of Fujian's ICH and Maritime Silk Cultural Resources

Fujian Province is richly endowed with ICH resources, which have undergone multiple rounds of review and publication, resulting in a comprehensive list of representative projects. As of 2022, Fujian has announced seven batches of provincial-level ICH representative project lists, spanning a wide range of fields including folk literature, traditional music, traditional dance, traditional theater, quyi (folk storytelling and comic dialogue), traditional sports,[3] games, and acrobatics, traditional fine arts, and traditional craftsmanship. Among Fujian's ICH projects, there are numerous representative works with distinct regional characteristics. For example, the proverbs and daffodil legends of southern Fujian not only exhibit the life wisdom and aesthetic pursuits of the local people but also possess unique linguistic charm and cultural connotations. The song lyrics and guqin art of Quanzhou, with their melodious tunes and profound artistic conception, have become an integral part of Quanzhou's cultural heritage. These ICH projects not only enrich Fujian's cultural tapestry but also infuse new vitality into the province's cultural tourism industry [4].

Fujian has been actively engaged in the protection of ICH projects. By enacting relevant laws and regulations, establishing robust protection mechanisms, and strengthening the construction of ICH inheritor teams, the province has effectively promoted the transmission and development of these projects. Additionally, Fujian places great emphasis on the innovation and transformation of ICH projects. Through the organization of various activities and training programs, it has enhanced the popularity and influence of ICH projects, facilitating their integration and development with modern society.

Fujian's Maritime Silk Culture has a long and storied history, dating back to ancient times, and forms an essential part of the Maritime Silk Road. [5] The province is home to multiple cultural heritage sites associated with the Maritime Silk Road. These sites serve not only as important carriers of Fujian's historical culture but also as historical witnesses to the friendly exchanges between China and other countries. For instance, Quanzhou's Kaiyuan Temple and Chongwu Ancient City, with their unique architectural styles and rich historical backgrounds, attract a large number of tourists each year. The Kaiyuan Temple, with its magnificent architecture and profound religious and cultural connotations, has been a center of Buddhist activities for centuries. The Chongwu Ancient City, on the other hand, with its well-preserved ancient city walls and unique coastal defense architecture, showcases the historical importance of Fujian's coastal defense. These cultural heritage sites not only showcase the essence of Fujian's ancient architectural art but also reflect the province's significant position and role in the Maritime Silk Road [6].

The Maritime Silk Culture of Fujian is a result of the blending and collision of Central Plains culture, marine culture, foreign culture, and other cultures. Over the course of its long historical development, the people of Fujian have assimilated cultural elements from various sources and integrated them with the local culture, giving rise to a unique Maritime Silk Culture. This cultural amalgamation has not only enriched Fujian's cultural connotations but has also provided a new impetus for the province's economic development. The prosperity of the Maritime Silk Road in ancient times drove Fujian's economic growth and social progress. Fujian's port cities, such as Quanzhou and Fuzhou, served as important hubs for commercial and cultural exchanges. With the continuous expansion of the Maritime Silk Road, Fujian's foreign trade and cultural interactions became increasingly frequent, providing strong support for the province's economic and social development. Today, Fujian's Maritime Silk Culture has emerged as one of the key drivers of the development of the province's cultural tourism industry. [7]

3. Functions and Characteristics of the "Millennium Intangible Cultural Heritage, Maritime Silk Bond" APP

3.1 Design and Implementation of Functions
3.1.1 Display of intangible cultural heritage

culture

The APP offers detailed information about various intangible cultural heritage projects in Fujian. This includes, but is not limited to, the historical background, origin and development, technical characteristics, and inheritance status of each project. [8] The information is presented in a carefully curated multimedia format, combining pictures, texts, and videos, allowing users to gain an intuitive and in-depth understanding of the unique charm and cultural significance of each ICH project. [9] In addition to traditional text descriptions, the APP incorporates high-definition pictures and video tutorials to provide a more vivid and three-dimensional display of ICH culture. To further enhance the user experience, the APP invites ICH inheritors to conduct online live broadcasts or record teaching videos, enabling users to directly learn ICH skills and gain a closer appreciation of the essence of ICH culture. For example, in the case of traditional Fujian handicrafts like porcelain making, users can watch step-by-step video tutorials to understand the intricate process of shaping, glazing, and firing, and witness the exceptional skills and craftsmanship of the artisans.

