Design and Implementation of Quanzhou's New Intelligent Tourism Management Platform

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Abstract. In order to make Quanzhou's tourism industry more intelligent and informatized, and to respond to the country's policies call for the new industry model of "Internet + Tourism", a new type of smart tourism management platform in Quanzhou came into being. The article first analyzes the development status of Quanzhou tourism, and then analyzes and introduces the platform's overall design goals, functional requirements, tourist attractions information, hotel information and other main functional modules in detail, and finally completes the design and implementation of Quanzhou's smart tourism management platform.

Keywords: Quanzhou, Smart tourism, Management platform

1. Introduction
With the rapid development of the current computer Internet technology, the computer technology has been more and more widely used in various industries, and network technology has penetrated into the current social environment. In the past development process of the tourism industry, relevant tourism information was mainly obtained through television, newspapers or travel agencies. In the current development process, the rapid development of the mobile Internet 5G network has promoted the production of various information systems. Also with the rapid development of the current tourism industry, the application of tourism management platforms has become more and more extensive. Design and development of the management platform can effectively improve the development level of tourism.

In the current economic development process and various policies, the tourism industry in Quanzhou has developed extremely rapidly. In the management platform development process, it also fully utilizes large-scale tourism management platforms such as Ctrip and Qunar. However, according to the current development of the tourism industry, the tourism industry occupies a relatively small share in the entire market. The current Quanzhou tourism management platform still lacks a complete database of its own, and the current database also has a large dependency. Another problem of database is poor performance and controllability. Therefore, it is of great significance and value to design and build a new smart tourism management platform that conforms to the characteristics of Quanzhou by using network management technology.
2. Present Research

Quanzhou, the starting point of China's ancient Maritime Silk Road, the first batch of historical and cultural cities, the first "world multicultural exhibition center", is the ancient "Oriental largest port", known as the "World Religious Museum". The Eastern branch venue of the 2016 CCTV Spring Festival Gala and the Lantern Festival Gala were both located in Quanzhou. At the ninth BRICS summit in 2017, the live footage was transferred to Quanzhou after the speech by President Xi Jinping. The perfect interpretation of various maritime silk culture, folk culture, intangible cultural heritage and other elements in the 2017 BRIC Summit Art Gala and the 4th Maritime Silk Road International Art Festival in 2019 once again let the world focus on Quanzhou and let the world know more Quanzhou's diverse cultures. Both historical and current, provide rich content elements and opportunities for the development of Quanzhou's tourism industry.

Quanzhou has eighteen famous scenic spots, 824 key cultural relics protection units at all levels, and rich tourism resources. However, in the traditional way of tourism, tourists have to wait in line to purchase tickets for scenic spots, do not know where the hotel is, and the traffic lines are very crowded. Tourists have a little knowledge of the tourist facilities and scenic resources in Quanzhou, which is in a state of information asymmetry; at the same time, they cannot make journey planning reasonably. There are problems such as the lack of close cooperation between supervision departments, enterprises, businesses, scenic spots and other subjects, and the lack of positioning in related products.

With the improvement and development of Quanzhou scenic spots and the continuous improvement of publicity, more and more Chinese and foreign tourists come to Quanzhou for vacations. According to statistics, the city received a total of 4,431,300 tourists during the National Day and Mid-Autumn Festival in 2020, a year-on-year increase of 10.6%, and achieved tourism revenue of 4.247 billion yuan. With the rapid increase in tourists, although the Quanzhou Ancient City Office and the Municipal Cultural Tourism Bureau have successively launched six ancient city explainer training courses since 2017, and trained 271 ancient city explainers, they still cannot provide standard and consistent explanations for every tourist. Services, explainers are still in short supply. The gradual increase in passenger flow also puts a lot of pressure on management, operation and safety. Therefore, the application of advanced IT technology and the development and the design of a new smart tourism management platform that conforms to Quanzhou's characteristics have positive significance for Quanzhou's tourism industry, related enterprises or individuals, and have great practical value.

3. Overall Platform Design

3.1 Overall Design Goals

First, analyze from the perspective of the smart tourism management platform. The entire platform needs to be positioned relatively clearly, based on the tourism development of the entire city, and the overall planning is implemented in an orderly manner to ensure a good implementation effect in the process of operation, so as to ensure the effectiveness and objectivity of the entire platform.

From the perspective of the functional planning of the entire platform and the division of modules, the platform must have a relatively complete set of functions that meet the needs of current use, as well as expandable space in future development, so as to ensure that the entire platform can keep up with the development pace of the times.

In view of the current platform security construction goals, the platform must have high security, and the confidentiality of all customer information must be met. The current security intensity needs to be carried on and carried out under certain premises, and ultimately to ensure the entire network is safe and effective.

3.2 Platform Functional Requirement Analysis

The current tourism industry is very competitive and has become an important part of the local economy. A developed tourism industry can greatly enhance regional consumption and promote
economic growth. In order to enhance the competitiveness of Quanzhou's local tourism industry, it is very important to strengthen tourism promotion and provide various conveniences for tourists. As a tourism information management platform, this platform must provide tourists with intelligent, accurate, safe and fast tourism information services to increase the attractiveness of tourism in the region.

3.3 Platform Function Module Design

The functions of this platform are mainly divided into user information management, tourism information management, hotel information management, bus route management, booking information management and message information management, as shown in Figure 1. Each module is divided into two parts: front-end and back-end management. The front-end mainly provides users with information and services, so that users can quickly obtain travel information, hotel information, bus routes and other related information, and provide related booking services, so that users can plan the travel itinerary in advance according to their own needs, and realize one-stop completion from travel, sightseeing to accommodation, which improves the users’ experience. The back-end is mainly to update and maintain travel information, and process related orders.

