University of Science and Technology

Faculty of Information Technology & Computer Science Collage of
Postgraduate Studies
MSc in Information System

Development of an Automated Student Academic Record System (SARS)

For partial fulfillment of MSc in Information System

Prepared by: Mahir Gamal Sabir

Supervisor:

Dr.Nour eldien A. Nour eldien

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Abstract

Student Academic Record System (SARS) is a software application for education establishments to manage student's academic data. Also known as *student information management system* (SIMS), *student records system* (SRS), *student management system* (SMS), *campus management system* (CMS) , *school management system* (SMS) or *A student information system* (SIS).

In this research a web application that use the object oriented analysis and design methodology to develop a Student Academic Record (SAR) to University of Science and Technology (UST) was developed.

The developed system enables self-service for students to perform basic administrative functions such as tasks in a ─one-stop‖ service and access environment. The system ensures data integrity, privacy, and security in an open-access environment, and it supports faculty and staff who perform both basic and complex functions through simplified work processes and procedures.

المستخلص

نظام السجل الاكاديمي للطالب (SARS) هو نظام برمجي للمؤسسات التعليميه لادارة بيانات الطالب . و يعرف ايضا بنظام الطالب المعلوماتي (SIMS) ، نظام سجلات الطالب (SRS) ، نظام ادارة الطالب (SMS) ، نظام ادارة الحرم الجامعي (CMS) ، نظام ادراة المدرسة (SMS) او نظام الطالب المعولماتي (SIS).

في هذا البحث تم تطوير تطبيق وب يستخدم مفاهيم التحليل و التصميم الموجهة نحو الهدف لادارة السجل الاكاديمي للطالب في كلية علوم الحاسوب و تقانة المعلومات بجامعة العلوم التقانه.

هذا النظام او التطبيق يتيح مهام ادارية اوليه و غيرها من المهام المختصه بالطالب ، كما يضمن التكاملية في البيانات ، الخصوصيه و الامن من اي بيئة وصل يمكن استخدامها ، كما يوفر للادارة و فريق العمل المهام الاوليه و المهام المعقدة من خلال معالجات بيسطة.

1.1. Introduction

The international and national focus on student outcomes has placed an additional burden on universities for they must monitor the achievement of individual students, as well as groups of students, and show that all students are meeting high standards for learning. An education organization's ability to meet this challenge is affected by the organization's access to complete, accurate, and timely information about its students.

Many universities already build and use student academic data effectively. However, the proliferations of new reporting requirements and dramatic changes in technology have had a profound effect on the need for student data and the education community's ability to manage student records.

Purchase of more powerful computer hardware and software and the reconfiguration of information systems have become essential components in efforts to meet the needs of all students.

The aim of this research is to build an *Automated Student Record System (ASRS)* that manages student records form his entry to university till his graduate from that university.

1.2. Student Records

Student record System is, by definition, is any written information about a student. Student records can be described in terms of their contents (e.g., courses taken, grade point averages), use (e.g., identifying students eligible for the free lunch program), and storage medium (e.g., a manual file folder).

The maintenance of extensive, accurate, historical, and current data about individual student is essential to the functioning of universities, and can promote effective educational practices at all levels of the education system.

The contents of the student record are determined by the uses of the records. Typical contents may include family information, courses taken and grades, special program participation information, documents, assessment scores, extracurricular activities, and other information that is used by the education system to promote student success and provide appropriate services. Some of this information should be standard across classrooms, universities, while other information can be unique to the particular classroom, or a university

Student records are used for many important educational purposes, including instruction and guidance decisions; monitoring compliance with attendance and health laws; and administrative purposes, such as determining tuition status, scheduling students into classes, planning university bus routes, monitoring program completion, and completing reports for local, and state authorities. Instructional management systems are frequently linked to student record systems to provide more analytical capability for teachers and administrators. These systems allow for student learning plans, individualized education plans (IEPs), portfolios, and other student products to be stored and retrieved for instructional decision-making and achievement monitoring.

