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RESEARCH ARTICLE

Design and Implementation of Private College Enrollment Management System Based on B/S Mode

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Abstract

This system, combining with recruitment service characteristics of private college, adopts B/S pattern design for private colleges enrollment management system. The system includes PC terminal and mobile terminal access, realizing the display of SVG-based map, fully considering the convenience and friendly interactive interface of the system mobile terminal access, providing online consultation, registration, enrollment, payment, data statistical analysis and other functions, improving the efficiency and accuracy of enrollment data processing, so as to realize the information management of school enrollment. After the test, it meets the needs of enrollment management.

Keywords: Enrollment management system, SVG map, Online consultation, Statistical analysis

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1 Introduction

With the national and social attention to the education industry and the gradual improvement of people's living standards, the popularization of education in China has been greatly improved [1]. The Law of the People's Republic of China on the Promotion of Private Education promulgated in 2003 has promoted the private education in China to enter a stage of rapid development, and the number of private colleges and registered students has increased significantly every year [2]. Especially in recent years, compared to the overall recruitment planning of universities, the enrollment of private universities every year has certain uncertainty [3]. In the process of enrollment, the management department of the school leadership strictly manages the enrollment process as a whole, and the drawbacks gradually emerge due to the data delay and data error in the manual summary and analysis of the original enrollment data [4]. The communication between students and schools is not smooth, and the management cannot grasp the enrollment progress of each district in a timely and effective manner [5]. In the comprehensive evaluation of enrollment and the summary of enrollment, data errors often occur due to manual processing, which not only hinders the smooth development of enrollment work of schools, but also increases the workload of enrollment staff [6]. The recruitment management system, based on the Internet as the recruitment management platform, can centralize all information data, optimizing the allocation of recruitment resources, reducing the cost of publicity [7], transferring the manual data processing into automatic system processing, reducing the data errors caused by human participation, effectively improving the work efficiency of recruitment staff [8].

Therefore, in combination with the business needs of private colleges and universities, a set of recruitment management system suitable for the development of private colleges and with perfect functions is

designed to realize the process of recruitment publicity, registration, admission, data input, registration and payment, etc., and the recruitment progress of each district and secondary colleges is constantly summarized to provide effective data support for the analysis of recruitment situation and adjustment of recruitment strategy.

2 Demand Analysis of Private College Enrollment Management System

2.1 Business Requirements Analysis

Combined with the characteristics of private college enrollment, the system is to meet the examinee through the network to browse schools, consulting and registration; Recruit personnel complete the classified enrollment examination admission work [9–12]; School management through the system has rapid access to all kinds of statistics; By implementing the system page adapted for mobile terminal access, the mobile terminal page is displayed for mobile phone visitors. Enrollment management business relationship is shown in Figure 1.

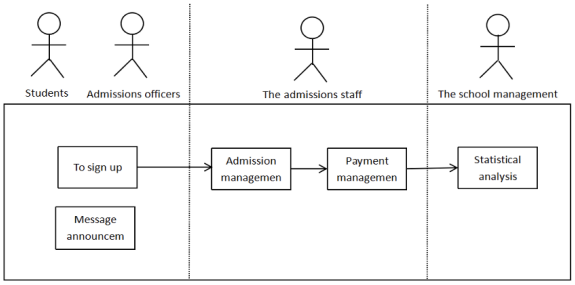

Figure 1. Enrollment management business relationship.

2.2 Role Analysis of the System

Private colleges enrollment management system [13–15] includes a user role based access control, including system administrators, students, and regional head, admissions officers, school management, different roles have different access, ensuring the safety of the system data. System role always use case diagram as shown in Figure 2.

