

Design and Implementation of University Students Internship Employment Tracking System Based on MVC Framework

Lei Xue

Northeast Petroleum University, Qinhuangdao, Hebei066004, China

Abstract: This paper is based on key projects of national science and technology support programs. Based on research of literature both abroad and in broad, the author analyses and compares the current development status of internship management system. Following the software development process and guided by educational technology theory, this issue describes details of the internship management system's user requirements and functional structure, and highlights the user-centered interaction design issues in the application, aims to bring a wonderful feeling to user experience and to extend the user's interest. On this basis, the main function system modules of applications for internships, practical arrangements, the teaching of design and algorithm is described in detail. From design to achievement of the algorithm, the system considers not only performance optimization, but also pay more attention to the whole process of convenience of using, aims to achieve better use, easy to use effects. The author reads through the literature, designs questionnaire for internship management system, by making a comprehensive analysis of which to improve the internship management system on the science, rationality, effectiveness and so on. Finally, future research ideas of Internship training management system are briefly described.

Keywords MVC; design pattern; object-oriented; software architecture; framework; Web application

INTRODUCTION

The demanding of high quality skill type talent has increased dramatically along with the social and economy development. The key point in the technical talent development is to train students' problem-solving skills, which can only be improved in the actual work. Therefore, all the vocational colleges that are specialized in technical skilled personal training pay extra attention to the students' education during their off-campus internship. [1] Due to the highly discrete geographic distribution of the internship sites and the excessive time fragment of both the instructors and the students, the traditional manual management and electronic data input mode could no longer meet the current student internships management requirement. Instead, information management mode that can track students' internship in a timely manner, monitor and evaluate the results of students' internship, and do real-time data statistic and analysis, becomes more and more popular. The internship management system that can provide information sharing and processing among college, students and industry plays critical role in this information management mode.

This paper discusses the important aspects in software development based on the architecture. By the theory of the software architecture, this paper analyzes and compares two types of developing mode, which are the traditional development mode of Web application and the developing mode of Web application based on MVC pattern. [2, 3] The development mode based on MVC pattern can

overcome many disadvantages in the traditional development mode. And its excellent feature is to separate display logic and operation logic, which can meet design requirements of the more and more complicated Web application. So it is an inevitable trend to use the development mode based on MVC pattern for Web application.

Internship training is a practical mode of teaching promoting in part of the vocational schools and colleges, however, there are a lot of problems in the reform practice management: limited teaching means and not fluent contact leading to process management difficult to control; High quality resources hard to share and statistical obstacles leading to the practical results difficult to accumulate. Along with the development of network technology, especially the development of Web2.0 largely can make up for the drawbacks of practice management [4], but now the practice management system is still in the information release system chromatography, As a result, the practice management work a lot of inconvenience. How to use network technique had a great effect for the practice management.

This paper is based on research of literature both abroad and in broad, the author analyses and compares the current development status of internship management system. This issue describes details of the internship management system's user requirements and functional structure, and highlights the user-centered interaction design issues in the application, aims to bring a wonderful feeling to user experience and to extend the user's interest. This system incorporates the practice management process

and the practice teaching system, better realize the unity of the management process and teaching, especially for the design details of the practical arrangements, largely solved the inconvenience of practice management.

DEMAND ANALYSIS AND TASKS

Through the requirement investigation of Hubei Wuhan Software Polytechnic College internship management department, we analyzed the business process and obtained the systems functional and performance requirement. The UML models are established using Rational Rose. [5]

We analyzed and compared the common software design patterns and software frameworks. Load Runner is used for the performance test of Struts2 and Spring MVC based projects. Spring MVC, as the winner of performance test, combined with Hibernate are picked to construct our software base platform.

Based on the project requirements, we finished the conceptual design, detail design, and database E-R design. Layered design was completed for presentation layer, control layer, business logical layer and persistent layer. The network deployment is made for actual application environment plays a guiding role in the following up integrate cabling procedure.

Iterative development model is used for developing management of the Spring MVC based vocational college internship management system. The UML modeling of main functions, configurations and core codes are listed in this dissertation.

Rich client technology has been adopted to configure system menus based on actual requirement of work environment. This increased the usability, maintainability, and extensibility of the system.

Role based visiting control enables multi-user multi-privilege dynamic setting, which ensured the system's security. Data in the Excel tables can be imported to or exported from the system. Jasper Report is used to analyze mixed types of data and generate corresponding report forms.

DESIGN AND LMPLEMENTATION OF EMPLOYMENT TRACKING SYSTEM BASED ON MVC FRAMEWORK

MVC Model 1.

The first major change in the architecture comes with the introduction of the MVC Model 1 Architecture (Fig. 1). This architecture was completely based on the page centric approach. In this model a Java Server Pages to program to control the Presentation, Business Logic and flow of the program. In this model the concept of the Business Logic was introduced. The business logic was hard coded in the form of the Java Beans and expressions. All this codes was used to write within the JSP page.

