



## The development of struts framework based on shopping website

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### ABSTRACT

*Construction on the shopping site is what we must first consider its development must first understand the current information website development background, domestic and international status and popularity of information technology. This article is from the development of a retail site, expand the analysis and the system design and database functions, the use and development of the theoretical knowledge of the application based on Struts framework technology of MVC model in the system, an online shopping site finished. The site can be realized commodity browsing, search, buy; customers can give web site message, view the shopping help the realization of the basic requirements for general shopping sites. The development of Struts framework based on shopping website.*

**Keywords:** shopping site, platform, framework, e-commerce, CSS

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### INTRODUCTION

E-commerce activities on the network to expand the company's corporate influence, increase traffic, improve customer satisfaction, has become a key consideration by many companies [1]. Which are built above with a well-functioning shopping site in the most efficient way, the selection of the best tools technology, rapid development, it is deployment, application shopping site as the current focus of the issue.

Web server development technology have improved the development of complex Web applications become possible, so have the two most important enterprise-class development platform - J2EE and .NET. J2EE is a pure Java platform, including the three core technologies, Servlet, JSP and EJB. Java technology is platform independence, portability, and the support of many IT manufacturers. Web client, the main task is to show the information content; the HTML language is an effective carrier of the information displayed. CSS (Cascading Style Sheets) and DHTML (Dynamic HTML) Web pages more wealth to the dynamic show. The technology is the first dynamically generated HTML pages CGI technology, now the mainstream server-side technology PHP, ASP, JSP, have produced and widely used. ASP also mainly running on top of Microsoft's server products, the PHP can run on Windows, Linux, Unix, Web server, but some code to make changes in the platform conversion, and the JSP can run on almost all platform. The paper puts forward the development of shopping site based on struts framework.

### 2. J2EE platform, MVC architecture and Struts framework

J2EE as the development platform SUN Company is in order to promote the support of many IT vendors. The MVC architecture is the platform of a development model, as an important separation technology, so that the coupling of the system greatly reduced, while improving the reusability of the system. Struts are an implementation of the MVC architecture is a popular Web development framework, has been widely used [2]. This chapter introduces the J2EE platform, MVC architecture, Struts framework.

MVC (Model-View-Controller) model - view - controller is a classical architecture; the application is divided into three parts of the model, view, and controller. Model is the main part of the application, it is generally said that the business data and business logic to provide data for the view layer. A model can be used for multiple views, improve the reusability of the system. View is the interaction with the user interface. Can be used to display information and

accept user input. It generally does not conduct business processes, but can handle model changes the view changes to update the view synchronization, as is shown by equation 1.

$$\begin{cases} C_{j+1} = HC_j H' \\ D_{j+1}^h = GC_j H' \\ D_{j+1}^v = HC_j G' \\ D_{j+1}^d = GC_j G' \end{cases} \quad (j = 0, 1, 2, \dots, J - 1) \quad (1)$$

Controller controller accepts user's request, and then calls the appropriate modules and views to complete this request. Servlet in J2EE projects generally take up this task. J2EE application model based on the MVC architecture in Figure 1 [3].

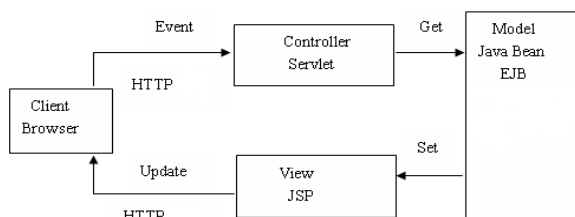


Fig. 1 J2EE model based on MVC architecture

The framework model is software architecture; it focuses on the description of the overall structure. This section briefly describes the components of the Struts framework, principle of operation and its characteristics.

The Jakarta-Struts is an open source project provided by the Apache Software Foundation, it provides a model for Web application - View - Controller (MVC) architecture. In the Struts framework, MVC architecture from different components. Model constitutes a Java Bean or EJB components that implement business logic. Controller ActionServlet, and other auxiliary objects such as: Action, the Action Forward, Action Mapping to achieve, and view a set of JSP files. Struts concrete realization of the MVC framework in the form shown in Figure 2.

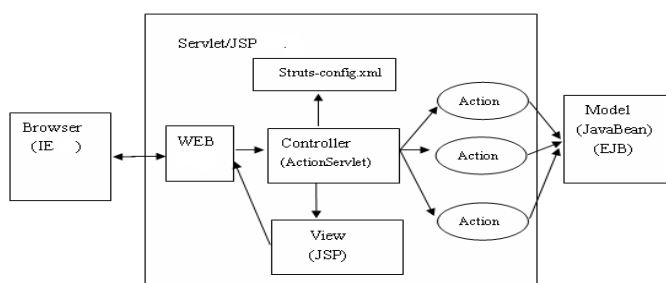


Fig. 2 Struts implementation of MVC framework map

Implement the view of the JSP file, there is no business logic, there is no model, only the label, these labels can be a standard JSP tag or customized labels (such as Struts comes with the label). Under normal circumstances, the Action Form bean in the Struts framework also divided into the View module [4]. The Action Form bean is actually a Java Bean, Java Bean conventional methods, it also contains some special method: such as Validate () method (used for verification of the submitted value), the reset () method (for Form in the value of re-assignment). Struts framework with the Action Form bean form data passed between the view and controller. View of the form is submitted, the controller automatically update and synchronize the Action Form bean.

