

The Design and Implementation of the Tracking Management System for the Post Practice of College Students

Jing Gao^{1,*}, Guoxin Fang¹, Lei Liu²

¹Guangdong Hengdian Information Technology Co., Ltd., Guangzhou, Guangdong, China.

²Guangdong Open University, Guangzhou, Guangdong, China.

How to cite this paper: Jing Gao, Guoxin Fang, Lei Liu. (2023) The Design and Implementation of the Tracking Management System for the Post Practice of College Students. *Advances in Computer and Communication*, 4(1), 41-45.
DOI: 10.26855/acc.2023.02.006

Received: February 15, 2023

Accepted: March 10, 2023

Published: April 7, 2023

***Corresponding author:** Jing Gao, Guangdong Hengdian Information Technology Co., Ltd., Guangzhou, Guangdong, China.

Abstract

Students in higher vocational colleges generally have a six-month internship in the second semester of their junior year. At this stage, students go to enterprises to participate in real work and take positions in enterprises corresponding to their majors. In the current internship management process, there are also paper-based documents. Students are outside the school, and are prone to the loss of mail documents, inconvenient management and supervision, and other problems. In order to manage the data generated at this stage and analyze the development track of students' internship and employment, this paper, based on the popular SSM framework in the industry, develops a B/S structure of college students' internship tracking management system, which provides students, instructors, professional principals, counselors, department leaders, educational supervision, administrators and other roles, and each role is assigned a certain function. This project uses computer technology to realize the information management of post-placement practice of students in higher vocational colleges.

Keywords

Internship, Functional design, Technical architecture, SSM Framework

1. Introduction

Post placement practice is an important part of the professional teaching of vocational education, an important part of the talent training plan and teaching activities in colleges and universities, and an important way to cultivate students' good professional ethics, strengthen students' practical ability and professional skills, improve their comprehensive professional ability, and cultivate innovative awareness and entrepreneurship. Students can understand the operation, organizational structure, rules and regulations and corporate culture of enterprises through internship; Master the typical work flow, work content and core skills of the post; Cultivate the professional spirit of dedication, excellence, honesty and trustworthiness, and enhance the employability of students. The main purpose of post placement practice is to enable students to apply their professional knowledge and skills to practical work and improve their working ability [1]. Through internship, we can fully understand the profession and occupation, meet the basic requirements of employment, and achieve zero employment adaptation period. Post placement practice plays a very important role in the whole teaching process of colleges and universities, especially in the process of vocational teaching. The State Council's Provisions on Vigorously Developing Vocational Education clearly requires that students in higher vocational colleges practice for no less than half a year. It is of great significance to realize the standardized management of placement practice to improve the quality and effect of placement practice. However, in

the current process of internship management, there are still paper-based documents. Students are out of school, and it is easy to lose mail documents, and it is not convenient for management and supervision. The tracking management system of internship for college students developed in this paper can easily realize information management [2].

2. Functional design

The tracking management system for the internship of college students should be able to manage the data generated during the internship for six months, and track and investigate the employment situation of students. The roles involved in the system include: students, instructors, professional principals, counselors, department leaders, academic supervisors, administrators, etc. Different roles have different functional views [3].

System management: administrators can manage users, roles, menus, etc. in this view.

Management view: The management view can be subdivided into department leader management view and instructor management view. Each view has corresponding operations. The administrator can manage the department, grade, specialty, class, teacher, student, etc., and can import the information of students and teachers by importing excel or manually entering information. After importing the information of teachers and students, the background will automatically generate an account with corresponding identity for users to log in to the system.

Teacher view: you can check personal information, view the guidance students, view the internship data submitted by the guidance students, and find out whether the students have submitted. By marking "locked", students are not allowed to modify the submitted internship records, which can prevent students from misoperation after submitting, resulting in inaccurate information.

Student view: you can check personal information, view the instructor, fill in the registration form of placement practice, complete the placement practice manual, upload the application for independent contact placement practice, placement practice safety agreement, placement practice agreement, acceptance certificate of placement practice unit, placement practice record form, placement practice assessment form, etc., fill in the placement practice log, view the teacher's log approval, and generate the placement practice manual, View internship results, etc.

Statistical view: through this view, you can quickly view the distribution of students, tutors, and positions, statistics of internship information, employment information, and statistics of employment rate.

3. Database model design

By analyzing the system participation roles, we can get several basic entities: administrators, teachers, and students. The administrator has the highest authority and can set the function menus that other roles have. To facilitate the assignment of role permissions, a role-based user authority model (RBAC) is designed, including user tables, role tables, menu tables, user tables that record user accounts, basic information, role names, role notes, etc., and menu tables that record menu names, function URLs, function permission tags, etc. Users and menus are linked through roles, a user can have multiple roles. By querying the user role list and the role owning menu list, all the menus owned by the user can be obtained. The user and role are in a many-to-many relationship, the role and menu are in a many-to-many relationship, the user and role establish an intermediate table, and the role and menu also establish an intermediate table. There is a one-to-many relationship between instructors and students. One instructor can guide multiple students. One student can fill in multiple internship information and employment information. Students can fill in records. Instructors can only review the records of their own students, and administrators can review the records of all students [4]. The database design model diagram is shown in Figure 1.