- **User information management**
- **Tourism information management**
- **Hotel Information management**
- **Booking information management**
- **Bus route management**
- **Message management**

![Figure 1 Platform function diagram](image-url)

3.3 Platform Function Module Design

The development and design of the platform module mainly start from the following aspects: First, travel: provide driving routes, bus routes and other traffic information of Quanzhou tourist attractions; second, stay: provide hotel information, which can update information in real time for the convenience of travelers to choose and book accommodation. The third is tourism: provide information on various scenic spots, highlight scenic features, and provide services such as ticket booking. The platform will establish a complete, scientific, convenient, and accurate operating mechanism to effectively and reasonably allocate all resources in the travel process. The entire platform can basically covered the issues that tourists care about and the various needs that may be encountered during the travel process. The specific functional modules are as follows:

1. The user management module is mainly for the management of user information and user rights. There are usually two categories of users. One is the back-end administrator responsible for the management and maintenance of back-end information, and the other is for visitors and member users. By registering as a member user, tourists can enjoy a full range of tourism information and services provided by the platform.

2. Tourism information management module, in order to enable tourists to know relevant tourism information more quickly and have a clearer plan before traveling, during the operation of the platform, it is necessary to introduce scenic spots clearly. The scenic spot information management function, such as the reservation processing of scenic spot tickets, add, delete, modify, and query related scenic spot information.

3. The hotel information management module can maintain relevant hotel information, and also
provide a set of information query functions for effectively understanding the hotel itself, which is convenient for querying hotel introduction and picture display, hotel bed real-time information, hotel bus routes, etc. The current platform also must have relatively strong query management capabilities that adapt to complex structure information, and meet the information management functions of the hotel.

(4) Bus route information management module. Every year, many foreign tourists travel to Quanzhou on business. They do not understand Quanzhou's bus route system. This requires the platform to provide related bus route information query functions to meet tourists’ query needs, at the same time, it must also meet the needs of the administrator to add, delete, modify the bus route information management functions.

(5) Booking information management module, the platform will generate a lot of ticket information during the process of operation, and it needs to provide corresponding booking information management functions to meet the needs of administrators and member users. Managers can query information according to the current ticketing system, and modify and delete the query results, or add new ticketing information. After logging in to the platform, member users can view the scenic spot information according to their actual travel itinerary needs, and finally book tickets according to the actual itinerary.

(6) The message management module is mainly used for communication between tourists, tourists and administrators. Tourists can post their travel needs, travel feelings or suggestions through the platform, and can also query and refer to other tourists’ suggestions and evaluations. The platform construct an important module for tourists to exchange experiences. The administrator can manage the message information of tourists through the back-end, and get relevant information to improve tourism services.

4. Realization of Smart Tourism Management Platform

By analyzing the overall design goals, functional requirements and functional module designed of the platform, a new smart tourism management platform in Quanzhou was designed. The color selection of the entire platform interface comes from the red of the red bricks and red tiles of the ancient house in Quanzhou, and the exquisite cultural relics preservation unit photos are used as the background, so that users can comprehend the multicultural characteristics of Quanzhou. Browsing platform prompted members to make up their minds to travel in Quanzhou.

4.1 Platform Home Page Interface

The homepage of the platform is the first page displayed when users browse the front-end of the platform. It mainly displays the content of member login, my favorite attractions, about Quanzhou, search, and travel information, as shown in Figure 2. In order to obtain more and more comprehensive high-quality services, tourists must register as a platform member and enter an accurate user name, password, and verification code to log in to the platform before they can make reservations and leave messages. Users can bookmark related attractions that they are interested in while browsing the platform, and they will be displayed in “My Favorite Attractions” after the collection. Through "About Quanzhou", a systematic introduction is made to Quanzhou, so that tourists who have not traveled to Quanzhou have a general understanding of Quanzhou. The search section allows users to search and view travel information by entering relevant keywords according to their needs. Quanzhou's recent travel information, activities, events and other information will be displayed in the travel information, so that tourists can have a prior understanding of the travel destination.
Figure 2 Main interface of the platform homepage

Figure 3 Main interface of tourist attraction information
4.2 Platform Back-End Management
In the management and maintenance of the platform, administrators log in to the back-end management terminal to manage and maintain the platform information. Take the tourist attraction information management as an example. The main attraction information displayed at the front desk includes: display profiles and photos of popular attractions, the "Hot Attractions" module of the scenic spot ranking information, the user's favorite scenic spots column and the summary column of related scenic spots cities, click on the specific city name to jump to the scenic spot interface involved in this city, as shown in the figure 3. The back-end is mainly for the administrator to add, delete and modify information such as the name of the attraction, ticket price, opening hours, traffic information, and introduction of the attraction, and to manage and maintain the user's reservation order, as shown in Figure 4.

Figure 4 Add scenic spot information in the background

5. Conclusion
On April 18, China has finalized its nomination to the World Heritage List 2020 as “Quanzhou: Emporium of the World in Song-Yuan China”, which has promoted the development of tourism in Quanzhou. And the rapid increase in the amount of tourist information calls for the intelligent tourism management platforms. The new requirements of information integration, combined with the current development of Quanzhou tourism, it is very important to continuously optimize and upgrade the intelligence and performance of the management platform, which will greatly promote the rational allocation of various tourism resources in Quanzhou, and attract more tourists. The platform can help tourists make journey planning more reasonable and convenient. It has very important practical significance for the tourism industry and social development.

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