Design on Textbook Subscription System Based on JavaEE

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Abstract. With the continuous expansion of universities and increase of school scale, workload of textbook management staff in college become more and more heavy. Using the traditional manual record has been unable to meet the demand, this paper study the design of college textbook subscription system based on JavaEE. Firstly, introduce the key technologies, including JavaEE, Ajax, Hibernate; then, research database design, design textbook subscriptions table; finally, according to the characteristics of textbook subscriptions designed functional modules of the system. Design of college textbook subscription system based on JavaEE, to address the shortcomings of the traditional way, to achieve the rationalization and scientific for textbook management, improve the efficiency of textbook subscription management, and saving cost.

Introduction

With the continuous development of information technology processes, speed of updating knowledge faster and faster, constantly expanding university, college textbook subscriptions management is facing the type and quantity of textbooks version continue to increase, making college textbooks subscriptions management facing complex, textbook variety, large quantity, the number of textbooks demand is difficult to determine. There are a large number of duplicate data entry the college textbooks subscription entire process, which not only increases the workload of textbook management, reducing management efficiency, the use of manual management time-consuming, laborious, but there are still many people in the manual calculation errors, has been unable to meet the development needs, Therefore, using computers to manage subscriptions college textbooks has important significance. A standardized and efficient college textbook subscription system will be obtained on the basis of good teaching effect [1-2].

In this paper, using JavaEE to design textbook subscription management system, JavaEE is to build solutions for enterprise applications on the Java platform, which greatly simplifies the development, deployment and management of enterprise-class solutions for complex problems, it also provides for enterprise applications transactions, security, naming, persistence, and resource management services, which make JavaEE application developers to focus on developing business logic without regard to the underlying detail [3]. This paper carries on the design according to the previous textbooks subscription shortcomings, past teachers can only choose some textbooks stack room, not to develop an appropriate teaching materials by teachers according to their actual situation, students can only query, not free subscriptions, the lack of flexibility. The system can solve all the disadvantages of the traditional way, to facilitate the textbook subscriptions, the safe, reliable, fast, efficient and significant savings in manpower and resources, to achieve the textbook management rationalization and scientific, improve the efficiency of textbook subscription management, savings the cost, with a certain application prospects and value [4].

The Key Technology

JavaEE is multi-diered, distributed, component-base enterprise application model by Sun company proposed. It is widely used in the Java programming language server platform. Is provided by the component-based approach, consists of a set of services, application program interface (API) and protocol, used to design, develop, assemble and deploy enterprise applications, it also provides a multi-layered distribution application model, component reuse and consistency of the security model, and flexible transaction control for Web-based multi-tier applications [5].

Three component technology of JavaEE are Servlet, JSP, EJB; among the advantages of EJB components that encapsulate good, no need to modify the code and recompile between application system, EJB technology is a distributed computing system architecture specification that component-based, EJB distributed enterprise applications for business logic components, EJB components is to follow a specific format to write a Java class file [6]. Multi-tier distributed application model of JavaEE, the interaction between them is very high frequencies. Generally include the presentation layer, control layer, business logic, and persistence layer. The presentation layer is to achieve interaction with the user. The business logic layer is responsible for with procedures functional logic processing. Persistence layer is responsible for data storage, access, and update operations, and more interaction with the database. To achieve independent of each other between the layers, each layer to provide specific services, the various layers can be combined by minimal coupling method, after stratification, not only the levels function units and easy to implement, and easier to maintain and expand [7]. JavaEE system architecture is shown in Fig. 1.
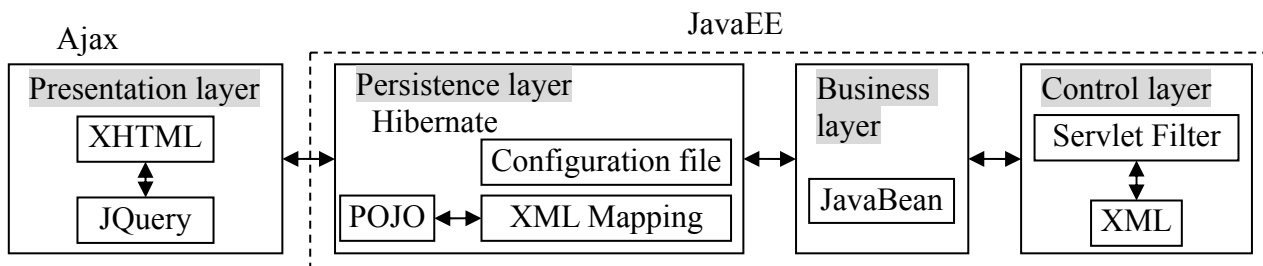

Fig. 1. The architecture of JavaEE

Ajax is Asynchronous JavaScript and XML, Ajax is Web application development methods to use client-side scripting and Web server exchange data. Web page without interrupting the interaction processes to reload, it can be dynamically updated. Using Ajax create close to local desktop applications, direct, highly available, richer, more dynamic Web user interface. Make the Web response more sensitive, more efficient data transmission, provides the ability for the browser and the server asynchronous communication [8].