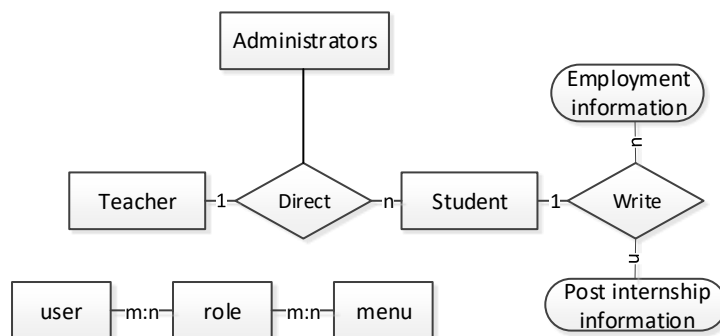


Figure 1. Database model diagram.

4. Technical architecture

The implementation scheme of this system adopts the popular technology combination in the industry. The back-end logical layer server operating system uses Linux, and the web service uses Tomcat/Nginx; The data access layer database uses MySQL, and the cache component uses Redis; The front-end presentation layer uses WeChat official account as the entrance to jump to the responsive page developed using HTML5 technology. The back-end development framework uses SSM, and the front-end development framework uses Bootstrap.

1) SSM: A perfect combination of three frameworks: SpringMVC, Spring, and Mybatis. The mainstream J2EE enterprise-level development framework is characterized by lightweight, low code intrusion, and mature technology. It supports a typical three-tier architecture: DAO (data layer), Service (business layer), and Web (presentation layer). Mybatis is a data-layer framework that supports customized SQL statements, free and flexible parameter transfer, automatic result set assignment, and separation of interface design and SQL statements to facilitate code review. Spring provides a container factory for uniformly managed objects, allowing access to any instance in the factory through a consistent access interface, that is, object control inversion (IOC); Spring also supports declarative transactions. For high-concurrency applications, the method with transactions is often the bottleneck, which may cause database access delay if you are not careful. Using declarative transactions can easily develop a single, pure transaction method. Spring MVC is a web layer framework that supports restful style URLs and MVC development patterns [5].

2) Bootstrap: a concise, intuitive and robust front-end development framework, built based on HTML5, CSS3, and JQuery technologies, provides reusable static components such as navigation, paging, and panels, dynamic plug-ins such as drop-down menus, tabs, pop-up boxes, and a powerful and flexible grid layout system. Bootstrap can be used to quickly and efficiently develop robust and elegant responsive static pages [6].

3) MySQL: The most popular relational database used for Web development. It supports transaction and lock mechanisms, and can run on a single point, master-slave replication, and cluster scale [7].

The technical architecture of the system is shown in Figure 2.

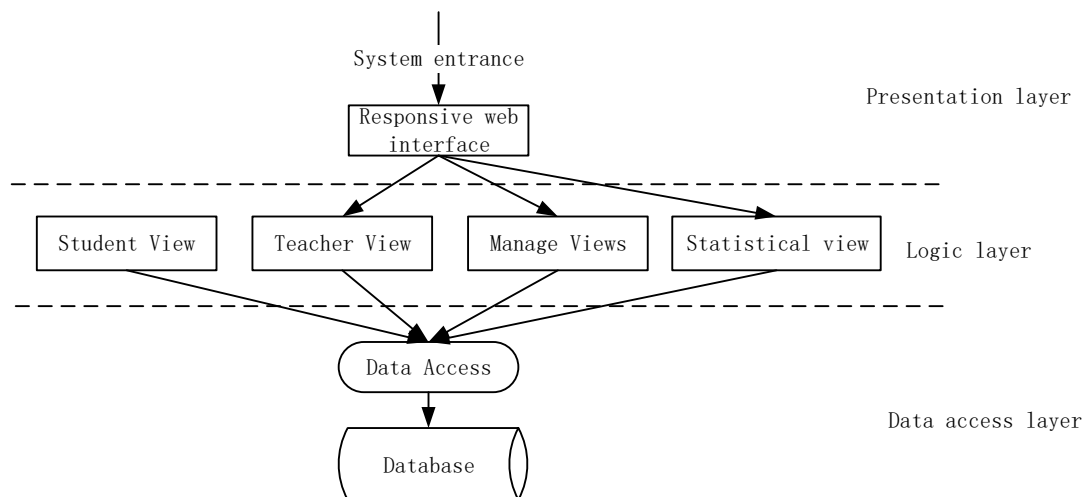


Figure 2. System technical architecture.

