A Study of Student Information Management Software

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Abstract— **As a man-machine system that utilizes computer software & hardware resources and database, MIS (Management Information System) can provide information to support the operation, management and decision-making functions of enterprises or organizations. With the continuous scale expansion of colleges and universities, the number of students has increased. Dramatically and various students-related information contents are also doubled. In the face of huge amount of information, it is required to possess the student information management system to improve the efficiency of student management. Through this system, the standardized management, scientific statistics and fast query of student information can be realized, and thus the workload of management can be reduced. In this paper, a typical student information management system will be established to realize the systematization, standardization and automation of student information relationship.**

Keywords-Management Information System; Database Analysis

I. INTRODUCTION

With the continuous scale expansion of colleges, the number of students has increased dramatically and various students-related information contents are also doubled. Under the background of rapid developments of colleges and universities, the trend of gradual scale expansion of students will still continue. The scale expansion has gradually increased the employment pressure on university graduates, while the rapid development of domestic economy has also made the employment environment become increasingly complicated. In this case, institutions of higher learning need a student information management system to manage all kinds of information, in order to improve the management level. The accomplishment goals of student information management system shall comprise the following aspects:

Query of student achievement information

Statistics of student achievement information

The student information management system can be obtained by integrating, blocking and designing the above functions according to the requirements for structured programming.

II. DEVELOPMENT PROCESS FOR THE INFORMATION MANAGEMENT SYSTEM

In general, the following several stages are required in the development of management information system:

(1) Stage 1: Survey and Analysis: Obtain the demand information of software and definition for basic functions and form the description of basic software functions.(2) Stage 2: Data modeling: Establish the data and the method & process for operating data involved in the application and thus form the data flow chart according to the information obtained from investigation & analysis of application. (3) Stage 3: Functional design: Conduct detailed application functional design and thus form the application software design documents according to the investigation & analysis results of application and data modeling. (4) Stage 4: Selection of database system. Select the database system suitable for the application. (5) Stage 5: Select the network system structure. (6) Stage 6: Select the database access technology. Select the appropriate database access technology. (7) Stage 7: Code design. Design the software code for application. (8) Stage 8: Testing & commissioning. Find out the problems in the design until the stable operation. (9) Stage 9: Release of application software. (10) Stage 10: Software maintenance & upgrade. Solve the problems arising from the practical application of published software system and make improvements and upgrades of software according to the changes in the practical application environment.

III. SURVEY AND ANALYSIS

Survey and analysis also means the demand analysis. The student information management system based on network environment in this paper is a computer network application system for student management internally operated within Wuhan Institute of Technology. Based on the students' comprehensive information database and touches on students' basic information, class information, rewards & punishment, scholarship, school register changes and integrated treatment of normal operation of student affairs office and other information, it can provide timely and thoughtful services for students and teachers and it also serves as one of the important auxiliary means of ensuring the normal operation of student management work. With the rapid development of the national colleges and universities, as well as the accelerated progress of informatization among sister schools, it has become an inevitable trend of development to enable the Internetworking between students and teachers and schools.

In terms of requirements, the project has the following

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features:

As shown in fig.1, in consideration of the numerous information categories and relatively complicated treatment process, it is the most basic and most important task to provide schools, students and teachers with timely and thoughtful information and services during the whole process. Therefore, the student information must be accurate, thorough, the records of time process must be clear and the changes in information data can reflect to all relevant departments of the school and all operational staffs in a timely manner. (2) In consideration of the diversified student information contents, expressions and processing modes, organizational forms of different colleges and operation modes, it is required to integrate all the information into the unified management of the college and it must also have a certain degree of flexibility. (3) Student information source should include two modes, i.e. manual and automatic. (4) Easy to use & easy to learn: The student information management system needs to be operated in parallel and used by a lot of people, or operated by only one person. At the same time, in consideration of the fact that the computer skills of some existing personnel and maintenance personnel within colleges still remain weak, it is thus required to possess friendly man-machine interface in the system, ensure convenient and flexible operation, harmonize the user interface appearance and operating modes of each subsystem and provide convenient online helps. (5) Possess high reliability and usability. The system can carry out continuous and trouble-free operation for a long time, its core equipment network and database server should be provided with backup servers and the database data can be copied and backed up on regular basis. In case of unexpected failure in the server, the system should be able to switch to the backup server and continue working automatically without taking the risk of data loss. (6) easy-to-maintain management & maintenance system: Simple and convenient system management tools should be made available, including user rights management, function management of each workstation, system operation parameters management, operation logbook management, integrated network management and system monitoring, commissioning and diagnostic tools. (7) Good system scalability. The system can be built in different systems and the client system scalability is good.(8) Good performance/cost ratio. As the project funds in schools are limited, it is thus required to select and use those cost effective systems and products, so as to improve the performance/cost ratio, under the premise that the functional requirements, system performances and system safety & reliability of system can be guaranteed. Subsequently, higher requirements for software reliability and robustness are also proposed. (9)The system should have good openness, as well as clear and standardized external interface.

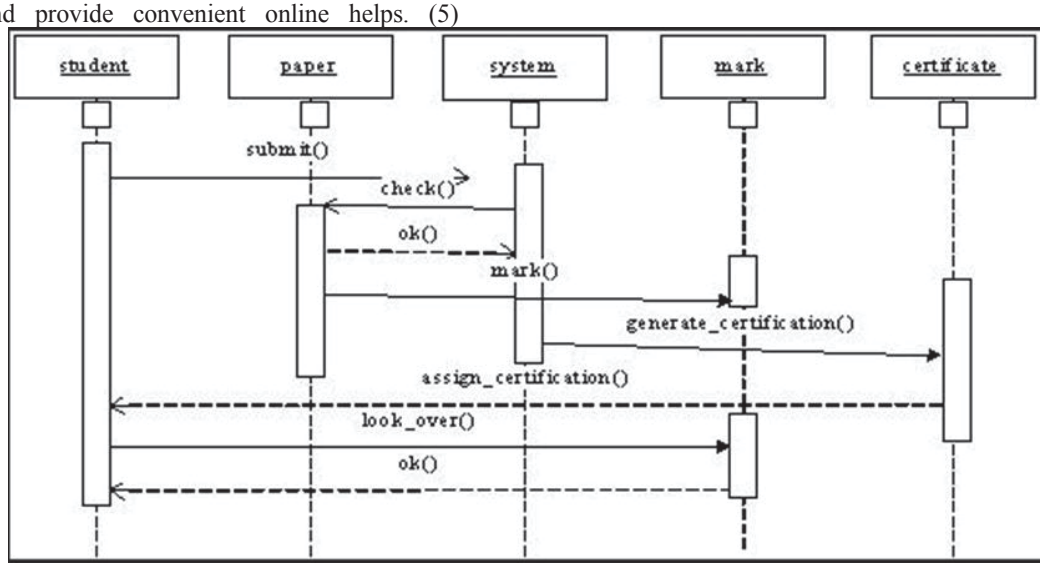

Fig.1

IV. Design of Database Functions

The functional design hereby refers to the detailed functional design. After the completion of demand analysis, design staff has already prepared a functional description of the conceptual design, but this is not the functional design document to be used in the software development process. Instead, it is still required to provide a more detailed definition of the software functions.

A. Database demands analysis

In connection with the general demands for student information management system, it is workable to design the following data items and data structure, through the analysis of content and data process of students' learning process:

Students basic information, including data item: student' ID, name, sex, date of birth, political affiliation,

class, phone number, date of enrollment, home address, notes, remarks and etc.

Class information includes such data items as class, grade, name of the class teacher, classroom, etc.

Course-related basic information includes such data items as course number, course name, course category, course description, etc.

