BioTechnology

An Indian Journal

Analysis on application of tourism information service system under the J2EE environment

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ABSTRACT

With people's living standard unceasingly improving, the travel industry develops fast. However, the information level of the travel industry is relatively low, the management is backward, and the industry foundation is weak, which causes the low-level competition of travel companies. Therefore, the tourism information service system is designed, in which visitors can easily search for scenic spot information, book travel agencies and make the tourist routes. This study first discusses on the necessity of the construction of tourism information service system, and then introduces the related technologies in detail which are needed to build the system, such as J2EE technology, Java development language and SQL Server 2005 technology, etc. Then it specifies the construction of the tourism information service system which includes the business requirements of tourism information service, the goal of tourism information service system, functional and non-functional requirements, performance requirements and running environment requirements. Finally it describes the architectural design of the tourist information service system which has a certain applied and extensible value.

KEYWORDS

INTRODUCTION

With the rapid development of economy, people's living standard significantly increases, so the travel industry gets the unprecedented development potential[1]. But right now the foundation of the overall tourism industry is weak, the information level is relatively low, the management is backward, which directly causes the low competition of travel industry and cannot meet the travel demand of tourists. For the above problems of tourism service, utilizing the tourism information service system can make the tourism service work more smoothly and better coordinate the relationship between the tourists and the tourism sector, thus to better improve the tourism service value.

The core content of this study is to build the tourism information service system based on J2EE environment, whose main points include[2]: designing tourism customer login module, tourist route module, tourism forum and electronic map module, etc. The tourism information service system adopts Windows Sever 2003 operating system, chooses J2EE development environment and uses Java as the development language of the system, and the database adopts the mature technology of SQL Server 2005, which has large data processing function to ensure the data safety and accuracy and is able to achieve a seamless connection with Windows Server 2003. Tourism information service system will employ B/S pattern and J2EE technology that can be very easily embedded in the system[3].

The tourism information service system takes advantage of the Web2.0 technology, fused with J2EE and SQL 2005 technology, eventually to build a comprehensive travel service platform which can provide tourism information inquiry service, tourism administrative service and electronic commerce,etc. What's more, the platform can provide a more comprehensive and efficient service.

RELEVANT TECHNOLOGIES OF TOURISM INFORMATION SERVICE SYSTEM

J2EE technology

The core of J2EE technology in fact is Java which can effectively reduce the complexity of the related issues of enterprise development and management, and J2EE is also a kind of technical architecture different from the traditional development, in which some components can simplify the application system development and overhead in order to improve the system security and portability. Strictly speaking, J2EE is actually a set of technical specifications which includes service framework and technically common standards and specifications. Therefore, following J2EE technology has a good compatibility for different platforms.

By comparison, following the architecture of J2EE technology has the following several advantages[4]:1)Improve the efficiency of development: In the J2EE specification, the enterprise can let the middle-ware vendors to complete a few trivial general server task. In this way, developers can more effectively deal with the key technology, thus to shorten the system development time; 2)Keep the existing IT technology: The products based on the J2EE platform can make use of the existing hardware and operating system; 3)J2EE technology can support the heterogeneous environment; 4)J2EE technology has the elasticity: In order to meet the needs of business applications in future, J2EE vendors will provide a kind of load balancing which can solve the system bottleneck and also allow multiple servers integrated at the same time.

Java development language

Java technology has the characteristics of compatibility, high returns and platform portability. In today's information age, the Java development language which is a more mature language in today's software development has a great potential for development. The Java technology will make the program more secure, and the operation status is more stable, saving money and time.

SQL server 2005

SQL Server 2005 is structured query language whose main function is: connecting the database and manage it. The SQL language standard is now widely used in a relational database management system, even if it later needs to extension and development for the database, the SQL language commands can still be used for operating almost all of the database.
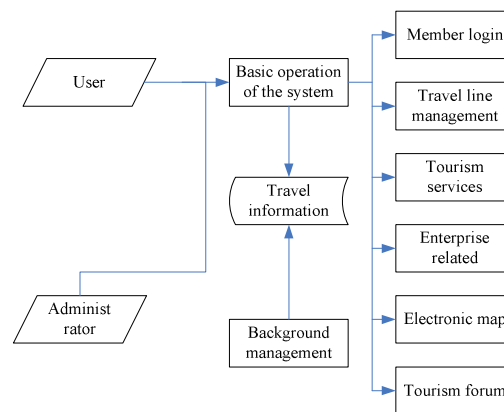
THE CONSTRUCTION OF TOURISM INFORMATION SERVICE SYSTEM

The business requirements of tourism information service

This study investigates the current situation of tourism industry, and there generally exist many questions. The specific problems are as follows: It is difficult to get the effective tourism information in traditional tourism market. The channel obtaining the travel information is very narrow, and the cost of access to information is high, and the information is uncertain;2)Tourist information collection and management are backward, and the actual investigation and measurement are completed by men. It also needs men to finish the statistics of tourist resources information, tourism image making and evaluation to the tourism resources;3)Online travel information is relatively drab, and the content and form are single, lacking of audio and video files.

