



Study on the Development of Smart Tourism in Liangzhu Ancient City Ruins Park--Based on Visitors' online commentary data

Yan Min ^a, Zhou Bo ^{b*}

School of Culture and Tourism, Zhejiang International Studies University, Hangzhou 310023, China

^ayanmin021000@163.com, ^{b*}zhoubo0043@126.com

Abstract. Smart tourism is an important way of creative transformation and innovative development of cultural heritage, as well as an important means of enriching the way tourists experience tourism. As a world cultural heritage, Liangzhu Ancient City Ruins Park shoulders the mission of spreading Chinese culture to the world and telling a good Chinese story. Smart tourism creates a brand new path for the protection, utilization and development of Liangzhu Ancient City Ruins Park. Based on tourists' online review data, this paper discusses the future direction and path of smart tourism development in Liangzhu Ancient City Ruins Park from the perspectives of experience theory, technology theory and system theory, so as to deliver the core cultural connotation of different site scenes to tourists and show the 5000 years of Chinese civilization in an all-round way.

Keywords: Liangzhu Ancient City Ruins Park; World Cultural Heritage; Smart Tourism

1 Introduction

In July 2019, Liangzhu Ancient City Ruins successfully applied for World Cultural Heritage, marking that the five thousand years of Chinese civilization has been widely recognized internationally. In the post-World Heritage era, it is our responsibility to protect the Liangzhu Ancient City Ruins and continue the heritage of culture; it is our natural mission to spread the Liangzhu culture and release the national cultural influence. Therefore, we must continue to explore the methods of protection and inheritance for Liangzhu Ancient City Ruins. World cultural heritage develop tourism has been recognized as an effective way to activate and utilize world cultural heritage. Heritage tourism research has also attracted widespread attention ^[1]. Cultural heritage and tourism are in fact complementary to each other. The development of tourism is a way to realize the social value of cultural relics and historic sites, and it is an integral part of cultural heritage protection ^[2].

As a heritage park, Liangzhu Ancient City Ruins Park takes into account the dual purposes of tourist service and ruins protection at the beginning of construction. With

the development of smart tourism, heritage parks actively use digital technology and smart technology to constantly change the methods of protection and experience of cultural heritage, and convey the core cultural connotation to tourists around different heritage scenes. The emergence and development of smart tourism has created a new path and provided new kinetic energy for the protection, utilization and development of cultural heritage. Based on the investigation of Liangzhu Ancient City Ruins Park, this paper analyzes the current situation of the development of smart tourism, and discusses the paths of smart tourism development of Ruins Park from the perspectives of experience theory, technology theory and system theory.

2 Literature review

2.1 Smart Tourism

As a rapidly developing industry, tourism has always been at the forefront of technology application. The progress of information technology and the development of the Internet have reshaped the operation mode of tourism and made tourism more intelligent. The integration of information technology and tourism has reshaped the operation mode of tourism. Technology has become a driving factor for tourism organization management, tourism product innovation and stimulating tourism intention^[3]. Smart tourism has developed rapidly under the background of information technology development. Relying on big data, Internet, information and communication technology, smart tourism provides a new mode of tourism development, a new way of tourism experience, and new opportunities for value creation and management^[4], leading the trend of integrated development of tourism industry and information technology. Relying on the advantages of information technology, smart tourism helps scenic spots improve tourism service and management level, optimize tourism activities and enhance tourism competitiveness^[5]; At the same time, smart tourism shows great potential in meeting tourists' personalized experience and greatly stimulates tourists' tourism intention^[6]. Smart tourism enables tourists to actively perceive tourism resources, tourism activities and other information and adjust tourism plans.

2.2 World cultural heritage and smart Tourism

Smart tourism has played an important role in the protection, utilization and inheritance of world cultural heritage. Especially for world cultural heritage scenic spots, relying on augmented reality to restore cultural relics and historical buildings and create a time-space travel experience for tourists. The Olympian temple in Greece has become the first ancient temple in the world to benefit from augmented reality through the development of archeoguide augmented reality restoration and reconstruction^[7]. Deshou palace in South Korea has developed an intelligent situational perception self-service navigation system to provide tourists with real-time location, nearby scenic spots and other information. Meanwhile, various guide modes provide personalized, customized and intelligent guide services for different types of tourists^[8]. A guide system called smart

space that can promote knowledge and information exchange to improve tourism services. After tourists install and register the application, the core service layer will create a file containing tourists' long-term situational information, and flow knowledge and information from the smart space to tourists according to tourists' needs [9].

