

Successful Cases of Smart Tourism Construction on Analysis and Research -- Taking Hangzhou and Xiamen as Examples

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Abstract—With the development of the economy and society and the continuous deepening of Internet+, the tourism market continues to develop, and the requirements for tourist experience continue to increase. The competition between the tourism industry is no longer limited to the competition of hardware conditions such as tourism resources. Can it be through informatization and intelligence? Services improve tourist satisfaction. Platforms that integrate various advanced technologies are key tools for exhibitions in multiple tourist attractions. The level of smart tourism construction has also become one of the signs of urban modern development. This article is a series of research results of the Sanya City Smart Tourism Construction Research Project. The second article of the series focuses on the research on the domestic smart tourism construction excellent cities. Hangzhou and Xiamen are selected as examples. There is no comparison, but a summary of the relevant ones. The construction content and successful experience provide a useful reference for the research on the construction of smart tourism in Sanya.

Keywords—Tourism informatization; smart city; Smart tourism.

I. INTRODUCTION

Smart tourism is not only a new development direction in the field of tourism informatization, but also a new development concept of tourism towards modernization [1]. Since its rise, the construction and research of smart tourism are still in the stage of continuous progress and improvement. Compared with other international and domestic cities, Hainan's overall smart tourism construction is far from reaching the construction standard of core tourism cities. Under the background of the new policy of port construction in Hainan Free Trade Zone, as the core city of Hainan International Tourism Island and tourism as the key pillar

industry of Sanya, the construction of smart tourism is imperative. In view of this, this study compares and analyzes the successful cases of smart tourism construction in domestic excellent cities, selects Hangzhou and Xiamen as the research object, summarizes the relevant construction contents and successful experience, and provides a useful reference for the research of smart tourism construction in Sanya [2-3].

Hangzhou is the first batch of national smart city pilots in 2012, and Xiamen is the second batch of national smart city pilots, and is a typical coastal tourist city. Their research has a good demonstrative role and research significance, which is suitable for the construction of Sanya smart city. There is no question of comparison between cities.

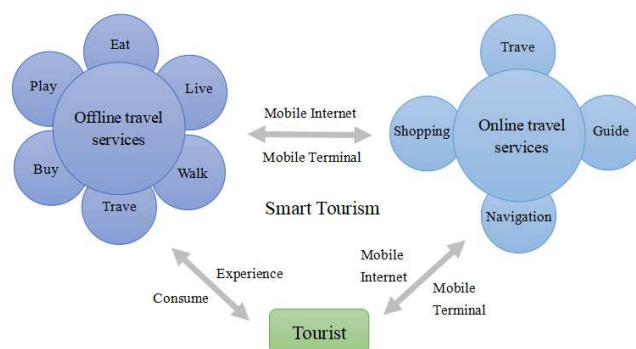


Fig. 1. Smart tourism structure chart

Smart city originated in the media field, which refers to the use of various information technologies or innovative concepts to connect and integrate urban systems and services, so as to improve the efficiency of resource utilization, optimize urban management and services, and improve the

quality of life of citizens. Gradually, in the process of urban development, make full use of emerging technologies such as Internet of things, Internet, cloud computing, high-performance computing and intelligent science in the five core areas of urban infrastructure, resources and environment, social people's livelihood, economic industry and municipal management [4-5]. Intelligently perceive, interconnect, handle and coordinate the relevant activities and needs of urban residents' life and work, enterprise operation and development and government functions. Smart city is the source power to promote the development of smart tourism industry.

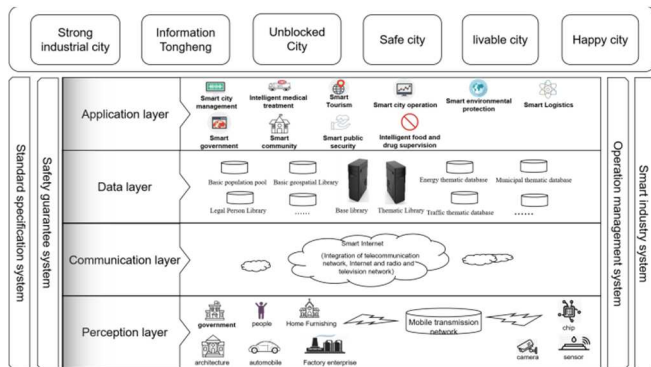


Fig. 2. Smart city structure

This paper is a series of research results of Sanya smart tourism construction research project. Based on the analysis of the basic data of Sanya smart tourism and urban construction and development in the early stage, this paper compares and analyzes the successful urban cases of smart tourism construction in domestic excellent cities, and selects Hangzhou and Xiamen as the research objects, summarize the relevant construction contents and successful experience, so as to provide a useful reference for the research of smart tourism construction in Sanya.