3.1.2 Tour route planning

Leveraging Fujian's abundant ICH resources and cultural relics related to the Maritime Silk Road, the APP is capable of generating personalized tour routes for users. Users can select specific ICH workshops, historical relics, or cultural attractions based on their interests and travel schedules, allowing them to fully immerse themselves in the authentic Fujian cultural atmosphere. The APP also features an intelligent recommendation function that utilizes users' browsing history and preferences to suggest heritage projects or tour routes that may be of interest to them. This personalized approach significantly enhances the overall travel experience. For example, if users show a particular interest in traditional intangible cultural heritage, the application may recommend a trip that includes visiting local intangible cultural sites and experiencing intangible cultural heritage production. (As shown in Figure 1.)

3.1.3 Interactive communication platform

This app integrates community forum functions, providing users with a space for free interaction with other intangible cultural heritage enthusiasts and local inheritors. Here, users can share their travel experiences and insights gained from exploring intangible cultural heritage, as well as ask questions to other users or inheritors and receive professional answers and advice. In addition to community forums, the application also provides online Q&A functionality, allowing users to seek immediate help from professionals at any time. This real-time interaction not only increases user engagement, but also improves the efficiency and accuracy of information acquisition. By integrating VR technology, users can immerse themselves in intangible cultural heritage projects, such as virtual creation of Quanzhou hair accessories or participation in fishing girl cultural activities, and even generate exclusive IP images to enhance participation. Users can virtually try on different styles of Quanzhou hair accessories in the virtual fitting room and share pictures on community forums, triggering discussions and exchanges among users .(As shown in Figure 2.)

3.1.4 E-commerce services

The APP integrates an online shopping mall system, offering users a seamless and convenient shopping experience. While browsing ICH project information, users can directly purchase authentic ICH handicrafts and Maritime Silk Road cultural souvenirs. These products not only possess unique artistic value and cultural significance but also serve as an important means of promoting and preserving ICH culture. The APP supports multiple secure payment methods to ensure the safety of transactions. Additionally, a comprehensive after-sales service system is in place to provide users with peace of mind during the shopping process. For example, if a user purchases a handcrafted porcelain item and it arrives damaged, the after-sales service team will promptly address the issue and provide a replacement or refund.

**3.2 Analysis of Product Characteristics**

3.2.1 Digital display methods

The APP makes extensive use of AR (Augmented Reality) and VR (Virtual Reality) technologies to offer users an immersive experience like never before. Through AR technology, users can virtually "interact" with the essence of Fujian's ICH culture using their mobile phones or tablets. For instance, they can watch the detailed production process of

Quanzhou hair ornaments or participate in virtual reconstructions of historical ceremonies. VR technology, on the other hand, transports users to the bustling scenes of the Maritime Silk Road, allowing them to personally experience the prosperity of ancient trade and the grandeur of cultural exchanges. This digital display approach significantly enhances

user participation and makes ICH and Maritime Silk Road cultures more vivid and tangible. For example, in a virtual tour of a Maritime Silk Road port, users can see the ships docking, the merchants trading goods, and the cultural exchanges taking place, all in a highly realistic virtual environment.

Figure 1. Personalized Tourist Attraction Recommendation
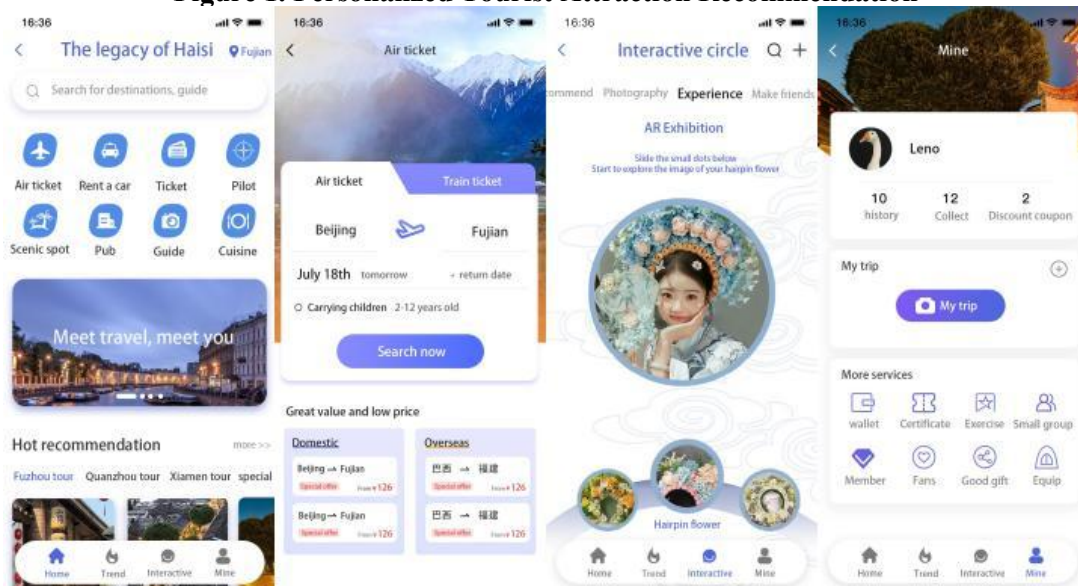
Figure 2. Integration of VR Technology and Non-Heritage Projects