3 Evaluation Analysis of Visitor Network of Liangzhu Ancient City Ruins Park

3.1 Data analysis methods

The source of data utilized is network text data, and the comments of tourists on the network about the heritage culture and tourism experience of Liangzhu Ancient City Ruins Park are selected as data samples. Through the Octopus software in the Ctrip website with "Liangzhu Ancient City Ruins Park" as the keywords, to obtain a total of 669 comments, the collection time from November 2015-August 2022 period. Using ROSTContentMining software as the analysis tool, based on the content analysis method, the network text information for word frequency semantic network construction, to achieve the purpose of mining text data information.

3.2 Data visualization construction

Visualization of semantic network analysis: ROST-CM is used to analyze the semantic network and construct a visual graph (as shown in Figure1), which shows the diffusion structure of "core-sub-core-periphery". The more lines are connected, the higher the frequency is, and the closer the words are to the core, the closer they are to the core words.

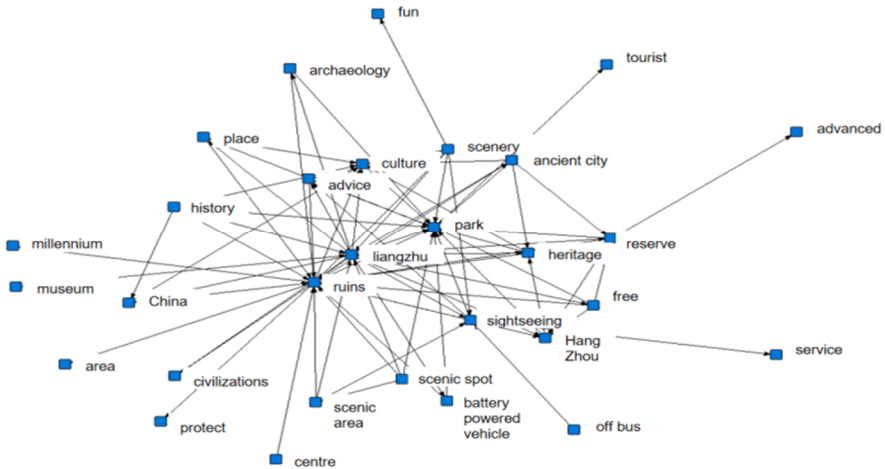


Fig. 1. semantic web graph

The figure shows the self-made research data in this article

High-frequency word frequency table construction (as shown in Table1): based on ROST-CM software, the selected comment data were analyzed for word frequency after word division to extract 30 high-frequency words about the comments. The high-frequency words mainly contain nouns, verbs and adjectives.

Table 1. Frequency table of words for evaluation of domestic tourists

Keyword	Frequency	Keyword	Frequency	Keyword	Frequency
ruins	197	sightseeing	70	suit	44
Liangzhu	184	landscape	70	heritage	43
scenery	168	cost performance	69	free	42
park	152	feature spot	67	China	41
Ancient city	84	history	66	civilization	41
experience	84	amusing	65	reserve	40
worth	83	electromobile	58	time	40
scenic spot	81	interesting	58	tour	40
culture	79	advice	57	environment	36
place	76	overall	53	deserve	33

The table is a compilation of the research data in this article

3.3 Results of data analysis

3.3.1. Tourists Experience Forms Are Single.

On the whole, the form of tourist experience is diverse and rich, mainly through the visual experience, auditory experience and about six kinds of experience to bring visitors a vivid cultural experience. However, combining the semantic network and word frequency analysis (as shown in Figure1 and Table1), it can be seen that the tourists' experience of "sightseeing" and "visiting" mainly relies on the "battery car" and "bus" in the park. From the perspective of experience content, this only meets the visual experience and part of the tactile experience, lack of multi-sensory stimulation and input, which will lead to monotonous experience content resulting in poor visitor experience. From the perspective of experience depth, this will lead to uneven satisfaction among tourists of different cultural levels, and the experience difficulty and satisfaction of different tourists may vary. Tourists can only understand Liangzhu culture by viewing the landscape, then it is difficult to understand the history, tradition and cultural connotation of Liangzhu culture, so that Liangzhu excellent cultural heritage as well as dissemination is difficult to truly realize.