The first part of this paper introduces the concepts of smart tourism and smart city; The second part analyzes the success of the construction of smart city in Hangzhou, compares it with the construction of smart city in Sanya, and summarizes the experience; The third part analyzes the success of the construction of smart city in Xiamen, compares it with the construction of smart city in Sanya, and summarizes the experience; The last part is the conclusion.

II. ANALYSIS OF SUCCESSFUL CASES OF SMART TOURISM CONSTRUCTION IN HANGZHOU

A. Current situation of smart tourism construction in Hangzhou

Hangzhou was selected as the second batch of National Smart tourism pilot cities in 2012 and is also one of China's important e-commerce centers [6]. Compared with other traditional second tier cities, the level of intelligent construction is higher. Relying on high-tech industries such as the Internet and mature e-commerce platforms, it focuses on the development of information economy and digital economy by using big data, artificial intelligence, cloud computing and blockchain, and integrates with the cultural tourism industry to launch a series of intelligent tourism innovation projects [7].

In April 2016, Hangzhou and Alibaba cloud jointly created the concept of Hangzhou urban brain, creating a world precedent. In October of the same year, the construction was

officially launched at the Hangzhou Yunqi conference. At the end of 2017, Alibaba cloud et urban brain was selected as the national new generation AI open innovation platform. At present, the Hangzhou urban brain jointly built by the Hangzhou municipal government and Alibaba cloud has taken over 128 signal intersections, reducing the traffic time in the pilot area by 15.3%, shortening the arrival time of 120 ambulances by half, and initiating AI machine patrol, which is known as the "next moon landing plan" in the technical field.

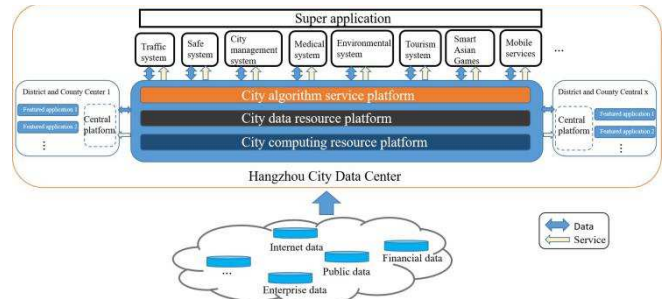


Fig. 3. Urban brain: "a gift from Hangzhou to the world" Alibaba cloud: boosting the intelligent upgrading of the city

In 2018, Hangzhou released the country's first urban data brain plan. Tourism is the main construction target and application field. According to the intelligent construction mentioned in several opinions of Hangzhou Municipal People's Government on implementing the global tourism development strategy and accelerating the construction of international important tourism and leisure centers, the construction of Intelligent Tourism is gradually carried out. In 2018, the total tourism revenue was 358.91 billion yuan, including domestic tourism revenue of 333.56 billion yuan, foreign exchange tourism revenue of 3.831 billion yuan, and the total number of tourists received was 184.034 million [8].

In 2019, the total tourism revenue was 400.5 billion yuan, with a year-on-year increase of more than 10%. The total number of tourists was 208137000, with a year-on-year increase of 13% [9]. In 2020, influenced by COVID-19, Hangzhou launched a cultural tourism promotion campaign to create a new consumption experience for smart Wen brigade. A large number of smart tourism application scenarios were launched in hotels and scenic spots, promoting non-contact services and consumption, so that the whole year's tourism industry in Hangzhou was restored to over 80% in 2019. The total number of tourists in the whole year was 176 million, and the total tourism revenue was 333 billion 500 million yuan [10].

According to the requirements of the overall construction plan of "smart Hangzhou" (2014-2020) and the guidance of the code for the construction of smart scenic spots in Hangzhou, the code for the construction of smart hotels in Hangzhou, the code for the construction of smart travel agencies in Hangzhou and the code for the construction of smart villages in Hangzhou, the construction of smart tourism in Hangzhou has achieved initial results, mainly reflected in smart services Smart management and smart marketing [11].