The model represents the state of the application and business logic. For large Web applications, business logic is usually a Java bean and the EJB component, for a small program or the business logic is not complex processing, can be implemented in the Action class execute () method, as is shown by equation 2.

$$C_{j-1} = H' C_j H + G' D_j^h H + H' D_j^v G + G' D_j^d G \quad (J = J, J - 1, J - 2, \dots, 1) \quad (2)$$

The controller is composed of the ActionServlet classes and the Action class. In an application using the Struts framework, the ActionServlet object at run time is generally only one, and is automatically provided by the Struts framework.

ActionServlet in the Struts framework plays the role of the core controller, it receives an HTTP request, according to the configuration files Struts-config.xml configuration information, forwards the request to the appropriate Action object. Action object receives a request, call the execute () method. This method is accomplished through the use of the Java bean or EJB business logic. Processing business logic, the view of the user to switch to another view, as is shown by equation 3.

$$\hat{C}_j = (C_j^1 + C_j^2) / 2 \quad (3)$$

Struts-config.xml is the form of an XML document storage requests are forwarded to the configuration file mapping information. The configuration information: the data source, the global forwarding, global exception, Action mapping, the Form the bean registered. ActionServlet through this file is in order to get configuration information [5]. Figure 2 is the icon of the Struts implementation of MVC. The browser makes a request to the Web container, Web container to transfer the request to the Struts framework controller ActionServlet is responsible for request processing, the controller to obtain configuration information from the Struts\_config.xml file, and then by specific Action in the system to perform the business logic which may call for certain business logic processing system model of the Java bean or EJB, has been dealt with then the data to the appropriate JSP page, and finally the Web container Web page sent to the client, this process will be completed under the Struts framework the client and server interaction.

Web applications using the Struts framework is first when it starts to load and the initialization AcitonServlet, AcitonServlet read from the Struts-config.xml application configuration information and store the information to a variety of used to the starting role in allocating the object(such as: ActionMapping, the ActionForward).When the program runs, dynamic call these configuration objects.

A strut is open source software, which allows developers to in-depth understanding of its internal implementation mechanism. Framework of each piece has a strict division of labor, especially in the part of the controller, such as the Action to handle the business logic mapping Action Mapping processing, the ActionForward used to handle the steering configuration. In addition, the advantages of Struts are also reflected in: Taglib tag library and page navigation. Taglib Struts comes with the tag library; flexible use of the tag library can reduce the program code, and make the page simple. Struts page navigation by configuring the Struts-config.xml to achieve this configuration file in source code (ie, in the form of an XML document) can graphically configure, it makes clearer the context of the system, for future maintenance, updates there are great benefits.

### 3. Description and design of the system requirements

After the existing traditional business processes, inspection and observation, and careful consideration, the analysis of business processes that may occur in the future, can get the system functional requirements as follows: 1. Goods browse. Show Web page to highlight the performance of commodities, goods page, basic information of the display of goods, such as the name, date of manufacture of goods, commodities, production companies, and other information. Have a page, at the same time, be able to view the detailed information of the goods, in addition to the basic information of the goods you want to add the detailed description of the goods, the evaluation of other customers for the goods, the goods from different sides, look that can be observed in pictures [6].

Sign on as a way of trading, the two companies know each other's information, at the same time as the mall party, to distinguish between different purchasers, and consumers buy goods records, generate orders, which require the user's information. User registration information stored in the database, this information is called when the user later in this web site to purchase goods is given by equation 4.

$$STD = \sqrt{\sum_{i=0}^{M-1} \sum_{j=0}^{N-1} (F(x, y) - MEAN)^2 / (M \times N)} \quad (4)$$

Shopping help take into account that some customers are not familiar with online shopping, to design a page to display the entire shopping process to help users shopping, shopping among the common problems encountered while listed for reference. Feedback, user suggestions and comments on the company after the day-to-day operations

will have a huge impact, and promptly collected customer feedback after the mall to provide quality, customer satisfaction is of great significance [7].

The shopping cart, the user site to buy something to temporary storage was Suoyu the purchase of goods. Design a simulated shopping cart, you can save, modify, delete these temporary shopping information. Site news, site may have some announcements, promotions and other information you want to publish, to design a page to display the information published on the website, as is given by equation 5.

$$RMSE = \sqrt{\frac{\sum_{i=1}^M \sum_{j=1}^N [R(x_i, y_j) - F(x_i, y_j)]^2}{M \times N}} \quad (5)$$

Consider the system requirements analysis, the modular design of the site are as follows: 1. Users registered login module. Contains display registration agreement, registration information records, user login; Merchandise display module. Include general merchandise display, retrieve, and display detailed information; Shopping help module. Show the average customer shopping help; Press the display module. Display the site daily published notice, news, and so on.

