

# Design of a JSP based Mobile Phone Repair Reservation System

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## Abstract

**With the development of the times, mobile phones are becoming more and more popular. The increase in the number of mobile phones will lead to an increase in the number of mobile phone repairs. Developing a mobile phone repair appointment system can be beneficial for mobile phone repairs. The mobile phone repair reservation system adopts the B/S mode, using Eclipse software as the system development tool and Java programming language for system development. The system database adopts SQL Server database. In system development, JSP and Servlet technologies are used to help users repair their phones more conveniently, while also benefiting maintenance personnel. The mobile phone repair reservation system designed in this paper consists of a front-end user module and a back-end administrator module. The front-end module implements functions such as registering and logging in for front-end maintenance personnel, modifying personal information, publishing, viewing, modifying, and deleting appointments for maintenance personnel, registering and logging in for front-end users, modifying personal information, making appointments, viewing appointments, and canceling appointments. The backend module enables administrators to modify personal information, view and delete personal information of users and maintenance personnel, view and delete appointment information, and other functions.**

## Keywords

Cellphone Repairs; B/S; SQL Server; Java.

## 1. Introduction

With the reform and opening up, China's economic development has been getting better and better. Nowadays, people live a prosperous life, and while meeting their daily needs, they also purchase other products such as computers and mobile phones. Nowadays, the price of mobile phones is reasonable, and the functions of mobile phones are more diverse, almost becoming a necessity in life, and it is indispensable for many people, from waking up in the morning to going to bed at night. Because mobile phones may be necessary for entertainment, work, study, and communication. However, when using mobile phones, various problems may arise, such as broken screens or the need to replace batteries. Therefore, with the significant increase in the number of mobile phones, the market for mobile phone repairs has also expanded. Moreover, the management of the mobile phone repair market is chaotic, and it is necessary to set up a mobile phone repair appointment system to help users repair their phones.

The mobile phone repair appointment system not only facilitates users, but also facilitates maintenance personnel. The mobile phone repair appointment system can help users avoid wasting time. Users only need to log in through their computer to make a mobile phone appointment, and can choose a free time to make an appointment. At the same time, it can also avoid situations where they have to wait for a lot of time to repair during weekends and other times when everyone is generally free. The mobile phone repair appointment system can help maintenance personnel improve work efficiency. Maintenance personnel may encounter situations where they are occasionally busy with work and occasionally have little work.

However, the mobile phone repair appointment system can avoid such situations, evenly distribute work time, and thus improve work efficiency.

## **2. Research Status of the System**

### **2.1. Current Research Status in China**

The mobile phone maintenance industry appeared in the early 1990s and has developed rapidly in China for more than ten years. At present, the mobile phone maintenance market in China consists of official maintenance, traditional maintenance and Internet maintenance, of which the traditional maintenance market accounts for the largest proportion. The repair population is mainly male, with a wide range of age radiation. Apple phones have the most repairs, while Android systems have the most phone repairs in China. The repair volume is large in Beijing, Shanghai, Guangzhou, and Shenzhen, with a large proportion in southern cities, mainly due to screen, battery, and motherboard failures. Each mobile phone brand in China has its own official repair appointment platform, as well as many third-party mobile phone repair platforms such as Fengxiu, Qianjiwang, Shanxiu Xia, etc., which still have a relatively large market share in China.

### **2.2. Current Research Status Abroad**

Mobile phones in the United States are relatively cheap, and the manufacturer's service is also very good. Many Americans have no habit of repairing mobile phones. When a phone malfunctions, they usually replace it directly. In Japan, the place where mobile phones are repaired is called a pick-up shop, which specializes in repairing mobile phones. After signing a series of contracts and using replacement machines, the phone will be left there and sent to a dedicated repair location until the repair notice is completed. Thai mobile phone repair shops are mainly concentrated in the electronic area of shopping malls, and most of the shops have average technical skills. Due to the rapid development of the Indian economy in recent years, the increasing popularity of mobile phones has driven the development of the Indian mobile phone repair industry. Now the number of mobile phone repair shops in India has reached tens of thousands, big and small. They send a large number of maintenance personnel to China every year to learn new technologies and wholesale some mobile phone accessories. So basically, they are all traditional repair shops, and apart from the official repair appointment platforms of various mobile phone brands, there are no major mobile phone repair appointment systems.

### **2.3. System Design Content and Objectives**

The mobile phone repair reservation system conducts system analysis through research on mobile phone repair reservation, designs the overall idea, and then adopts B/S mode for overall design, detailed design, and database design. Eclipse software is used as the system development tool, Java programming language is used for system development, SQL Server system database is used, JSP and Servlet technology are used in system development to complete the system of repair personnel publishing reservations, users making reservations, canceling reservations, and administrator managing users and reservations. Finally, the basic functions of the system were tested, and the expected functions were basically achieved, which basically met the needs of users.

