Design of Smart Travel Management System Based on Cloud Service

Fang Gao¹, Liangyu Li ² *

¹,² Wuhan Business University, Wuhan, China
*Corresponding author e-mail: 12027904@qq.com

Abstract. The design and implementation of the database is an important task in system development. Many information in the management of smart tourism needs to be saved and managed so that these data can be analyzed later. Therefore, in the process of designing the system, the original number of system requirements is analyzed, and the relationship between business entities is established. Combined with the relational database used by the system, E-R diagram drawing and data table implementation were performed.

Keywords: Smart Travel, Special Tourism, Passenger Behavior Analysis

1 Introduction
The speed of development of tourism in our country is very fast. Some cities have achieved very good results in the development of tourism, which has led to the development of the local economy. In accordance with its own reality, a city strives to create a distinctly distinctive tourism economic model that effectively serves the people. Against this backdrop, this article has conducted in-depth analysis and research on the development of tourism in the city, and put forward the idea of designing a smart tourism management system based on cloud services for the city. Specifically, the following research contents have been developed.

According to the functional requirements, the functional modules of the system can be divided and designed in detail. According to performance requirements and functional requirements, the overall architecture, logical architecture, and physical architecture of the system can be designed in detail. In the application system, business information is stored in the database, and the conceptual structure design and logical structure design of the database are also the main content of this chapter. A detailed description of each part of the detailed design process will be given below.

2 System architecture
Architecture design is the main work in the system design phase. Before designing the system architecture, you must have a comprehensive understanding of the application background, functional requirements, performance requirements, and actual application environment. The system architecture design determines the performance of the system to a certain extent, and the factors involved must be considered comprehensively ¹⁻³.
2.1 Overall architecture design
The process of designing and developing the logical architecture of the smart tourism management system mainly includes four levels: module layer, base layer, functional layer and cloud service layer. The development and design of the system is to achieve specific management operations through these four levels, including hardware, software services, system modules and system functions. When the smart rural system is actually running, these four levels coordinate with each other to achieve specific system functions. Its specific structural framework is shown in Figure 1.

![Figure 1 Overall system architecture](image)

Most of the systems used by enterprises now use the old construction method, that is, the independent development and development of each system module, and the integration of various demand services into the system development, that is, if the function expansion is carried out later, Even with the same features, you need to rebuild your deployment. At this stage, the development of cloud computing is becoming more and more perfect, which can reduce the cost to a large extent, and can also improve the stability of the system[4,5].

2.2 Logical architecture design
Under the guidance of the overall development architecture of the system, the logical architecture design of the system is carried out, and the specific process description of the system programming implementation is described. The development architecture of the smart tourism management system is illustrated in Figure 2. It can be seen that the whole system is very clear from the logic implementation. Through the client to provide all users' login access system function interface, all the data in the system is saved to the back-end database. At the same time, the implementation of the Web program is programmed and developed according to the MVC architecture on the program development logic architecture. In the development of the program, we must pay attention to the realization of the functions of each software structure layer, so that the code logic results are clear and easy to read. Thereby significantly improving system development efficiency. Therefore, the overall structure of the system development is to adopt the B/S software development architecture, and the user is provided to log in to the system to carry out tourism information inquiry through the provision of the server[6].
The core of the development of the smart tourism management system is the database. All the data in the system operation process is managed by data storage and extraction of the database. The program is used to realize the connection between the Web program and the database, and then the management of the program service model is realized through the corresponding database operation statement or stored procedure. Through the program mapping relationship in the system, the correspondence between the business entity and the system data table is realized, thereby completing the service work for the object-oriented program implementation.

The user access request processing is used to send the user's access and operation requests to the system through the Http protocol, and the interaction management with the user is implemented through the View view layer, and then the access request from the user is received through the control layer and the specific processing class is called to the user. The request is processed, and the data processing instruction is sent to the data layer interface by means of classes and methods in the system. In the technology of implementing the page, Jsp is combined with Struts technology to improve the user's interaction with the system. The processing of user requests is all managed by the web application.

2.3 Network architecture design
The smart travel management system not only records the basic information of the scenic spots, but also records all the passenger travel information, which is very important for the passenger's personal safety. When programming the system, standardize the service interface and optimize SQL statements to ensure that the system is not injected by SQL statements. In terms of network architecture design, technologies such as firewalls are used to verify the users of the access system. The login account of the passenger is bound to the mobile phone number, and the mobile phone number of the user who accesses the system is verified. If the mobile phone number of the access system is not his/her, the user is denied access. The application server and the database server are isolated, and the database is periodically backed up, and the files on the server are backed up in the form of a disk array to ensure the security and stability of the system.

