

Digitalisation of Mazu Religious Culture and Costume Experience from a Service Design Perspective-The Mazu Cultural Tourism Zone on Meizhou Island as an Example

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Abstract: This study takes the A-Ma culture and dress experience of Meizhou Island as the core object, focuses on the development goal of ethnic cultural tourism in the context of rural revitalisation, explores the innovative path of Meizhou Island A-Ma cultural tourism from the perspective of service design, and carries out the relevant service design practice. Taking Mazu culture of Meizhou Island as a research case, comprehensively using questionnaire survey, field visit and other research methods, comprehensively analysing the current situation of ethnic culture tourism in Meizhou Island. Based on the service design theory and methodology, combined with the SWOT model, the service system integrates online and offline, and with the help of AR, VR and other advanced digital technologies, it explores the connotations of A-Ma culture and dress culture, innovates the digital experience design ideas, and provides a new direction for the inheritance and development of the A-Ma culture to effectively enhance the users' sense of experience of the national culture tourism. The service design aims to promote the sustainable development of ethnic culture tourism on Meizhou Island, which in turn drives regional economic growth.

Keywords: Mazu; Meizhou Island; Service Design; AR Technology; VR Technology

1. Introduction

Under the wave of the digital era, how to make A-Ma's faith and dress culture flourish in the context of the new era and achieve sustainable inheritance and development has become an important topic that needs to be resolved urgently. The premise of effective protection, the integrated development and high-quality development of tourism should be promoted, and support for the integration of intangible cultural

heritage into scenic spots and resorts to create scenic spots of intangible cultural heritage characteristics should be provided. With the help of policy support and financial investment, it is possible to salvage and protect A-Ma cultural materials; the development of the A-Ma cultural tourism industry can lead to regional economic development; and the strengthening of the construction of cultural venues provides venues for traditional activities, such as A-Ma ceremonies, and ensures that A-Ma cultural inheritance will be carried on by successors. As a national AAAAA-level tourist attraction, Meizhou Island Mazu Cultural Tourism Zone has an important research value and demonstrative significance in the inheritance of Mazu culture and tourism development. Therefore, in-depth discussion on how to enhance the experience of Mazu cultural tourism visitors on Meizhou Island through the integration of service design and science and technology, promote Mazu culture and optimise the tour service process is of great practical significance for improving the quality of national cultural tourism services.

2. Background Studies

Since the 1970s, with the booming development of global tourism, tourists are no longer satisfied with traditional sightseeing tours, and there is a growing demand for experiential, participatory and personalised tourism. With the gradual emergence of tourism experience research, it is timely to deeply integrate A-Ma culture into the tourism experience. This not only enriches tourists' itineraries, but also allows A-Ma culture to take on new life and vitality in its interaction with tourists, realising that A-Ma culture can be passed on from one generation to the next.

A-Ma, formerly known as Lin Mo, was born on Meizhou Island in Putian, Fujian Province during the Northern Song Dynasty, and was honoured by the United Nations in the 1980s

with the title of "Goddess of Peace". Meizhou Island, located on the southeast coast of Putian City, Fujian Province, is the birthplace of A-Ma's beliefs and the spiritual home of A-Ma's followers [2]. The Mazu Cultural Tourism Zone of Meizhou Island in Putian City covers an area of about 49.3 square kilometres and consists of important natural and humanistic landscapes, such as the Ancestral Temple of Mazu, Ancestral Temple Mountain, Mae Yu Chao Yin, and Goose Tail Divine Stone Garden[3]. Ecology is the brightest colour of Meizhou Island[4]. In recent years, Meizhou Island has adhered to ecological priority and green development, and accelerated the construction of zero-carbon demonstration and application scenarios. 2020 Meizhou Island A-Mazu Cultural Tourism Zone is determined to be a national AAAAA-level tourist attraction[5]. The A-Mazu costume is a traditional costume popular on Meizhou Island, Putian, Fujian. The A-Ma headdress, which consists of a sail-shaped bun, is the main feature, signifying that A-Ma has her heart set on the sea. The A-Ma costume consists of the A-Ma suit and the A-Ma trousers, which are decorated with a red lapel and a navy blue colour. A-Ma Zu trousers are commonly known as "red and blue trousers", with the blue representing the sea and the red representing the flame, which is a continuation of the Zhou Yi culture.