3.3.2. The necessity of smart development of cultural heritage tourism.

From the data of word frequency as well as semantic network analysis, it can be seen that in the top 30 high-frequency words of the 669 comment data (as shown in Table1), there did not appear any words related to digitization or smart, indicating that it is difficult for tourists to perceive the smart technology in the process of experiencing it,

which also reflects the weak digitization of Liangzhu Ancient City Ruins Park.

Smart tourism can not only provide new ideas for the rich experience of cultural heritage, but also effectively solve the problem of the relationship between "protection" and "utilization" of cultural heritage in the process of development. Smart tourism can creatively protect cultural heritage through digital cultural relics display and cultural heritage digital archive construction, and at the same time can let more people understand and pay attention to the value and significance of cultural heritage. Through the use of digital technology in smart tourism, tourists can experience cultural heritage in virtual reality scenes, and from the visual, auditory, interactive, sensual and other aspects of the experience to bring tourists a rich and diverse cultural experience form is also conducive to let tourists better understand and experience the local culture.

3.3.3. The current situation of smart tourism development in Liangzhu Ancient City Ruins Park

Liangzhu Ancient City Ruins is the first Neolithic city site discovered in the lower reaches of the Yangtze River, and is known as "the first city in China". On July 6, 2019, Liangzhu Ancient City Ruins was officially included in the "World Heritage List", which demonstrates the history of Chinese civilization for more than 5,000 years. Liangzhu Ancient City Ruins Park is an important carrier to realize the opening to the outside world and experience the "Chinese civilization of more than 5,000 years" under the premise of protecting and developing the ancient city ruins. It is a site-type park with many features such as tourism, leisure, and cultural promotion. Focusing on the construction of smart tourism, Liangzhu Ancient City Ruins Park has initially built products such as online reservation, self-service ticket sales, face-swiping entry, hand-painted maps, and intelligent voice explanations, which greatly simplifies complex links such as ticket sales and inspection in scenic spots, and greatly simplifies scenic spots.

4 Development paths of smart tourism of Liangzhu Ancient City Ruins Park

4.1 Smart tourism of Liangzhu Ancient City Ruins Park from the perspective of tourist experience

From the perspective of experience theory, smart tourism reflects the idea of tourists' experience as the core, and improves tourists' travel experience and the tourism quality of scenic spots through smart services, especially physical and spiritual enjoyment that tourists obtain in the entire tourism consumption process. Smart tourism uses smart services to meet tourists' expectations from pre-trip information acquisition and travel planning, consumption satisfaction during travel and post-trip feedback, so as to obtain the best results.

Based on the perspective of tourist experience, Liangzhu Ancient City Ruins Park uses 5G technology, VR technology and other most advanced digital technologies to

develop smart tourism products and build a "digital ancient city" as brilliant as Liangzhu ancient city in virtual time and space. On the one hand, the combination of artificial intelligence, virtual reality and other technologies is the general trend. Liangzhu Ancient City Ruins Park makes full use of the Internet and the practical application ability of scientific and technological innovation to comprehensively improve the display level of the park, fully display Liangzhu civilization by means of 5G, VR and AR, tell traditional stories and spread excellent culture with modern technology, and create immersive and experiential tourism products for tourists. On the other hand, under the background of the development of the times, Liangzhu Ancient City Ruins Park should pay attention to the target group of international tourists, and actively use VR technology to create an online experience for international tourists that is different from offline tourism. At the same time, Liangzhu Ancient City Ruins Park develop foreign language online tourism system and pay attention to the establishment and maintenance of online community. These are not only the international publicity of Liangzhu culture, but also the humanistic care for international tourists and created the best experience for tourists.

