**A**

**SCHOOL MANAGEMENT SYSTEM PROJECT PROPOSAL**

**BY**

**MUGAMBI TECHNOLOGIES**

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**Abstract**

This project automates the school management system. In the system, four users are allowed. The administrator(the school principal/director), The Accounts officer(Handles student fee payment) and the parent user(Views students progress at school among other announcements set by Administrator).

The school Administrator deals with Registering of students, creating other users i.e accountant and parent, updating student grades and posting announcements on the school blog.

The accounts user can set Term fees, and update fees on payment accordingly. This user can also add announcements for the parents to see and the parent user has a portal which they can access through their phones. This portal provides them with information on student academic progress, they can see fee balances, announcements made by the school and also view the fee structure comfortably.

A database has been used to enforce constraints and to store data. The prototype has been tested with data from Juja primary school. It has been observed that the system successfully registers students, facilitates Grading students, produces transcripts accordingly, and records fees for various students. It has also been viewed that parents too have been able to access their child’s marks, viewed fee balances due and downloaded fee structures accordingly.

**CHAPTER ONE**

**Introduction**

**1.1 Background**

The Education system is the backbone of every nation, and hence it is imperative to provide a strong educational foundation to the young generation to ensure the development of open-minded global citizens, securing the future for everyone. Advanced technology available today can play a crucial role in streamlining education-related processes to promote collaboration among students, teachers, parents and the school staff.

Education is central to development. It is one of the most powerful instruments for reducing poverty and inequality and lays a foundation for sustained economic growth. With this aim currently our government has given special emphasis to the educational sector and school improvement activities such as continuous professional development for teachers, training and upgrading teachers and capacitating schools with manpower and materials are among the major actions which have been taken in both primary and secondary schools. In order to facilitate and simplify these actions one of the major tools is to have an automated school management system.

School Management System(SMS) consists of tasks such as registering students, Grading students, producing report cards, producing official transcripts, producing different reports for parents and accounts users.

Automation is the utilization of technology to replace humans with a machine that can perform more quickly and more continuously.

By automating SMS documents that took up many large storage rooms can be stored on a few disks. However, the school system in most schools of Kenya is not automated and the record officers generate transcripts and reports manually.

**1.2 Statement of the Problem**

To help promote students' achievement and success, schools must have access to complete, accurate, and timely information about students. One of the benefits of automated SMS is that the student record system will simplify retrieval of required information and is a great instrument for school improvement by taking measures from the information acquired. Despite the use of automated SMS, the schools in Kenya are using paper based documentation systems for performing various tasks.

Transcripts of students are prepared manually by the record officer and teachers. Report cards are produced by the home-room teachers. In addition to that, retrieving records of students who have graduated a couple of years ago has been a difficult task and the manual system also has difficulty producing different reports which are required by the stakeholders such as teachers, administrators or officials from the schools.

Due to the inefficiency of the current manual system, the need arises to automate SMS in order to efficiently handle students’ grading, to produce transcript, report cards and the various reports satisfying users and customers.

**1.3 Objective of the project:**

The General objective of the project is to automate the SMS.

**1.3.1 Specific objectives:**

The specific objectives of this project include:

* To develop a way to register and store student data digitally.
* To develop a system that will help grade students digitally.
* Develop a system that will produce different reports accordingly.
* A system that will allow teachers, parents and stakeholders to view student results easily.
* To develop a system that will facilitate student fee management.

**1.4 Organization of the Document**

This report document contains seven chapters including this chapter. Chapter two defines and describes concepts with regard to SMS, aiming to give a general view to the reader of the document about tasks or activities which need automation in the school environment. Chapter three presents a review of research works on SMS. In chapters four and five, we presented the analysis and design of the developed system respectively. In the remaining chapters, prototype development and conclusion and recommendations are briefly explained.

**Chapter 2**

**Overview of the School Management System**

This project emphasizes the school management system in Kenya primary schools. Therefore, we give an overview of the management system of primary schools in Kenya.

Primary School education in Kenya requires a student to spend 2 years in pre-primary education, 6 years in primary education and 2 years in Junior secondary education. At the beginning of each academic year which starts in January, the students get registered and assigned rooms. Each class of students is assigned to a fixed room. Class teachers are assigned to each class of students. There

are three terms per year. The first term final examination is usually administered in March, the second term final examination is administered during the end of July and the third term examination is usually administered during the start or mid-November. Consequently, the results of each class of students is collected, organized, ranked by the corresponding class teacher and reported to each student. Transcripts are generated by the record officer. A student may request a transcript when he/she wants to transfer to another school or when he/she has completed/graduated from the school and needs to join higher education or for some other purpose.

Education stakeholders in Kenya want to know statistical reports like the number of registered students at the beginning of every year, the number of dropouts and the number of passes/failures at a grade level to aid them in decision making.