Mazu beliefs and customs refer to the beliefs and customs of Mazu, also known as Shennu beliefs and customs, Lingnu beliefs and customs, Shengnu beliefs and customs, Yuanjun beliefs and customs, Niangmu beliefs and customs, Niangniang beliefs and customs, Tianfei beliefs and customs, Tinhou beliefs and customs, Heavenly Lady beliefs and customs, and Mazu beliefs and customs in the Meizhou Mazu area, among other things. It is a traditional Chinese folk culture that focuses on worshipping and celebrating A-Ma's spirit of virtue, goodness and love, with A-Ma's temple as the main place of activity, and temple fairs, customs and legends as forms of expression. A-Ma's beliefs and customs consist of three series of rituals, folk customs and stories and legends. Meizhou is the location of the A-Ma Temple. As China's first world non-legacy in the category of beliefs and customs, the modernisation and transformation of A-Ma culture is of great significance in leading the transformation of traditional Chinese culture and broadening the path of innovation[6].

3. Service Design Intervention in Cultural Tourism

Service design focuses on user needs, attaches great importance to user experience, and stresses the integration of multiple elements such as people, processes, environment and technology. Based on meeting user needs and creating service value, service design aims to transfer value between service providers and service recipients and develop new service value through an overall understanding of the service process and collaborative design. Through drawing service blueprints and conducting user surveys, we sort out service touch points, optimise service processes, and commit to providing users with efficient, caring and innovative service experiences[7]. Involving the service design concept in A-Ma cultural tourism is essentially a software and hardware integration of A-Ma culture, social resources, design elements and service system, which can systematically redesign the natural scenic spots and humanistic scenic spots. Service design enhances service experience, service efficiency and service value by planning and organising the people, facilities, information and materials in the service. In Mazu cultural tourism on Meizhou Island, service design can optimise the waiting time for dressing and enhance the experience of faith culture; combine AR, VR and other science and technology to increase the interactive links, enhance the user's sense of participation and satisfaction, and make the tourism service more in line with the actual needs of tourists[8].

4. Current Status Study

A questionnaire is a commonly used research method that enables the collection of data from a large sample of people in order to understand their attitudes, behaviours, opinions, etc. It is a form of questions carefully designed for a specific purpose. It is used to measure people's behaviours, attitudes, social characteristics, etc., enabling the researcher to obtain the necessary information data for statistical analysis. In this study, the questionnaire method was used to investigate the current situation of A-Ma cultural tourism in Meizhou Island. The questionnaires were distributed through multiple channels online and offline, and a total of 250 valid questionnaires were collected[9]. The results of the survey showed that among those who had

travelled on Meizhou Island, 53.38% had an average or below experience of A-Ma culture, and only 21.91% were very satisfied; 51.79% thought that current A-Ma cultural tourism activities were average or less (as shown in Figure 1). In addition, 50.6% of the respondents wanted to increase the experience of A-Ma's costume culture, and 51.79% wanted to experience other A-Ma ritual activities (as shown in Figure 2). In order to ensure the scientific and reliable results of the questionnaire survey, this study fully referred to relevant literature and expert opinions during the questionnaire design stage to ensure the comprehensiveness and validity of the questionnaire content. Meanwhile, in the process of data analysis, descriptive statistical analysis methods were used to provide detailed statistics and analysis of the data to accurately reflect tourists' satisfaction with and demand for Mazu cultural tourism on Meizhou Island.

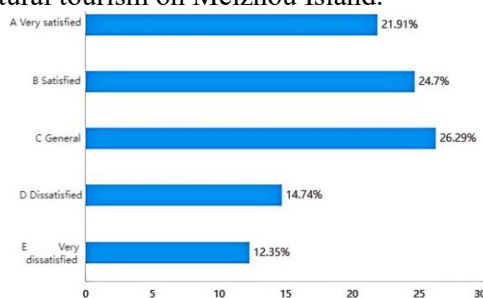


Figure 1. Satisfaction Survey Results (Author Research Self-Painting)

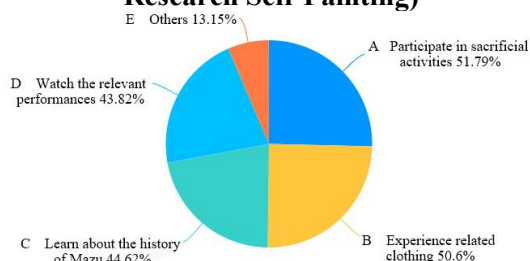


Figure 2. Demand Research (Author Research Self-Painting)

