

# *Design and Implementation of Student Information Management System Based on Springboot*

**Yu Yang**

*College of Information Engineering, Guangzhou Vocational and Technical University of Science and Technology, Guangzhou, 510555, China*

**Keywords:** Springboot, Student information management, Graduation thesis, Vue. js, Permission

**Abstract:** In order to facilitate the teachers in the university during the students' course selection, grades, graduation thesis, employment and other information fine management. The system uses the Springboot framework at the back end, the Vue js framework at the front end, and the mysql database to develop the student information management system. The main functions include: teacher information management, student information management, permission setting management, graduation project management, employment information management, achievement information management and so on. The information management of college students' documents enables teachers to master students' achievements, graduation design and employment information more effectively, and also enables students to understand their own information more quickly and improve work efficiency.

## **1. Background**

With the emergence of new information technology, people's life style is also changing. At present, the management of student information in colleges and universities is imminent, and some studies have been put forward. The technology is mainly based on B/S architecture <sup>[1-5]</sup>, On this basis, MVC three-tier architecture technology is added<sup>[6-10]</sup>, Some problems were solved. Due to the addition of new business of graduation thesis and employment information in college students, relying only on manual operation is very affect the work efficiency, therefore, this paper designs and implements a set of student information management system based on springboot.

### **1.1. Web Front-End Technology Comparison**

The student information management system designed in this paper is developed by the technology of separation of front and back ends. The correct choice of front frame is important to the development schedule. Through the comparison of the current more popular JQuery, Vue. js, Angular. js, Recat.js front-end framework,Vue.js framework has the advantages of small size, convenient modification, fast speed and so on, so the final choice of Vue. js framework as the front-end technology of the design system in this paper.

## 1.2. Back-End Technology Comparison

The choice of back-end development technology will determine the speed of system development, but also determine the scalability of the system. Through the current popular web back-end development framework: springboot, Jersey, Play, Diango, Go, node.js, the springboot framework is the best choice for this system.

## 2. Demand Analysis of Student Information Management System Based on Springboot

College student information management system sets up two kinds of user identity: administrator identity and student identity. Each identity can only access content that meets its permissions. The administrator is mainly responsible for the management of students' basic information, including the addition, deletion, change and check of students' information. Students can only query information relevant to themselves.

### 2.1. Overall System Design

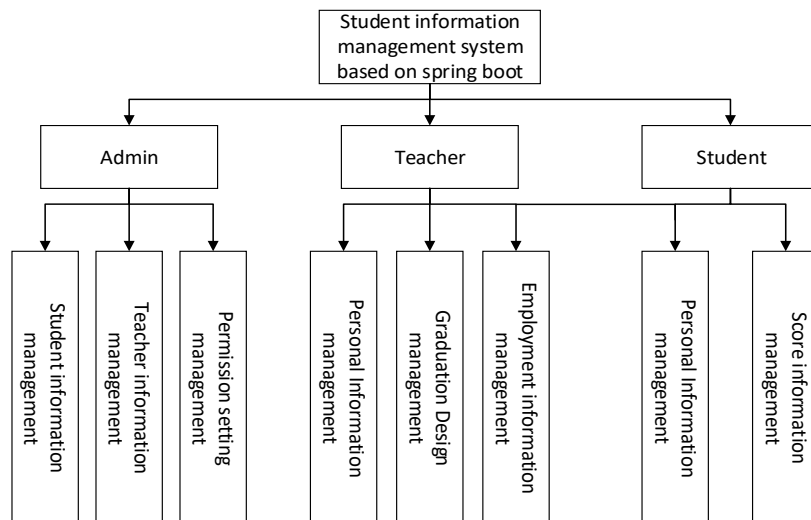


Figure 1: Overall system design

As figure 1, the overall design of the system, including the administrator, teacher and students three modules, in the administrator module has student information management, teacher information management and permission setting management module. Under the teacher module, there are personal information management, graduation design management and employment information management modules. Under the student module, there are personal information management and score information department management module. Among them, teachers can manage students' graduation project, employment information and achievement information.

