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Non-Book Resource Management of Library based SSM Framework

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Abstract

As the digital library development,network management of non-book resources is an inevitable trend. Using the network to the effective management and use of various types of non-book resources, can greatly enhance the value of non-book resources. Non-book library resource management platform is based on this and was incubated. Using of SSM (Spring MVC, spring, MyBatis) framework for rapid development of JAVA EE platform has become the mainstream scheme. This paper discusses the system requirements analysis, structural design, database design and the principles and methods of SSM application framework. SSM integration framework is used in development of non-book library resource management platform.

Keywords

Non-Book Resoure; SSM, MVC Model, Ajax , Echarts.

1. Introduction

Non- book materials refer to all materials not presented in the form of books, which is a general term for all non-book materials. The items recorded in this kind of materials can only be made by means other than printing for readers to use and study. At present, each library has different management methods for non book materials, and there are some problems in different degrees. Some libraries have not even catalogued any non-book materials. The traditional management method of non-book data is obviously backward, but in the traditional way, the following methods are generally used: (1) the disk and book are carried out; (2) the CD-ROM is used. (3) download and use the compact disc after compression.

With the development of digital library, the network management of non-book resources is the inevitable trend of non-book resources management. Using the network to provide online services has the incomparable advantages of stand-alone services. How to effectively manage and use all kinds of non-book resources through the network, to maximize the use value, has become one of the hot issues that the librarians need to pay attention to and study. The library non-book resource management platform can effectively manage and utilize all kinds of non-book resources in the collection, and maximize its use value. Based on the characteristics of Jiangsu maritime Polytechnic, this paper designs a library non-book resource management platform, which realizes the online query and access of non-book resources, including video resources (academic lectures, cultural and historical records, film and television, music concerts, classic MTV, etc.), foreign language learning (Interactive foreign language learning materials, CD, VCD, tape, etc.), book resources (book attached to the collection) Free CD-ROM and tape, courseware resources (some courseware in teaching), e-books (e-books that can be read freely), accompanying resources and online classes and other non-book resources.

2. Requirement Analysis

Through the way of browsing the web, this paper investigates all kinds of non-book resource management platforms, and on the basis of analyzing and synthesizing all kinds of commercial

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non-book resource management platforms, combined with the actual needs of our school, determines the basic functions of the system.

(1) System function.

The system is divided into eight functional modules: CD resources, video resources, audio resources, e-books, teaching courseware, teachers' monographs of our school, graduate papers and exquisite atlas.

(2) Batch import processing function of resources.

You can batch import data and resources into the system database. The administrator can query all the received records by time or query times, and delete the discs with very few use times in a certain period of time in batches according to the needs to free the server space.

(3) Management and statistics of users, IP addresses and access logs.

It provides user, IP and log management, supports CD access statistics and report generation, and supports user login authentication.The administrator can specify the IP address segment to access the CD-ROM resource with the book, as well as the access time limit. For users other than the specified IP address segment who want to use the system, they can obtain a user name and password from the administrator and enter the system by the way of user login.

(4) Resource category management.

Import Marc built-in parsing map classification, without any tools can automatically classify.

(5) Online operation of resources: Click to play or read operation, etc.

(6) Production and management of resource data.

The system will directly collect data from the OPAC system of the library and then import it into the CD-ROM Database with books. There is no need to solve the complex operation of MARC, no need for managers to input the basic information word by word, which greatly improves the work efficiency. According to the reader's request, the corresponding resources can be added, and the existing data in the database can be modified and deleted in batches at the same time.

3. System Design

3.1. Design Principles

The design of Library non book resource management platform is mainly based on the following principles:

(1) the software is very open and can be seamlessly connected with the library automation system.

(2) be able to centrally manage all kinds of existing non-book resources on the same platform.

(3) remote access can be realized through the Internet to meet the needs of the Ministry and adult colleges to jointly build and share resources.

3.2. Database Design

The system uses MySQL as the underlying relational database, which is composed of a series of products with powerful functions. It can not only meet the needs of the largest data processing system and commercial web site to store data, but also provide easy-to-use data storage services for individuals or small enterprises [1]. The system mainly includes the following data tables: user information table tb_user, which records user's details; resource list tb_resource, which records resource's details; type table tb_type, which records resource classification information; department table tb_dept, which describes system information.