For the research of Mazu culture, there are some research results, mostly for the research of Mazu ritual music culture, the research of Mazu dress improvement and the innovation of Mazu cultural tourism products, etc., and the research results with the design of Mazu tourism services are relatively few. Through the data collection and the collation of related research, the specific contents are as follows: From the perspective of music sociology and ethnomusicology, drawing on the research results and research methods of linguistics and bibliography, we analyse the music of A-Mazu rituals on Meizhou Island,

Putian, and explore the cultural connotation and tourism value. The famous designer Zeng Fengfei, whose design has always been rooted in the traditional culture of China, has been actively tapping into the She skills[10]. Using a very modern thinking and innovative method to integrate the national tradition with modernity, he opens up a new way of thinking for the development of traditional costumes[11]. Discussion on the enhancement of A-Ma cultural tourism products in Meizhou Island, on the basis of sustainable development and other theories, classify the A-Ma cultural tourism resources in Meizhou Island and evaluate the A-Ma cultural tourism resources in Meizhou Island, then analyse the problems of the enhancement of A-Ma cultural tourism products in Meizhou Island, and put forward the suggestions and guarantee mechanism for the enhancement of A-Ma cultural tourism products in Meizhou Island[1].

For culture and tourism digital 2024 culture and tourism digital innovation demonstration of the top ten cases, the Museum of Nature to create a digital people and AR guide project, visitors through mobile phones, tablets or VR glasses, etc. to enter the interactive interface, you can choose the route, the digital navigator to open the exploration journey, in addition to the regular exhibits, you can also see the AR special effects exhibits. The relevant person in charge of the Museum of Nature introduced that the project docking big model technology, the development of intelligent AI interactive question and answer system, able to answer visitors' questions in real time. Mazu cultural tourism on Meizhou Island can refer to and learn from its model and method.

In summary, in order to enhance the travelling experience of A-Ma culture on Meizhou Island, there are opportunities, but there are also still some challenges. For example, after fieldwork with visitors, residents, and staff at six attractions, including the A-Ma Temple and Tianfei's hometown, a number of problems have been summarised, such as the fact that the current form of A-Ma cultural tourism activities on Meizhou Island is relatively homogeneous, focusing mainly on the A-Ma Ceremony and visits to the attractions, and lacking in creativity and interactivity. Although the A-Ma Ceremony has high cultural value, it may lack a sense of participation and interest for some non-believing tourists. According to the visit survey, some

tourists hope that more interactive experience activities related to A-Ma culture can be added, such as A-Ma faith experience activities and A-Ma costume experience punch cards, so that they can gain a deeper understanding of the A-Ma culture and enhance the fun and sense of participation in tourism; there are also a little bit of problems with the already existing costume dressing experience, with a longer dressing time requiring queuing and waiting, insufficient costumes at peak times, and some punch card points not being convenient to punch cards, etc.

(Table 1). In order to deal with these problems, the design starts from the traveller's point of view, and analyses in-depth from multiple perspectives, such as the sense of play experience and supporting services. It should be necessary to combine the characteristics of Meizhou Island, develop a scientific and reasonable tour programme, adopt diversified interactive means, and put forward a tourism service design strategy covering the creation of special projects and the upgrading of service quality.

Table 1. Maejo Island Issues Research(Author Research Self-Painting)

Feature spot	Investigators	Merit	Inferior strength or position
Mazu Temple	visitor A	The earliest Mazu temple was built on the mountain, also known as the "Buddha Palace on the sea", with a statue of Mazu on its top	It mainly focuses on the Mazu festival and tourist attractions, which lacks innovation and interactivity
The hometown of Empress Tian	visitor B	You can experience the women's clothes of Meizhou	The photo process is simple, the makeup time is long, and there are few check-in points
Maiuk tidal sound	resident A	Its unique topography, under the action of tidal waves, has a sound	The popular walkway has been abandoned for years, and it is dangerous to wear clothes and check in
Lotus Beach	visitor C	The sand is fine and the beach is very gentle. It is very comfortable to play in the sand and step into the waves barefoot	Some beaches have problems of garbage retention and slight pollution of seawater, which affect the effect of check-in
Mazu Film and Television City, Meizhou Island	staff	The cultural performance "Origin of Meizhou" allows us to feel the unique intangible cultural heritage and folk customs of Meizhou Island, immerse ourselves in the thousand-year legend and witness the spirit of Meizhou	The filming site of the Mazu TV series in those days was poorly integrated with the Internet and tradition
The fossilized egg of a turtle	visitor D	The strange sea erosion landscape can be seen in the sea view and is a great place to take pictures	The geological science popularization function is weak, some coastal walkways are damaged and unrepaired, safety warning signs are insufficient, and it is dangerous to check in

