

**SCHOOL OF SCIENCE AND INFORMATION SCIENCES**

**BSC IN COMPUTER SCIENCE**

**COM 423 COMPUTER SCIENCE PROJECT**

**TITLE:HIGH SCHOOL INFORMATION SYSTEM**

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Chapter 1

Introduction

This is a school information management system intended to solve most of the problems the current system have, such problems include low speed, little efficiency and inadequate reliability from the systems.

Background of the Study

Looking at the world today, the technology is changing radically, with many organization shifting their system form standalone desktop application to on line base ones. Others are shifting to mobile technology where a lot of smart phone applications are being developed. Almost every above 18 person own a smart phone , every organization in todays world owns some computers , most of these organization have access to fast Internet connections and those that don't have any Internet have a good networked computers.

With this in mind, it clear what kind of information systems can be viable out there, obvious , these are on line based information systems.

On the other hand, most of the employees in organizations are always active in the Internet, they are used to the Internet because of the social networking systems like Facebook.

This necessitate a system that best suite what the users are used to.

Problem statement

Objectives

This system will accomplish the following.

1. Student registration.
2. Staff Registration.
3. Exam Management.
4. Fee Management
5. Communication with Parents

* Here, the school will be required purchase a mask or a short code from MNOs (Mobile Network Operators) or any MPRSPs (Mobile Premium Rate Service Providers), this will be used for communicating to parents via SMS (Short Message Service).
* On the other hand, the school will also be required to have a secure SMTP (Simple Mail Transfer Protocol) for the purpose of sending emails.
* Since this product is designed to manage many schools (a school will have an account). The cost for running an account will be significantly low. Otherwise if a school opts to buy this product, it will incur more cost for hosting on top of the product cost.

Scope and Limitation of the Study

Justification

Chapter 2

LITERATURE REVIEW AND CONCEPTUAL/ THEORETICAL FRAMEWORK

School Information Management system (SIMS) have existed since long time ago.

This is a student information system designed for high schools , in Kenya such systems came into existence a few years ago. They began in bigger High Schools ( National Schools) , here they were basically used for examination results. Later these systems found more uses in a school environment, such include fee monitoring, exam management tasks like setting exams, student management, staff management etc. They did pretty good job.

Nowadays we have better, more faster systems, majority of them being standalone desktop applications. A few of them are embracing the shift in technology because every organization is now tuning to on line systems.

Why on line ?

They don;t limit the users because one can work from anywhere.

On line technology enables distribution of systems. For example, a school management system can integrate Banks APIs to enable monitoring student fees.

Chapter 3

SYSTEM DEVELOPMENT METHODOLOGY.

This is a framework used to structure, plan and control the process of developing an information System. A lot of methodologies exists out there, such include :

\*Agile Software Development – a conceptual framework. It has the following types, Crystal Methods, Dynamic Systems Development Model and Scum.

\*Extreme Programming(XP) – used in very unstable environment, it allows flexibility within the modeling process.

\*Rapid Application Development – a variation of JAD that attempts to create an application more quickly via such strategies like reusing components.

\*Waterfall (Traditional) – it describes a development method that is rigid and linear. It has distinct goals for each phase where each phase is completed then the next one started and no turning back.

\*Rational Unified Process – attempts to capture many of the modern software development best practices .

\*Joint Application Development etc.

For reasons that will become apparent, this particular software can be best developed using JAD Model.

Joint Application Development (JAD) - developed by some two employees of IBM, in 1970s.

This methodology emphasis much on requirement definition and user interface design. Here, end users, executives and developers attend intense offside meeting discussing the system requirement.

Executive Sponsor- is a person from the customer's organization who has the ultimate authority to make decisions about the project. e.g the CEO.

Responsibilities

\*Set the vision for the projects

\*Honor the results of the JAD process.

\*Resolve business policy conflicts by being the ultimate decision maker.

\*Ensure the project team has access to and commitment from the right business user experts.

Users

Responsibilities

\*Serves as the main focus of JAD

\*Provide business Expertise.

\*Represent the strategic and tactical directives of the business

\*Represent all major user groups affected by the project.

Developer (IT Representative)

\*lend technical advice when required.

\*Help develop logical model and specifications.

\*help build prototypes

\*Ensures all technological constraints are represented

\*Develop an understanding of user business goals, priorities and strategies.

\*Represent job functions such as data administration,business analysis,programming etc.

\*Ensures a solution that is realistic for the budget.