Let us assume a case when we want to transfer the flow of the JSP application based on the data we received from the input

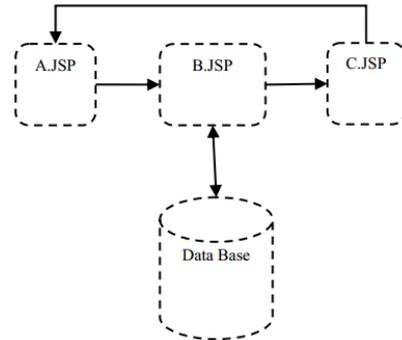


Figure 1. Page Navigation in MVC -1 Architecture

MVC Model 2

The model 1 architecture was able to solve some of the problem of the web and internet programming but still there were a lot of things missing from it. (Fig. 2) It was centered on the navigation of the JSP pages so there was the scope of the further development in the architecture point of view. During this process the next development was the Model 2 architecture. This problem was solved using the Servlet and JSP together. The Servest handles the Initial request and partially process the data. It set up the beans then forward the result to the one of the jsppage. The Servlet decide the one of the page to be displayed from the list of pages.

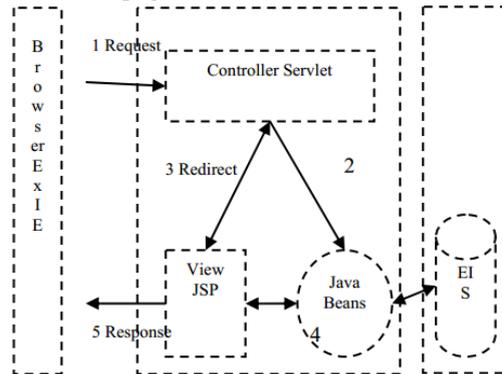


Figure 2. MVC -2 architecture

In this Model 2 architecture the JSP Pages were used to Presentation purpose only. The Business logic has been removed from the page. This makes the pages easier to represent and light weight pages which were easy to display on the internet. In this model all Control and application logic were handled by the Servlet. The Servlet was written in the java programming language. So it was also easier to handle the programming part of the Servlet. In this scenario the Servest becomes the power full for the complete application and It has emerged as the center point for the application. In the model 2 architecture

the Servlet becomes the gatekeeper for the all common tasks. It provides the common services like authentication, authorization, error control and follow of the application. This architecture have solved the most of the problems. But still there were many new issues emerged while applying this architecture.

Applying Architecture with Multiple Frameworks.

Web and Internet is ever growing area and the demands for the applications are growing. A single framework is not capable to handle the architecture of the application. To meet the currents requirement of the applications it's necessary to design a architecture to implement the frameworks. Struts framework have been designed and developed for the front end control of the web applications. It provides the various features for the applications that interact to the users. It also follows the MVC 2 design features. Spring Framework is the designed to handle the various tasks. The spring work for the desktop and internet based applications also. It follows the principals of the MVC 2. The simultaneous use of the Struts and spring frameworks in the single application with the applying the MVC Design principals so that we can Improve the performance of the applications. Struts Framework consists of three major blocks, Described in brief as follows. (Fig. 3)

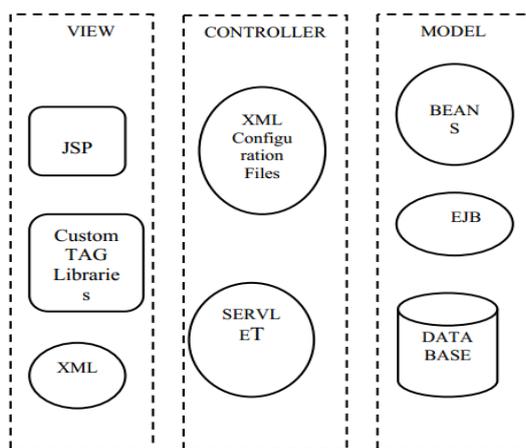


Figure 3. Struts Model Architecture

This approach is based a combination of applying the two framework struts and spring for the application development. The sequence diagram for the combined application is explained as above, which is the main driving force for the application. This approach assumes that basic knowledge of web applications is essential. We have tested the above concepts and find out it successfully. Major benefits of the above architecture are as follows. 1. It will provide a very clean division between actions, action forms, controllers, handlers, JavaBeans models, and views. 2. Spring's MVC is very flexible. Unlike Struts, this forces your Action and Form objects into concrete inheritance. We are using advantage of both.

3. Spring MVC is entirely based on interfaces. Every part of the Spring MVC framework is configurable. 4. It provides controllers, making it easy to handling of many requests from User Interface.

CONCLUSION

This paper designs and implements a MVC pattern based framework for Web application software systems. The framework has three layers according to MVC pattern. The view layer provides a component package and some templates. The component package and theses templates can be reused and lighten the burden of developers of Web page. The controller layer is composed of one controller and three executors, which are the SQL executor, the API executor, and the default executor. The three executors respond three sorts of request respectively. The model layer defines the data structures and encapsulates the operations to database. In the framework these is also an assistant tool package for system integration, that is menu manager system, which is composed of menu item manager, menu template manager and simple user manager.

The framework of Web application based on MVC pattern uses the theory of the software architecture, the object-oriented programming method, many kinds of design patterns, J2EE and xml techniques. So, the framework has many advantages, such as good reusability, scalability, modifiability, and it can also improve developers' working efficiency and the code qualities. So the framework is a nice option for software developers to choose it.

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