5. Functionality of A-Ma Travelling on Meizhou Island

As a speciality tourism area, the development of Meizhou Island needs to be closely centred on the demands of the tourism market. From the point of view of target user positioning, Mazu culture worshippers are one of the important customer groups, so in the process of tourism development, we need to fully consider the attractiveness of cultural characteristics and our own resources to tourists. By promoting the

in-depth integration of online and offline resources, attractions and industries, we can accelerate the innovation and upgrading of the tourism industry and cultivate new economic growth points.

Meizhou Island has a profound Mazu culture, and has great potential for developing cultural tourism by integrating with science and technology. Through the SWOT analysis of tourism development in Meizhou Island (Table 2), it can be seen that the power of science and technology can be used to improve the tourism

service system and promote the development of A-Ma cultural tourism.

Table 2. SWOT analysis (Author's Own Production)

class	content
(S) superiority	1. As the birthplace of global ancestral surname culture, Meizhou Island has a strong brand influence of Mazu culture with the millennium-old Meizhou Mazu Temple (the world's first Mazu temple). It has nearly 300 million devotees in the world, and there is a mass foundation for the experience of religious costumes. 2. The Rainbow Road and the coastal greenway connect the mountain and sea landscape, which is suitable for cycling and hiking exploration. It is suitable for coastal vacation and cultural research activities throughout the year. 3. The ancestral worship activities on the birthday of Mazu and the commemoration day of her ascension every year are solemn and solemn ceremonies that have been passed down for thousands of years, which is a concentrated display of Mazu culture. This unique cultural experience cannot be replicated in other regions.
(W) inferior strength or position	1. Current tourism offerings are predominantly limited to traditional elements like Mazu Ancestral Temple tours and ceremonial festival spectacles, lacking innovative and interactive experiences that cater to diverse visitor needs. Beyond the temple complex and annual rituals, the island lacks immersive cultural programs that allow deeper engagement with local heritage. 2. The distribution of electric vehicle rental points on the island is uneven, and there is a shortage of vehicles during peak hours. 3. The waiting time for clothing rental is long, and the check-in point on the island is far away. 4. Belief activities have a specific time, and you can't experience them if you miss it.
(O) favourable circumstances	1. The country attaches increasing importance to cultural tourism industry 2. Meizhou Island integrates coastal resources and Mazu culture, develops the "culture + ecology" themed route, and links surrounding islands to build a "tourism community". 3. Expand digital products such as VR Mazu cultural experience, attract young customers through big data precision marketing, and enhance the vitality of tourism in off-season.
(T) threaten	1. With the rapid development of other Mazu cultural tourism destinations, Zhonghe Island tourism is facing competition. 2. Social security issues affect tourists' travel intention and the development of tourism market. 3. Environmental protection requirements, do not excessively damage the island ecology. 4. The rapid development of digital technology makes the technological upgrading speed of tourism industry accelerate.

6. A-Ma Cultural Tourism System Design from the Perspective of Service Design

6.1 Modelling the User

In order to deeply analyse the tourists' experience, this study adopts a combination of questionnaires and in-depth interviews to investigate the tourists who have experienced Fujian Mazu cultural tourism. The questionnaires were distributed through online and offline channels, and a total of 251 valid questionnaires were collected. According to the research data, female tourists accounted for 55.78% of the total number of tourists, and the age distribution of the tourists was mainly under 40 years old, accounting for about 80% of the total number of tourists. The A-Ma cultural

activities that tourists are most looking forward to participating in are sacrificial activities and costume experience, accounting for 51.79% and 50.6% respectively. (Data collected by author's online survey)

In addition, the study adopts a participatory research methodology by interviewing experts, staff and tourists in the field and conducting observations to gain a deeper understanding of tourists' expectations, behavioural habits and experiential pain points, including feedback on the existing travel experience, difficulty in accessing information, and emotional engagement. Through the analysis of these data, the knowledge structure, interest preferences and behavioural characteristics of tourists are refined to provide a basis for subsequent service design.

