Development of a Student Information Management System for Mobile Terminals

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ABSTRACT

The student information management system (SIMS) improves the efficiency of student management in colleges and universities. Since the emergence of mobile terminal, the demand for using the system on the mobile terminal keeps growing. We can use SIMS at any time and any place if we have a mobile terminal version. At present, the mobile terminal’s main operating system is Google’s Android and Apple’s IOS. We developed a SIMS based on B/S architecture according to our college’s requirements and we also developed the corresponding Android and IOS version.

KEYWORD: Student Information Management System (SIMS); Mobile Terminal; Android; IOS; B/S Architecture

INTRODUCTION

With the development of network communication technology and information management technology based on network, colleges and universities are promoting the information construction actively. To realization of digital campus the SIMS is an indispensable part of the school’s network and information construction. Through such a system, student information can be standardized management, scientific statistics and fast query. It can improve the efficiency of student management. At the same time, the student management staffs are willing to adopt such a more effective and convenient means to manage the students. The realization of network and mobile SIMS meets the needs of the era [1].

The development of network technology is towards more and more broadband. Mobile communications industry will move towards the era of mobile information. On the other hand, with the rapid development of integrated circuit technology the mobile terminal has powerful processing ability and it is changing from a simple communication tool to an integrated information processing platform. Modern mobile terminal has a very powerful processing capacity. It is a complete ultra-small computer system and can implement complex processing tasks [2].

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With the development of SIMS we also developed the mobile terminal version of the corresponding software. It not only improves the convenient and efficient of student management but also is a new exploration in the digital campus on the mobile terminals.

1 System Functions

Usually in college there are a large number of students, for example, there are about five thousand students in our college. It is impossible for the teachers to remember the basic information of every student [3]. At the same time, it is also time consuming to manage the information of each student who meets the requirements of graduation or not.

Login Function

This system includes 3 kinds of roles: student, teacher and administrator. Students can only see their own information when they login. Some of the information can be modified. The basic information is read only. When teachers log in, they can query and change the students’ information, view and change their own information, but they cannot view other teachers’ information. If the input account and password are correct it will enter the query form. Otherwise it will prompt error message.

Query Function

This function is used by teachers and administrators. The users can set the appropriate query conditions and find the students that match the conditions. In the mobile terminal version, in order to improve the response speed we first get the result count. If the result count is over 50 then we must add query conditions, otherwise we get the records that meet the query condition and enter the query result form.

Query Result Function

This function finds the students who meet the conditions in query module and shows them by list view.

Detail Information Function

In the list of query results we set a detail link column. When the link is clicked the user can view the detail of the student.

Information Import Function

The initial data of students’ information and teachers’ information is processed by the administrator and import into the database.

System functions see figure 1.

![Figure 1. System functions.](#)
SYSTEM STRUCTURE

This system uses B/S architecture. The development language is ASP.net C# and development environment is Visual Studio 2010. The database is SQL Server 2005. Server operating system is Windows Server 2003 Enterprises Edition. Internet Information Services (IIS) needs to be installed on the server. The client can access the system via a browser when the developed website is published on the server. The database is visited by the server side of the system.

Mobile terminal application uses C/S architecture. We use Android Development Tools [4] integrated development environment to develop the application. The application can be installed in android system. The application communicates with server via HTTP protocol. The system architecture see figure 2.

![System Architecture](image)

Figure 2. System Architecture.

DATABASE DESIGN

This system is mainly to manage the information of students including students' basic information, students' graduation conditions, and students’ failing subjects. The relationship between data see figure 3.

![E-R Diagram](image)

Figure 3. E-R Diagram.

DESIGN OF B/S VERSION

Through login form we can login SIMS. Login form uses username and password to authenticate the legality of users.

In the query form we set a lot of query conditions, such as student id, name, class, etc. The query form see figure 4.
When click the detail button in the results list we will enter the student detail information form. The detail information form mainly includes student's basic information and graduation related information. The basic information is mainly the student's personal information, including professional, class, cell phone number and other information. Graduation related information, including computer level, English level, certificate and other information. See figure 5.

If a student logins the system the system will show his information. Some fields of the student information can be changed by the student himself.

DESIGN OF MOBILE TERMINAL VERSION

Mobile terminal application communicates with server via HTTP protocol. Communication data format uses JavaScript Object Notation (JSON) [5]. The server side interface receives data in JSON format from the mobile terminal via HTTP protocol or sends data in JSON format which is retrieved from database to the mobile terminal.
Design of Login Function

Mobile terminal application needs to be authenticated before login the system. See figure 6. It sends request to login interface of server side via HTTP protocol. The request contains the user inputted account and password. The server side implements the interface which gets the data from the request and queries database to verify if it is a legitimate user. It sends verification result to mobile terminal application when the database returns the query data. After receiving the return value from the server side the login function determines whether to jump to the next form.

Design of Query Function

In the query form we set the student number, class name, student name, dormitory number four most used conditions. See figure 7. According to the conditions of the user input, the application sends request to the getting result number interface of the server side. After receiving the query conditions the interface assembles the SQL statement, queries the database and returns the number of results that meets the conditions. Taking the system response time into account, the system sets the results number cannot over 50. If the result is more than 50, it will prompt the user to increase the query conditions. If the result is less than 50, it will send the request to the data query interface of the server side. When the data query interface receives the request, it queries the database and returns the records that meet the conditions. In order to control the flow in network communication, the interface just returns the fields that need to be used. The application displays the data in a list when it receives the returned data from the interface. See figure 8.

Design of Detail Information Function

The application sends request to student detail information interface of server side when any one of the students in the query results list is selected. The interface queries the student’s information according to the student id and returns to the application. The application receives the returned data and displays it in the student’s detail information form. There is a photo in the detail information. Through the photo interface provided by the server side to get the photo and display it in the detail information form. See figure 9.

PUBLISH

Student information system is released on Server2003 Windows server and can be accessed by browser. The installation file of mobile terminal application is also published on the website. Users can download and install it on their mobile terminals.

CONCLUSIONS

The system uses ASP.NET technology to realize the B/S version of the SIMS. With the popularity of mobile terminals we developed the Android version of the corresponding system first. IOS version is under development and it will be completed in the near future. This system solves the subject that student management staff can grasp the basic information and graduation information of students timely and
accurately and it improves the efficiency of student management. It also provides a solution for transferring digital campus to mobile terminals.

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