3.2.2 Personalized recommendation system
Based on big data analytics and intelligent algorithms, the APP has developed a powerful personalized recommendation system. This

system analyzes users' browsing records, interest preferences, and historical behavior data to intelligently push ICH content and travel suggestions that align with their

individual tastes. This personalized approach not only improves the user experience but also helps users more efficiently discover and explore the rich tapestry of Fujian's ICH and Maritime Silk Road cultures. For instance, if a user has frequently browsed content related to traditional dance, the system will recommend upcoming dance performances, workshops, and related historical sites. [10]

3.2.3 Multi - language support

By offering an international version or cross-language support, the APP aims to expand the global reach of Fujian's traditional ICH and Maritime Silk Road cultures. This will enhance Fujian's international visibility and influence, attracting a more diverse global audience. For example, providing translations in English, Spanish, French, and other major languages will enable users from different countries to access and understand the content more easily.

3.2.4 Education and training module

Through features such as live broadcasts by inheritors, expert lectures, and online courses, the APP serves as a platform for users to learn about ICH and Maritime Silk Road cultures. This digital integration of traditional culture with modern technology breathes new life into the preservation and transmission of traditional heritage. For example, an expert lecture on the history and significance of a particular ICH item can be accompanied by a live demonstration by an inheritor, providing a comprehensive learning experience.

3.2.5 Policy support and cooperation network

Relying on the policy support of the Fujian provincial government, the APP has established collaborative partnerships with numerous cultural heritage protection institutions, ICH inheritors, and tourism enterprises. This ensures the authenticity and richness of the content, providing users with a reliable source of information. For example, collaborating with local museums and research institutions can provide access to rare historical documents and artifacts for display and research within the APP.

4. The Impact of the "Millennium Intangible Cultural Heritage, Maritime Silk Road Bond" APP on the Development of Modern Traditional Culture and Cultural Tourism

4.1 Dissemination and Popularization of Traditional Culture

The APP utilizes digital technology to organize and disseminate ICH projects, historical stories, and cultural elements related to the Maritime Silk Road. By breaking free from geographical and temporal constraints, it enables users worldwide to access and understand these precious cultural heritages with ease. The APP features a rich multimedia content library, including videos, audios, pictures, and texts, providing users with an immersive learning environment. Through interactive functions such as online Q&A and virtual guided tours, users can gain a deeper appreciation of the connotations and charm of traditional culture. For example, a virtual guided tour of a historical site can include detailed audio explanations of the architecture, historical events that took place there, and the cultural significance of the site, allowing users to have a more in-depth understanding.

4.2 Innovative Development of the Cultural Tourism Industry

Leveraging big data analysis, the APP can analyze users' interests and preferences to formulate precise marketing strategies for the cultural tourism industry. It also recommends tailored tourism routes and cultural experiences based on users' individual needs, thereby enhancing user satisfaction and loyalty. The ICH projects and Maritime Silk Road elements incorporated into the APP offer a wealth of inspiration for the innovative development of cultural tourism products. By integrating these elements into tourism product design, unique and culturally rich experiences can be created to meet the diverse demands of the marketplace. The APP promotes the seamless integration of culture and tourism, highlighting the intrinsic connection between traditional culture and tourism resources. This encourages tourists to engage more deeply with the local cultural context during their travels, adding cultural depth and value to the tourism experience. For example, a cultural tourism package could include a visit to an ICH workshop, a performance of traditional music and dance, and a hands-on experience of a traditional craft, all designed based on the user's preferences.

4.3 Protection and Inheritance of Cultural

Heritage

The APP raises public awareness and concern for the protection of cultural heritage by showcasing the historical and cultural significance of ICH projects and the Maritime Silk Road bond. [6] Through using the APP, users develop a sense of respect and responsibility towards cultural heritage preservation. The APP provides a platform for ICH inheritors to showcase their skills and works, facilitating wider recognition and dissemination. Additionally, the online education and training features attract more young people to engage in ICH inheritance, injecting new energy into the preservation of traditional culture. For example, a young user who becomes interested in a particular ICH through the APP may be inspired to learn the craft from an inheritor and continue the tradition.

