

Design and Implementation of Public Transportation Inquiry System Based on J2EE

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Abstract. With the acceleration of science and technology, public transport has become an important travel tool, so the public transport inquiry system is becoming more and more important. China's urban public transport enquiry system is in the early stage of its development. Therefore, people have less information available. In order to solve this problem, a public transportation query system based on J2EE is designed. This paper describes in detail the function of the system and can help the public to query information in various ways, which can demonstrate all available bus routes between any two bus stops and find the shortest route by using Dijkstra's algorithm. In addition, it provides message functions, user management functions and back-office vehicle management functions so as to provide users with more accurate query information.

Information

With the rapid development of urban economy, the scale of cities has become larger and larger, which makes the city public transport system more and more huge. There is a glittering array of newly-built communities, which has caused some difficulties for people to choose a bus line. We have obtained through experiments that most of the people who have lived in the city for a long time can not quickly tell us the bus routes when given two random locations inside the city. Although maps can quickly solve this problem to find the routes at two locations, the efficiency of such queries is rather low, so the problem is essentially to provide an efficient public transport query system. This article aims to find out the shortest route between any two locations based on J2EE design. By placing this system in the main places of this city, we can tell the level of a city's intelligence, digitization as well as informatization.

System Model Architecture

J2EE Application Components

J2EE applications consist of components. J2EE is a software unit with independent functions, which are assembled based on related classes and files and interact with other components. The system includes the following components:

- (1) J2EE application server and client program.
- (2) Java Servlet and JavaServer Pages (JSP) and Web components
2. WEB layer components

The J2EE web layer component contains servlets or JSP pages. According to the J2EE specification, the basic operations on data are usually implemented using JavaBeans, and the processing of data is usually performed by a business logic layer that invokes operations in the JavaBean.

3. Customer layer components
- Web-based applet or static HTML page.
4. Write the algorithm

The shortest path data structure algorithm is usually written using Dijkstra's algorithm as the center algorithm for calculating the shortest path, so as to solve the shortest path search between stations.

Bus Query System Function Analysis

Urban public transport is an important window that reflects the city's civilization and modernization. For citizens, especially foreign tourists, if they can quickly find the bus route to their destination, it will be much more convenient for their travel. With the accelerating urbanization process, the urban area is further expanding and bus lines are constantly changing. Our existing online public transport inquiries system lacks intelligence on the one hand and cannot provide people with a good ride plan. On the other hand, they cannot immediately reflect the existing public transport network in the city and people often find the lines on the Internet outdated, and this directly affects people's travel. In today's increasingly developed and perfect city

public transport system, for some big cities, it is necessary to have an intelligent public transportation inquiry system that is convenient for user inquiries so as to solve the problem of people asking for difficulties in big cities. The functional modules that the system will complete are shown in Figure 1.