**The current fee collection method**

The current fee collection and management system is automated but does not produce enough reports as expected. The administration may want to produce reports such as how many students have arrears from previous terms, the current invoices, payments from a certain period, payments made by a specific student and other reports. The current system does not allow parents or teachers to view student’s grades or fee status unless they came physically to the school.

We need to create a solution that automates the collection of fees and generation of reports. In a school environment, the system manages tuition fees, miscellaneous fees, project fees and other charges for student services. It helps the school administrator to automate the fee collection, generate receipts and refunds. It increases efficiency and reduces the cost needed for maintaining manual records and saves time and effort for both the user and the school administrator.

The fee management problem is said to be feasible if and only if it satisfies the following constraints (requirements):

* Accountants can set and update different term fees.
* Accountants can view and pay invoices for different students.
* Accountants can produce reports accordingly e.g. current invoices, payments made by a student, payments in a certain period of time etc.
* Accountants can add miscellaneous fees and assign to a student.
* Fee breakdown of a student can be generated to see how we arrived to the current amount owed.

To automate the school activities some literature reviews have been done. The literature reviews is discussed in chapter 3.

**CHAPTER THREE**

**Literature Review**

**Overview of schools administration**

Schools in Kenya are under the **ministry of education** through stewardship of a **cabinet secretary**. Under the cabinet secretary is the principal secretary who is the chief accounting officer in the ministry.

In each county there is a **commissioner** of education who coordinates all the activities of education in a county. In a district, a **district education officer (DEO)** is in charge of all matters of education in the district except staffing which is done by the **TSC county commissioner**. These are the officers in charge of managing education outside the school settings. Within the school we have the board of management (B.O.M.) whose secretary and executive officer is the school principal. The B.O.G. is the one who directly manages a school. The Principal of the school is the overall in charge of the school and oversees everything in the school that includes: finance, staffing, relationship with the outside world, infrastructure development and any other. Under the principal are the deputy, H.O.Ds and teachers.

The school has other stakeholders like parents who pay fees and are represented through parents teachers association (P.T.A.), KNEC who are the external examiners on behalf of the government and the sponsor who is represented in the B.O.G.

**Use of ICT in schools**

The use of ICT in Kenyan schools has been neglected (Makewa L. et al, 2013). The earliest attempt by the governments to use ICT to aid management was in using EMIS to collect data on schools census Moest(2005). Mingaine L. (2013) identifies one of the major challenges faced by principals in implementing ICT in public secondary schools as ICT costs.

The major uses of ICT in schools have been in;

* Typing of documents such as letters and examinations.
* Communication.
* Teaching and learning.
* To aid in school management.

Schools first got computers as donations and put them into offices for typing letters and examinations. Later with the proliferation of the internet in workplaces, schools started using computers to communicate, at almost the same time the ministry of education through the Kenya literature bureau started developing e-content and encouraged teachers to use ICT for curriculum delivery. The use of ICT in management is the latest move initiated by principals and teachers to ease the management of schools.

**School management systems**

**Introduction**

The trends towards SMS started in the early 1990’s, when many schools started receiving donations from western countries (Mingaine L., 2013). And on realizing that many companies had automated their tasks to ease management, schools started acquiring these systems. For some schools they developed their systems through their teachers while others got their solutions from local vendors who developed for those specific schools. Some of those systems lacked support when these vendors rounded off their business or moved to do other things or when the teachers were transferred to other schools. Some of them were made from Ms Access and when the school’s data reached some level Access became very slow or even could not open. Some schools lost their data and regretted automating their systems.

Makewa L. et al (2013) in their study found out that in Kuria districts (North and South) only 15 out of 35 schools had computers. The authors also note that the use of ICT in schools vary from one district to another due to academic, economic, political, and cultural levels of development factors. They also noted that a neglected part of computers in education is the use of computers to facilitate school administration processes. These days with much training of school managers, schools are employing technicians to maintain these systems, training their teachers to do so or outsourcing these services. There has been a lot of hype about the worthiness of the cloud, however before adopting this, the worthiness and challenges should be considered individually and based on an objective framework. This technology will help solve some problems in organizations but not all problems will be solved by technology. In business, specialization is important where organizations concentrate on their line of production while outsourcing services that are not key to their businesses. While each company is specialized in its own industry, market or product, and some companies’ benefit, due to size or requirements, from designing, building, managing, and renovating their own private office building, it is in the best interest of the vast majority of companies to share the office services they all use, notably certain fundamental utilities. Schools main business is to disseminate knowledge to learners and should outsource the ICT resources from cloud providers to promote efficiency, reduce costs and make this sustainable.

Cloud computing enables businesses to reduce cost of running businesses by outsourcing support and maintenance to providers that have lower marginal costs and better expertise.