According to user role analysis and basic function of model analysis, basic data management module mainly management object is a system administrator and admissions staff to complete the basic Settings [16–18]. Information bulletin module contains the school introduction management, enrollment information management, online consulting management three sub-modules of browsing and management functions. Admission module is the core function of this

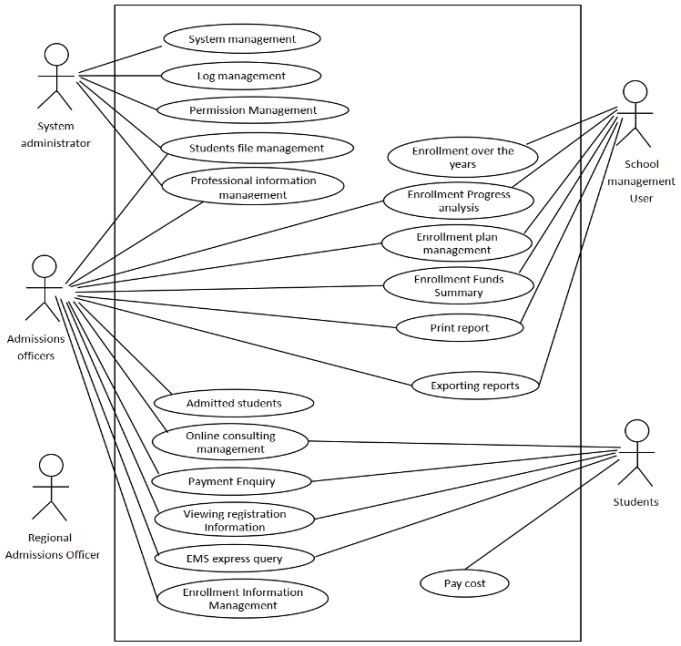

Figure 2. Total use case diagram of system role.

system, including student registration, enrollment management, admission query, slip line module. The statistical analysis module is to analyze and summarize all the enrollment data, mainly including the enrollment progress analysis, enrollment funds analysis and other statistical analysis tables. The main participants of the financial payment module are admission office staff and student users.

2.3 Non-functional Requirements Analysis of the System

The system analyzes the system security, stability, concurrency and other aspects.

(1) System security. The system needs to consider the security of user authentication, network security, database security and so on.

(2) System stability. System performance is implied when operating system in the peak of the response time and joint count, and when processing efficiency the mass data is dealt with.

(3) System concurrency. Due to the annual enrollment work time concentration, the peak number of access to the system is very high, the system performance will directly affect the response time and user access efficiency. Through the investigation of similar systems, the author found in the registration after the start of every day at 4 PM to 8 PM visiting will gradually achieve the highest access number, the highest peak number of users online about admissions annually by 1% to 2% of the total. According to the

analysis and calculation of the enrollment data of the school over the years, it is concluded that the maximum number of concurrent connections in the system will reach about 50-100 people, and the average response time of the system is no more than 5 seconds.

In addition, in the recruitment process, the staff will inevitably carry out a large number of batch operations on the system, such as viewing information, batch processing, data backup and other operations. These operations can be optimized in the following ways:

(1)Using paging mode on data page;

(2)Reducing database connection times;

(3)Optimizing database query structure;

(4)Backuping data In the morning off-peak, etc.

3 Design of Private College Enrollment Management System

3.1 The Software Architecture of the System

The system is mainly divided into front and back two systems, in which the front system is mainly used for the daily operation of visitors and students, including all non-management module browsing functions, such as browsing information announcement, registration, admission inquiry, online consulting and other functions; The background system is mainly used for users with management authority to manage the system, such as the management of basic information of the system, the management of enrollment rules, the business operation of student enrollment, the statistical analysis of the system and other functions, and demarcated access boundaries for different modules in the system to avoid unauthorized access by users, ensuring the security of system data. The system architecture is shown in Figure 3.

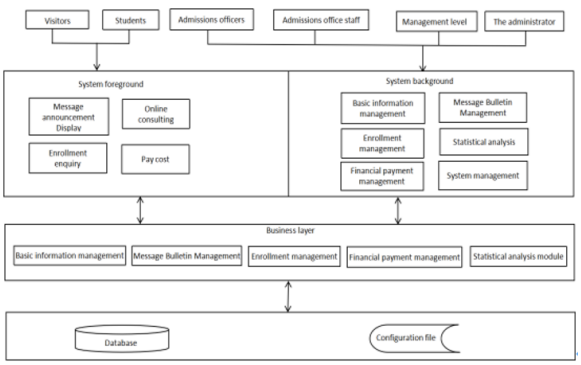

Figure 3. Private college enrollment management system architecture diagram.