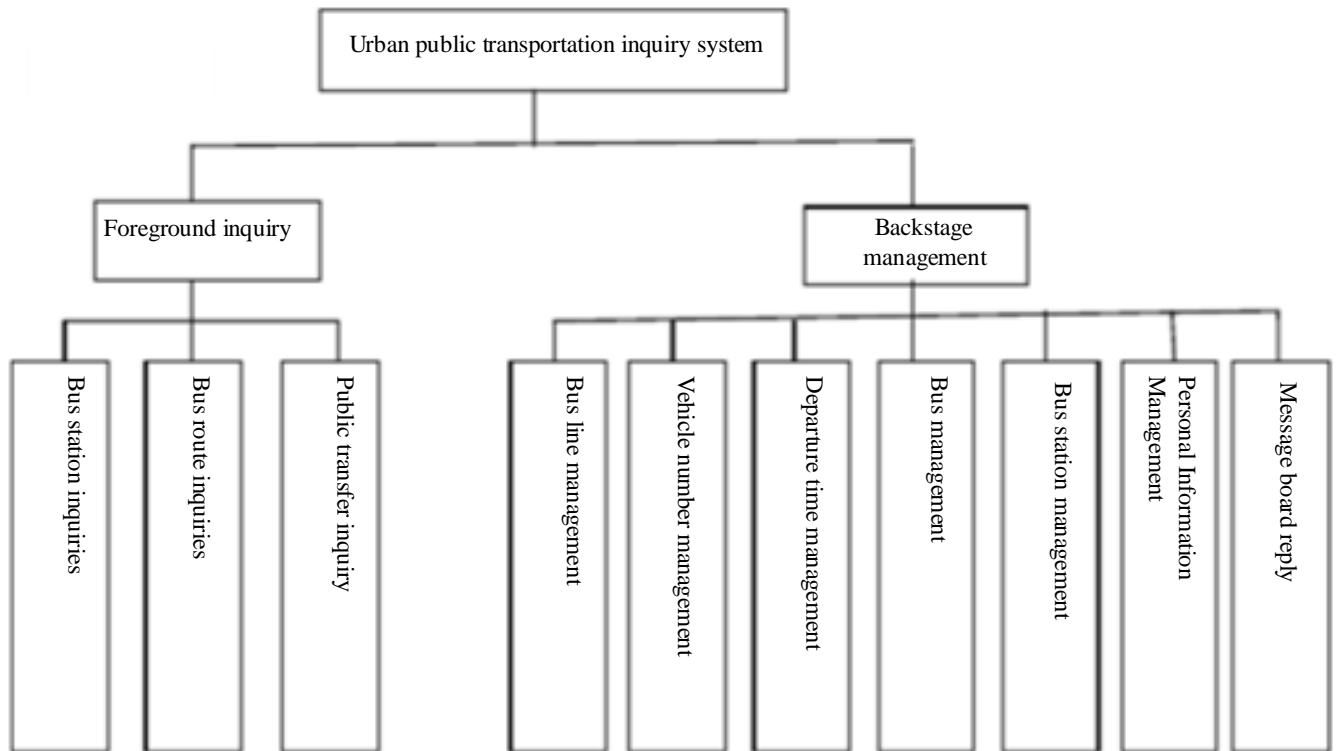


Figure 1 System functional modules

The data flow diagram of the bus inquiry system is shown in Figure 2.

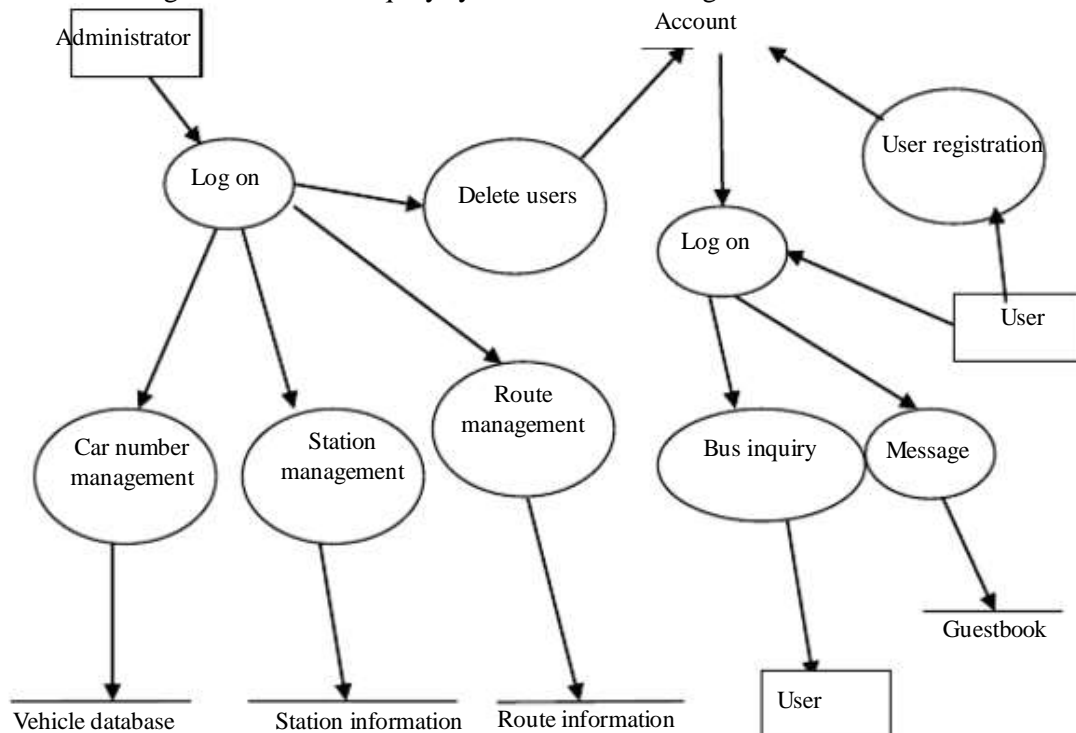


Figure 2 System data flow diagram

Data Base

The goal of conceptual design is to demonstrate the conceptual structure of the database required by the

urban transit inquiry system, which is also considered as a conceptual model. The conceptual model is independent from the database logical structure, DBMS that supports the database, and does not depend on the computer system.