**Functionalities of a school management system**

A school management system has the following functionalities.

1. Recording student’s details when they are admitted in schools. They include names, date of birth, admission number, home address, guardian name and telephone number among others. These details are stored and edited whenever changes occur.

2. One of the functions of an SMS is in processing examination results. In this module teachers accumulate students’ marks in the course of the term, each time an examination is done the teachers inputs the results of exams in the system. After the end of an examination the results are analyzed and reports generated. These reports are used to grade students as well as appraise teachers.

3. A school like any other organization employs various people to work and help teachers to achieve their goals, these employees of the school are paid. To achieve this in an efficient manner schools use a module called payroll. This module holds workers' details on age, days worked, basic salary, salary deductions among others which are used in deriving a person’s net salary.

4. A school has got various sources of revenue, one of the most significant is from parents and guardians of the students in the school; others include the government and sponsors. When money is paid to a school the person paying is given a receipt while those to be paid issue an invoice to the school. All this is managed by a module called finance management module.

5. A time table module is used to create a schedule for teachers on the time and class to teach. It reduces the complexity and enormity of this daunting task, and reduces it to a click of a button. 6. Another common module in SMS is the communication module where stakeholders can be communicated to using text on their phone or to their emails. Using this module communication to stakeholders is more efficient and cheaper.

**On premise based SMSs**

In the beginning of this century many western countries started giving donations to African schools so as to try and bridge the digital divide. This was in some instances seen as contributing to e-wastes in Africa. Moest(2005) cited a case in Narok High school where Macintosh computers were found at a corner in the school. This is when schools started considering SMS.

The first schools' management systems were simplistic. They ran on a single computer and every person who wanted to input data had to book to use the computer. They were mostly made from MS Access. The school had very poor practices of running and maintaining them. They were mostly used to process examination results. With time they became very slow and unusable and some schools even lost data. The schools had to go back to the drawing board.

The second generation school management systems had a centralized database either on a server or a desktop, accessible through the network through desktop computers or laptops which had the school management system installed in them. They have eased the management of schools by quickly providing the required information from a click of a button. The process of making students report forms has been made easier and neater. They are only accessible within the school premises. They lead to a great capital outlay in buying the hardware and software. They also bring issues with licensing of software and hardware and software maintenance burden to schools.

**Cloud-based SMSs**

In a cloud based SMS school software and information is stored on remote servers and accessed over the internet just like Gmail and Hotmail.

Examples of cloud based SMS in developed nations

In developed nations there are a significant number of examples of cloud based SMS currently in use. Such examples are highlighted below.

1. The Bromcom MIS provides capabilities for entering test and assessment scores, building timetables, tracking attendance and managing many other student-related data needs in a school. It is specifically made for secondary schools although it can be scaled up and down to serve other institutions.
2. InterSIS is an integrated school management suite and has modules for planning, assessment & reporting, admissions & enrollment to mention a few it is built on top of Xero, a cloud accounting solution.
3. Fedena is school management software which is used by thousands of educational institutions worldwide for all administration, management and learning related activities. It is used to manage students, teachers, employees, courses and all the systems and processes related to running a school.
4. Openschool is an open source cloud based SMS running on a MYSQL database and built using PHP. It is readily available for downloading and use. The code is available to be changed to suit the given situation.

Intel Corporation has been designing their cloud based school management system referred to as learning management system. Their paper on the systems states as follows.

**Cost:** Cloud computing will bring down the cost of ICT but Intel C.(2012) mentions that the cloud is not for free. Even if a school were to use open source which are free to educators they still need to pay for storage and network.

Intel C. (2012) urges schools to consider the following while thinking about cloud:

* Security of the school data and student intellectual right.
* The capability of infrastructure to support the cloud now and in the future.
* Cloud may mean a long time commitment with external vendors, so vendors should check thoroughly before engaging a provider so as to avoid disappointment.

In this solution the data is accessible from anywhere with a network and can be accessed through the phone. McIntosh D. (2013) states that a cloud based Administrate LMS would be available from March 2013. Just as reflected on the available materials on education systems where much literature is written about e-learning and very little of school management systems, many cloud based education systems are for e-learning as compared to those of management. Much emphasis is put on e-content.

2.3.3.4.2 **Examples of cloud based SMS in developing nations with emphasis on Kenya**

Developing nations can benefit a lot from the use of cloud computing in schools. Cloud based SMS is not very common. In Chavakali high school in Vihiga County, parents can access the performance of their children through the networks.

**Brilliantte** School Management System is Kenya's cloud-based Enterprise School Management System software developed by Brilliantte Solutions Limited. It is suitable for secondary schools. It is web-based, cross-device, cross-browser and comes with a beautiful user interface and is user friendly. It is easily accessible by the stakeholders.