Ajax is not a technology, but rather a combination of a series of related technology application skills. Ajax involves technology Javascript, XMLHttpRequest, DOM, XML technology, and others. Core of Ajax is a JavaScript object XMLHttpRequest, which allows sending a request to the server through JavaScript, and processing server response, to avoid blocking the user action. By using the XMLHttpRequest object, the browser through client-side scripting to exchange data with the server, Web page without frequent reloads, its content is dynamically updated by the client script [9]. XMLHttpRequest is the soul of the whole Ajax technology, only depend on the XMLHttpRequest object, Ajax can realize asynchronous send requests; JavaScript scripting is another important part of Ajax technology, is the Ajax programming technique, which is mainly used to create XMLHttpRequest object to the server sends the request, and provides the interface operations such as HTML, XML and other document objects through callback scripts and DOM (Document Object Model) technology, used to dynamically update HTML; XML (Extensible Markup Language) to define structured data specification to enable online transmission of data and documents in line with uniform standards, Expressed using XML data and documents, can easily be shared so that all programs [10]. The working principle of Ajax is shown in Fig. 2.
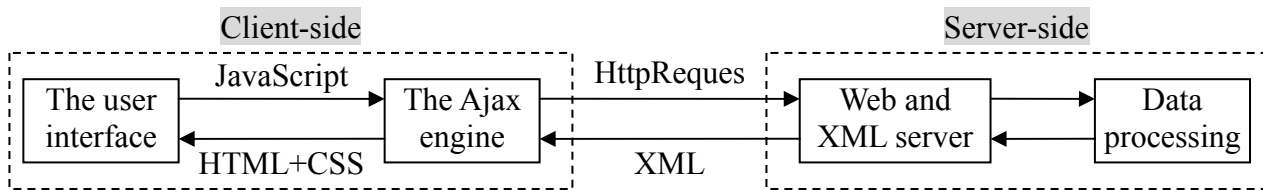
Fig. 2. The working principle of Ajax

Hibernate is a developed source, and very good, mature ORM framework. It is mainly carried out on a lightweight object encapsulates for JDBC, complete data persistence operations, but also is a framework of the developed source code, software developers are free to use object-oriented programming methods to manipulate the underlying database. Hibernate can be used in JDBC, Java client, Servlet, JSP and the other Web applications, most importantly, Hibernate can replace and is applied the CMP in the JAVAEE EJB [11].

The use of Hibernate framework to construct the data persistence layer, needs to create a data access object DAO value object and the Hibernate Mappings mapping file, where each value object encapsulates the data of persistence layer object, corresponding to a table in the database, the number of attributes and the corresponding get/set method is composed; each DAO class defines the select, insert, update, delete and other basic methods of database operations, persistent layer in the business entrance of each module is DAO interface, DAOImpl class is an implementation class of DAO interface, is implementation of specific business, provide data source for the business layer. All DAOImpl are inherited from Hibernate DAOSupport class [12].

Database Design

Database is the core part of modern management information system, a good management information system must be required to have a rational design, good performance of the database structure, all the exchange of information and the implementation of functions are based on the database, so the database design is essential. Operation of the database is mainly on the table operations of database, so reasonable to build a database table is an important basis for the rational design of a database. According to the needs of the system, textbooks subscriptions involves processing information is more, use the database table mainly includes: administrator table, student information table, teacher information table, department information table, textbook information table, textbook subscription information, course information table, order information table, user login table, which subscription information table containing teachers and students about textbook subscription information. Textbook subscription table is shown in Table 1. Textbooks subscription information table: textbook ISBN number, textbook name, publisher, publication date, author, price, department number, book type, barcode, number of students, grades, reviewers ID, course name, subscription number of books, courses number, remark.