According to the above problems, this study proposes a solution that improves the construction of tourism information service system through the platform relying on electronic maps, making the system effectively organize tourist information and letting the tourists select the concerned information through getting all kinds of tourism information. The tourism information service system designed by this study should include the functions of tourist login administration, travel line management, query electronic map, tourism services provided, the related content of tourism company and the system background maintenance[6]. The specific functions are as follows:

(1) Tourist Login Administration: Mainly to complete the new customer information registration and allow the registered members to log in and modify the information.

(2) Travel Line Management: For the purpose of the tourist route query, it can independently reserve the travel line at the same time.

(3) Tourism Services: To complete the reservation of hotel, flights and travel vehicles.

(4) The Related Services of Tourism Enterprise: Mainly to provide the introduction to the company profile, the travel industry information and enterprise contact information, etc. in the travel information service system.

(5) Query Electronic Map: Its Function is to zoom in and check the tourist map, to calculate scenic route distance and find the place names, etc.

(6) Tourism Forum: To provide a platform of the complaints and exchange for tourist.

(7) Background Management: To realize the functions of registered customer management, line modification, the scenic spot introduction, hotel recommendations and travel information management. The tourism system business processes are as shown in Figure 1:

Figure 1 : The system business processes sketch

The goal of tourism information service system

The goal of tourism information service system is that the tourists can online search the scenic spots and the route arrangement from the travel agency without leaving home. In general, the goal can be divided into the following two points [7].

(1) The tourism information service system will provide the query for tourism destination details and offer one-stop travel query information for visitors, making the tourists comprehensively understand the information of the scenic spots.

(2) Help the tourists book the hotel rooms and confirm the schedule, avoiding the trouble due to lack of understanding of the destination, to make the tourists have a pleasant trip.

The functions of the tourism information service system

The main functions of tourism information service system are shown below.

(1) Tourism information service system is the main platform for communication between tourism enterprises and the customers, whose main functions include the application for registration of customers and tourism service enterprise.

(2) Tourism service enterprise can publish the enterprise information in the system after registration.

(3) The tourism information service system will check the registration information of the travel service enterprise and the members.

(4) Make the feedback for tourists.

(5) Take the tourism service enterprises as the entrance to the customer information query.

(6) Take the scenic spots as the entrance to the customer information query.

(7) Offer the exchange forum for the tourists.

(8) Manage the registered customer information, such as the login frequency of customers, update frequency of the customer information, the client's reward and recharge, etc.

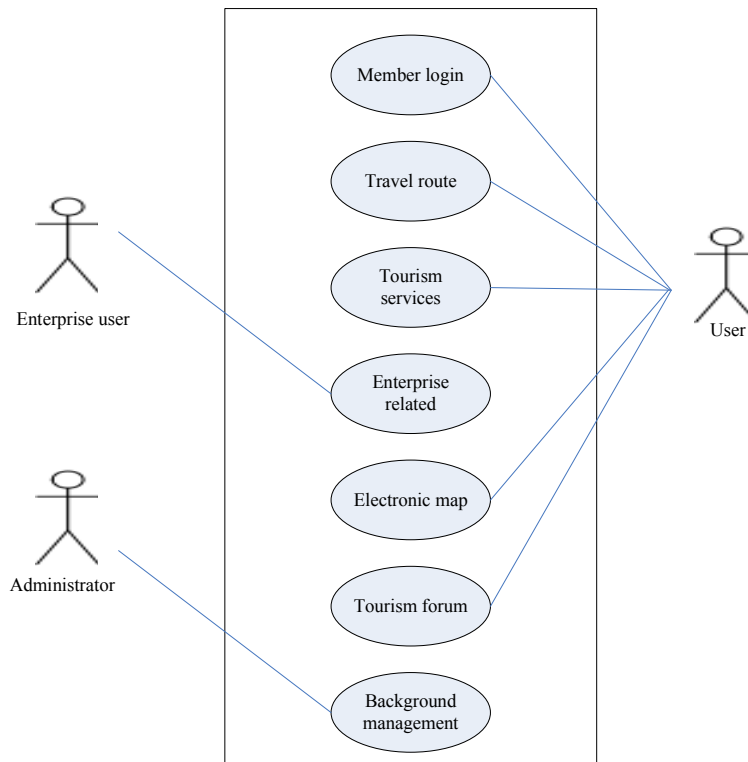The main functions of the tourism information service system are as shown in Figure 2:

Figure 2 : The tourism information service system based on J2EE

The detailed functional case is shown as below:

(1) Customers (Tourists) Function

In the tourism information service system, the customers using functions include customer login, tourist route query, tourism services and electronic map query, etc. The main functional cases of the customers are as shown in Figure 3 and Figure 4.
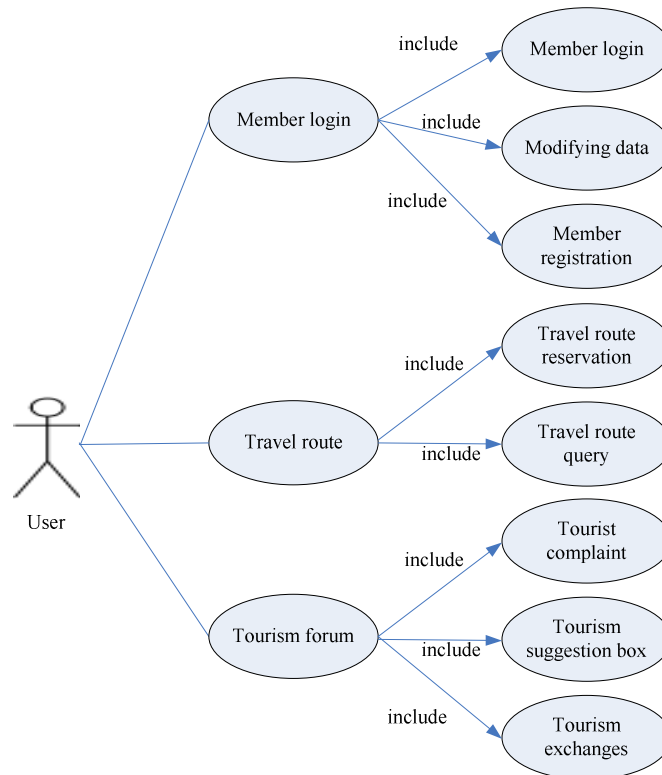

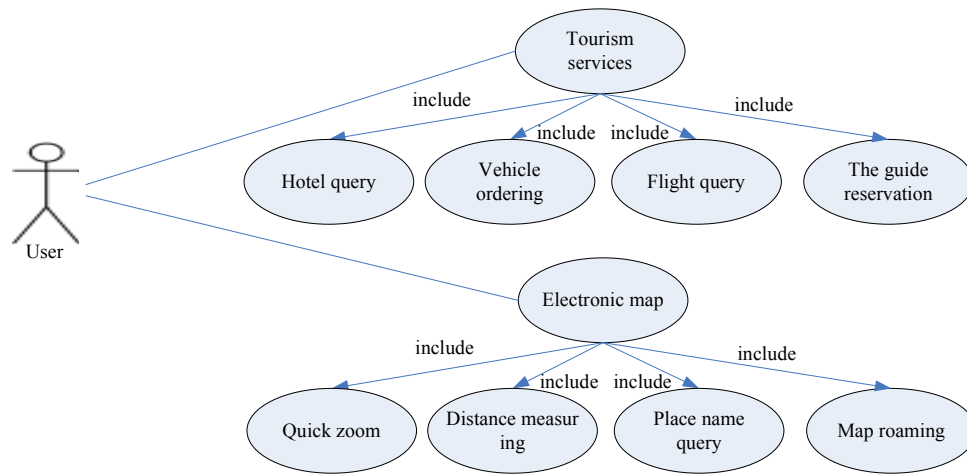**Figure 3 : User functional case(一)**

Figure 4 : User functional case(二)

As shown above, the specific functions are as follows:

(1) Customer login: Its function is to complete the login information registration of the new customer and modify the registered customer information.

(2) Making the travel route: Its function is to query the suitable tourist route and enable to book the workable tour line, and the tourist route query includes the different routes of domestic, province, Hong Kong, Macau and the neighborhood.

(3) Tourism services: Its function is to complete the booking for hotels, flights, tour guides and transportation.

