The Development and Realization of Ideological and Political Teaching Platform Based on JSP Technology

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Abstract

Starting from the analysis of ideological and political courses in terms of its meaning, theory, technology and content, this paper introduces the basic knowledge of J2EE platform and the theory of an online learning platform supported by JSP, SERVLET and JAVABEAN technologies. JSP technology is used to build an online teaching platform for college teachers to teach ideological and political practice course. The platform consists of four subsystems, which are system administrator, teacher management, Youth League Branch secretary management, and student management. By setting different levels of privileges for users of different identities, we realize the platform’s teaching and learning functions. The system takes advantage of the strong development capacity of Ellipse software to establish a model that can analyse and design the teaching platform step by step. Finally, the system realizes the overall function of the platform, applying it to real situations by which the utility is verified.

Keywords: JSP, online teaching platform, ideological and political practice class, Web.

1. INTRODUCTION

With the application of online information technology in class teaching in colleges and universities, the existing teaching mode has made a qualitative leap. Internet-enabled teaching will symbolize and constitute the information age to a great extent (Li et al., 2010; Luo and Gu, 2012). It is an urgent issue to be considered and addressed as to how to allow online teaching full play so that beginning the reform of higher education with online teaching and how to use existing technology to build a powerful and structured online teaching system (Mo, 2011; Ren, 2010).

This paper is about the development and realization of the ideological and political teaching platform based on the B/S structure of the JSP technology. The core content of the platform research is to improve teaching effectiveness and efficiency through the powerful Internet, so that both teacher users and student users can realize the traditional functions of teaching, learning, evaluation, and testing. Operations such as teaching design and homework correction on the teacher’s side, homework assignment on the counsellor’s part, and homework submission on the student’s side are based on the Internet, which is helpful to information interaction between educators and students.

2. THEORETICAL AND TECHNICAL BASIS

2.1 Introduction to the J2EE platform

J2EE is an architecture that leverages the Java 2 platform to simplify the complex issues associated with the development, deployment, and management of enterprise solutions. J2EE provides a good mechanism and better service for building a scalable, flexible, and easy-to-maintain business system (Erfle, 2001).

2.2 MVC framework technology to achieve

MVC (Modal View Controller) exists in the Desktop program, where M refers to the data model, V the user interface, and C the controller. During MVC processing, the controller first receives user request and choose the model for processing, and then the model uses business logic to deal with user request and send the data back to the controller. Finally, the controller formats the data with corresponding views and presents them to the user through the presentation layer (Nannan, 2011).
2.3 Introduction to B/S mode

The system uses B/S (Browser / Server) mode, i.e. browser and server architecture. User interface is realized through WWW browser. There are rarely any transaction logics that are realized in the front (Browser), but the main transaction logic forms the so-called 3-tier structure in the server (Server). By changing the locations and access patterns of users of different identities in accessing and operating the same database, the data platform and management and access privileges can be effectively protected (Luo, 2012), as shown in Fig. 1.

![Figure 1. Online access platform pattern for B/S structure](image)

2.4 JSP technology overview and application model

JSP (Java Server Pages) technology is a processing logic that uses Java programming language to write XML-like tags and scriptlets to generate dynamic web pages (Peng et al., 2013). It is executed in the server which is linked to the client with HTML text, meaning that the client is browsable with browser. JSP can be expressed in an easy-to-understand equation: HTML+Java=JSP.

2.5 Web services

Web services are XML standard interfaces for a variety of business, application, and system services. Web Services technology can usually be divided into three key components: Description Stack, Discovery Stack and Wire stack (Ma et al., 2011). The author describes the various techniques of the stack processing Web Services to understand the versatility of business processing models and workflow structures in B2B relationships. According to our findings, in stack processing, the technologies and wire stacks used for directory discovery and review are composed of those technologies that provide information flow for the Web Services run-time engine. The architecture of the architecture is shown in Fig. 2.

![Figure 2. Stack of architecture structure for Web Service](image)
2.6 Introduction to the database

The platform database uses SQL Server, a relational database management system (DBMs) developed and promoted by Microsoft. The database connection pool is employed to upgrade database operations (Ren, 2012; Mo, 2011; Assun et al., 2006). A database stored procedure is a set of SQL statement sets that are compiled into a database in order to complete a specific function. The stored procedures in the series of SQL Server are divided into system-supplied stored procedures and user-defined stored procedures (Sun et al., 2009; Wei, 2013).