1) Construction of smart tourism services

In terms of smart tourism services, Hangzhou has launched a series of smart public service system construction and developed a variety of smart tourism public service application projects. Establish a tourism website group in Hangzhou, including tourism government affairs, tourism

consulting, tourism foreign language network, etc., operate a characteristic home stay resource website, and launch the "West Lake Tour Network" to provide convenient information query and reservation services for tourists. To promote mobile Internet terminals, the official account of the WeChat public "Hangzhou public travel" is known as "travel artifact" and can be inquired into tourist routes, real-time stations, subway lines, water buses and highways information. Xiaoshan International Airport has opened an official wechat [12].

Tourists can check in through wechat and board with QR code. International tourists can brush their passports, recognize their fingerprints and faces, and pass customs in 20 seconds. The "Hangzhou civilized tourism service center" is also set up in the airport, with all-weather consulting services for inbound tourists in seven languages such as English, French and Spain and other small languages. The parking lot is equipped with intelligent car search system and senseless payment. In 2016, Hangzhou Municipal People's government developed the "Hangzhou City brain" app, in which the "one hour more tour" section includes intelligent service functions such as tourist attraction reservation, tourist attraction passenger flow query, voice explanation and digital tourism special line, providing tourists with accurate tourism information.

In 2020, influenced by COVID-19, the intelligent service system of Hangzhou Qiandao Lake scenic spot was transformed into intelligent service system. Intelligent control epidemic prevention ensured the convenience and safety of tourists' travel. It provided "non-contact" comprehensive services, and upgraded intelligent functions such as online appointment, time-sharing quick scan code or face painting, electronic voice guide, first departure and post payment, and so on. Meet the needs of tourists for fast and safe travel.

2) Construction of smart Tourism Management

In terms of smart tourism management, Hangzhou has built a smart management platform and established a number of smart tourism application management projects. Hangzhou makes use of the big data platform to carry out early warning management, diversion guidance during the event and accurate marketing after the event for the tourism market. Through the new generation of information technology, Hangzhou transforms the traditional passive handling of the tourism industry supervision form into the whole process real-time supervision. For example, the traffic command center can master all kinds of traffic information data, convert traffic monitoring videos everywhere in real time on the screen, facilitate daily traffic management and emergency command, and help tourists solve travel problems anytime and anywhere through a 24-hour service hotline.

As of July 2019, Hangzhou has completed the construction of intelligent transportation with the help of big data, with a total passenger transportation of 22.3249 million. Hangzhou also carries out smart tourism construction for scenic spots, hotels and travel agencies through industrial guidance and technical guidance to jointly build an information management platform.

By building a 1 + 3 + 3 system, that is, a tourism big data platform, three systems of data collection, analysis and application, and three application services of government decision-making, enterprise operation and public service, Hangzhou improves the management of tourism enterprises by government departments, Improve the operation of tourism

enterprises and help tourism consumers get a better consumer service experience.

3) Construction of smart tourism marketing

In terms of smart tourism marketing, Hangzhou has built diversified network marketing channels, deeply promoted "taste Hangzhou" and "experience Hangzhou", so as to optimize operation and precision marketing. Hangzhou innovated overseas marketing in the international tourism market, strengthened new media marketing in the domestic market, and launched 6 Hangzhou Tourism VR publicity films to show Hangzhou's exquisite and beautiful comprehensive city brand and characteristic tourism resources with rich cultural heritage.

"Hangzhou culture, broadcasting and tourism network" and "e-Portal website of Hangzhou culture, radio, television and Tourism Administration" as portals to promote Hangzhou tourism and tourism government affairs, just show the intelligent marketing of Hangzhou, with concise and clear pages, unique characteristics, rich content and complete functions.

Through the official website, tourists can not only learn about local culture, customs and history, but also a series of tourism information, tourism strategies and preferential information about food, accommodation, travel, sightseeing, shopping and entertainment, and support online consultation and purchase. The website is also associated with practical tourism tools, including culture and broadcasting tourism app, toilet finding applet, official microblog Wechat and travel guide are available for tourists to choose from. It not only has a good publicity and marketing effect, but also enables domestic and foreign tourists to really travel as they say, It is really a treasure for tourists to travel, a stage for tourism enterprises to display, an assistant for government department management, and a bridge for government enterprise exchange and cooperation.