Course information includes such data items as grade information and courses, etc.

Student achievements includes such data items as test number, class, student ID, student's name, courses, test scores, etc.

B. Design of database concept structure

As shown in fig.2, after the attainment of above data items and data structure, it is workable to design various entities as well as the relationship between them, so as to lay foundation for the future logical structure design. The entities according to the above design & planning entity shall comprise student entity, class entity, grade entity and course entity.

sysuser_Info

```
CREATE TABLE[dbo].[sysuser_Info](
[sysuser_ID][char](10)COLLATE Chinese_PRC_CI_AS NOT NULL,
[sysuser_PWD[char](10)COLLATE Chinese_PRC_CI_AS NULL,
[sysuser_DES][char](10)COLATE Chinese_PRC_CI_AS NULL
)ON [PRIMARY]
```

student_Info

```
CREATE TABLE[dbo].[student_Info](
[student_ID][int]NOT NULL,
[student_Name][char](10)COLLATE Chinese_PRC_CI_AS NULL,
[student_Sex][char](2)COLLATE Chinese_PRC_CI_AS NULL,
[birthday][datetime]NULL,
[class_NO][int]NULL,
[telephone][char](10)COLLATE Chinese_PRC_CI_AS NULL,
[register_Date][datetime]NULL,
[address][varchar](50)COLLATE Chinese_PRC_CI_AS NULL,
[comment][varchar](200)COLLATE Chinese_PRC_CI_AS NULL,
)ON [PRIMARY]
```

class_Info

```
CREATE TABLE[dbo].[class_Info](
[class_No][int]NOT NULL,
[grade][char](10)COLLATE Chinese_PRC_CI_AS NULL,
[director][char](10)COLLATE Chinese_PRC_CI_AS NULL,
[classroom_No][char](10)COLLATE Chinese_PRC_CI_AS NULL
)ON [PRIMARY]
```

course_Info

```
CREATE TABLE[dbo].[course_Info](
[course_No][int]NOT NULL,
[course_Name][char](10)COLLATE Chinese_PRC_CI_AS NULL,
[course_Type][char](10)COLLATE Chinese_PRC_CI_AS NULL,
[course_Des][char](10)COLLATE Chinese_PRC_CI_AS NULL
)ON [PRIMARY]
```

gradecourse_Info

```
CREATE TABLE[dbo].[ gradecourse_Info](
[grade][char](10)COLLATE Chinese_PRC_CI_AS NULL,
[couse_Name][char](10)COLLATE Chinese_PRC_CI_AS NULL
)ON [PRIMARY]
```

score_Info

```
CREATE TABLE[dbo].[score_Info](
[exam_No][char](10)COLLATE Chinese_PRC_CI_AS NULL,
[student_ID][int]NOT NULL,
[student_Name][char](10)COLLATE Chinese_PRC_CI_AS NULL,
[class_No][int]NULL,
[course_Name][char](10)COLLATE Chinese_PRC_CI_AS NULL,
[score][float]NULL
)ON [PRIMARY]
```