1. ER module

The ER module is an abstraction of the real world. Its main components are entities, connections and attributes. By using these three components, we can build ER models for many application environments.

2. ER module operation

In the process of implementing conceptual design of database, we have to often transform ER diagrams, which are also referred to as the operation of ER module, including the splitting, merging, addition and deletion of entity types, contact types, and attributes.

3. Database concept design using ER method

The database conceptual design based on ER model can be divided into three steps: first, design the partial ER model, then combine the partial ER patterns into a global ER model, and finally optimize the global ER model to obtain the final ER model, ie concept mode. ER design mode is shown in Figure 3.

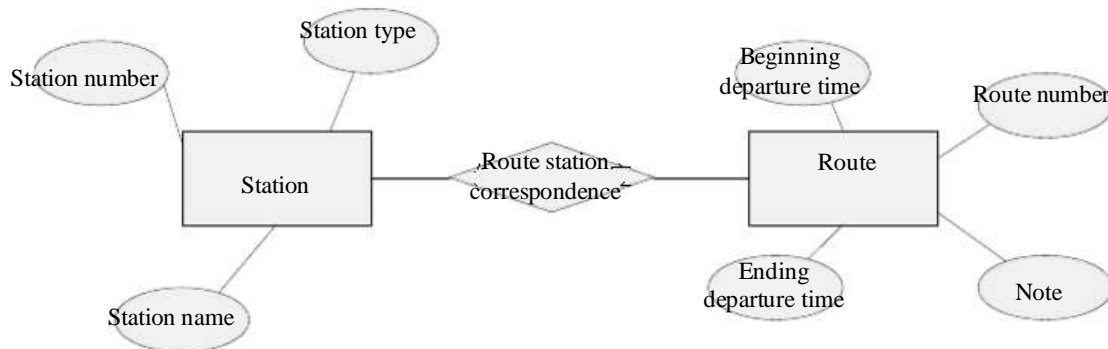


Figure 3 ER chart demonstration

Design and Implementation of Bus Query System

The public transit query module is a direct medium for users to interact with the system. In addition to completing the user's request, it is more necessary to take the user's point of view and put people first and design humanized interactive pages. The query module mainly consists of a text box and a submit button. For the public transportation inquiry system, user enters the starting station and terminal station, submits the request to ask the system to list all the qualified bus schedules. When users find there is an error, they can click the refill button and the text box will automatically empty. Of course, users can also select the second query method: that is to select the route to be queried and then the user will automatically lists all the bus stations.

The realization of bus number query function: users can put the bus number to query the bus information and display it, which shows as follows:

System testing and analysis

Comprehensively test the whole system after the design of each module is done. The purpose is to operate the system quickly, stably and safely. In the process of system testing, the following situations may occur:

(1) Null pointer exceptions are captured for the data submitted on the page. Any invalid or null data needs to be processed by the program.

(2) Capture database connections and abnormal close in a timely manner so as to guarantee the timely release of database connection resources, and provide information for the next use.

(3) Capture abnormal database query.

(4) Capture abnormal database updating.

(5) Capture abnormal database addition.

(6) Capture abnormal database deletion.

(7) Permission control, which controls the permissions of administrators and users through session variables.

(8) If the encoding mode of the page is different, the character string should be transcoded.

Conclusion

This article completed the design and implementation of the public transportation query system based on J2EE. After various tests, the operation effect is pretty good. For the system, it can be considered as a separate module bus system, which can also be placed in more functional public places in the city, providing people with quick and easy queries. This not only reflects the development level of an urban public transport query system, but also shows the digital and informational level in a city. The development and use of public transport inquiries will also promote urban public transport to better serve the people.

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