Complete a mobile phone repair appointment system that can operate normally and meet basic functions. Front end maintenance personnel can achieve functions such as registration and login, viewing personal information, modifying personal information, changing passwords, publishing appointments, viewing appointments, modifying appointments, deleting appointments, and returning to the homepage. Front end users can achieve functions such as registration and login, viewing personal information, modifying personal information, modifying personal passwords, viewing appointments, making appointments, deleting

appointments, and returning to the homepage. Backend administrators can achieve functions such as registration and login, viewing personal information, modifying personal information, modifying personal passwords, viewing user information, deleting user information, viewing appointment information, deleting appointments, and returning to the homepage.

### **3. System Analysis**

#### **3.1. Requirement Analysis**

The mobile phone repair appointment system can help users register and log in through a browser, and then schedule a suitable time to repair their phones. This system mainly consists of three modules: maintenance personnel, users, and administrators. Log in from this common interface to enter different interfaces. Maintenance personnel can register and log in, and then publish maintenance appointments. They can see the appointment messages they have posted, including those that have been scheduled and those that have not. Users can view appointment messages and choose a suitable appointment based on the appointment time and location. If the situation changes, they can also cancel the appointment. Administrators can view the personal information of users and maintenance personnel, delete personal information, and view and delete appointment messages.

#### **3.2. Business Process Analysis**

The mobile phone repair appointment system business is divided into maintenance personnel business, user business, and administrator business.

Maintenance personnel enter the homepage, register and log in to the maintenance personnel system. Through the personal information form, they can view personal information, modify personal information, and change passwords. Then publish the appointment, view the published appointment messages through the appointment message table, and modify or delete the appointment.

Users enter the homepage, register and log in to the user system. They can view and modify their personal information and password through the personal information form. They can also check the appointment message through the appointment message form and make or cancel the appointment.

Administrators can enter the homepage, log in to the administrator system, view and modify administrator information through the personal information table, change administrator passwords, view and delete personal information of maintenance personnel and users, and also view and delete appointment messages through the appointment message table.

#### **3.3. Functional Module Analysis**

The mobile phone repair appointment system is divided into front-end repair personnel module, user module, and back-end administrator module. The maintenance eye module mainly realizes the function of maintenance personnel publishing maintenance messages, users mainly realize the function of making and canceling appointments, and administrators mainly realize the function of managing personnel information and appointment messages.

The functional requirements for the maintenance personnel module are as follows:

- (1) Registration function for maintenance personnel, select the role of maintenance personnel, and then enter the number, username, password, mobile phone number, and email to register the account.
- (2) Maintenance personnel login function, enter the number, username, and password to log in.
- (3) The personal information management function for maintenance personnel allows them to view personal information, modify personal information, and change passwords.

(4) Maintenance personnel can publish appointment management functions by entering serial number, name, phone number, email address, time, location, and remarks to publish appointment messages.

(5) Maintenance personnel can view the appointment management function and see the published appointment messages.

(6) The maintenance personnel can modify the appointment management function and modify the appointment message.

(7) The maintenance personnel can delete the appointment management function and delete the published appointment messages.

The functional requirements for the user module are as follows:

(1) User registration function, select the user role, and then enter the number, username, password, phone number, and email to register the account.

(2) User login function, enter the ID, username, and password to log in.

(3) The user's personal information management function allows for viewing personal information, modifying personal information, and changing passwords.

(4) User reservation management function. The user checks the appointment message and selects the appropriate one to make an appointment. Check the appointments you have made and you can cancel them.

The functional requirements for the administrator module are as follows:

(1) Administrator login function, where administrators enter their ID, username, and password to log in.

(2) The administrator's personal information management function allows for viewing personal information, modifying personal information, and changing passwords.

(3) Management of maintenance personnel information, viewing and deleting maintenance personnel information.

(4) User information management, viewing and deleting user information.

(5) Appointment message management, view and delete appointment messages.

### **3.4. Technical Analysis**

This system uses Eclipse programming software, and the system database uses SQL Server database, mainly implemented using JSP and Servlet. Eclipse is very suitable for the Java language, as it is very convenient for development, writing, error checking, compilation, and assistance. There is a Chinese version that is easy to learn, free, and open-source. SQL Server syntax is simpler and easier to use, with good performance, strong stability, and greater security. And using Servlet is portable, more robust, and easy to develop.