2.7 Development environment and tools

Operating system: Microsoft Windows Xp

Database: SQL Server2000

Development Kit: JDK Version 1.6

JSP server: Tomcat6.0

Compile environment: MyEclipse8.0

3. SYSTEM OVERVIEW

3.1 Analysis of functional requirements of online teaching platform

3.1.1 Basic model of teaching system

The basic model of the system is shown in Fig. 3.

![Figure 3. Basic model of online instructional system](image)

The flow chart of the system is shown in Fig. 4.
3.1.2 System function components

After multi-facet investigation, we discover the functional requirements of the online teaching system. The basic composition of the system is shown in Fig. 5:
The system users have 4 sub-systems: Youth League Branch secretaries, group branch secretary, teachers, students, the design of the system also includes four subsystems, the following is the online teaching platform design of the four systems have the function.

The system administrator system should include functions such as instructional design management, teaching and outing management, practice forum management, reference data management, teaching planning management, online investigation management, preview activity management, academic record management, and rights management. The subsystem of Youth League Branch secretaries include online style management, online survey management, preview activity management, data management, survey analysis, and assignment correction; the student subsystem includes online survey, preview, and assignment submission.

4. DATABASE DESIGN

The complete process of the database design of the teaching platform includes database requirements analysis, database conceptual structure design, database logical structure design, database physical design, database validation and maintenance design.

4.1 Database design steps

(1) Database structure definition.

(2) Data table definition.

(3) Storage devices and storage space organization.

(4) Data usage permission settings.

(5) Data dictionary design.

(6) The establishment of relational data structure.

4.2 Database physical design

The physical design of the database can be started right after completing logical design. SQLserver2000 system database is our choice for the database, whose major data tables are designed below:

(L) Administrator table: This table stores the system administrator’s ID, password, name, and photo, as shown in Table 1.
Table 1 Table of admin

<table>
<thead>
<tr>
<th>Field name</th>
<th>Data type</th>
<th>Bytes</th>
<th>Empty Yes or No</th>
<th>Name note</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>int</td>
<td>4</td>
<td>No</td>
<td>number</td>
</tr>
<tr>
<td>Pwd</td>
<td>varchar</td>
<td>20</td>
<td>Yes</td>
<td>Administrator password</td>
</tr>
<tr>
<td>Name</td>
<td>varchar</td>
<td>10</td>
<td>No</td>
<td>Administrator name</td>
</tr>
</tbody>
</table>

(2) Student table: This table contains the administrator to add the student-related information. Such as: number, login password, student name, class ID, gender, contact phone, email, QQ number, student number, political outlook, ethnic, Origin, identity number and so on. As shown in Table 2

Table 2 Table of student

<table>
<thead>
<tr>
<th>Field name</th>
<th>Data type</th>
<th>Bytes</th>
<th>Empty Yes or No</th>
<th>Name note</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>int</td>
<td>4</td>
<td>No</td>
<td>number</td>
</tr>
<tr>
<td>Pwd</td>
<td>varchar</td>
<td>20</td>
<td>Yes</td>
<td>Administrator password</td>
</tr>
<tr>
<td>Name</td>
<td>varchar</td>
<td>10</td>
<td>No</td>
<td>Administrator name</td>
</tr>
<tr>
<td>Class ID</td>
<td>int</td>
<td>4</td>
<td>Yes</td>
<td>Class ID</td>
</tr>
<tr>
<td>Sex</td>
<td>varchar</td>
<td>5</td>
<td>Yes</td>
<td>Sex</td>
</tr>
<tr>
<td>Tel</td>
<td>varchar</td>
<td>20</td>
<td>Yes</td>
<td>Phone number</td>
</tr>
<tr>
<td>Email</td>
<td>varchar</td>
<td>50</td>
<td>No</td>
<td>Email</td>
</tr>
<tr>
<td>QQ</td>
<td>varchar</td>
<td>20</td>
<td>Yes</td>
<td>QQ number</td>
</tr>
<tr>
<td>Sno</td>
<td>varchar</td>
<td>20</td>
<td>Yes</td>
<td>student number</td>
</tr>
<tr>
<td>Politics status</td>
<td>varchar</td>
<td>10</td>
<td>Yes</td>
<td>Politics status</td>
</tr>
<tr>
<td>Nationality</td>
<td>varchar</td>
<td>30</td>
<td>Yes</td>
<td>Nationality</td>
</tr>
<tr>
<td>Native</td>
<td>varchar</td>
<td>50</td>
<td>Yes</td>
<td>Native</td>
</tr>
<tr>
<td>Card Id</td>
<td>varchar</td>
<td>20</td>
<td>Yes</td>
<td>Card Id</td>
</tr>
<tr>
<td>School ID</td>
<td>int</td>
<td>4</td>
<td>Yes</td>
<td>School ID</td>
</tr>
<tr>
<td>Specialty ID</td>
<td>int</td>
<td>4</td>
<td>Yes</td>
<td>Specialty ID</td>
</tr>
<tr>
<td>Date of birth</td>
<td>varchar</td>
<td>20</td>
<td>Yes</td>
<td>Date of birth</td>
</tr>
</tbody>
</table>
pic               | varchar   | 200   | Yes             | Picture          |