3.3. Development Framework

Spring MVC is a web application framework, which is based on the model view controller (MVC) model [2]. Mybatis provides a thin layer of encapsulation of JDBC, which provides a completely

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transparent persistence mechanism while providing as much flexibility as possible [3]. Spring is an open source framework.The development of the platform is realized by using the integration technology of three lightweight frameworks of SSM.

4. System Implementation

The library non-book resource management platform is developed with MVC mode. The following will be introduced in layers according to MVC mode.

4.1. Model Layer

The model is the processing of business process / state and the formulation of business rules. The processing of business process is a black box operation for other layers. The model accepts the data requested by the view and returns the final processing result. The design of business model is the most important core of MVC. This layer deals with business related logical requests. Because the business logic of this system is not very complex, the model layer mainly includes entity class and database operation part.

4.2. Controller Layer

The controller can be understood as receiving the request from the user, matching the model with the view, and completing the user's request together. The role of dividing the control layer is also obvious. It clearly tells you that it is a distributor, which model to choose, which view to choose, and which user request to complete. The control layer does not do any data processing. For example, when a user clicks a connection and the control layer accepts the request, it does not process the business information. It only passes the user's information to the model, tells the model what to do, and selects a view that meets the requirements to return to the user.

4.3. View Layer

The system uses spring tag library to simplify the difficulty of page development, avoid using too much java code in JSP, and greatly simplify page development.

4.4. Application of Related Technologies

(1) Ajax

Ajax technology is used in many places in the system. For example, if you load all the Chinese classification information into the page at one time and generate the corresponding tree, the efficiency of the system will be very low, and the corresponding time of the page will be very long. [4] Using Ajax technology, first, as long as the first layer of Chinese classification is loaded, when the user clicks the corresponding type, it will pass Ajax loads its subcategories, which greatly improves the efficiency of the system. As shown in Figure 1.

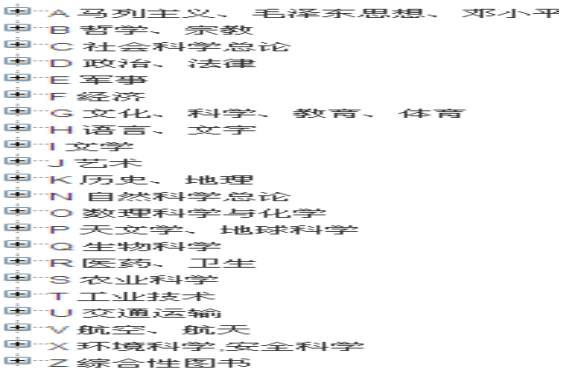

Figure 1. The tree of Chinese classification code

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(2) ECharts

In order to display the chart on the web browser, the user interface is required to use HTML and pictures to show the data, while the traditional user interface developed by using the control of the operating system itself can not adapt to a wide range of clients [5]. Therefore, in order to create a chart that can be viewed in a web browser, you can directly generate a chart picture file on the web server and send it to the browser. The system uses echarts to generate web-based charts. It is mainly used for various charts, including pie chart, histogram (ordinary histogram and stack histogram), line chart, area chart, distribution chart, mix chart, Gantt chart and some dashboards, etc. These charts of different styles can basically meet the current requirements. In this system, we use echarts to display the distribution and download of resources, so that users can see the general situation of resource use at a glance.

(3) File Upload

n the non-book resource management platform, administrators need to upload resource files, such as videos, courseware and other information to provide readers. In this system, the server processes file upload using the Commons file upload component provided by Apache Company. The client uses the multi file upload plug-in (jQuery. Multi file) to enable users to select multiple files to upload at one time. In addition, the plug-in also provides some basic verification functions, such as file extension verification.

(4) Performance testing

In many practical software development projects, security testing has become an indispensable part of the software development life cycle and a long-term task in the whole project process. In the test of this system, unit test and integration test are carried out to check the code design and modify it in time after finding bugs. When the system is put into use, it also needs long-term maintenance.

Apache JMeter is a 100% pure Java performance testing tool designed specifically for running and server loading tests [6-7]. JMeter is used to simulate concurrent access of multiple users to verify the performance of the system. By simulating 100, 200 and 400 users' concurrent access, the results show that the system can respond to users' requests in a normal time range.

5. Conclusion

The above describes how to use MVC mode to design and implement non-book resource management system. With the continuous development of web applications, using MVC mode can well divide the web system into three layers, so that the program developers can grasp the progress of the project more clearly and manage the system better. The web applications designed under this specification greatly improve the scalability and reusability of the software, and ensure the stability, flexibility and maintainability of the system.

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