

## The System Analysis and Design of Student Management Information Based on UML

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### Abstract

Student management as an important part of university management, and according to the actual situation of the school work, student management information system can not only improve the efficiency of staff and students, but also can be significant savings. In this paper, object-oriented design methods are applied to the software systems. It uses Rose UML modeling to complete the requirement analysis of the student management system, and the functionality and performance analysis.

**Key words:** UML; Student management; Feasibility analysis

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### INTRODUCTION

In recent years, with the expansion of colleges and universities, the number of students is also increasing, which is bound to bring university management a great deal of pressure. College student management as an important part of college management, and its importance can not be ignored. Therefore how to ease the management pressures of the increase in the number of college students has been a problem that we have to face. With the continuous development and improvement of computer technology and the mature of the Internet technology, IT is gradually entering various fields of

human social life and plays an increasingly important role. In this background, the student management system emerges as the times require. Student management system is an information system that can do various types of data collection, storage, processing, transformation and transmission. It is the application of IT in the field of teaching management. An efficient student management system is not only for the smooth development of the university management to provide favorable conditions, but also plays an important role to improve the quality of Higher Education and culture first-class talents.

### 1. FEASIBILITY ANALYSIS

The feasibility analysis is on the basis of the systematic investigation, according to the availability of the necessity and possibility for the development of new systems to analysis and research from technical, economic, social and other aspects, in order to avoid investment mistakes and to ensure the success of the new system development. The purpose of the feasibility study is to determine whether the problem can be solved in the shortest possible time with minimal cost (Li, 2008). The feasibility of the system include the following aspects:

(1) Economic feasibility: To evaluate the economic benefits of the project, the system development funds for our school is economically acceptable, and the implementation of the system can significantly improve the work efficiency of our school in the student management, which is not only contribute to the achieve of campus information management, but also convenient for students to use this system to obtain more accurate data about their own and to improve the students' enthusiasm, so that the system is economically feasible.

(2) Technical feasibility: Technical feasibility analysis is that whether they have the right hardware and software environment. Currently, our campus network covers the main buildings of the area of teaching areas and

dormitories to meet the Internet needs of the Department of the Ministry of teaching institutions, various functional departments, as well as students. A good school network infrastructure provides a solid foundation for the college to build “information campus”. This system is to be a C / S mode (Win Form) and B / S development model, using Microsoft Visual Studio 2010 as development tools, the object-oriented programming language C # as the development of primary language, and SQL Server 2005 database as a background. At the same time it is completed by ADO. NET database access. In the development process, it particular emphasis on the specification of the code, comments, integrity, naming standards and so on. What’s more, it also emphasis the team code update management in a timely manner. After the realization of the system package installation to clients and customers through permission to enter the system to operate the function that can be operated. Therefore the software development platform of the system has matured and feasible. From the hardware side, with the rapid development of technology, hardware update speed becomes faster and faster, the capacity is larger and larger and the reliability requirements become more sophisticated, hardware platform can completely meet the needs of this system. So the system is technically feasible.

(3) Management feasibility: The feasibility of management is analyzed from two aspects, the leadership and the basic work. From the leadership, it is mainly to investigate and analysis the attitude of leadership to information systems; from the basis of the work, it is mainly to look at if the management level of enterprises, the various rules and regulations and the original data are complete. In the student information management system, the feasibility of management means that it has got the strong support of the management, and it has scientific management system and method, a sound regulatory framework, the correct raw data, so the system is feasible in the management.

In summary, the development objectives of this system has been made clear, and it is feasible in the technical and economic aspects, what’s more, this system needs less investment and can get quick results. Therefore, the development of the system is entirely feasible.

## 2. SYSTEM REQUIREMENTS ANALYSIS

The main task of the needs analysis phase is to deal with the object with detailed investigation, determine the functionality of the new information system on the basis of current information systems, and establish the logical model of the new system (Yan *et al.*, 2010). Use the use case view to carry on the demand analysis of the student management system. Use the use case diagram describes the function and needs of the system from the user perspective, and it is able to demonstrate the relationship between the variety of roles outside the system and

the various use cases inside the system. The use case diagram are mainly composed by the actors and use cases, participants are a role in the user relative to the system, the participants are always looking forward to using the provided function of the system, a use case is a use of the participants to the system. The student management system use case diagram as shown in Figure 1 shows, the system has four participants, respectively is educational administration management personnel, student worker management personnel, and the teachers and students. Regarding the educational administration management personnel, student worker management personnel and the teachers together as teachers, the elliptic of the Figure 1 is cases, which means a typical interaction between the users and the system.

