Design and Implementation of Book Management and Sales System

Yan Zhang, Xiaoping Feng and Fanqi Wei

Jiangxi Technical College of Manufacturing, Nanchang, 330095

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Abstract. With the development of economy and the improvement of people's living level, shopping online has become a more and more popular way of shopping. In recent years part of book stores start to develop book online sales system in our country. The users can buy the book they wish over the internet. But Chinese e-commerce is far behind the other countries. So it is very necessary to develop a book online sales system with strong functions and simple operations suitable for our country. In this paper, the online book shopping system is designed and developed based on the understanding of e-commerce now. With the functions of this system related to book as the core discussion object, this paper mainly describes the system requirements, the system design and the system development process. This system is designed to meet the requirements of users of reading and buying book online in order to save the users' time of shopping.

Introduction

With the development of internet, the popularization of the internet has been raised. Now, people's pace of work is often too fast to find the time for shopping in the store. Book is one of the commodities which are easily managed, and its distribution is very easy to be carried out in the sales process. However, users can easily buy the book where there is the internet from the current development trend. Because buying book online can save a lot of cost, the users can buy the book online with a great discount, and the price of book is much lower than the price of book in the store that is one of the attractions of online shopping for users. This system is developed to satisfy the social requirements, and it is mainly designed and developed for the readers who have no time to read or buy the book in the bookstore. With the help of the functions of this system, the readers can read and buy the book online. At the same time, many additional functions of buying and reading book online are added to improve the practicality of this system in the market.

Brief Introduction of SSI Structure

We are very familiar with MVC design pattern which is very popular because of its advantages such as low coupling, high re-usability and high maintenance, especially on the Java platform. SSI structure specifically refers to Struts 2 structure, iBatis structure and Spring structure.

Struts 2 mainly originates from the webwork structure (compare with Stmts1). In the respect of data transmission, Struts 2 has more strong OGNL tag function which can help to carry out the mutual transmission of data with the data on the jsp page by defining variables in action, and the formbean in Struts 1 is eliminated in this process. In the aspect of jump control, the information content of configuration file is simplified to make the transmission between page and action to be more simple and intuitive for better management of JT developers in Struts 2.

Spring has many strong functions. For example, its IoC/DI mechanism can help us to save the work of writing the factory pattern and carry out the hosting of data sources of control class, business logic class, data access class and JNDI or JDBC. The support of Spring for AOP helps us to save a lot of work in the aspect of the transaction processing of user right control.

iBatis is a kind of light-weight OR Mapping structure. iBatis can help to carry out the semi-automatic object-relational mapping compared to Hibernate. The developers need write the exact sql statements to provide greater freedom for system design and provide convenience for the sql optimization, as shown in Fig. 1.

Figure 1. Basic Working Flow Chart of Struts 2

System Functional Requirements Analysis

Book online sales system can be divided into five big modules the module for login, register and cancel of member, user information management module, users' shopping cart management module, book information management module and information statistics module according to the specific system requirements. The module for login, register and cancel of member is mainly used to carry out the operations of register and cancel of member. The users need firstly login on the system for carrying out the other operations when they want to buy the book online.

User information management module is mainly used to manage the personal information of users such as the personal password, the personal order and the personal books collected. This module provides a great convenience to manage their own personal information for the users. The users' cart management module is mainly used to manage the commodities in the cart by providing some related operation functions which mainly includes increasing the books, removing the books, changing the number of books and clearing the commodities in the cart. Book information management module is mainly used to carry out the unified management of all the books in the system which mainly includes some functions such as increasing or removing the books, viewing the books, searching the related books and ranking the sales of books. Information statistics module is mainly used to carry out the book statistics according to the sales, views and collection times of the books. The users can view and choose the favorite books in the system according to their own preferences and requirements. The overall use case of this system is shown as Fig. 2.

Figure 2 Use Case Diagram of Book Online Sale System

Outline Design of Book Online Sales System

B/S structure is adopted in the outline design of book online sales system, the users can access the system through a browser. Just a few logic is realized on the front end, and most of logic is realized on the server side, in this case, the pressure of the client is greatly reduced, and the pressure and cost of the maintenance and update of system are reduced. The outline design can be divided into four layers presentation layer, application services layer, business logic layer and database layer, and the interfaces among each layer are also given to ensure the independence of each layer.

The presentation layer is the mutual interface between users and the system which is carried out with the help of JQuery and Ajax. JQuery has strong plug-in to carry out the interactions on the front end.