(3) Teacher table: This table contains information of teachers that are added by the administrator, such as number, login password, profile, gender, contact phone, email, QQ number, college ID, major ID, and teacher number.

(4) Assignment information table: This table stores assignment information such as label, title, content, subject ID, add people, and add time.

(5) Information table: This table stores messages sent or received among administrator, teachers and students, such as number, title, content, sender, receiver, whether read or not, and send time.

(6) Study data table: This table stores the learning materials information that teachers have downloaded, such as number, data name, storage path, add people, add time, and course ID.

(7) Teaching style table: This table stores a variety of teaching and learning information, such as information number, information title, release time, the publisher, detailed information and the course that they are in.

(8) Teaching design table: This table contains a variety of information in the teaching plan, such as: activity number, activity name, activity content, and the course that they are in.

(9) Student homework table: This table contains information about the student's homework, such as homework number, preview activity number, student number, homework name, homework content, submission date, and student performance.
4.3 Database connection

We use the tomcat-based connection pool mechanism which automatically generates a certain number of links once the project is launched. The specific configuration information is as follows (the file under tomcat conf\Catalina\localhost\logisticx.xml):

```
<Resource name="jdbc/db" scope="Shareable" type="javax.sql.DataSource"/>
<ResourceParams name="jdbc/db">
  <Parameter>
    <name>maxWait</name>
    <value>5000</value>
  </Parameter>
  <Parameter>
    <name>maxActive</name>
    <value>4</value>
  </Parameter>
  <Parameter>
    <name>password</name>
    <value></value>
  </Parameter>
  <Parameter>
    <name>url</name>
    <value>jdbc: microsoft: sqlserver://localhost:1433; DatabaseName=DB_WuLiu</value>
  </Parameter>
  <Parameter>
    <name>driverClassName</name>
    <value>com.microsoft.jdbc.sqlserver.SQLServerDriver</value>
  </Parameter>
  <Parameter>
    <name>maxIdle</name>
    <value>2</value>
  </Parameter>
  <Parameter>
    <name>username</name>
    <value>sa</value>
  </Parameter>
</ResourceParams>
```

Call the codes of the connection pool:
```
Context ctx=new InitialContext();
Datasource ds=(Datasource) ctx.lookup ("Java:comp/env/jdbc/db")
con=ds.getConnection();
```

5. DETAILED DESIGN AND IMPLEMENTATION OF OUR SYSTEM

5.1 MVC model design ideas

Struts used by the system is a framework based on the MVC schema for Web applications. Struts consists of Servia, tag library, practical library and other components, as shown in Fig. 6.
Struts has its own Controller and some integrated technologies to realize the model layer (View) and view layer (View). At the model level, Struts can be easily combined with data access technologies such as JDBC / EJB and other third-party libraries such as Hibernate / iBatis and ObjectRelationalBridge. At the view layer, Struts is able to work with JSPs (including JSTL and JSF), Velocity templates, XSLT and other presentation layer technologies.

The project system is realized on the basis of MVC model design ideas which runs model layer, view layer and control layer of the entire online platform. By this means, Eclipse platform can be used to design a variety of business logics and data flows in a clear way, which greatly shortens the project development cycle.