The record may contain information collected from the student (or family); from teachers and other university staff; and from other sources outside the university, such as health care providers or testing companies.

The record for a student may be stored in a central location (such as a university computer) for the convenience of anyone with authorized access and a need to obtain information; or there may be a separate paper or computer record maintained by each person who has contact with a student. Some parts of the record may even be stored outside the university, as happens when student health records are stored and maintained by the local public health service, or when state test scores are

stored and maintained at the state education agency. No matter where the student records are stored, procedures must be in place to ensure that access is granted only to authorized individuals and that only authorized individuals have the capacity to maintain (update) the records.

In summary, a complete student record may be a single file, or it can be made up of several separate records, each with specific content or uses and each stored and maintained in a different way.

1.2.1. Description of a Student Record System (SRS)

Student records are often viewed as paperwork produced for the education bureaucracy. However, a well-designed student record system, whether using paper documents or automated systems, yields many benefits. The most important of these is the ability to report information for decision making about individual students, universities, and programs

When student records are added to an overall management information system that includes information on staff, materials, and budgeting for the university, more management activities can be accomplished and efficiency will be improved. Student record systems, thus, play a key role in the overall functioning of the education system; but more importantly, they increase a university's ability to meet the needs of students.

Separate student records become a student record *system* when they are linked together or made accessible to perform one or more critical functions.

These functions may include generating reports, adding/deleting/changing records, and conducting analyses. Like individual student records, student record systems may be housed in several ways: as paper files in filing cabinets, on microfilm, in computer files, or in a combination of methods. To improve the efficiency and

usefulness of data, many universities have entered their student records into automated databases. Automated systems using available computer technology offer tremendous advantages over traditional paper systems. However, most computerized systems still rely on paper records at various stages within the system.

Numerous companies offer software products designed to store and provide access to student information. Often these products include administrative applications that handle course scheduling, transportation planning, and other useful activities. Sometimes there are instructional applications that work in conjunction with administrative applications to record and analyze student progress. Many of these software companies have developed their student record system products with the assistance of local educators from various different university districts. Other student record systems have been developed by district staff or consultants for a specific university (often called proprietary systems using custom software). Each institution or agency seeking to maintain individual student records must determine the best system design and software solution for its organization. An important consideration is the maintenance of the system as changes or improvements are needed, as well as what it will take to keep the system working on a daily basis. The information that follows can help your organization identify and implement the most appropriate automated system.

1.2.2. Benefits of a Well-Designed Automated Student Record System

Well-designed automated student record system will reach more than teachers and administrators. With automated systems, the processing and exchanging student records among universities will be more efficiency. It will also benefit the students, parents, community, legislators, and others by providing information on the functioning and

success of the education system. Some of the most important advantages are discussed below.

1. **Cost savings and cost avoidance**

A well-conceived and implemented automated student record system can reduce the costs of handling the paperwork associated with record keeping.

Even when such a system proves initially expensive and actual reductions in current costs are not achieved, it is justified given future savings and efficiency.

Nevertheless, system developers and implementers have to deal with two major concerns in order to maximize the cost-saving benefits of an automated system. First, it is sometimes thought that automated data systems do not result in actual savings. Granted there are computer purchase costs and personnel needed to maintain the system. These costs, while not minimal, should pay for themselves with the usefulness of the data and the reduced time data providers have to spend on data collections. Concerns about the reliability of computers may also lead some staff members to continue keeping their old records, ‒just in case.‖ In fact, during the early stages of automating data it is often wise to maintain the data in two places, so that glitches can be resolved before relying solely on the automated system. Once the system is fully functional, however, the back-up paper system is no longer needed. Another mistake often made is that organizations automate a paper system instead of completely redesigning a system that takes advantage of the computer's capabilities as they exist now as well as thinking about future possibilities. The re-conceptualizing of a system that contains virtually no paper means that redundant activities such as entering data can be avoided. If, however, you merely automate the paper system,   you

may achieve fewer savings than could be achieved through a newly-conceived automated system.

