Research on Design of Tourist Database for Smart Tourism

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Abstract: Improving tourists' satisfaction with tourism services and recommending personalized, high-quality, and efficient tourist information to tourists has become the focus of developing smart tourism. This requires strengthening the design of the tourist database, promoting the effective combination of science and technology and the tourism industry, and driving tourism innovation and development with science and technology. This paper analyzes the structure of the tourist database based on the needs of the tourist database design under smart tourism, clarifies the key technologies for database design implementation, and conducts experimental verification to confirm that the design is effective.

1. Introduction

With the development and promotion of scientific and technological innovations such as information technology, computer network technology, geographic information technology, and cloud computing, smart tourism has been further developed. With the help of terminal devices, it can provide targeted services according to the actual needs of tourists and enhance the tourist experience. Sex, satisfaction. In order to ensure the effective achievement of the development goals of smart tourism, it is necessary to rely on strong database support to do a good job of classification of tourist travel data and lay a good foundation for accurate tourist information.

2. Demand Analysis of Tourist Database Design Under Smart Tourism

From the analysis of the concept of "smart tourism", it can be known that smart tourism is also called "smart tourism". It is supported by advanced science and technology (including information technology, computer network technology, geographic information system, Internet of Things technology, cloud computing, etc.). With terminal equipment as the carrier, it can perceive, acquire, organize, analyze and utilize tourism and related information (including tourism resources, tourists, tourism activities, etc.) to meet the personalized tourism needs of tourists, and finally realize tourism management, tourism services, The improvement of the quality and efficiency of tourism marketing and other tasks will promote the stable, healthy and sustainable competitive development of the tourism industry. Therefore, the key to the development of smart tourism is to improve information services, that is, to perceive the personalized needs of tourists for travel information (living, traveling, eating, traveling, entertainment, shopping, etc.) and provide them with accurate information services[1].

Therefore, when constructing a tourism database for smart tourism, the database should meet the following basic functional requirements:

(1) Basic information perception and recording of tourists. Including name, gender, age, occupation, education, financial situation, contact information, etc.

(2) Perception and mining of tourist preference information. Including attraction type preferences, dining type preferences, hotel type preferences, transportation type preferences, entertainment type preferences, shopping type preferences, etc. (3) Perception and utilization of tourist location trajectory information. It can help tourists to formulate emergence plans in time and space, enhance tourist experience, and reduce congestion and traffic jams in scenic spots.

(4) Tourists interact with smart tourism terminals. According to the trajectories left by tourists in the system, it can explore the preferences of tourists and tap the tourist needs of tourists, so as to provide tourists with accurate recommendation services. At the same time, based on system logs, travel experience, satisfaction evaluation, etc., it provides a basis for tourism management adjustment and provides a reference for other tourists' travel planning.

Based on the basic functional requirements of the tourist database under smart tourism, a user model as shown in Figure 1 was constructed.