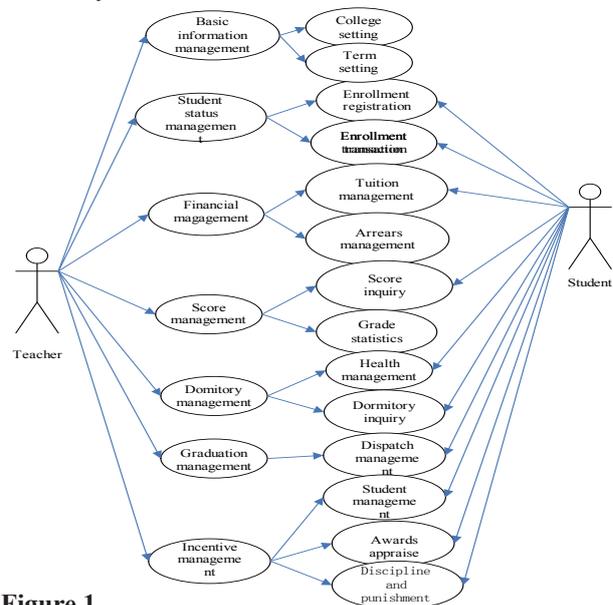


Figure 1 Student Management System Use Case Diagram

## 3. SYSTEM FUNCTION DESIGN

According to the requirement analysis of the system, the system on the function mainly includes seven modules in the following.

(1) Basic information management. The basic information management refers to basic data maintenance of the system, including the college setting, class setting, specialty provision, the teachers’ basic information maintenance and user management, etc..

(2) Student status management. To achieve the Student registration and management of transaction information, including the student’s academic departments, class, name, native place and other basic information maintenance, as well as the enrollment transaction information, such as leave and return to school, drop out of school, early graduation, extend the schooling time and so on.

(3) Financial management. To achieve the amount should be paid, have been paid, the inquiry of the delinquent amounts and the holding over of the application of the online tuition.

(4) Score management. To achieve students' self-service inquiry about course credits having been revised and course type summary (Indicate these courses are humanities public election or professional elective), the total number of course credits and grade point situation per semester to make students know which courses have been revised and which courses need to be elected.

(5) Dormitory management. To achieve the function of report about dormitory hygiene conditions and prohibited appliances circumstances. Dormitory administrators input the excellent quarters, dirty and messy quarters respectively, and match with the quarters of the students' basic information, then four (or six) students of the excellent quarters will be marked as "excellent", and students of dirty and messy quarters will be marked as "dirty and messy".

(6) Graduation management. To complete the information management of the graduated students, including the career guidance for students, dispatch management, the management of the employer, the work investigation after graduation, and generating student employment situation analysis table etc..

(7) Incentive management. Including scholarships appraised management, competition award-winning management and discipline and punishment management. According to the existing resources of the school, scholarship appraised management is to achieve the application for "People's Scholarships", "Good Student", "Enterprise Scholarship", "National Scholarships", "Motivational Scholarships", "State Grants" and other functions under the conditions; In addition, the system also can make the application form submitted to the Class teacher for the first instance, work department for the review after completing the application form, what's more, it can achieve respectively the subtotals of the declarations and audit the adopted summary forms. In the competition award management, the situation of the competition award is imported into the system by the relevant teachers and it will be showed in the student award-winning appraising series of column. The discipline and punishment management is to achieve the input function of the student discipline and punishment situation, including name, student number, time of occurrence, event, authenticator, the punishment time, conclusions and other information in order to reduce the discipline phenomenon.

#### 4. SYSTEM PERFORMANCE ANALYSIS

The interface of the system is simple, practical and complete functional. The establishment of this system strives to achieve that the interface is intuitive, clear and simple to operate, the input screen closes to the reality and has man-machine affinity; at the same time, the system interface fault tolerance must be strong, which could be able to effectively prevent data misuse, button combos,

and other causes which lead to the data entry mistake (Wang, 2007); In addition, the design of the system must meet the operational needs of student management, the function must be comprehensive and practical and easy to expand.

This system has good inclusiveness and expansibility (Wang, 2008). During the operation of the student information management system, it must have good inclusiveness and expansibility. It is not only to be able to accept the existing system, but also be able to support the expansion and upgrade of system hardware and software, so that it could meet the current needs of users, and leaves room for future expansion, which is conducive to the smooth development of the student management.

Decision support for semi-programmed: In student management, many decisions are rule-based. Managers can make use of previously used methods and rules to deal with the problem. However, managers will inevitably encounter some unexpected events, which can not be solved relying solely on the previous methods and rules, so it requires managers must quickly make decisions based on their experience and knowledge. Therefore, the student information management system to the support of education management decisions must be semi-programmed.

Safety performance requirements are high. Many of the students' information will be stored in the student information management system, so the security of the system is particularly important. The system must have a safe and efficient communication mechanisms, authentication, authorization check to solve the security and confidentiality issues of the academic information system (Yang, 2007), to prevent the leakage of information and illegal invasion of the confidential information. At the same time, the system will use the data backup and recovery to protect data security. In addition, with the combination of the security mechanisms of the campus network, it uses routing technology, establishes the educational management system firewall to prevent the attacks of network "hacker" and "virus".

#### CONCLUSION

Student information management system is an information system about students' all kinds of information management and analysis. It is an application of management information system in the field of teaching management. As an important part of university management, it plays an important role in the practical application. In this paper, student management system has conducted feasibility analysis, requirements analysis, functional analysis and performance analysis, and will lay a solid foundation for a future system development and implementation in order to achieve the overall management of the campus students and to promote the work of student management scientific, standardized, information and high efficiency.

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