4) Construction of West Lake smart scenic spot in Hangzhou

In the "national day tourism insight" released by Xinhuanet's think guest joint personal promotion big data in 2020, the number of visitors to Hangzhou West Lake scenic spot ranked first. The huge number of visitors every year tests the reception and management ability of Hangzhou West Lake scenic spot. The West Lake scenic spot attaches great importance to the intelligent construction of the scenic spot and has made many achievements in the construction of the intelligent scenic spot.

In terms of tourism information consulting services, the scenic spot has established its own official website, microblog and wechat public account to release scenic spot information for tourists to query. It has cooperated with Gaode map to launch intelligent scenic spot map navigation and query functions. Scenic spots and toilets in the scenic spot can be queried at any time. At the same time, multiple consultation points have been set up in the scenic spot, Most of the consultation points are located near public transport stations, and the dark green appearance of the consultation points is very eye-catching.

There are 15 smart West Lake service kiosks in the scenic area, and self-service query equipment is set in the kiosk. Tourists can query scenic spots, hotels, catering and other information according to their own needs. At the same time,

the kiosk is equipped with automatic selling equipment. Tourists can complete the purchase through online payment to provide convenient services for tourists.

In terms of scenic spot management, online payment is realized for catering, cruise and shopping in the scenic spot, which is convenient for management and supervision. Sightseeing cars and bicycles in the scenic area can be rented through mobile terminals. There are bus, subway and taxi points around the scenic spot to realize traffic connection. Most scenic spots in the scenic area are covered by WiFi, and public telephones and telephone alarm points are set up to provide consultation, complaint and rescue services.

Infrared stream of people monitoring equipment is implemented in the scenic spot to detect the real-time stream of people in the scenic spot. Due to the large number of tourists in the West Lake scenic spot, the scenic spot and relevant departments such as public security, traffic police and urban management have established different levels of stream of people control. According to the size of tourist flow, the relevant parts provide corresponding control measures and police force to ensure the safety of tourists and the normal operation of the scenic spot.

After the effective control of "New Coronavirus pneumonia" in 2020, West Lake scenic area took the lead in developing local tourists by registering identity information, checking big data and health codes, and then liberalized tourists from all over the country. After the increasing flow of people, the scenic spot has adopted measures such as scenic spot monitoring and diversion into the park to achieve the operation of the scenic spot while doing a good job in epidemic prevention and control.

B. Experience and Enlightenment of smart tourism construction in Hangzhou

Tourism informatization, intelligence and internationalization have been effectively promoted in Hangzhou. As one of the eight ancient capitals of China, Hangzhou has rich historical and cultural tourism resources. It creates a "digital smart Hangzhou" through digital tourism. The government cooperates with tourism enterprises to integrate tourism resources, guarantee tourism services, and build a tourism data management platform through smart tourism construction. The precise promotion of smart marketing and other successful measures can provide a lot of enlightenment for the construction of smart tourism in Sanya. For example, in the context of epidemic prevention and control, it is worth learning to build a contactless smart scenic spot and upgrade the smart service system in Qiandao Lake, Hangzhou.

In addition, for example, smart marketing through microblog and other network publicity has also been very successful, updated in time and received high attention from fans. Both Sanya and Hangzhou have rich tourism resources. In some aspects, the conditions for tourism development in Sanya are slightly better than that in Hangzhou, but the construction of smart tourism lags behind. The study of the successful case of smart tourism construction in Hangzhou has a certain reference value for Sanya on how to develop smart tourism construction with its own characteristics and market attraction.

III. ANALYSIS OF SUCCESSFUL CASES OF SMART TOURISM CONSTRUCTION IN XIAMEN

A. Current situation of smart tourism construction in Xiamen

Xiamen is one of the first batch of smart tourism pilot cities determined by the National Tourism Administration. In the conference on building a smart tourism city in 2012, it was pointed out that building an international modern, convenient, safe and humanized smart tourism platform is the primary task of tourism development in Xiamen. In 2014, ten smart tourism city construction projects, such as "smart scenic spot", were launched in succession. In 2015, the "Intelligent Tourism Summit Forum" was successfully held to explore the new development mode of "Internet plus tourism".