The pros and cons of the system database design directly affect the after site with data connection speed and complexity of an update query [8]. This section describes the design of this system is based on the database the overall structure of the relational database design and data sheets.

The system's database design is named for the shop data write database scripts for later migration of the database. Take into account the initial amount of data for this site, began to run when the database file size to 10M, 50M, increments 5M. Trigger for some of the operations of the database you want to write the script, to prevent the data does not change, so ensure the safety and accuracy of the data.

The system interface is the user interface; it is the user can directly see. Research in computer ergonomics, it is interface design and more attention. Design the user interface to fully take into account human factors, such as the user's characteristics, how the user interacts with the system; the user how to understand the output generated by the system as well as users of the system have any expectations, as is shown by equation 6.

$$PSNR = 10 \times \log_{10} \frac{MN[\max(F(x, y) - \min(F(x, y)))]}{\sum_{i=1}^M \sum_{j=1}^N [R(x_i, y_j) - F(x_i, y_j)]^2} \quad (6)$$

Needs relating to commodity price information, the user's personal information page of the site, the information should ensure their accuracy, so in the interface of the system to verify the processing of such information. The same time, the user's private information, to ensure the basic security of the information displayed on the page, such as hide the display to the user's password, the user's question to check before they can perform certain actions.

#### 4. Site specific implementation of the Struts framework

Struts framework to develop the introduction of the Struts framework in project development model, and then in accordance with the specification of this model system [9].

The JSP page is the most tedious part of the development, in Myeclipse development tools can drag completed part of the control, but most of the information display to use code written in the form. The JSP page of this site is mainly HTML tags, JSP tags, custom tags (mainly Struts tag), CSS and JavaScript [10]. This system is mainly used HTML tags, bean tags, and the Tiles tag. When the page is the introduction of the java bean, you can use the import attribute of the JSP page tags can also use the jsp label use bean property.

ActionForm is used to submit the Form data synchronization mapping class, if not dynamic Form Generally speaking, each ActionForm corresponds to a JSP page. System ActionForm: loginAgreeForm, noteForm, orderForm Forms 8, respectively, corresponding with the corresponding JSP page, of course, some pages may not need to configure the Forms.

In this system, the ActionServlet is the central controller, it is automatically provided by the Struts framework, so no programming is required to achieve the program. Struts-config.xml configuration file, which controls this site page flow, which set up the database connection information, global forwarding, global exception mapping relations,

Action, ActionForm, the resource file location information when the application up and running ActionServlet will read information from the configuration file to determine the next step.

Struts-config.xml there are two editorial formats, one is shown above in source code form, another form of the graphics page. Editor in the graphics page which is more convenient, graphics drag configure. You can also right click, and then generate the associated Action ActionForm, the ActionForward.

In order to make the site pages to form a unified layout, this program use the Tiles tag library, so that the whole site to form a consistent interface. The layout page file the: layout.jsp. It formed the layout of other pages can be inserted into the internal, while reducing the complexity and difficulty of development of the JSP page. For example, the development of the home page, which involves a lot of encoding, the Tiles framework, it can be split into a functional part of, and then the various parts of the preparation, finish writing the various parts of the rounds, and then insert a unified layout page can it.

The formation of a unified layout, the other page becomes very simple, the other page is essentially the same, simply insert one of the necessary pages to form the final page.(Message of the page) such as index.jsp (home page) and innote.jsp only slight differences in the content part into the local page inserts the contents of the index.jsp indexcontent.jsp, in innote.jsp content inserted note.jspdisplay different pages under the unified framework of the page.

## CONCLUSION

The main features of this system are reflected in the following aspects: 1. Application configuration file of the Struts framework Struts-config.xml makes the transfer of control is very clear. In the future maintenance, change this configuration file can create a new page flow. 2. Using the Tiles framework development page, reduce the complexity of the page developed to maintain a uniform appearance and the system page. Based on the MVC pattern, the establishment of a reusable class reduces the duplication of development of the system.

The development process of the shopping site, select the appropriate development framework will not only speed up development, improve the quality of development, but also to improve program maintainability, reusability. The three-tier separation of MVC architecture reduces the coupling of the system. Presentation layer, model layer, business logic to assume the task of the layers, reducing the inter-linkages between developments of the complexity of the system greatly reduced. Struts framework, develop the corresponding JSP, ActionForm, Action, the first design page to submit the data, then generate the ActionForm Struts-config.xml graphics development, while allowing the system to automatically generate the JSP page, as long as a slightly modified, it can be used. Finally generate the corresponding Action class, which is a more appropriate order.

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