6.2 Optimising Service Touchpoints

Optimising service touchpoints requires in-depth analysis and improvement of each contact link in the tourists' travel process, covering guide equipment, information display, interactive links and so on. According to the type of guide media, service touchpoints can be classified into physical touchpoints (e.g. signage, mobile phones, devices, etc.), digital touchpoints (e.g. APP, etc.) and interpersonal touchpoints (e.g.

staff, tour guides, etc.). By comprehensively assessing these touchpoints, difficulties and room for improvement in the visitor experience process are identified. By analysing the user journey map and service touchpoints, it is found that tourists have pain points such as incomplete information acquisition, single experience items, and insufficient interactivity in the process of tourism (Table 3).

Table 3. User Journey Map (Author's Own Drawing)

	Before the trip				After the trip
Action	Pushed by ads	Experience folk customs Plan the route	Experience apparel queue up	Travel according to the route	Sharing records
contact point	Different types of APP (guide, booking, etc.)	map cicerone staff	a dresser dresser cameraman cellphone	map cicerone signboard	photo album keepsake
be affected by					
pain spot	1. The APP is complex and it is not easy to find the required information. 2. There is uncertainty about the authenticity of the content. 3. It is impossible to connect with merchants to understand the real situation and make an appointment	Lack of interactive projects	1. Long waiting time during peak period 2. Clothes are in short supply during peak period, which cannot meet the demand 3. Shortage of photographers	It's inconvenient to check in in some areas	Fewer people follow the record sharing
favourable circumstances	1. Design a special APP according to the situation 2. Implement real-name system for merchants in the APP 3. Provide communication and appointment channels 4. Update data in a timely manner	Combine with AR and VR to launch interactive experience projects	1. Launch AR costume experience, no need to wait 2. Connect with the APP to synchronize and upload	Best VR experience, ever	Set up a small community in the APP for people to communicate and share Enjoy yourself

6.3 Service Design Blueprint

6.3.1 Design of an online service platform based on virtual dress up

Based on the user journey map, this study designs a supporting APP and applies AR technology to deeply integrate the virtual information with the real scene, aiming to provide a richer and more interactive experience for tourists. Through the mobile APP, tourists in the scenic area are able to obtain detailed introduction, historical background, cultural stories and other information of the attractions, which are superimposed on the real scene in the form of virtual images or text to help tourists understand the connotation of the attractions in a more in-depth manner. The design process of the

APP follows the user-centred design principle, and is optimised through several rounds of user testing and feedback to ensure the practicability and ease of use of its functions.

The APP mainly contains five modules: Service, Treasure Hunting, Shooting, Dress Up and My (Figure 3 and 4). In the "Service" module, tourists can book hotels and restaurants in advance, which is convenient for their itinerary arrangements; the "Treasure Hunting" module develops interactive games using AR technology, such as AR Treasure Hunting, AR Photo Shooting, etc., which enhances the fun and sense of participation in travelling; in the "Dress Up" module, virtual try-on of A-Ma's costumes is achieved through AR technology. In the "Dress-up" module, the virtual try-on of A-Ma's

costumes is realised through AR technology, which provides tourists with a realistic and interesting try-on experience by restoring the details of the costumes, creating an immersive scene, and enriching the interactive experience. The operation of trying on is simple and convenient. Users can complete the matching of costumes by clicking, sliding and other conventional operations, and can freely choose

costumes and headdresses. The interface clearly shows the introduction information of the costume and headwear, and at the same time, it focuses on user feedback and gives prompts and confirmations in time to enhance the user's experience. In the "My" module, visitors can upload photos, post videos, and share with other users, which further enhances the interaction and sense of community among users.