Application services layer is used to receive and process the requests passed from the front end. The processing of the requests is finished by calling each business components, and the requests processed also should be passed to the front end through application services layer that is carried out with the help of Stmts.

The business logic layer includes all the businesses the entire system needs such as user information management, shopping cart management, book information management and other practical businesses.

Data layer includes all the operations of data in the system. For example, user data and book data are included in the data layer. The system structure design is shown as Figure 3.

Figure 3 System Module Chart

Database Design

1. User registration form: to store the users' basic information.
2. Book category form: to store the information of book category.
3. Basic information form of book: to store the basic information of book.
4. Comment form of book: to store the readers' comments for book.
5. Registration form of the books out of stock: to store information of the book out of stock.
6. Ordering information form of book: to store information of the book purchased.
7. Information form of the book's order: to store information of the book's order.
8. Shopping cart information form: to record information of the purchaser and the book.

Implementation of Book Online Sales System

The user can login on the system by entering account number and password. When the user clicks OK, the system will package the user name and the password of input on the front end and transfer them to the database through Service layer and Dao layer in order to compare them with the user name and the password in the database and carry out the verification of the user name and the password. If the account number and the password are correct, the user can directly enter the operation page; if the account number and the password are wrong, the system will automatically jump back to the login page.

When login is successful, the system puts the Login object in the Session, and it also puts the User object corresponding to Login in the Session to carry out the judgment for user rights. The user with different rights can carry out different operations. Rights includes administrative rights and member rights. The user with administrative rights is the superlative degree user who can manage the book and members. The user with member rights can manage his own shopping cart and order. The specific flow chart of member login module is shown as Figure 4.

Figure 4 Flow Chart of Member Login Module

Conclusion

This paper mainly describes the whole design and development process of book online sales system from the use case selected in the requirements phase to the database design and the definition of system timing in the design phase to each function extraction process in the implement phase of system. This paper emphatically describes the users' shopping cart management module and the

book information management module. At the same time, the user information management module and the information statistics module of system are described a little. The practical application environment also is considered in the function design. The module for login, register and cancel and user information management module mainly provide great operation rights for the users to manage their own information. In the whole system, the predefined functional requirements are realized, and the book ordering function and the book purchasing function are effectively realized with the help of all the functions with good cooperation. In a word, the system has reached the design original intention that the system can provide great convenience for the users to purchase book online.

References

- [1]. Yang D D, Zhou Y, Department F. Exploration of the teaching model of basic computer application course of military professional education[J]. Computer Engineering & Science, 2014.
- [2]. Scherz C J, Williams L E. Digital Computer Application in the F-15 Engine Air Inlet Control System[J]. Journal of Guidance Control & Dynamics, 2015, 1(6): 57-63.
- [3]. Ge J. Computer application technology[J]. Network Security Technology & Application, 2014.
- [4]. Liao Y. Research and Application of Operation Training System for Computer Application Foundation Course of Higher Vocational Education[J]. Software Engineer, 2014, 105(5):68-78.
- [5]. Stuart L, Barlow N, Gunaratne S, et al. International Journal of Computer Application[J]. Headache, 2014, 33(3):164-164.
- [6]. Hope P, Zhang X. Examining user satisfaction with single sign-on and computer application roaming within emergency departments[J]. Health Informatics Journal, 2015, 21(2):107.
- [7]. Shalom N. Computer application playlist and player[J]. 2014.
- [8]. Ben-Artzi G, Shacham Y, Levi Y, et al. Systems and methods for interactive testing of a computer application: US, US8650544[P]. 2014.
- [9]. Zhou L. "The Flipped Classroom" Mode-Guided Teaching Design of Computer Application of Economic Management[J]. Journal of Hubei Radio & Television University, 2014.
- [10]. Yue Y Q. On the Teaching and Learning Behaviors in Computer Application Specialty under the Background of Project Teaching[J]. Jiangsu Education Research, 2016.
- [11]. San-Bin W U, San-Ping W U. Study of the Teaching Mode of Computer Application Foundation Courses Based on Project-driven Teaching Method in Higher Vocational Colleges[J]. Value Engineering, 2016.
- [12]. Wang X Y, Wang D M, Wang S B, et al. Construction of Multi-level Practice Teaching System of Computer Application of Training Innovative Talents[J]. Journal of Anqing Teachers College, 2016.