4.2 Smart tourism of Liangzhu Ancient City Ruins Park from the perspective of technology theory

From the perspective of technology theory, smart tourism emphasizes the application of information technology to realize the intelligence of tourism management, tourism service, tourism marketing and tourism decision-making. Liangzhu Ancient City Ruins Park should vigorously build a "smart brain", relying on intelligent technology to help Liangzhu Ancient City Ruins Park realize the onlineization of core systems such as scenic spot management, smart service, smart marketing, and publicity. Based on the precipitation of more historical data, it can be more accurately analyze the operation situation, provide technical support for Liangzhu Ancient City Ruins Park, and improve the operational efficiency of Liangzhu Ancient City Ruins Park. The "smart brain" promotes the digital transformation of Ruins Park, accelerates promotion of digital governance, protection, development and scientific operation.

Under the empowerment of the smart tourism system, the Liangzhu culture with a history of 5,000 years will be more vividly presented. Meanwhile, smart tourism will create a highlight cultural and tourism project that is "the world's first, China's original, and Liangzhu's original creation", focusing on the integration of heritage culture and tourism, strengthening cultural experience, interaction and immersion, facing international tourists, and protecting cultural heritage. It is organically integrated with low-intensity development and utilization of cultural leisure, cultural tourism, cultural exhibition, etc., and comprehensively promotes the active utilization, activation and transformation of Liangzhu World Cultural Heritage.

4.3 Smart tourism of Liangzhu Ancient City Ruins Park from the perspective of system theory

Smart tourism is a systematic and dynamic comprehensive concept, which is an important part of a smart city. Smart tourism balances the industrial chain relationship

among the government, enterprises and tourists, forms a complete comprehensive system, and promotes the maximization of ecological, cultural, social and economic values through the common development of "meeting the experience needs of tourists with application innovation", "improving the business ability of enterprises with management innovation" and "promoting the transformation of government functions with service innovation", finally realize sustainable development of tourism industry.

In the world heritage application stage, Liangzhu Ancient City Ruins Park has also strive to combine the traditional heritage protection with the smart tourism experience through the smart tourism construction. In the future, relying on smart technology, Liangzhu Ancient City Ruins Park should speed up the construction of information network facilities and improve the construction of smart tourism projects from the aspects of service, management and operation, focusing on the sustainable protection and tourism service construction objectives of Liangzhu Ancient City Ruins Park. First, build a comprehensive data service center. Liangzhu Ancient City Ruins Park should integrate the data assets of the scenic spot, collect all kinds of data, and actively realize intelligent service, digital operation and online management. Secondly, as a world cultural heritage, Liangzhu Ancient City Ruins Park should add an international language system to the smart tourism service system and improve the International Version (multilingual version) function of the online website, so as to improve the tourism efficiency and experience of international tourists. Thirdly, Liangzhu Ancient City Ruins Park should improve the intelligent ticketing, parking, security, mobile guide app and other systems, realize the intelligence of IT infrastructure and improve the intelligent level of serving tourists. At the same time, the smart tourism platform should realize the all-round monitoring of the scenic spot, send real-time notifications of various situations of Liangzhu Ancient City Ruins Park to the corresponding staff, carry out fault handling and emergency management, and improve the management efficiency and emergency capacity of the scenic spot.

5 Conclusion

Smart tourism is an important means to innovate the protection of cultural heritage in ruins parks and promote the integrated development of culture and tourism. As a world cultural heritage, Liangzhu Ancient City Ruins Park should vigorously promote the construction of smart tourism from the perspective of tourists' experience, technology and systems, and establish tourism ecosystem of ruins parks based on smart systems. Smart tourism has become an important force in the protection and inheritance of heritage culture. Through the development of smart tourism, Liangzhu Ancient City Ruins Park will built a multi-business intelligent system such as a smart management system for ruins park, a smart service system for tourists, and a smart marketing decision-making system, so as to accelerate the development of Liangzhu Ancient City Ruins Park into a high-level smart scenic spot.

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