2.4 Functional architecture design
The system uses a modular design in the process of functional design, so it is necessary to conduct an in-depth analysis of the closeness of different services when implementing the function development, thereby dividing into multiple modules, and then subscribing each module. The features are carefully designed. When designing with modular thinking, certain principles must be followed, including: (1) modular principle; (2) integrity principle; (3) unity principle. By analyzing specific business processes, the system can be divided into six modules: member management, attraction management, travel experience sharing, passenger behavior intelligence analysis, intelligent monitoring system, and command and dispatch system. According to the different logic, it can be divided into five modules: member management, attraction management, travel experience sharing, passenger behavior
intelligent analysis, intelligent monitoring system and command and dispatch system.

3 Cloud service design
The tourism intelligent management system is based on cloud service development, so the design of cloud service is the core content in the design phase of the whole system. The design of cloud service is relatively independent compared to other functional modules. The use of cloud services is mainly to improve the scalability and fault tolerance of the system. When designing the cloud services, the following three aspects are mainly carried out.

3.1 Cloud storage service
All application systems involve the storage and forwarding of business information. For general application systems, business data is stored in the database. There are some problems in the storage of data through traditional databases, such as: large occupied space, no access. Flexible and so on. The use of cloud service technology to store business data can solve these problems well. According to the user role, it can be divided into management personnel and application personnel. The management personnel can manage the data type and size, and can also be based on the needs of business operations. Control access to cloud data. For the average application, the cloud storage service can quickly and flexibly access related cloud data. Because the cloud data server stores a lot of business information, the security requirements are relatively high, and the application management personnel need to perform authentication when accessing the system. Because there are many users accessing the system, the cloud server must have a certain load balancing capability.

Different structures of data also need to adopt different storage structures when storing. In general, two storage methods are mainly used: structured storage and unstructured storage. A lot of information is saved by file information. In order to meet the needs of customers, the system integrates multiple file formats. Different file formats have the same description information, such as file name, file type, size, uploader and upload time. Etc. These descriptions are structured information. For the file itself, files of different formats need to be stored on the hard disk. These files are unstructured information, mainly because it is stored in NAS mode[7,8].

3.2 Cloud notification service
According to the notification object, the cloud notification service is also divided into two types: the administrator notification interface and the application personnel notification interface. As described in the previous section, the notification result for the administrator is mainly to provide the administrator with the editing of the notification information, the setting of the notification type, the operation permission setting of the application personnel, and the like. For the application staff, you can choose the type of information you need to accept according to your needs. The cloud notification service supports multiple types of information notification, including: short message form, mail form, and so on.

The communication protocol invoked by the sending of different types of notification information is different. For example, if a notification is to be sent by means of a short message, a short message gateway needs to be set. If the notification information is issued in the form of mail, the format editing and content transmission of the information need to be performed according to the smtp protocol. For tourists, the notification of the sending of some information may be a kind of harassment information for them personally. In order to avoid this, the blacklist setting function is provided to the tourists, and some businesses that frequently send harassment information can be sent. Or the attraction manager pulls the blacklist so that no information notifications from the merchant or attraction administrator will be received.

3.3 Cloud log service
The operation log has a very important role. During the operation of the application system, some erroneous operations are inevitable, and the operations of the errors can be recovered through the
operation log. Because the number of access users of the system is relatively large, in order to ensure that each user's operation log can be recorded, the system needs to support the asynchronous storage mode, which can greatly improve the carrying capacity of the system.

The operation log records the operation of each step of each user, so the number of operation logs is not only related to the number of users accessing the system, but also related to the specific operation of the system user. The travel service system has a large number of users, and each user can perform different operations. Therefore, the number of concurrent operation logs generated is large. To ensure that information is not lost, an asynchronous processing mechanism is required to record the operation logs concurrently to the cloud storage server. In. Like cloud notification services and cloud storage services, cloud is also a service for two types of users, mainly: cloud service administrators and application personnel.[9, 10]

4 Conclusion
Based on the demand analysis, the software architecture and network architecture of the system are designed according to the existing network environment. In terms of software architecture design, the Java Web three-tier architecture is adopted to improve system reliability and scalability. In terms of network architecture design, try to adopt the existing network environment and reduce the investment in hardware. A detailed design description of the system's functional architecture and database is then given.

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