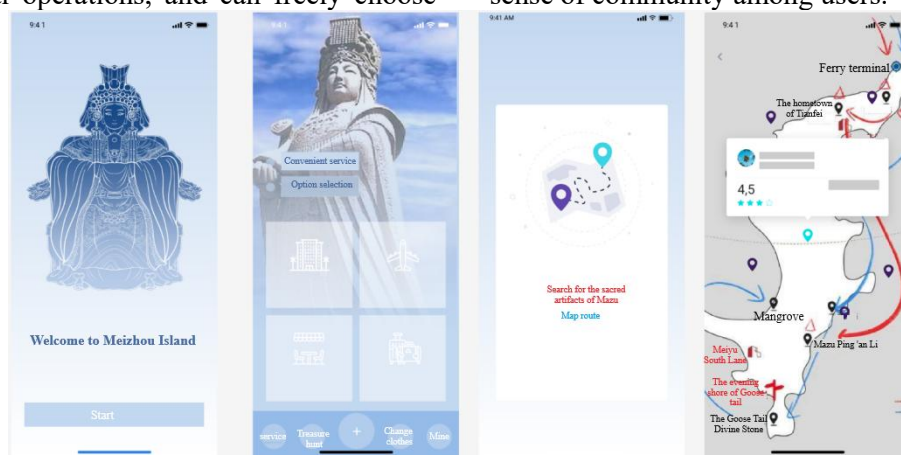


Figure 3. UI Design 1 (Author's Own Drawing)

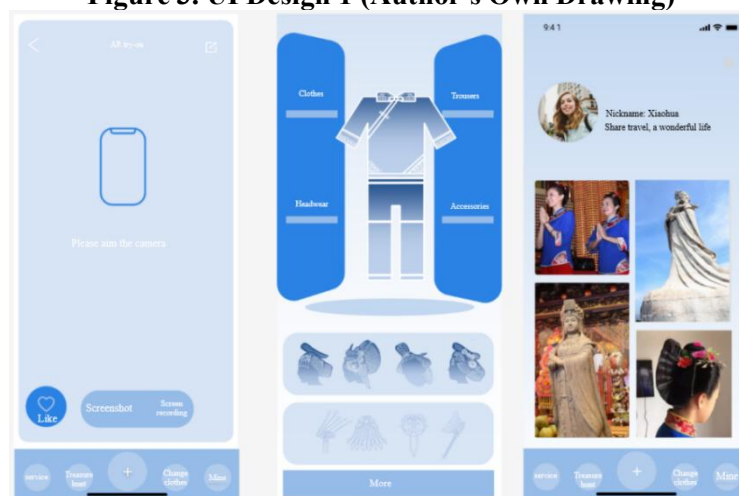


Figure 4. UI Design 2 (Author's Own Drawing)

6.3.2 Design of offline tourism services based on A-Ma activities

AR technology has been introduced to optimise A-Ma cultural activities in response to problems such as long time intervals between activities and unbalanced visitor experience (crowded peak seasons and poor off-season experience). At Mazu cultural tourism attractions, tourists can scan buildings, cultural relics, costumes and other entities through VR technology to obtain detailed cultural interpretations, virtual animation demonstrations or historical stories, so that static cultural elements can be brought to life, and understanding of the connotations of national culture can be deepened.

The 360-degree three-dimensional restoration of the iconic landscape of Meizhou Island and the use of VR technology to create an immersive experience, allowing visitors to feel as if they were in the sea waves and the sea breeze. Setting up a number of interactive card points, visitors can take photos with the virtual A-Ma statue, characteristic buildings, and use body sensing technology to achieve free walking and interaction. In the process of experience, interspersed with A-Ma culture popular science explanation, introducing the legend of A-Ma, dress culture connotation and other knowledge. At the same time, with realistic sound effects (such as the sound of waves, birdsong, ritual

music) and special effects (such as fireworks, auspicious light), to create a shocking immersive experience atmosphere.

7. Summaries

In the context of rural revitalisation strategy, service design provides innovative ideas for the development of A-Ma cultural tourism in Meizhou Island. This study effectively optimises the experience and communication mode of A-Ma cultural tourism on Meizhou Island by constructing a service design scheme that integrates online and offline. By summarising the advantages and shortcomings of the development of A-Ma cultural tourism on Meizhou Island, using SWOT analysis to clarify the development direction, and designing a service design blueprint that includes a user travel touchpoint map and an online-offline integration scheme, the study provides a feasible solution to enhance user experience, strengthen cultural identity, and enhance market competitiveness. However, this study also has certain limitations. For example, during the research process, due to time and resource constraints, in-depth interviews and research could not be conducted with a larger group of tourists, which may have affected the comprehensiveness of the findings. In addition, although this study proposes a service design scheme based on AR and VR technologies, it has not yet been tested for large-scale practical application, and its effectiveness and sustainability in actual operation still need to be further verified. Future studies can further expand the scope of research and increase the number of samples to obtain more comprehensive research data. At the same time, it is recommended that the service design scheme be tracked and evaluated over time in the actual operational environment, in order to continuously improve and optimise the service design and provide stronger support for the sustainable development of A-Ma cultural tourism on Meizhou Island.

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