The Development of Online Shopping System Based on the MVC Pattern

ABSTRACT: The paper mainly introduces the development process of the online shopping system using the MVC design pattern and SSH framework technology. Because this system adopts the MVC design pattern, the development program truly achieves loose coupling and greatly simplifies the development code and has high maintainability and extensibility.

KEYWORDS: MVC pattern, Online shopping, SSH framework

1 Introduction

In recent years with the rapid development of Internet, the Internet has gradually become the best way of the acquisition, transmission and exchange information. Electronic commerce became popular, more and more merchants begin to build their own online store and show a kind of new shopping's concept to consumer. Online Shopping System broke through the time and space limit, make trading activities at any time and any place, thus it greatly improves the efficiency.

2 Requirement analysis

The functional requirements of this online shopping system include frontend customers and backend system administrator. Customer functional requirements includes register member, browse merchandise and query goods, check shopping cart and order status, browse news, etc. The administrator functional requirements include add, delete and modify the commodity information, management of members and the order, and other functions.

When customer logins the shopping website, he can directly browse commodity, including browse by product classification, commodity browsing, latest promotion commodity browsing, customers browse merchandise. At the same time, the customer also can browse the web site news and information for the latest information in time. Customers also can input keywords to retrieval needed goods. If the customer needs to buy goods, he must first login (if no website member account is required to register an account first). Customer can check your shopping cart and order after login and take related operations of their shopping cart. After System administrator logins into the background management system, the management personnel have different permissions to the corresponding operation, management, maintenance products, web site members, website news and order status, etc.

3 Design of the online shopping system

The development of Java Web applications mainly has two solutions by using framework at current. One solution is to use classic framework of EJB +JSP + JSF. Another solution is to use

lightweight framework of Struts + Spring + Hibernate (simplified SSH). Although EJB is powerful but because of its complexity, it is often used only in a large enterprise projects. The JSF as a relatively new technology standard is although the novel outstanding but also seems to be somewhat immature and remains to be development. And SSH framework technology is currently widely used. Its performance is excellence and stable, and various technical support documents, material also more abundant. So this paper adopts the SSH framework technology to development the online shopping system.

This online shopping system uses the MVC design pattern. The front desk page of system uses JSP and the struts2 tags to show goods and news, combined with Java Script and AJAX technology. It optimizes a page at the same time, further enhance the user experience. Control layer is the core part of the system, by the Struts action of the play. It is responsible for collecting various request message from the page to the server and then according to the different request to call a different business process logic. Finally the results forwarded to the appropriate view. Spring acts as a "housekeeper" status in the system. It is responsible for maintenance and management the service beans invoked by system action. Persistence model layer is responsible by Hibernate to take data processing. It provides various database operations for business logic calls.

Overall module structure of this system is divided into front desk user module and administrator module background. Each module is subdivided into several sub-modules and completes the corresponding function. Contact between various modules and form a complete system. After the user logins web site it can realize a series of functions.

3.1 Design of the front desk module.

The front desk module is mainly responsible for showing the a variety of goods and news information by a variety of forms for users. At the same time it provides keyword query functions. It can be convenient for users to quickly find the required goods and browse related news. Visitors can register as a site member, login to purchase goods, shopping cart management, order management, modify personal information, etc.

3.2 Design of the background module.

Background module shall be the responsibility for the normal operation of the maintenance and management of the shopping site after the administrator logins. The administrator can management commodities, member of website, news and information, the order submitted by users, etc.

3.3 Database design.

This system uses My SQL as the background database. My SQL is an open source relational database. It uses the most commonly database management language, structured query language. Since My SQL is open-source, anyone is free to use and in need of personalization changes on it. Because of the My SQL database’s high performance in terms of speed, reliability, and adaptability it is pay attention by people.

Through requirements analysis can know, objects used by the system are customers who needs to buy goods, so it is necessary to establish membership table, used to store the basic information of the user. Customer's main activity is to browse and buy goods, so it is

necessary to establish commodity information table. Lookup the commodities, in order to facilitate users to select the desired goods, so must be carried out on the goods classification, establish product category table. And to set up the customer's shopping cart list and order sheet, etc.

4 Implementation of the online shopping system

This system adopts My Eclipse8.5 development tools, uses Java and JSP language to coding, and writes the SSH framework configuration files.

4.1 Implementation of system public module.

In the process of system development, many function modules are used multiple times, such as some utility classes and the algorithm to repeated use. In the coding phase it must design the base class and public module. The public part extracted from the system, so the system implementation can more focus on business logic, and at the same time reduce code redundancy.

Data access is the basic function of each module to invoke almost. This system uses Hibernate for persistence database processing. At the same time it uses an interface design ideas and designs basic data access interface. This interface declares the system by using the DAO methods, calls to other modules. For the interface to write a DAO implementation class, the class implements all methods in the Base DAO interface.

4.2 Implementation of the front desk module.

This system will make the same style of all pages. The same kind of user operations is within a single interface to complete. Clicking mouse can easily realize commodity browsing, purchase, orders, query and other functions. It is easy to understand, and to use.