4.4 Promotion of Cultural Exchanges and Cooperation

The Maritime Silk Road, as an ancient maritime conduit for trade and cultural exchanges between China and foreign countries, holds profound historical and cultural value. The APP promotes cross-cultural understanding and exchanges by presenting relevant content, laying a solid foundation for international cooperation. Under the framework of "Millennium Intangible Cultural Heritage, Maritime Silk Road Bond," the APP also focuses on cross-strait cultural exchanges. By highlighting shared ICH projects and Maritime Silk Road elements, it strengthens cultural identity and emotional bonds between the people on both sides of the Taiwan Strait, promoting the common prosperity and development of regional cultures. For example, an online exhibition featuring ICH items from both sides of the Taiwan Strait can enhance mutual understanding and appreciation.

5. Challenges and Countermeasures

5.1 Challenges Faced

5.1.1 Imbalance between the depth and breadth of content

Striking the right balance between content depth and breadth is a significant challenge. If the content is overly complex, it may exceed the comprehension capabilities of some users,

hindering their ability to fully appreciate the unique qualities of ICH and Maritime Silk Road cultures. Conversely, if the content is too simplistic, it may fail to capture the essence and value of these cultures, diminishing the user experience. For example, a detailed technical explanation of a traditional craft may be too difficult for a novice user, while a superficial overview may not satisfy an expert user.

5.1.2 Differences in user interests and cognition

There is a wide variation in the interests and levels of understanding among different user groups regarding ICH and Maritime Silk Road cultures. Meeting the diverse needs of all users with a single content approach is a formidable task. Some users may have a profound interest and in-depth knowledge, while others may be less informed or only casually interested. For instance, a history buff may be interested in the historical context of ICH items, while a tourist may be more focused on the visual and experiential aspects.

5.1.3 Insufficient international promotion

Despite the APP's rich content and functionality, its international reach and influence are limited due to language barriers, cultural differences, and a lack of effective global marketing strategies. For example, without proper translation and localization, users from different countries may have difficulty understanding and navigating the APP.

5.1.4 Low user engagement

Over time, many users may reduce their usage frequency or discontinue using the APP altogether due to a lack of continuous interaction and engaging features. For example, if the community forum becomes inactive or the interactive features are not updated regularly, users may lose interest.

5.2 Countermeasures

5.2.1 Optimize the content strategy

Formulate differentiated content strategies. For beginners, provide basic introductions to help them quickly understand the knowledge in relevant fields. For experts, provide in-depth research materials to meet their higher-level needs. Also, use multimedia forms (such as videos, audios, pictures and texts, VR/AR, etc.) to enrich the presentation of the content to enhance the attractiveness and

understandability of the content.

5.2.2 Enhance user interaction and participation

Design interesting and rewarding interactive links such as online question-and-answer sessions, challenge competitions, and user creation and sharing. These activities can not only stimulate the enthusiasm of users but also promote exchanges and interactions among them. At the same time, establish a user community to encourage users to communicate and share with each other, thus forming a good user ecosystem.

5.2.3 Strengthen international promotion

Study the cultural backgrounds and market demands of different countries and regions, conduct localized customization and optimization, strengthen cooperation and exchanges with international cultural heritage protection institutions, and jointly promote the international dissemination and exchanges of intangible cultural heritage culture. Through the use of multilingual versions and international promotion channels, increase the popularity and influence of the APP in the international market.

5.2.4 Continuously collect user feedback and optimize

Establish an effective user feedback mechanism, collect and handle users' opinions and suggestions in a timely manner. According to user feedback and market changes, continuously optimize the functions and services of the APP to improve the user experience and satisfaction.

6. Conclusion

Through the discussion in this article, we deeply understand the important role of the intangible cultural heritage APP in the inheritance and development of intangible cultural heritage culture. It is not only an inevitable choice to adapt to the development trend of the mobile Internet era but also an important way to meet the public's needs for understanding and learning traditional culture. In the future, with the continuous progress of technology and the deepening of application, the intangible cultural heritage APP is expected to become an important position for the dissemination of intangible cultural heritage culture and an important force to promote the innovative development of intangible cultural heritage culture. We look forward to more people with lofty ideals devoting themselves to the development and research of intangible cultural heritage APP in the future, jointly contributing wisdom and strength to the inheritance and development of intangible cultural heritage culture.

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