## **4. System Design**

### **4.1. Overall System Design**

The system is divided into three modules: front-end maintenance personnel module, front-end user module, and back-end administrator module.

The functions of the front-end maintenance personnel module include maintenance personnel registration, maintenance personnel login, maintenance personnel personal information management, appointment publishing management, appointment viewing management, appointment modification management, and appointment deletion management.

The functions of the front-end user module include user registration, user login, user personal information management, and appointment management.

The functions of the backend administrator module include administrator login, personal information management, maintenance personnel information management, user information management, and appointment management.

## **4.2. Detailed System Design**

### **4.2.1. Maintenance Personnel Module Design**

Maintenance personnel can choose to register and log in to the maintenance personnel system, where they can view and modify personal information, as well as change passwords. Maintenance personnel can post appointment messages, view appointment messages, and then choose to modify or delete them.

### **4.2.2. User Module Design**

Users first choose to register and log in to the user system, where they can manage personal information, view appointment messages posted by maintenance personnel, select suitable ones for appointment, and then view their own appointment messages. They can also choose to cancel the appointment.

### **4.2.3. Administrator Module Design**

Administrators log in and enter the administrator system to manage personal information, maintenance personnel information, and user information. They can view and delete the personal information of maintenance personnel and users, manage appointment messages, and view and delete appointment messages.

## **5. System Implementation**

### **5.1. Implementation of Maintenance Personnel Module**

The maintenance personnel module mainly includes: registration and login, personal information management, posting appointments, viewing appointments, modifying appointments, and deleting appointments.

#### **5.1.1. Registration and Login**

1) Registration of maintenance personnel

The maintenance personnel input the number, which is unique as it is the primary key in the database table. If the entered number already exists, the registration fails. Select the role as a maintenance personnel, enter the username and password, the two passwords must be the same, enter the 11 digit phone number, and enter the correct format email.

On the maintenance personnel registration page, check if the registration information meets the requirements and output the results.

2) Maintenance personnel login

The maintenance personnel can enter the correct number, name, and password to jump to the maintenance personnel system. If the input is incorrect, a reminder box will pop up. Click OK to return to the login page and log in again.

### **5.2. Maintenance Personnel Login Page**

Obtain the number, name, and password of the maintenance personnel to log in.

#### **5.2.1. Personal Information Management**

1) Personal information of maintenance personnel

Maintenance personnel can see their name, phone number, and email address.

Personal information page for maintenance personnel.

Obtain the number, name, phone number, and email address of the maintenance personnel.

2) Repair personnel modify personal information

The maintenance personnel modified their personal information and successfully displayed a success prompt box. Click OK to jump to the page for viewing personal information.

Determine whether the format of the modified information can be successfully modified.

### 3) Maintenance personnel changing password

The maintenance personnel can change the password. If the change is successful, a success prompt box will pop up. Click OK to jump to the page for viewing personal information. If the change fails, an error prompt box will pop up. If two input passwords do not match, a prompt will be output.

## 5.3. Implementation of Administrator Module

The maintenance personnel module mainly includes: login, personal information management, maintenance personnel information management, and user information management.

### 5.3.1. Login

The administrator can enter the correct number, name, and password to jump to the administrator system. If the input is incorrect, a reminder box will pop up. Clicking OK will return to the login page and log in again. Obtain the administrator's ID, name, and password to log in.

### 5.3.2. Personal Information Management

#### 1) Administrator's personal information

Administrators can see their name, phone number, and email address. Obtain the administrator's ID, name, phone number, and email information.

#### 2) Administrator modifies personal information

The administrator modifies their personal information, and if the modification is successful, a success prompt box will pop up. Click OK to jump to the page for viewing personal information. Determine whether the modified information meets the requirements and output the result.

#### 3) Administrator changes password

The administrator changes the password. If the change is successful, a success prompt box will pop up. Click OK to jump to the page for viewing personal information. If the change fails, an error prompt box will pop up. If the password is entered twice but does not match, output a prompt.

## 6. Conclusion

This article preliminarily establishes a mobile phone repair reservation system based on JSP and SQL Server. The system is designed through overall design, detailed design, and database design. JSP, JavaBean, and Servlet are used to complete a system that can basically achieve registration and login, front-end maintenance personnel issue appointments, users make appointments, and back-end administrators manage them. However, there are still many details that have not been paid attention to, and many areas need improvement. For example, the interface is relatively simple and not aesthetically pleasing, and needs to be optimized to make it more beautiful. The code can be simplified, and there are fewer database tables. More database tables can be added to break down the data in more detail, and other functions can be added. These all need to be continuously improved in future optimizations to make the system more complete.

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