The main function modules:

(1) Student Information module: After successful login, the administrator enters the operation interface, which is mainly responsible for adding, deleting, modifying, and checking the basic information of students.

(2) Teacher information module: After the administrator successfully logs in, the operation page is displayed. The administrator is mainly responsible for adding, deleting, modifying, and checking the basic information of the teacher.

(3) Permission setting management module: Administrators according to the identity of teachers and students, set the graduation project management, employment information management,

performance information management of the relevant authority functions.

(4) Teacher personal information management module: Add, delete, and check the basic information of teachers, professional titles, academic achievements and other information.

(5) Student personal information management module: Add, delete, change, check and other operations of students' basic information, grade, grades, graduation project and employment information.

(6) Graduation design management module: Mainly responsible for uploading the proposal report, assignment book, first draft of the paper, second draft of the paper, final draft of the paper, adding, deleting, modifying and checking the defense information and other operations.

(7) Employment information management module: Employment unit, start and end time, work content, reward and punishment information and other contents of the addition, deletion, change, check and other operations.

## 2.2. Detailed System Design

### 2.2.1. Database Design

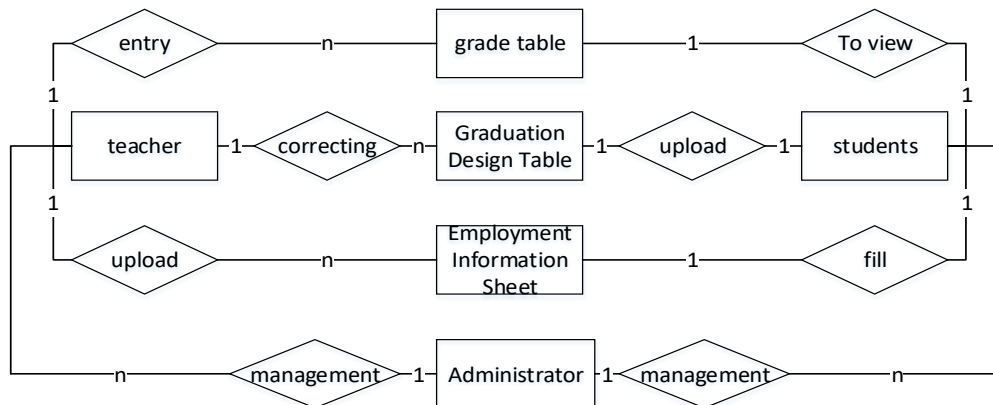


Figure 2: Entity Relationship Diagram

Through the analysis, the main users in the system are: administrators, teachers, students. Administrator: mainly manage the information of teachers and students, set the permission of teachers and students in the graduation design, employment information, achievement information module. Teacher: Mainly manage their own basic information, participate in the management of students' grades, graduation thesis and employment information. Students: Mainly responsible for personal basic information, query results, upload graduation thesis and fill in employment information. The connections between various entities include: a manager can manage multiple teachers and students, belonging to a one-to-many relationship. Each student can only and a score sheet, a graduation design table, employment, belong to the relationship of 1 to 1. Teachers can manage multiple score sheets, graduation design sheets, employment information sheets, which belong to a large relationship, as shown in Figure 2.

## 3. System Test and Implementation

### 3.1. Login Module Test

The administrator needs to log in first, and then can manage related information. Determine the login user's identity based on the login account. If the login fails, an error message will be given, as shown in Figure 3.

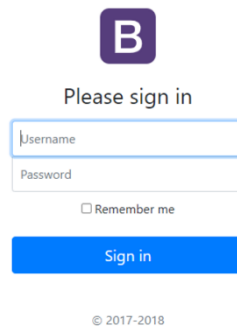


Figure 3: System login

In Figure 3, Chinese and English conversion is set in the login interface. The basic information of the user is obtained through the login form, and whether the user has logged in is judged by querying the database. If the user has logged in, the user is released. If you are not logged in, the system displays "No permission, please log in first" and returns to the login page.