In 2016, the telecom city signed the "framework for cooperation in smart Tourism cities" to strengthen the of tourism informatization [13]. In 2018, it won the "comprehensive Award for smart urban governance in China", and the citizen card app with online service marketing function of tourism sector was shortlisted as the "top 30 best practice achievements of the first digital China Summit". In 2019, it received 100.1287 million domestic and foreign tourists, a year-on-year increase of 12.5%, and the total tourism revenue was 165.59 billion yuan, a year-on-year increase of 18.1%. In 2020, affected by the epidemic, we launched a multi-dimensional smart tourism platform that can provide reservation tours, peak staggering tours and so on, so as to realize the recovery of the tourism consumption market.

Encourage the establishment of software information platform enterprises relying on the development of big data, mobile Internet, Internet of things, cloud computing and other fields, deeply integrate artificial intelligence with economic and social development, and promote the agglomeration and development of generation service industry dominated by tourism. The specific construction of smart tourism in Xiamen can be analyzed from the following aspects.

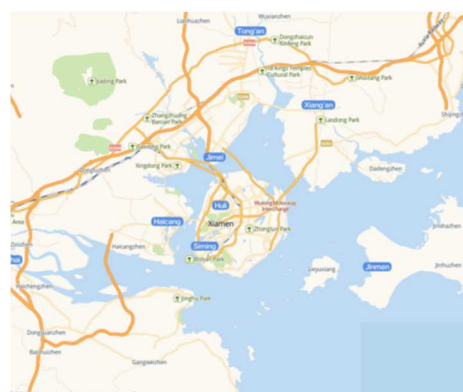


Fig. 4. Xiamen City Map

1) Construction of smart tourism services

Set up Xiamen Tourism Distribution Service Center, build a smart tourism distribution service system, build an integrated platform for information service, management and marketing, and connect with tourism service institutions in various regions to integrate marketing. Provide tourists with public services such as online and offline synchronous tourism consultation and reservation, personalized customized itinerary, complaint handling and marketing publicity, lay out the city's transportation network to enable tourists to travel without obstacles, and timely warn, command and rescue

weather and accidents through the tourism information release platform.

Design and develop the annual tourism card system, assist the scenic spot to build a smart scenic spot management system, and win the winner in the digital China innovation competition in April 2020. As of August 2020, Xiamen Tourism Distribution Service Center has provided tourism services for a total of 2.053 million people, with tourist satisfaction as high as 99.8% [14].

At the same time, Xiamen has also built a smart scenic spot service system, especially in Gulangyu and Hulishan fort, including free WiFi, self-service voice guidance and explanation, so as to optimize the scenic spot management and operation mode. Start smart tourism construction projects such as tourism big data, tourist sampling analysis, integrity tourism management system, smart hotel and smart Travel Agency.

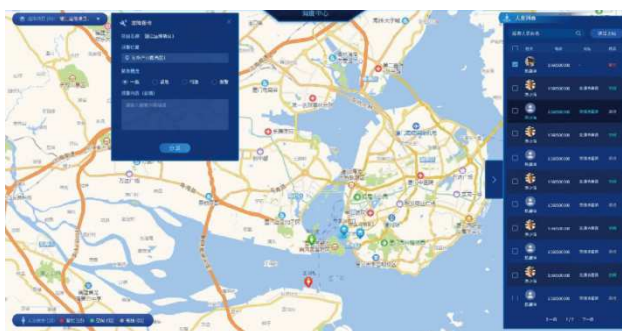


Fig. 5. Smart Xiamen special personnel dispatching control system

2) Construction of smart tourism marketing

Xiamen actively carries out the smart marketing project of new media, innovates marketing methods and improves the level of internationalization. Launch urban tourism promotional films with Xiamen characteristics in high-speed rail, bullet train stations, airports and other tourism public places through new media, carry out national tour promotion activities, and jointly promote them with surrounding tourism cities and counties. Through the media Internet, we recruit high-quality tourism route travel experience engineers from all over the world, collect more than 100 high-quality tourism routes and improve tourism quality. Xiamen tourism marketing promotion and sharing are carried out globally through foreign mobile social networks such as Facebook, Twitter, YouTube and Instagram and microblog social network platforms.