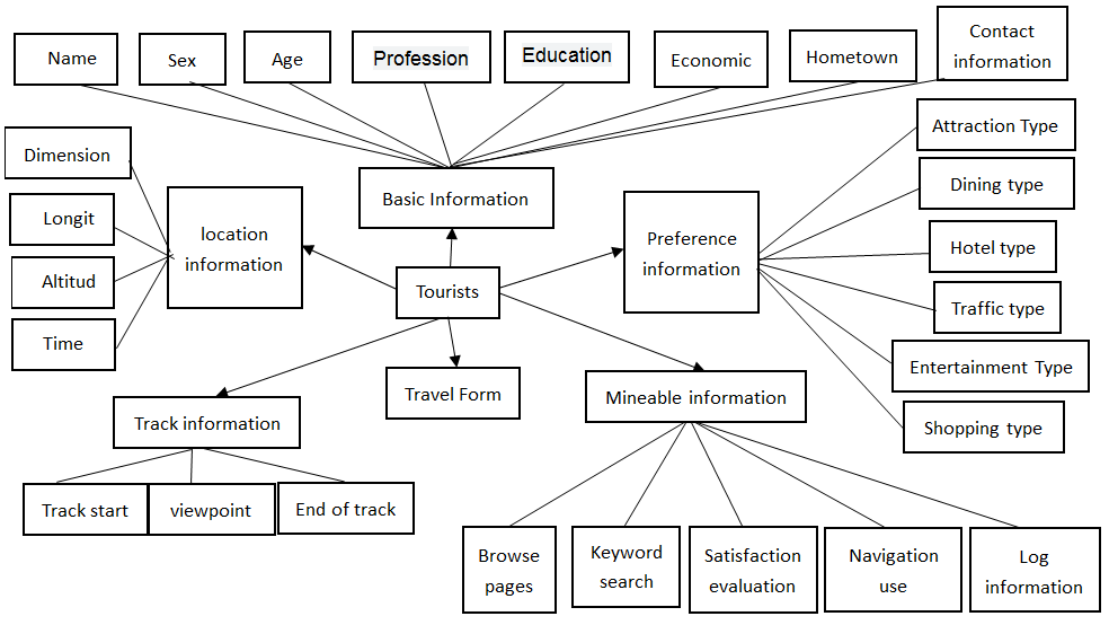

Figure1. Visitor database user model.

3. Structural Analysis of Tourist Database Design Under Smart Tourism

3.1 Structure Design of Tourist Database

Based on the tourist database user model, the tourist database structure design for smart tourism is designed to ensure the scientificity, effectiveness and practicability of the tourist database design. In this process, we first need to design the basic functional requirements of the tourist database, clarify the common characteristics of the tourist data, summarize them, and form a database conceptual model. Taking the basic information model of tourists as an example, the main contents involved are "visitor ID", "user name", "system login password", "visitor gender", "visitor age", etc. [2]. Taking the tourist position and trajectory information conceptual model as an example, due to the relatively large number of tourists in China and the large number of trajectory points, in order to improve the database data storage capacity and save storage space, the conceptual model is determined as shown in Figure 2.

Secondly, the designed conceptual model should be transformed into a logical model supporting a relational database to form a table of basic information for tourists, a data table of tourist location trajectories, etc. and clarify the hierarchical relationship between the tables.

Finally, the database structure is determined as "relational-object data structure", and the physical model of the visitor database is obtained through the design of table fields, attributes, views, and primary keys.

Taking the basic information of tourists as an example, the primary key of the basic information table of tourists is "Visitor ID" (field name: UserID; type: Number; length: 12);

The "guest username" must be unique (field name: UserName; type: Varchar2; length: 12);

The field name of "Passenger Password" is "Pass Word", the type is "Varchar2", and the length is "16";

The field name of "Occupation" is "Job", the type is "Varchar2", and the length is "10"; The field name of "Education" is "Education", the type is "Varchar2", and the length is "10";

The field name of "E-mail" is "E-mail", the type is "Varchar2", and the length is "30";

The field name for "Age" is "Age", the type is "Number", and the length is "3";

The field name of "Phone Number" is "Phone", the type is "Number", and the length is "11";

The field name for "Budget" is "Budget", the type is "Number", and the length is "11";

The field name for "Gender" is "Sex", the type is "Char", and the length is "2".

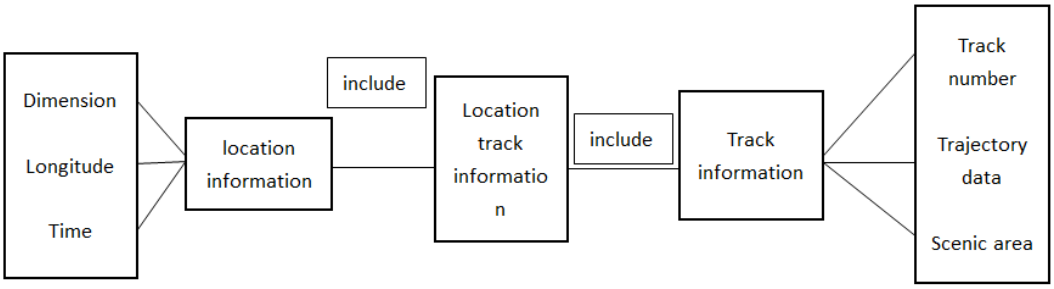

Figure 2. Conceptual model of position trajectory.

3.2 Database Structure Design of Points of Interest

In the process of designing a smart tourism system, in order to enrich the functions of the smart tourism system and improve the quality and efficiency of smart tourism services, a Point of Interest (POI) database is required. The traditional POI database based on smart city construction has too many types of points of interest and lacks practicality in smart tourism. In this regard, we can design a database of points of interest for smart tourism based on tourist preference information. In combination with the tourist database, it meets the functional requirements of smart tourism system design, and realizes intelligent tour guides and personalized and diversified active services. In the design of this tourist database, the data of scenic spots are divided into "attractions" (including natural landscapes, cultural landscapes, historical sites, guide services, etc.), "catering" (including western food, Chinese food, fast food, etc.), and "shopping" ((Including supermarket shopping, mall shopping, convenience store shopping, tourist souvenir purchase, etc.), "accommodation" (including guest houses, convenient hotels, hotels, etc.), "entertainment" (including playgrounds, sports fields, exhibition halls, etc.), "transportation" (Bicycle sheds, bus stations, private car parking lots, sightseeing stations, etc.), "Scenic Area Public Services" (ticket windows, information desks, management offices, public toilets, etc.), "Others" (including hospitals, drug stores, etc.), etc. Type to meet the needs of tourism for scenic information services.