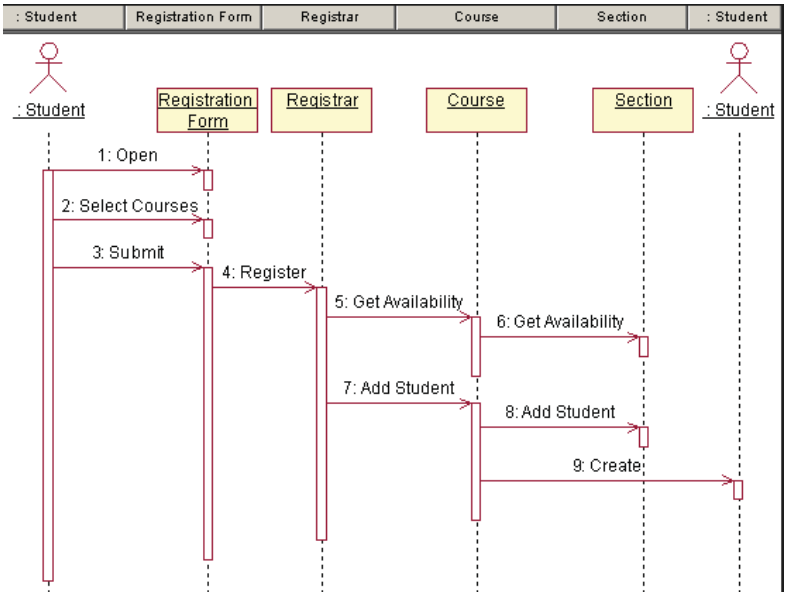

Fig.2

C. Designated special management with settings of limits

(1) The system shall comply with the provisions of student information management system, meet the requirements for student information management and realize the direct-viewing, convenient, practical and safety requirements for operating process.

(2)Different business departments manage different data. Establish the comprehensive data management functions in the system design and realize, first of all, the scalability of a data item, so as to ensure data extensions in the event of new or treatment process for existing data.

(3)Provide the implementation frame, so as to realize the system maintainability and portability. The application of modular program design method in the system is not only convenient for various combinations and modifications of system functions, but also convenient for the supplementations and maintenance of those technical maintenance personnel who have not participated in the development. The system should have function of database maintenance and timely carry out the addition, deletion, revision, backup and other operations of data according to user requirements.

(4)The system should possess the function of statistical analysis, provide the statistical information of students and make judgments in accordance with the setting conditions and the rule of statistical analysis and provide the basis for decision-making and management.

D. Management module of students' basic information

As an important information management module, the students' basic information management shall comprise students' basic information (name, sex, birth date, etc.), social relationship information, input, modification and deletion of learning resume information, etc. After the graduation of students in each year, there is need to convert the basic information of graduates, i.e. from the current student information to alumni information. Similarly, on the welcoming occasion of freshmen in each year, there is also need to lead the information of freshmen, input the social relationship information and learning resume information, so as to provide data & information support for enrolled students' information management.

(1)School register changes: Students' register information keeps records of the register of each enrolled student. In consideration of the variations in learning foundations, hobbies, strong points, levels of the mastery of basic knowledge, as well as apperception ability of knowledge and basic quality, it is thus inevitably to exist upgrade & stay-down, transfer to another department or major and so on. The management module of school register changes possesses the function of handling the records of school register changes.

(2)Awards & punishment management: This module is used to manage the information about awards & punishment of students during the academic year. Through the input and withdrawal of information about student management part, it is possible to get a clear-cut understanding of the student performances at school.

(3)Students' scholarship information management: Along with the gradual realization of tuition-required enrollment in higher education, there are diversified distributions of scholarships at school. This module is used to manage the scholarship information of students' and it plays a key role in the registration & confirmation of students' conduct evaluation and the retrieval of students' employment information.

(4)Students' comprehensive evaluation information management: While implementing the tuition-required education, the scope of school comprehensive evaluation accounts for 60% of the number of students. In order to accurately analyze the students' registration and people counting obtained from the comprehensive evaluation and also pay by bank the cash to the "All-in-one-card", it is required to ensure accurate data management.

(5) Student' Internet-surfing registration information management: In order to make enrolled students fully enjoy the abundant network resources of school, the relevant department of school has installed campus broadband network at student dormitories. Students may apply for the opening of network and payment process, so as to realize the data sharing and full utilization of network resources.

V. SUMMARY

This paper discusses in detail the design and implementation of student information management system.

The system has basically realized the function requirements in demand analysis. The user can enter into the system interface after successful logging. The student' information management module is composed of student achievement management, class management, test subject management and user management. Logging is permitted only after the validation is passed. The whole system is easy to access and easy to maintain.

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