The number of fans and browsing attention are growing, and the comprehensive ranking of online tourism brands is rising. Comprehensively upgrade the official tourism website and official WeChat applet. Xiamen tourism network can provide tourists with comprehensive tourism consultation on food, accommodation, travel, purchase and entertainment. Through big data statistical analysis, Lvji Network provides information services and drainage for the whole process of tourists before, during and after tourism, so as to realize the integration of purchase and B2B2C marketing. It can be connected with the tourism resource data and service function system of various domestic platforms to realize the intelligent distribution function of tourism products, facilitate tourists' in-depth tour and promote tourism consumption.

3) Construction of smart Tourism Talent Training

According to the data released by Xiamen tourism authorities, backpackers and self-help tourists account for more than half of the current composition of tourists in Xiamen, which means that tourists have more autonomy in the choice of tourism products. Therefore, changes and innovations should be made in the cultivation of tourism talents. We should pay attention to the cultivation of professional and technical talents, professional managers and compound talents, and pay attention to the orderly transmission of the formation of intelligent tourism talent team.

Government departments can cooperate with tourism enterprises and local universities to explore the training mode of smart tourism talents and jointly cultivate professional and technical talents, professional management talents and compound talents proficient in information technology and tourism business. For tourism enterprises, we should strengthen the training of intelligent tourism knowledge and skills for senior managers [15].

In 2014, Xiamen Tourism Bureau and the Department of hotel management of Xiamen University held a new idea activity for talent training to start the smart talent training plan. In 2015, Xiamen Tourism Administration, together with overseas Chinese University and Renwoyou (Xiamen) Technology Co., Ltd., established an industry university research base to jointly establish a smart Tourism Research Institute, cultivate smart tourism senior talents based on big data mining, develop smart tourism products, incubate innovative e-commerce enterprises, pay attention to tourism safety early warning and tourism evaluation and acceptance, and innovate scenic spots, transportation Travel agencies and other tourism ecological chains, and launched the 720° 3D panoramic system of Xiamen online for free use by citizens and tourists.

In 2020, the Xiamen municipal Party committee issued the "talent boarding the heron" plan. The government strongly supported the provision of financial subsidy policies related to smart tourism R & D for tourism enterprises, attracted well-known universities, scientific research institutes and enterprises to set up scientific research centers for smart tourism applications, introduced smart scientific research talents and entrepreneurial talents around the tourism industry chain, and established a talent security system, build a smart tourism talent training system with core competitiveness and innovation [16].

B. Experience and Enlightenment of smart tourism construction in Xiamen

The inspiration of this study is that the construction of intelligent tourism should not only strengthen the construction of basic information, provide wireless Wi-Fi for tourists, improve the information portal, create intelligent scenic spots, provide intelligent tours and smart ticketing services for visitors, build online service management platform, innovate Internet plus marketing ideas, and also emphasize the cultivation of talents. Smart tourism needs big data mining talents who can master the mining, analysis and application of tourism big data. The government, schools and enterprises should jointly practice, deeply promote the government industry university research cooperation mechanism and cultivate smart tourism talents.

Tourism is an extension of people's lifestyle, and tourism, as a leading industry in the service industry, will inevitably change due to revolutionary changes in information technology. In addition, with the development of production and life, new tourism methods such as online tourism, cruise and yacht tourism, RV tourism, and self-driving tourism are developing rapidly. How the tourism industry can meet these emerging needs is also inseparable from its own modernization. Technically speaking, the most important thing here is to realize "smart tourism".

Xiamen is one of the 18 cities selected as one of the first batch of "National Smart Tourism Pilot Cities", and Hangzhou is one of 15 cities selected as one of the second batch of "National Smart Tourism Pilot Cities". Two cities have special representatives. They have a good demonstration effect in smart tourism, and they are excellent cases of learning in the construction of smart tourism in Sanya [17].

IV. CONCLUSION

Compared with other domestic cities, Hainan's overall smart tourism construction is far from reaching the construction standard of core tourism cities. Under the background of the new policy of port construction in Hainan Free Trade Zone, as the core city of Hainan International Tourism Island and tourism as the key pillar industry of Sanya, the construction of smart tourism is imperative.

By analyzing the successful urban cases of domestic smart tourism construction, this paper summarizes the successful factors and uses them for reference. Through comparison and comprehensive thinking, we can find the gap with our own smart tourism construction. At the same time, combined with the characteristics of Sanya, we can learn from each other and explore the path of smart tourism construction in line with the actual situation of Sanya. This is the purpose of this paper to study the construction of smart tourism in Hangzhou and Xiamen.

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