The main implementation code is as follows:

```
Public class Login Handler Interceptor implements HandlerInterceptor {
@Override public boolean preHandle(HttpServletRequest request, HttpServletResponse response, Object handler) throws Exception {
//Obtain the loginUser information for judgment Object user = request.getSession().getAttribute("loginUser");
if(user == null){
//If no login is displayed, the login page is displayed request.setAttribute("msg","No permission. Please log in first");
request.getRequestDispatcher("/index.html").forward(request,response);
return false;
}else{
//Log in, release return true;
}
```

In the resource access, by adding a WebMvc configuration class, by implementing addViewController to add a view parser to mvc, complete the page jump. The main code is as follows:

```
public class MyMvcConfig implements WebMvcConfigurer {
public void addViewControllers(ViewControllerRegistry registry){
registry.addViewController("/").setViewName("index");
registry.addViewController("/index.html").setViewName("index");
registry.addViewController("/main.html").setViewName("dashboard");
}
```

### 3.2 Teacher Information Management Module Test

After the administrator login successfully, you can manage the basic information of the students and teachers, the grades management, graduation thesis management, employment information management and other modules for authority management, to the teacher information management module, you can add, delete, change, check and other operations of the teacher's information.

id	lastName	email	gender	department
test	A123456@qq.com	man	College of Information Engineering	2022-10-27 17:55:14
test	A123456@qq.com	man	College of Construction Engineering	2022-10-27 17:55:14
test	A123456@qq.com	man	College of art	2022-10-27 17:55:14
test	A123456@qq.com	man	College of Information Engineering	2022-10-27 17:55:14
test	A123456@qq.com	man	office of academic affairs	2022-10-27 17:55:14

Figure 4: Student information query results

As Figure 4, the teacher management module is used for demonstration. Other functional modules are similar to the teacher management module, which can add, delete, change and check the table.

#### 4. Conclusion

This system combined with the actual needs, analyzes the problem of information asymmetry between administrators, teachers and students in college. The back end uses springboot framework, the front end uses vue.js framework, the database uses mysql, the development of college student information management system. It effectively solves the information exchange between teachers and students, and also reduces the redundancy of data.

#### Reference

- [1] Liu Z, Wang H, Zan H. *Design and implementation of student information management system//2010 International symposium on intelligence information processing and trusted computing. IEEE, 2010: 607-610.*
- [2] Yue Z, Jin Y. *The development and design of the student management system based on the network environment//2010 International conference on multimedia communications. IEEE, 2010: 5-8.*
- [3] Zhang Y, Li Z, Wen Y, et al. *Design and implement of international students' management and security warning system based on B/S architecture//International Conference of Pioneering Computer Scientists, Engineers and Educators. Springer, Singapore, 2018: 623-631.*
- [4] Xianli L, Ping W, Guosong L, et al. *Research On Student Comprehensive Quality Management Information System Based On B/S Architecture//2021 18th International Computer Conference on Wavelet Active Media Technology and Information Processing (ICCWAMTIP). IEEE, 2021: 471-473.*
- [5] Zhu Z M, Xu F Q, Gao X. *Research on school intelligent classroom management system based on Internet of Things. Procedia Computer Science, 2020, 166: 144-149.*
- [6] Subari A. *Development of Information System Based on Web Application for Measuring Educational Performance Indicator Using Codeigniter Framework. Advanced Science Letters, 2018, 24(12): 9520-9522.*
- [7] Xiaokun Y. *Design and implementation of student status management system based on SSH2 framework technology//2016 International Conference on Smart City and Systems Engineering (ICSCSE). IEEE, 2016: 222-225.*
- [8] Lv Z, Zhou C, Zhou C. *Design and implementation of ideological and political education evaluation system//Journal of Physics: Conference Series. IOP Publishing, 2019, 1176(4): 042067.*
- [9] Xue L. *Design and implementation of university students internship employment tracking system based on MVC Framework. Journal of Applied Science and Engineering Innovation, 2015, 2(3): 93-95.*
- [10] Li Y, Jing W. *Research on Integrated Management System of Physical Education Course Information based on Spring MVC Framework//2022 International Conference on Information System, Computing and Educational Technology (ICISCET). IEEE, 2022: 121-124.*