3.2 The function Module Structure of the System

The function module division of the system is the basis of the overall guiding ideology and concrete implementation plan. According to the characteristics and working process of private admissions, combined with analysis of the working process and the current enrollment. the functional module structure of system is described as shown in Figure 4.

3.3 The Database Design of the System

According to the analysis of the top-down design method of the private college enrollment system, the top layer of the system database is mainly composed of four entities: students, the head of district enrollment, the head of the school enrollment office, and the school management personnel. Students fill in the application for volunteer registration under the guidance of the admissions officer in the area, the school admissions office staff complete the examination and admission of the registration information, the school management staff guide and control the whole progress. System of E - R diagram as shown in Figure 5.

4 Implementation and test of private College enrollment Management System

4.1 System Implementation

The enrollment management system of private colleges and universities is implemented by B/S architecture, and the server side is realized by ASP+MySQL. Therefore, the IIS environment of the system is configured and MySQL database is set up. This system implements basic data module, information module, admission to register module, statistics analysis module of main function realization, and describes the system access control, mobile terminal responsive layout and the partition map shows the implementation of the process, the main response to the realization of the layout code:

(1)Set the movement properties of the page Viewport

The HTML page needs to be set to the width of the browser window equal to the width of the device screen without initial scaling.

```
<meta name="viewport" content="width=device-width, initial-scale=1" />
```

Due to Internet explorer version does not support this setting before, you need to call CSS 3 - mediaqueries. Js Settings.

```
<!–[if lt IE 9]>
```

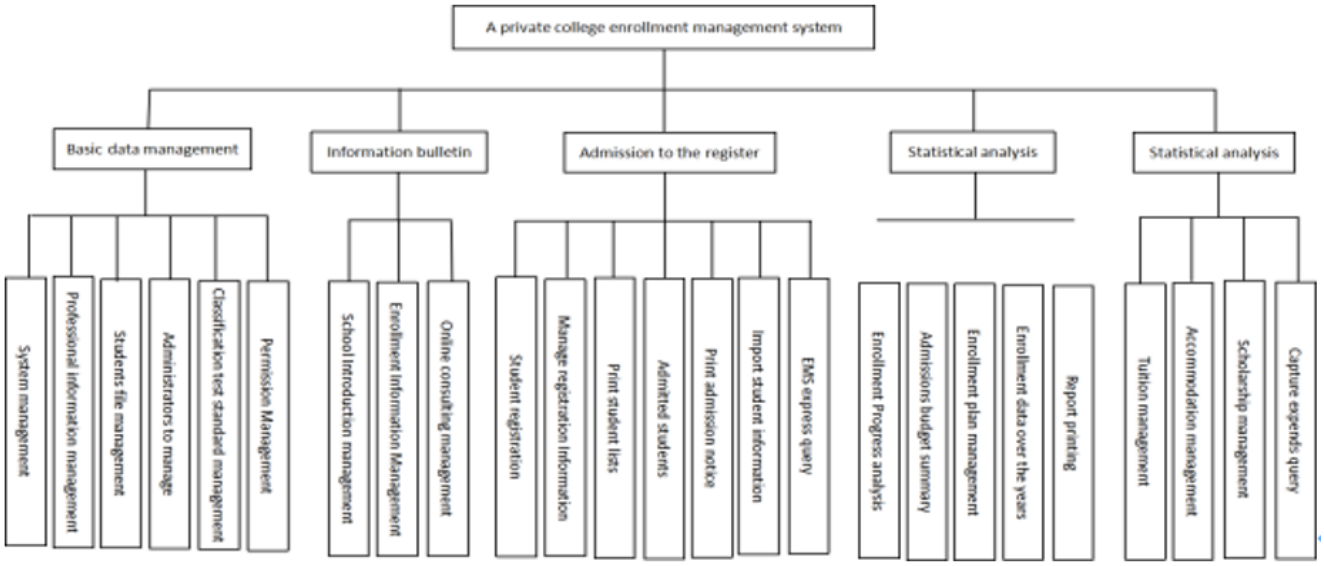

Figure 4. Business function module diagram of a private college enrollment management system.