Inputting a web address into the home page of the system, users can quickly login or register in the browser. He can query the latest products and promotional items and browse news and information. Steps of homepage design are as follows: (1) to add the website Logo area, and then add a navigation menu bar below. (2) on the left to add commodity classification, and then promote the product in order to add new releases and area. (3) to add text news area on the right side. (4) finally, to add a footer area at the bottom.

4.3 User registration and login.

If users want to buy goods in this system, he must first login account. If the user is not a site member, he must register. In the homepage, users can click on the "register new member" to the registration page. In the registration page, he must input login name, password and verification code. The form information will be submitted to the background of controller to processing. The system will check the user information and return to registration information. Registered validation rules has the following points: (1) the "login id", "password", "verification code" cannot be empty. (2) two password must agree. (3) contact phone number and zip code number. (4) email format must be

correct.

If the information cannot pass the check , the system will return the corresponding message. After user registers to become a member of the site, he can login from the main interface. Login area has two main textfield controls. They can receive user name and password. Adding a login button can submit login information to the server. Server updates the user information, and stores
the member in the session that indicates the user has logged in.

4.4 Users browse the goods.

Enter the main interface users can see part of the latest goods and promotional items. Clicking on the menu bar of the "new releases" and " sales commodity" can enter the corresponding page to browsing more goods.

Commodity browsing using the JSP custom tag technology. It makes the page needs to display goods places without having to write a lot of logical function code (such as data access) and only need to add a custom tag and incoming parameters. Tedious operation will be transferred to label the definition of the class, so it can make front page display large thin body. Custom tags can be used in each place at the same time, improve the function modular of the system.

4.5 The management of shopping cart.

When the members login and want to buy goods, they will click on the "buy" button to add the item to shopping cart, and into the shopping cart management interface. In this interface, the user can choose to the buy number, delete goods in shopping cart, and into the next order confirmation or go to shopping.

After the selection of purchasing items is complete, click "to enter the next step" button of the shopping cart, enter the confirmation of order page, the user can see the selected all of the goods and price information.

4.6 The management of order.

If the user confirms to order he can click the "submit order" button in order interface. The system will put the shopping cart information submitted for the order. If the user clicks on the menu bar on order management connection, he can see the user submitted the order before. In order management page, he can delete orders, view order details.

4.7 Browsing news.

Below the menu bar is news module, which includes a constantly switch slide news text and to the right of the connection. Click on the headline users can enter to browse news and information. Similarly, the system also defines news page tags, slide news tags, related news tags.

4.8 Commodities, news search.

When the user can't find the needed goods or would like to browse news and information, he can use the site's search function. In the commodity, news search area, he can search on website commodity or news

If users want to select the search goods in pull control, he can click the search button, the page

jumps to search Mer.jsp page. When the option is news, he can click the search button, the page jumps to search News.jsp page.

4.9 Implementation of shopping system background.

Each function module in System background uses the same design scheme, which involves management functions of goods, news, product categories and orders to add, delete, change and check. They all have adopted the front desk page requests sent to the controller action, then action invocate the service of business processing module, the last action to deal with the results back to the view layer, and the service layer is call one or more DAO methods for data processing.

4.10 System user login.

Website can log on to enter the backstage management system, for the related maintenance management work. In order to enter background management system, administrator must log into “ account" and "password" and the verification code.

When the administrator input correct user name, password and verification code, he can enter the main interface of the system background. The main interface is divided into the following areas: (1) at the top displaying system title, the current login user and time, etc. (2) a tree navigation menu on the left, click the menu can be performed the corresponding management functions. (3) page in the center is used to display the ongoing specific administrative actions.

4.11 Backstage commodity management.

Backstage commodity category management module can manage the commodity category, including the commodity categories to view, add, modify, and delete. If commodity manager purchase a batch of new products, he can click the "add" link to enter new product category page. Backstage commodity management module can manage the commodity, including commodity add, view, modify, and delete, and change the goods release status.

4.12 Backstage order management.

Order management enables administrators to easily see all the order information, change the order’s status, and delete the order.

4.13 Background news management.

In news management administrators can view all the current site news, add new news or make changes to the existing news information. Click the delete link he can delete news columns specified.Click "news management" on the left tree menu, administrator can see the web site of the news column, publish status and current news. Click the "new" connection, he can add new news.

4.14 Background member management.

Click "member management" on the left tree menu, administrator can see membership level of the website, including ordinary members and VIP members, as well as a variety of membership levels. He can add a new level, the

revision of member level, and delete member level in the page.

4.15 System user management.

Click "system user management" in the navigation bar, administrator can enter the system user management interface, add the system user, view the permission of current user, modify and delete the system users operation. Click "new the system users" or "new" , he can add the system users to assign specific permissions.

Conclusion

This paper has realized the General function of shopping website, such as browse, purchase of goods, the shopping cart, order management and search functions. The system can meet the needs of customers shopping online and also add news browsing. The user can browse news and information on shopping. It changes the traditional single shopping mode in shopping website. After testing, the system has reached the expected function and performance requirements.

This system uses SSH open source framework, integrating their own core technology advantage. this system adopts the MVC design pattern, the development program truly achieves loose coupling and greatly simplifies the development code and has high maintainability and extensibility Because the system is running stable and reliable, the function is perfect, the operation is simple and the style is unified interface, it can give a good experience for users.

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