(4) Electronic map: Its function is to calculate the distance between the scenic spots, zoom the map for checking and find the place-name information according to the scenic spot.

(5) Tourism forum: Its function is to complete the travel advice and complaints from the tourists and tourist information communication.

(2) The Functions of Tourism Service Enterprise

Tourism service enterprise can use the module function related to the companies, which includes the company profile, the enterprise dynamic, the industry news, the recruitment information and contact-us. The function of the travel company is as shown in Figure 5.
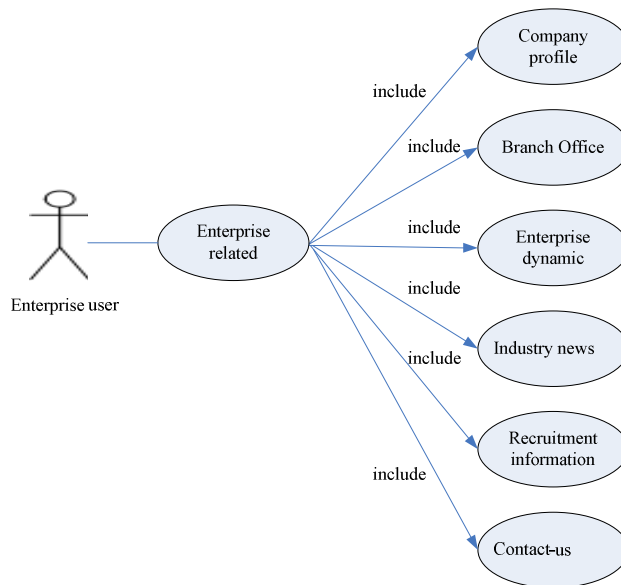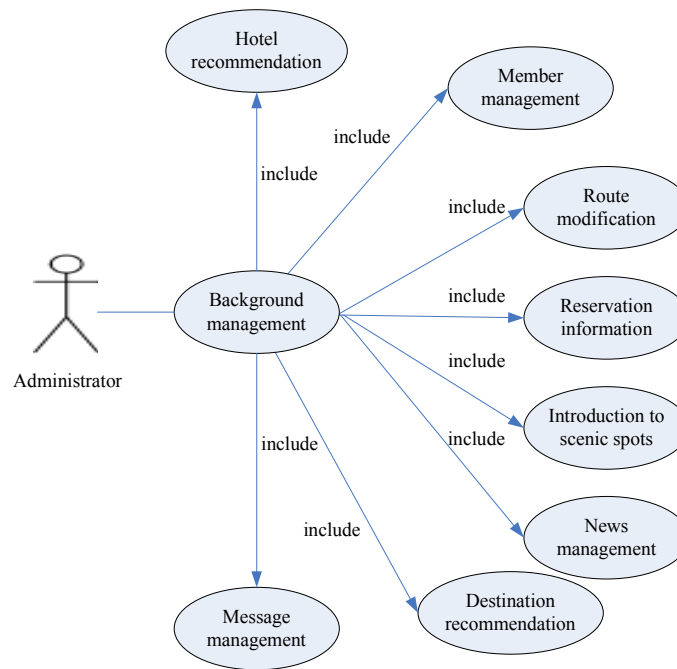

Figure 5 : The functional case of enterprise user

(3) The Administrator Functions in the Tourism Information Service System

The administrator in the tourism information service system is responsible for the maintenance and management of tourism information service system, whose main responsibilities are to recommend the hotels, manage the tourists, modify the tourist line, reserve the hotels and the travel line, introduce the scenic spots, manage the travel news, recommend the

travel destination and manage the message, etc. The administrator functions in the tourism information service system are as shown in Figure 6.

Figure 6 : The administrator function case

The requirements of the tourism information service system

Nonfunctional requirements of the tourism information service system

The nonfunctional requirements of the tourism information service system include the security, reliability, portability and scalability, and maintainability of the system. Each specific function is introduced as follows:

The Security of the System: Customers can access the system through registering and confirming in the system, and the customer cannot acquire any service information from the tourism information service system in the case of without the registration.

The Reliability of the System: Customers need a legitimate login system to accurately access to the travel information in the system.

The Portability and Scalability of the system: When appearing a new customer, it can extend the function of the system on the basis of the original one and will not affect the existing function.

The Maintainability of the System: Ensure to solve the faults in the system within 24 hours.