2.   Quicker response

When information from a student record is requested, it is usually needed promptly. A principal making placement decisions about a new student needs the previous university's records immediately to assign the student to the appropriate programs and services. A counselor with a student in crisis needs immediate access to records to help intervention specialists effectively deliver their services. A university board making a policy changes to a ‒no-pass/no-play‖ rule needs analyses to support its decision. A well-designed student record system allows for timely retrieval of needed information in these, or similar, situations.

3.   Accuracy

Data quality is basic to a well-designed student record system. Having clearly defined data elements that are used consistently promotes data quality. Paper records have traditionally been considered accurate, although not necessarily complete or accessible. Maintaining data quality as information is shared, analyzed, and reported is a characteristic of a well-designed system. Accuracy is vital at every stage, from data collection, to entry, to maintenance in the system. Accuracy provides users with the confidence they will require to rely upon a student record system.

4.   Getting the needed information

An effective automated student record system should provide the information required on request, easily, and without burdensome trial-and-error searching. From the first steps of designing the system, the queries that will follow are anticipated and accommodated. Similar to an office filing system, the adequacy of a student record system is often judged by how much time and effort are required to find and retrieve information.

Therefore, a key part of the design of a student record system is its process for access, retrieval, and reporting.

5. Moving data among different education agencies

A well-designed automated student record system allows for the easy and efficient movement of student records among levels of the education system using standard formats. For instance, when a student moves from one university to another within the same district, or to another district, the information can be extracted, prepared, and transferred electronically. The university receiving the electronic record can download the student record, thus eliminating the need for re-entering the information. Electronic data can also be received more rapidly than paper documents, enabling quicker decision-making about the student. Such a system can also be used to transmit student records to a state education agency that collects individual student records. It can also be used to transmit student transcripts to postsecondary institutions where a student is seeking admission.

There are many advantages to having an automated student record system. The move from paper-based record systems to automated systems, or the upgrade of existing automated systems, means that there is a greater chance that information will be readily available when important decisions must be made about improving educational

programs and services. Once the decision is made to upgrade the system, the next step is look at the process needed to design and implement an effective student record system.

1.3. Problem statement

The creation and management of accurate, up-to-date information regarding a student's academic career is critically important in the management of a university. Previously, the UST relied heavily on paper

records. While paper records are a traditional way of managing student data there are several drawbacks to this method. First, paper records may be difficult to manage and track, in addition to the physical exertion required retrieving, altering, and re-filing paper records are all non-value added activities. Additionally, it is only possible for one user to alter physical records at a time. Finally, data integrity and logging is difficult.

1.4. Research objectives

The objectives of this thesis include creating an easy to use and comprehend Student Record System, ensure data integrity and validation, maintain visual conformity

throughout the system, increase efficiency and convenience for staff and student users and contain a strong error-handling system.

1.5. Research methodology

This thesis will use a special methodology for analysis and design, called Ripple, which is geared towards learning what's involved in all software development, large or small, but it, is applicable to the real world as well

Ripple is simplified object oriented analysis and design methodology, which is about viewing and modeling the world/system as a set of interacting and interrelated objects. It also has many features such as universe consists of interacting objects and describes and builds systems consisting of objects

1.6. Thesis organization

The thesis was organized as follows, chapter two discusses *student academic record system* methodology, and chapter three was dedicated for system requirement as well as system analysis. Chapter four devoted

for the system design, and chapter five for implementation and testing. Finally, chapter six is a conclusion and recommendation.

1.7. Results

Expected from the SARS to increase the efficiency of the college's record management, decrease time required to access and deliver student records, decrease data duplication, increase data integrity, increase user access and convenience, decrease time spent on non-value added tasks and increase ability of staff to better serve the student population.