Since this is a high school information system where users are always active on the system, it requires much clients involvement in the design and development , this ensures that the system meets its requirements and zeros down chances of client rejecting it. To accomplish this , a series of workshops called JAD sessions are organized. For this system, it requires intense meeting with teachers and other stake holders in a school environment. During such meetings, the developer get to know what users needs most, for example, to know what's convenient for a teacher while submitting exam results, the developer must interact actively with a number of teachers.

This model focuses on the business problem rather than technical details, thus , its more suitable for developers of business systems.

When compared to other methodologies, JAD is found to lead to shorter development time and greater client satisfaction.

Project suitable with JAD

\*A System that involves many groups of users whose responsibilities cross traditional department

\*A System that is considered critical to the future of the organization.

\*A System that is a first time project for the organization.

Generic JAD Life Cycle

\*Planning/Definition

\*Preparation

\*Design Sessions

\*Finalization

Advantages of JAD

\*it shortens the time taken while collecting user requirements. This in turn reduces the number of requirement changes that are so costly. However, it success depends on effective leadership of the JAD sessions. Key users, executives and developers should participate to achieve the above benefits.

\*Enhances quality

\*Promote teamwork with the customer

\*Lowers development and maintenance cost

\*Reduces development time, cost and errors.

Collecting Facts and Data .

Some sample data is generated on line, such include names.

Other data and facts are collected during the JAD sessions from the users.

Tools used to analyze the data

\*PhAdmin3 is used to as a graphical user interface that enable easier viewing of data from the database since the database management system used has no graphical interface.

\*A command interface (terminal) is needed for initialization of the database

Tools to implement and test the system

\*Ant , a product from Apache is used to deploying the system.

\*Junit, used for module testing.

Time schedule and project cost

For the success of this project, KSH 10,000 is allocated for organizing JAD sessions, and visiting various schools.

KSH 7,000 is allocated for preparing various documents that are required in the whole process. Such include this proposal document, System documentation and questionnaires.

Some amount totaling to KSH 3,000 are kept aside for emergency purposes

The above totals to KSH 20,000.

### System Users

### Teachers

Their main work is exam management, a teacher uploads his/her exam results.

### Class teacher

View and or print his/her stream exam results

### HOD/CM

View and or print class result, for example, can print results for the whole form 1 classes.

### Deputy Principal

Can do everything a principal can do except deleting users

### The secretary

### Student management

Registration

This is mostly the work of a secretary, it include registration. Details captured:

1. Student basic details ,
2. Student primary school details,
3. Student guardian/parent details,
4. Student sponsor details

Allocation and role assignment

1. Student is allocated a house plus classroom and subjects.
2. Other roles like prefects, clubs etc. are also registered in the system by the secretary as a directive from relevant authorities.

### Account clerk/ bursar

He/she handle matters relating with cash, that is, maybe pocket money, fees and petty cashes.

For pocket money

A student opens an account with the school and deposit the pocket money which can be withdrawn anytime.

For fee

The system will integrate banks APIs(Application Programming Interface) to enable monitoring of the students fees, here balanced can be checked and statement generated.

### The principal

He/she will consult our the system admin, then provide his/her school details, such include school name, desired school username and password, school email, school phone number, school logo and digital signature. Having provided the above information, the account will be created. Here the admin will create an account for the principal too, that is, staff username (Principals username) then principal’s password (staff password), will all that a principal can login to his/her school and add other users. The users will then login.

He/she makes the payments for using the product, this is done every term.

### Coding and programming tools

### Coding

The system is based on JavaEE (Enterprise Edition), using MVC (Model, Controller View) model. A lot of java server pages (jsp) a written plus servlets containers and other java classes like POJOS (Plain Old Java Objects) and DAOs (Data Access Objects) .On the view, cascading style sheet, java Scripts libraries and some html are used for Designing the UI. On top, some more files are still included, these are the deployment descriptors (web.xml), configuration file, build.property file, log configuration file, scheduler configuration file, cache configuration file and database initialization files. All these are properly groped and put in various directories within the programming machine. Such directories include

1. Web for the java server pages and the deployment descriptors
2. src for Java codes
3. etc for persistence management , this has cache files, database files , schedulers and configuration files
4. the root directory is the webapp

### Programming tools

1. Subversion, this tool is used for version control, in this project I have used github as a repository.
2. Apache ant, this tool is for deployment. It is more efficient than IDEs (Integrated Development Environment).
3. Wildfly (JBOSS), this is a server
4. Postgres, this is a database Management System (RDMS)
5. Eclipse IDE for Java coding and testing
6. Netbeans IDE for Jsp coding
7. Linux Operating System

### Server Requirement

Fast machine with at least 4GB RAM and at least 500GB HDD running UNIX based OS

### User Requirement

A web browser that can support java script

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