4. Technical Analysis of Tourist Database Design under Smart Tourism

In the process of designing the prototype system, in order to ensure the scientific realization of the design concept of the visitor database and promote the effective use of the role of the visitor database, it needs to be supported by effective technology.

4.1 Key Technologies

As far as this design is concerned, the ORACE database management system is selected for database system development. The ORACE database management system is currently a widely used relational database management system. It has strong distributed processing capabilities and can scientifically process and store text objects and binary objects [3]. At the same time, the data management functions of the ORACE database management system are relatively complete, which can meet the needs of large-scale and long-term storage of data while ensuring data security, and improve the ability of tourists to store and share data. In addition, the ORACE database management system is extensible, which lays a foundation for the improvement and improvement of the functions of the tourist database to a certain extent.

In the process of database application development, the open platform is determined as Microsoft Visual Studio 2018; the programming language is C ++ (The C ++ Programming Language / c plus plus), which can implement object-oriented programming and process-based programming, practicality Strong, large-scale program programming with high efficiency and quality), supplemented by Java Script (literally interpreted scripting language); ORACE database communication uses OCCI (although it is responsible for ADO technology and ODBC technology, but it runs fast and can be used for Oracle The objects in the database can be manipulated arbitrarily, and advanced message management queues are implemented to achieve diversified connection pool management and program measures processing functions.) The database front and back ends are developed using CESIUNM software and ASP.NET technology respectively [4].

4.2 Module Function Implementation

The prototype system is mainly composed of "data management module", "user registration module", "POI online acquisition module", and "travel web service module". The "data management module" is mainly composed of a menu bar (displaying the basic functions of the database management software), a data table window (located in the central area of the database management software, used for data viewing, data information bar data processing, etc.), operations The message bar (operation information display), data information bar (data detailed information display), data organization data (significant data classification, organization data display) and other components [5]. The "user registration module" is used for tourists to set basic information and preference information. Including user name settings, password settings, mailbox settings, date of birth settings, education settings, career settings, travel options, travel budget settings, attraction type preferences, entertainment type preferences, dining type preferences, hotel type preferences, etc. "POI Online Collection Module" meets the needs of POI data collection, and the collection forms are mainly on-site data collection and network data collection. The "Tourism Web Service Module" is used to meet the needs of tourist user information registration, account login, travel information query, and point of interest data recommendation. Generally, after completing the system registration, users can log in to the system through the Web interface to complete data upload, query, change, and delete operations. The system can make targeted recommendations for travel information based on tourists' interests and preferences.

5. Experimental Analysis of Tourist Database Design Under Smart Tourism

The experimental scene of the tourist database is determined as "Dujiangyan Scenic Spot in Sichuan". During the experiment, new technology was used to collect scenic area data, including scenic area data, scenic public toilet data, scenic area supermarket data, etc., and the scenic area was stored in the POI database. At the same time, through survey questionnaires, interviews, etc., collect tourist data for the scenic area and its surrounding population to complete the entry of basic information and preference information of tourists. According to the preference information and location information of tourists, the function of “whether to recommend nearby points of interest based on the location fragments of tourists” is invoked in the Web (as shown in table. 3). The test shows that within 200 meters of the user's range, there are two recommended points of interest, Fuyun Pavilion and Yu King Palace.

Table 1. Tourist database function test.

Parameter	Value
Username:	pandora
Lat:	103.6093
Lon:	31.0060
Transfer	

Conclusion

All in all, tourist data is indispensable for the development of smart tourism. In the design and development of smart tourism systems, strengthening the design of the tourist database can effectively meet the needs of system data analysis and utilization, and promote the maximization of the application value of tourism resources. In this study, by understanding the characteristics of smart tourism, clarifying the basic functional requirements of the tourist database design, and on the basis of this, the design of the tourist user model was used as the basis for the tourist database. The tourist database was developed by relying on the ORALCE database management system to realize the design of the tourist database. After experimental verification, it is determined that the tourist database is effective and practical.

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