Table 1. Textbook subscription table

Fields NO	Fields Name	Fields Type	Fields Width	Primary Key
1	ISBN	Varchar	50	Y
2	Tb_name	Varchar	200	N
3	Publisher	Varchar	100	N
4	Pub_time	Nvarchar	50	N
5	Author	Varchar	30	N
6	Price	Varchar	50	N
7	DepartID	Int	10	N
8	Tb_type	Varchar	30	N
9	Barcode	Varchar	30	N
10	Student_number	Int	10	N
12	Student_class	Varchar	10	N
13	Reviewers ID	Varchar	50	N
14	Course_name	Varcharv	50	N
15	Course_number	Int	10	N
16	Order_number	Int	50	N
17	Remark	Varchar	50	N

Function Module Design

According to textbook subscription process, teachers choose textbooks based on the course plan, then fill textbook subscription list; faculties department to discuss the teachers selected textbooks and summary; faculties audit the selected textbooks and summary textbook subscription list; Office of academic affairs selection textbooks and summary institute order; after the administrator information into textbook subscription management system, by teaching faculties secretary select department, professional, department, class, textbook information and other information in the system, complete the system textbook subscriptions work; subscriptions list generated by the system, send an e-mail or print a list to the book suppliers [13]. The paper designed the administrator management module, teacher management module, student management module. System module structure is shown in Fig. 3.
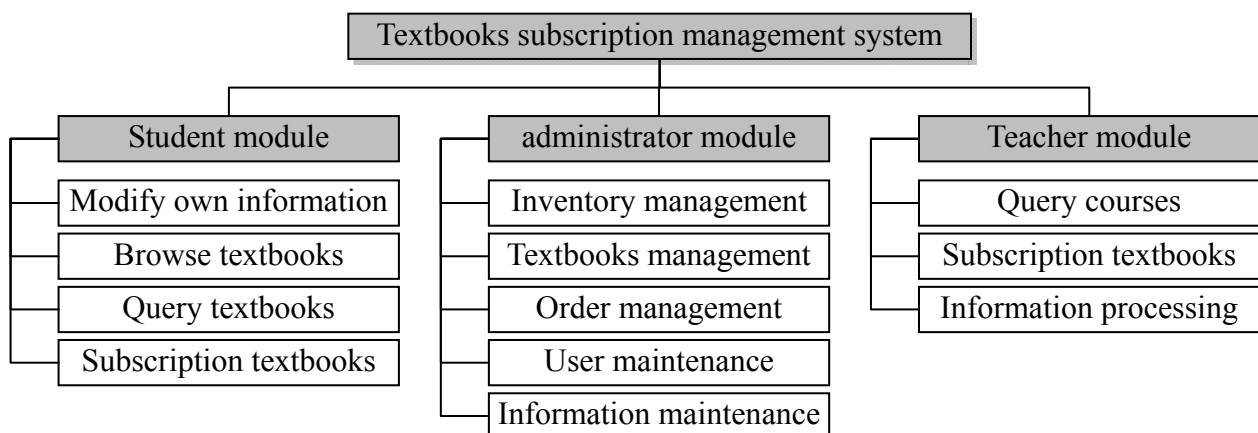

Fig. 3. The system function module

Teacher subscriptions module is to change the way of teacher traditional subscription, provides great convenience for teachers to use textbooks subscriptions, and promote the improvement of teaching quality. This module allows the teacher to perform textbooks online browsing, subscription

and query operations, and for some part of the subscription can modify and delete. Teachers textbooks subscription, show the need to specify the textbook curriculum and class, teachers through the system in the online selected textbooks for students, and to fill in with the number of books, to form teachers subscription list.

Student subscriptions module is convenient for students to conduct inventory textbook query and browse, timely to grasp the school textbooks situation and make timely understanding to course textbook [14]. Students can also choose textbooks, after selecting, directly generate orders, including the student's personal information and textbook order information. Students and teachers order information will be classified and summarized according to book types, so that each book is only one subscription information.

Textbook subscriptions administrator can be exported total orders through the system, to determine booksellers according to the different press. Textbooks subscription administrator module is the most important part of the system, based on information means to achieve textbook subscriptions work, to meet textbook information management, maintenance, and timely processing textbook orders, according to the displayed curriculum and class information and to send textbook. Manage textbook inbound and outbound, registration missing books and subscriptions, and so on.

Conclusion

Textbook management work is an important part of colleges teaching management, and textbook subscriptions work is an important link to influence textbook management. In order to ensure high-quality textbook in the classroom and to improve teaching quality, should be paid attention to the existing problems about textbooks subscriptions. This paper designs the college textbook subscription management system based on JavaEE according to the present situation of college textbook subscription management and the existing problems. in the design of effective teaching JavaEE provide transaction, security for the application, naming, persistence, and resource management, and other services, greatly simplifying solutions for complex issues such as the development, deployment and management, low total cost of its development, so ordering textbooks access to information quickly and accurately, send textbook for student becomes easier, cost settlement quickly and easily, effectively improve textbook issue and subscription work efficiency, reduce the error rate in all aspects, more efficient management of college textbooks.

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