A school management system by Kenya Cloud Space is integrated management software with cloud computing services which allows for automatic upgrades, automatic backups and access of information from anywhere using mobile phone, tablet PC, laptop or desktop PC.

**Benefits of cloud based SMS**

The following benefits will be achieved by schools when they adopt cloud based SMS.

Due to high costs, servers requires very tight physical security, this is another challenge to companies especially the ones that are setup in remote locations, when servers are acquired through the cloud then the consumer will be relieved of the physical security cost bothers that comes with these servers;

Some highly IT trained personnel would require retention in schools by providing competitive salaries and other stipends. These companies will require less internal IT personnel because much of the work will be done by the cloud provider. This high cost is eliminated from the company; the company will only budget for a very lean IT team.

Apart from hardware, software also comes at a cost. There are various types of software required in a company and they include: server operating system, database management system, server antivirus, desktop operating systems, desktop antivirus, specific institution management software, Office among others. All these software comes at a cost for initial purchase and later requires an annual license and later will require upgrading from one version to another and this will also cost more money. To avoid this financial burden then one just needs to adopt cloud computing and will realize a lot of savings.

Many companies will buy server hardware with more capacity than they require because of the expected growth in the future, meaning most of the time this capacity is underutilized, the hardware just lies idle while the money used to buy it could have been put in an alternative use.

This project work tries to fill the gap by automating the various activities at schools. It tries to satisfy customers' needs and simplify the works of administrators, record officers and teachers. With an automated school management system parents can easily interact with the school community to follow up their children’s achievement and play their role in the school development processes.

**CHAPTER FOUR**

**SYSTEM ANALYSIS**

In this chapter the functional and non-functional requirements of the system are described and modeled using UML models.

**4.1 Functional Requirements**

The functional requirements of the system are:

* Register a student,
* Grade a student
* Generate various reports,
* Record student fees.
* Communication between parents and the school.

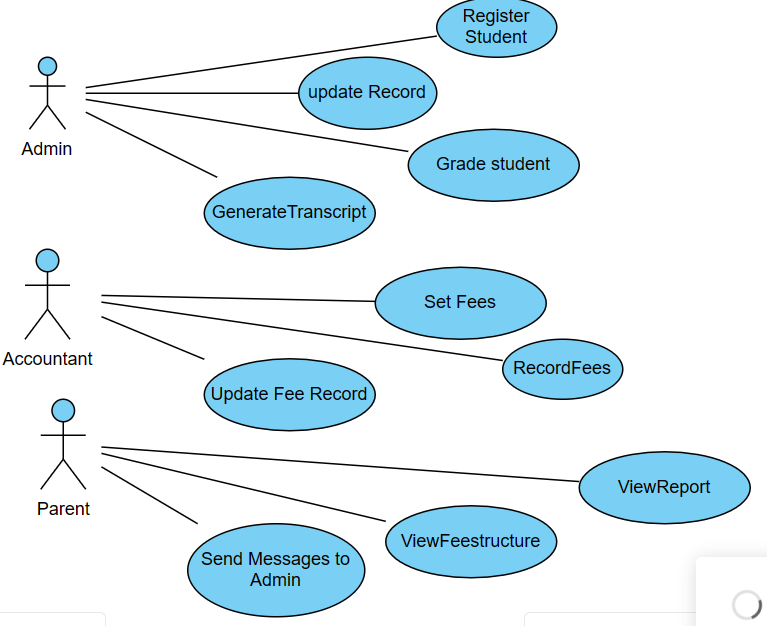
**4.2 Non Functional Requirements**

Security requirements are important factors in this system as classified data will be stored in the database. User validation will be done during login to ensure that the user is valid and that the user only has access to his or her permission data.

General users will only have access through the user interface. The system will have consistent interface formats and button sets for all forms in the application, will have a form based interface for all data entry and viewing formats, and will generate reports that are formatted in a table and that should look like the existing manual report formats for user friendliness. The system will be easily maintained by the developer or other authorized trained person and it shall respond as fast as possible in generating reports.

**4.3.1 Use case Diagram**

Use cases of the system are identified to be “RegisterStudent”, “RecordFees”, “GenerateTranscript”, “GenerateReportCard”, “ViewReport” and “ViewFeeStructure”. The diagram depicted in Figure 1 shows the use case diagram of the system.



Figure

**4.3.2 Actor Description**

**Name:** Admin

**Description**: An Admin is a person who registers a student, input, update student data and produce transcript and report card.

**Name**: Accountant

Description: An Accountant is an employee that handles student fee payment module. He/she is responsible for setting fees for different terms and updating student fees when a payment is made.

**Name**: Parent

Description: A Parent is a person who is registered as parent of the student and responsible to follow the student in close contact with the school. He/She can view the status of the student such as result/performance of the student online.