5. Implementation of key functions

This system is aimed at college students who need internship. It provides college students with the functions of selecting internship instructors, filling in internship information, and filling in employment information. It also provides managers with the functions of viewing and statistics. The system administrator can realize the operation of roles, permissions, module configuration, etc., the import of basic data and the configuration of interfaces, and the statistical summary and analysis of various data; The department leader can assign the instructors of the discipline, view the guidance of all instructors, students' internship process and other dynamic real-time data, and timely supervise and guide the internship based on the retrieved statistical data; The instructor can review the application form of the student internship unit in the system, dynamically query the change situation and number of changes of the

student unit, complete the functions of guiding student records, online exchange and answering questions, and score entry in the system, and realize the supervision and guidance of the entire process of internship; Intern students can upload internship unit information, contract unit information, view instructor information and guidance opinions through the platform. Next, select several key functions to analyze their implementation.

5.1 Assignment management of internship

In the system placement placement assignment stage, the instructor and the student have assigned key associations. One teacher can guide multiple students. The teacher and student are one-to-many. The administrator is responsible for assigning placement information. You can choose to import placement information table, or modify placement instructor, and query placement assignment information by conditions.

5.2 Registration of internship information

After entering the internship stage, students should register the internship information, including the company name, company address, position, salary, etc., and upload the internship application form, the acceptance certificate of the internship unit, the internship agreement, the internship safety agreement, the internship assessment form, the internship record form, the internship manual, the internship report, etc, The uploaded attachment records the specific situation of students' internship. The instructor can view and manage the attachment uploaded by students.

During the internship, students should carefully make work records. At the end of the internship, students' work skills and achievements should be assessed and evaluated mainly by enterprises.

The results of student placement practice are based on the hundred-point system, and the evaluation results are excellent, good, medium and poor. The content and format of student placement practice summary are unified.

The key codes for adding internship information are as follows:

```
@RequestMapping("/save")
@RequiresPermissions("mis:practice:save")
public R save(@RequestBody PracticeEntity practice) throws IOException{
    ShiroUtils utils = new ShiroUtils();
    String username = utils.getUserEntity().getUsername();
    practice.setXh(username);
    StudentEntity oldInfo = StudentServiceImpl.getUserInfoByXH(username);
    practice.setNj(oldInfo.getNj());
    practice.setCreateBy(username);
    practice.setCreateDate(new Date());
    practice.setUpdateBy(username);
    practice.setUpdateDate(new Date());
    String companyName = practice.getCompanyName();
    String wenjian = practice.getFolder();
    String realPath = new HttpContextUtils().getHttpServletRequest().getRealPath("upload");
    if (wenjian==null || wenjian.equals("")) {
        practice.setFolder(null);
        PracticeServiceImpl.insert(practice);
        return R.ok();
    }else {
        if (!wenjian.equals(companyName)) {
            String path = realPath+"/"+username+"/"+wenjian+"/";
            File filepath = new File(path);
            if(!filepath.exists()){
                filepath.mkdirs();
            }
            path = realPath+"/"+username+"/"+companyName+"/";
            filepath.renameTo(new File(path));
            practice.setFolder(null);
            PracticeServiceImpl.insert(practice);
        }
    }
}
```

```

        }else {
            practice.setFolder(null);
            PracticeServiceImpl.insert(practice);
        }
    }
    return R.ok();
}

```

5.3 Employment information survey

After the internship, students enter the initial employment stage. In order to count the employment situation, students can register the initial employment information through the system, including personal information, graduation time, company name, work position, company type, employment salary, etc. In addition to basic information, they can also upload contract attachments; Instructors can view and manage the employment information of students under their guidance; The administrator can query the employment status of students by conditions, such as the employment rate by specialty and the average salary by class.

6. Summary

Based on the classic enterprise-level development framework SSM, the tracking and management system for college students' internship is developed to provide management, investigation and data collection during their internship. Compared with the traditional paper-based management method, information management is more efficient and convenient. This paper discusses the development process of the tracking management system for college students' internship in detail from the perspective of software development cycle, such as demand analysis, function design, process design, database design, technical architecture, code testing, etc. I believe it has certain reference significance for readers to develop software.

References

- [1] Yuan Jing. Practice and thinking on the process management of college students' internship [J]. Western Leather, 2017, 39 (24): 14
- [2] Liu Yi. Design and implementation of the linkage management information system for college students' internship and employment in Guizhou University [D]. Shandong University, 2017.
- [3] Lv Chao. Design and implementation of internship management system for a university [D]. Dalian Maritime University, 2017.
- [4] Zeng Fantao. Construction of three-dimensional internship platform for higher vocational education based on mobile terminals [J]. Guangdong Vocational and Technical Education and Research, 2017 (03).
- [5] Wang Yanqing, Chen Hong. Research and design of intelligent web system based on SSM framework [J]. Computer engineering and design, 2012 (12).
- [6] Xue Ru. Research and Application of Web System Based on SSM Framework [J]. Computer Products and Circulation, 2018 (07): 30.
- [7] Dai Quanping. Front-end performance optimization of web applications [J]. Electronic Technology and Software Engineering, 2016 (20).