The performance requirements of the tourism information service system

The tourism information service system can accept at least 500 customers to visit at the same time, and ensure the normal operation of the system. Under the normal network, the response time shown in the electronic map is within 3 seconds, and the response time displayed in the text information is within 2 seconds. It needs a database table with the maximum number of lines of 10000 at least, more than 40 GB disk capacity and 512 MB memory.

The security requirements of the tourism information service system

Because the network is open, when enterprises or customers release the tourism information, it will cause the problem about the system network security. Therefore, the system needs the high system security, and now it will mainly check from the aspects of the tourist service system security, network security and data security. It mainly embodies in the following several aspects:

(1) Only the registered customers can enter the system, and it will verify the customer ID when logining the system.

(2) Allow the administrators to allocate the customer's identity permissions, but it will provide the real-time identity allocation so as to ensure the security of the system.

(3) Some specific functions can only be run by the administrator, making the functional separation to the administrator and the customer.

**(4)** Ensure the safety of the system data and offer the data backup for the database.

In addition, the most important thing is to ensure the security of network equipment such as the switches, servers and the firewall. What's more, it has to restrict to visit the system for the unauthorized customer.

The running environment requirements of the tourism information service system

The running environment of the tourism information service system mainly involves in the main body that is the client and the server. The client's requirement is lower so long as to connect the Internet and install a Web browser component. While the server's requirement is higher, it needs to install Tomcat,Windows Server 2003 operating system and SQL Server 2005 database management system.

The architecture design of the tourism information service system

Based on GIS software, the system supports the development decision model and application analysis model, effectively separating the data processing and logical processing. From the integral design structure of the system, it adopts multi-layer B/S structure, including the Web server, the client workstation, the application server and the database server. The Web server and electronic map server are in charge of the response to customer's request, the client workstation is responsible for the customer to submit the request and information result display, finally the database server takes charge of data management. And the server side completes all aspects of the response, the administrator only needs to maintain the system on the server side. The whole structure of the tourism information service system is as shown in Figure 7.
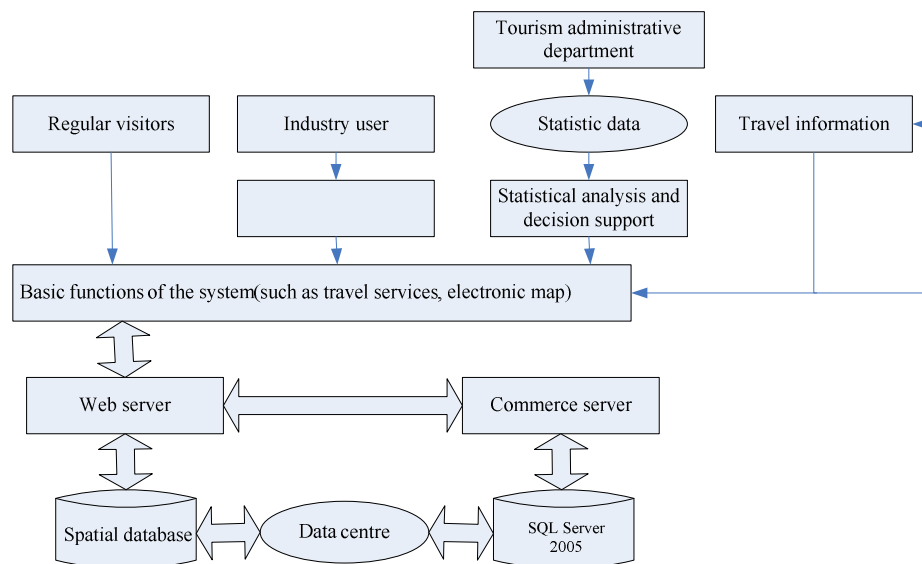
Figure 7 : The overall architecture of the system

When choosing the development tools, this system adopts the SuperMapIS of the Beijing SuperMap company as the development platform of the tourism information service system. This technology using component technique is open architecture, and it can undertake the research and development of the tourism information service system. The system also adopts SQL server 2005 database development tools to build the database management system, but also uses SuperMapIS map engine to provide the space for the database technology, thus improving the use efficiency of spatial database, eventually using the Internet browser to access the database's data.

CONCLUSION

This study first discusses on the necessity of the construction of tourism information service system, and then introduces the related technologies in detail which are needed to build the system, such as J2EE technology, Java development language and SQL Server 2005 technology, etc. Then it specifies the construction of the tourism information service system, which includes the business requirements of tourism information service, the goal of the tourism information service system, functional and non-functional requirements, performance requirements and running environment requirements. Finally it describes the architectural design of the tourist information service system which has a certain applied and extensible value.

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