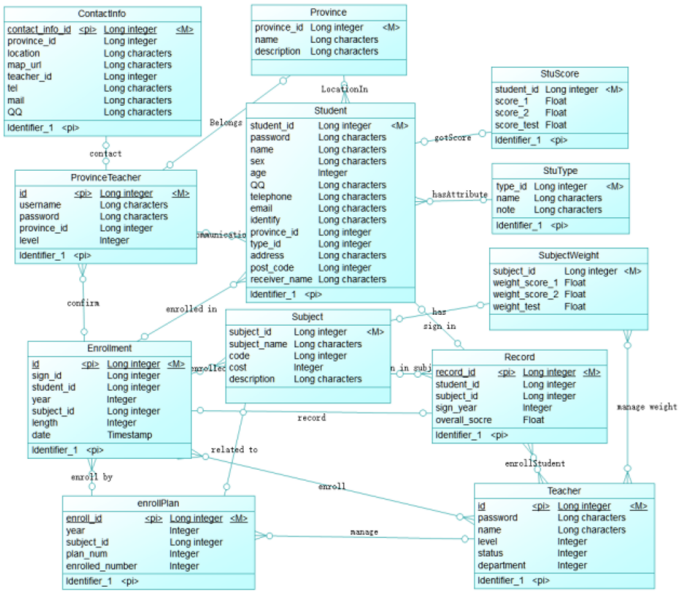

Figure 5. Database E-R diagram.

<script src="js/css3-mediaqueries.js"/>

<![endif]–>

(2)Create CSS cascading style sheets

System for PC browser, direct call the original style. CSS table, then according to the equipment screen width attributes to distinguish between different types of mobile phone and Pad devices, create the corresponding style sheets, such as to create screen width less than equal to 480px apparatus style480. CSS, Create stylepad. CSS for iPad devices.

(3)Using Media queries (Media Query) for equipment information.

Through the use of media in the link query, in view of the screen width less than the specified pixel devices called mobile terminal dedicated cascading style sheets (CSS).

<link rel="stylesheet" type="text/css"

media="screen and (max-device-width: 480px)"

href="style480.css" />

4.2 The System Test

4.2.1 System Test Environment

PC and mobile terminal operation environment of the system have been tested. PC test environment, the system for online management system based on Web, System test uses Win7 64-bit flagship edition, Win10 professional edition, Mac OS X El Capitan 10.11.4 system and matching browser IE8, Microsoft Edge 25, Firefox 46, Google Chrome 46 and so on for testing. Mobile terminal test environment, combined with China's young students use mobile phone, select the top ranks in market and ones the students use more often to test, such as huawei, millet, apple brand related models. After testing in PC and mobile terminal environment, all system operates normally.

4.2.2 System Test Cases

Test cases are carried out for each function of basic data management module, information announcement module, enrollment module, statistical analysis module and financial payment module respectively. Through a group of test operations, input data and expected results, each function of the test module can meet specific requirements.

4.2.3 *Non-functional Testing of the System*

The non-functional testing of this system is conducted from the security, stability and concurrency test aspects. System security testing: according to the user authentication system security, network security, database security strategy for testing, test results are safe; System stability test: The system is deployed on a virtual server, and the system does not respond slowly or stall due to system errors during normal access to the front and background functions of the system. When the system is accessed by 100 concurrent users, the CPU usage is less than 20% and the memory usage is 60%. The system runs normally and meets the system stability requirements. System concurrency tests: use the Apache JMeter to conduct stress tests, analysis of different system under the condition of concurrent operation, judge whether the response speed of the system is within the acceptable range. According to the stress test results, the system does not appear abnormal situation, such as server error, collapse, 100 concurrent access latency meets the demand of system design.

By testing, the system each function module can be normally used, students can get useful information through the system and complete application of the basic operation, basically meets the basic need of admissions systems for a certain private colleges admissions.

5 Conclusion

For private colleges enrollment management business needs, combined with the ASP +MySQL technology, adopting B/S mode, the design has realized the private universities recruit students management system, providing support for the recruitment of students propaganda, registration, admission, data input, tuition payment and other routing work. The test results show that the enrollment management system can meet the needs of private college enrollment and improve the work efficiency for the enrollment staff.

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