5.2 Architecture design

According to the model designed by MVC system, the system structure of the system is divided into three parts: model layer, view layer and control layer. Each model definition in the model layer is mainly placed in the package of com.wudian.wudianstu.soic.model. The data manipulation information in the control layer is mainly placed in the package of com.wudian.wudianstu.soic.operation, and the displayed information of pages in the view layer is mainly placed in the WebContent.soic folder. The independent operation of the three layers helps achieve the realization and optimization of details in a specific layer during the process of programming. The links between layers provide an access to their communication through structures.

5.3 Design and implementation of the operation page

5.3.1 Design and implementation of the login page

One of the technical priorities of our system is the validation of the login design and login process. According to the needs of the learning platform, the system designs four types of users: system administrators, teachers, Youth League Branch secretaries, and student users. They log on the system through an authentication program. The flow chart of the login page is shown in Fig. 7.

![Figure 6. Structure chart of Struts](image)

Figure 6. Structure chart of Struts

![Figure 7. Sketch map of login interface](image)

Figure 7. Sketch map of login interface
In the student login system, for example, the login page has four buttons, i.e. course introduction, teaching team, courseware results, and course information introduction. Different levels of users simply fill the user name and password in the text box. The login page is shown in Fig. 8.

![Login interface](Image)

**Figure 8. Login interface**

The implementation code of the login page is located in a public folder in the WebContent.soc folder, for which the focus is how to obtain identity authentication of different levels of users and control the login of student users.

### 5.3.2 Design and Implementation of Subsystem Function

System administrator subsystem is similar to the student system. By logging in the system with administrator identity, administrators click on the item "enter the course" to access various operating modules of the administrators, including teaching design management, teaching style management, practice forum management, reference data management, education planning management, online survey management, preview activity management, learning performance report management, and rights management.

The rights control function includes three functions: assigning user roles, managing user roles, and managing operation information. Role distribution is the main focus of this function, which can be realized by setting up deal variables and distributing roles according to deal value. The implementation process and core codes are shown as follows:

```java
// If the deal value is filled, fill in the new data
else if (deal.equals("insert")){
    <form id="form1" name="form1" method="post"
    action="index.jsp?deal=insertdo">
    <fieldset><legend>set up user roles</legend>
    <p>student number:<input type="text" name="stuid" id="textfield" /></p>
    <input name="check" type="button" onClick="javascript:showMyName()"
    value="name validation"></p>
    <p>name:<input type="hidden" name="stuname" id="textfield" value="null" />
    </p>
    <p>possible roles
    <%
    Collection role= soc_roleOPer.SelectAllsoc_role();
    Iterator it=role iterator();
    While (it.hasNext ()) {
        soc_roleGetset GETSET= (soc_roleGetset) it.next();
        out.Println (<"input type='checkbox' name='role' id='checkbox'
        value=' " + GETSET.getRoleid() + " '>" + GETSET.getRolename());
    }
    ```
```
// If deal is insertdo, insert the newly-written data into the database
} else if (deal.equals("insertdo")){
    String[] role = request.getParameterValues("role");
    // calculate the sumRole
    int sumRole = soc_FKsturolesOper.sumRole(role);
    soc_FKsturolesGetset.setSocsumrole(sumRole);
    soc_FKsturolesOper.Insertsoc_FKsturoles(soc_FKsturolesGetset);
    Out.println("input is right");
    Out.println("<a href='index.jsp?deal=insert'>continue to add</a>");
    Out.println("<a href='index.jsp'>back to the homepage</a>");
%

The teacher management subsystem includes functions such as teaching style management, preview activity management, investigation and analysis, and homework correction. The first three functions are similar to those of the administrator subsystem, but the assignment-related functions are unique to this subsystem.

The Youth League Branch secretory sub-system should include functions of online style management, online survey management, pre-class preview, attendance statistics, and assignment upload. Its specific module code is similar to that of the administrator subsystem.

The student management subsystem includes online survey, pre-class preview, and assignment submission. The realization of its functions are the same as that of the administrator subsystem functions except for the forbiddance of deletion and modification.

The overall interface of the platform is as follows:

![Figure 9. Operation interface of Web-based teaching platform of ideology and politics](image)

6. CONCLUSION

JSP technology is used to build an online teaching platform for college teachers to teach ideological and political practice course. We take advantage of the strong development capacity of Ellipse software to establish a model that can analyse and design the teaching platform step by step. The basic functions of the ideological and political practice course are designed, realized, applied to practice and verified by us, including teaching design, teaching style, introduction of curriculum construction, preview of contents, arrangement and correction of homework, and management and submission of performance.

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