

Design and Development of The Parking Space Autonomous Management System

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Abstract

The article purpose is to change the manual or semi-manual management model that parking Spaces now have, so as to make the parking space management more standardized and more effective. This system used the Browser/Server architecture, JSP(Java Server Page) as the front r & d tool, SQL Server as the background data warehouse for r & d. The system key functions realized in the last system include: user registration and login, message block, parking reservation, change of login password,fee settlement block and parking information query. The design manufacture of this parking space autonomous management system can increase the effect of parking space management to a large extent, all reflecting the information period of the special good.

Keywords:autonomous, JSP,B\S,tomcat

1. Introduction

With the rapid development of automobile industry, China's automobile ownership has increased sharply ¹. As a part of transportation facilities, with the busy and continuous development of transportation, people's requirements for its management are also increasing. They all hope that the management can achieve the effect of convenience, quickness and safety.

The scale of parking lots is different, and the management mode is also different. Managers need to choose and apply economic and stable management procedures according to their own conditions, so as not to choose a high-cost management system. This paper aims to design a simple, stable and practical parking lot management information system, hoping to have its own characteristics in fault tolerance, practicability and easy operation, and maintain certain scalability to meet the information management needs of different parking lots.

The whole system adopts the two-layer mode of separating the business logic layer and the user presentation layer. This developed mode can separate the database operation class from the user layer, which is

convenient for code modification and system maintenance in the future. The parking management system can make the parking lot management information and gain an advantage in the increasingly competitive vehicle industry

2. The Hardware Structure and Software

In the production of parking lot reservation management system, a fully equipped computer is very useful for. The required configurations are: server:Tomcat,development software:MyEclipse,database: MySQL, R & D language: JSP, Java language.At the same time, enough memory can ensure that the code runs smoothly. In addition to the structure of the web page, in a whole parking lot system, users need to hold a card to park, so as to run the whole system. There are also access cabinets to display the current status.The design of the access cabinet is shown in Fig.1.



Fig.1 The design of the access cabinet

2.1. Server

The server we selected is Tomcat. Tomcat is a free open source web application server. It is a lightweight application server³. It is widely used in small and medium-sized systems and when there are not many concurrent access users. It is the first choice for developing and debugging JSP programs. Tomcat is shown in the Fig.2.

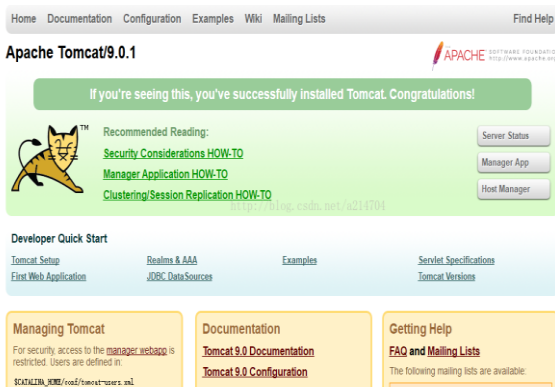


Fig.2. Tomcat server

2.2. Database

The function of database is to manage all kinds of data orderly and provide unified interfaces and services for other applications. Three database uses of MySQL:

(1) Multifunctional database: this option provides fast access to both transactional storage engine (InnoDB) and non transactional storage engine (MyISAM);

(2) Transactional database only, this option mainly optimizes the transactional storage engine (InnoDB), but the non transactional storage engine (MyISAM) can also be used;

(3) Non transactional database only. This option mainly optimizes the non transactional storage engine (MyISAM). Note that the transactional storage engine (InnoDB) cannot be used.

3. Software Design

The parking lot reservation system is designed and developed by individuals, and the development time is about one month. The hardware facilities needed to develop the software are a single computer. First, it is developed on the computer. After the development is completed, it is tested on the server. The development tool used is Eclipse and the database is Mysql.

3.1. Database design

The design of the database is the cornerstone of the project. According to the analysis of the key functions of the system, the tables of the parking space autonomous management system include administrator information table, parking space information table and parking information table.

3.2. Module detailed functional design

According to the functions of the parking reservation system, the system can be mainly divided into two modules: the front and rear platforms, which are the interaction of database information after user login and the operation of database information after administrator login. Function diagram of parking reservation system is shown in the Fig.3.

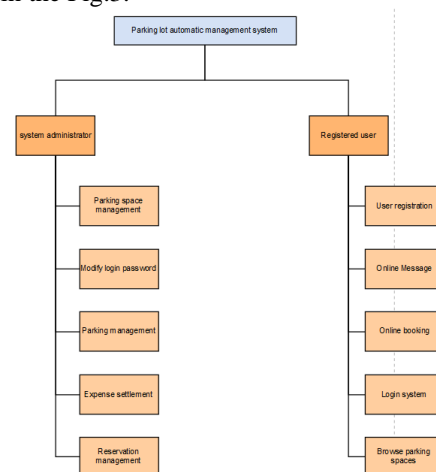


Fig.3. Function diagram of parking reservation system

3.3. Authorized design

Authorized design is shown in Table 2.

Table 2. Authorized design

Authorization number	User name	Object name	Jurisdiction
001	Administrators	Administrators	add,delete,check and change
002	User	User	add,delete,check and change

4. Software Test

The content of software testing^{3,4} includes software code testing and software system function testing. The specific content refers to simulating and inputting some real values in the program, then running it, and checking some errors on the way.

4.1. General check of source code

The inspection is mainly a functional spot check of some key modules to check the modules. For example, whether the names of variables and functions in the code meet the specification requirements of the development software; You can also check whether the notes in the program are standardized, whether the amount of notes meets the requirements and whether the notes are identified accurately; Check whether the data display meets the standards, etc.

(1) Naming convention check

Check whether the naming in the source code, such as variables, functions, objects, etc., comply with the agreed specifications.

(2) Note check

Check whether the notes of the program meet the specifications, whether the amount of notes meets the specified requirements, and whether the instructions of notes are correct. For example, the amount of notes is required to be more than 20%.

(3) Interface inspection

Check whether the database interface and external interface are named properly, whether they are correctly connected with functions, and whether they clarify the functions to be completed.

(4) Data type check

Some of the codes involved have definitions of numbers. For example, whether the floating point type is

used to define the price, the definition of date, the definition of number, etc. are in line with the specification.

5. Conclusion

Parking lot management is a troublesome and monotonous work, which repeatedly manages the vehicles in and out of the warehouse every day, and there is great instability in the type and entry time of vehicles, as well as great randomness in the parking spaces used by vehicles, which brings great inconvenience to the staff. So we developed this system, hoping to achieve more convenient and accurate operation under the use of this system.

This system used the Browser/Server architecture, JSP(Java Server Page) as the front r & d tool, SQL Server as the background data warehouse for r & d. The system key functions realized in the last system include: user registration and login, message block, parking reservation, change of login password, parking information management, parking information management, fee settlement block and parking information query. The design and manufacture of this parking space autonomous management system can increase the effect of parking space management to a large extent, all reflecting the information period of the special good.

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