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COM 311 PROJECT REPORT

**SCHOOL MANAGEMENT SYSTEM**

A PROJECT SUBMITTED TO

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PHYSICS, MATHEMATHICS, STATISTICS AND COMPUTER SCIENCE

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THE DEGREE OF

BACHELORS OF SCIENCE

IN COMPUTER SCIENCE

BY

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# Introduction

## Personal Information

My names are EKAI LONG’OLAN JACKSON an undergraduate student in Moi University, School of Biological and Physical Sciences pursuing a Bachelors degree in Computer Science.

## Project Summary

This proposal is about the development of a SCHOOL MANAGEMENT SYSTEM (SMS) that will manage the records of students regarding admissions, courses, examination part, and exam result summary for particular student and also other facilities to provide to generating reports for the school.

The system will be designed to help for keeping data, storing, manipulating data and analyzing the data. Extensive information will be available at your fingertips through this system. Viewing student data, managing student information and category and for examination, courses management, scheduling exams, results and related issues will be made simple and easy. There will be custom search capabilities to aid in finding students information and working on students’ records. This will make the system easier to navigate and to use maximizing the effectiveness of time and other resources. SMS will allow the keeping of personnel data in a form that can be easily accessed and analyzed in a consistent way.

Each of modules in SMS will cover many other student aspects from application to retirement. The system records basic personal information, admission information, courses information regarding student. Leading edge systems provide the ability to read applications and enter relevant data to applicable database fields, notify students and provide result.

SMS function involves:

* Manage new admissions
* Manage courses
* Student basic information
* Manage school
* Exam scheduling
* Result management
* Manage attendance

Three Type User in this online school management system ;

* Admin
* Student
* School(Staff)

## Purpose

The project is about to handle all the information of the student regarding course and examination. Also it manages resources which were managed and handled by manpower previously. The main purpose of the project is to integrate distinct sections of the organization into consistent manner so that complex functions can be handled smoothly by any technical or non-technical persons.

The project aims at the following matters:

* To manage information of student, faculty and courses.
* Consistently update information of all the students.
* Reports.
* Assistance in decision making.

## Scope

* Administrator can update and delete the whole information.
* Administrator has the status of all members and can give permission to allow the member of this site.
* The website is very flexible which can accommodate the any feature later on which we want to add for update the site.
* Provide the facility like send mail to faculty and principal
* Student can view profile.
* Student view result, news, schedule, photo gallery.
* End user can see all information about school event and school result.
* Information about school result.
* Bifurcation of the student’s information
* Bifurcation of the student’s exam information
* End user can know about new events held in School, Results, Rankers of the school
* This System has large scope for the online school management of all the students & school information.
* This system store all information’s of the students with snap of the student.
* This system store all information’s of the staff with snap of the staff.
* System can able to accept user request and manages information like student’s result
* System also provides inter messaging facilities for send messages to Principal and Faculty.
* System provides enhance security facilities to give such user rights to protect from unauthorized user. It creates password for login users like admin.
* System can give the all activities of student images.
* System can give the information about further study.
* System can give all detail information about school past history and present history.
* System can give all current news and activities.

## Objective

* Computerized System is efficient and accurate then manual so this system is very accurate and reduces manual works.

Save the time and make the work easy for desk user

* The school will provide a safe & secure environment
* The school administration, faculty, students and parents will be key drivers of a good school community
* The school will facilitate the holistic development of the child
* The school will provide the environment which fosters independent thinking, creativity, decision making and critical analysis.
* The school will help the child to grow into a competent learner and confident communicator.

It will Provides the good GUI and Maintains the whole information about School.

Main objective of this website is let multiple information such as principal, faculty, student, management, examination, standard and extra activity of school.

Admin side can change easily all school information like password, standard information, faculty, management etc.

Provide the facility like send mail to faculty and principal

The system can allow the administrator to select the unnecessary information and delete them from the database. Here administrators have total control on Site; he can delete or edit information.

* It is fraud protected because each work is done on computer so machine will never make fraud.
* It will easily used and the time consuming is decreased.
* It can reduce paper work.

This system is web-base application, so all people of world can access it from any place.

# System Analysis

## Study of the current system

The current SMS deals with maintaining a physical contact with the school management department for filing all the details and documentation work. The management needs to visit the school management department and collect the assignment and submitting his/her documents directly.

According to the current system, the management has to fill the forms manually, go to the account management department and submit him the form. The applicant needs to visit the schools portal now and then in order to get his work accomplished. The admin also has to manage all the users. He needs to maintain the records of all the users, their activity status, submission methods and installation details on paper. The manual process is more error prone and also slow. Moreover students in the school can interface his/her work area only. But if an online application is available then they can communicate whole system. Thus a simulation of this entire process can be a boon to the applicants as well as the admin.

## Problems and weaknesses of the current system

* The present system has certain major disadvantages. A few to be listed can be excessive paperwork, time consuming process flow, laborious work environment for employees, difficult to access historical data and all these problems lead to inefficient working of government sector causing dissatisfaction in the general public.
* Apart from the above stated problems there is lack of transparency in the existing system. This being one of the major drawbacks in the system needs special attention.
* The problems stated above have certain deep rooted problems like time consuming process flow for which may need to change the structure of the process flow in certain cases so that the system output can become faster.
* The following listed are the problems or weaknesses of the current system:
* So much time consume in preparing registers which is having replicated data.
* It is difficult to prepare data for decision making.
* Attendance related module is not there.
* Reporting and appraisal of the performance is not there.

## Requirement of New system

* Registration details of the applicant.
* Login details of the applicant.
* Personal details of the applicant.
* Information of all the members of the applicant’s group.
* Educational and employment information.
* All information regarding the e-forms must follow.
* Certain legal details of the Students and School.
* Communication with whole system.

### Hardware & Software Requirements

**Hardware Requirement:**

* 1 GHz processor or higher.
* 512 MB RAM
* Minimum 02 GB Free Hard Disk Space

**Software Requirement:**

* Web Browser.
* Flash Player

**Development Environment:**

* Front End: PHP, HTML, CSS, JAVASCRIPT.
* Back End: Microsoft SQL Server 2005.
* RAM: 512 MB Minimum.
* Hard Disk: 80 GB Minimum.
* Operating System: Any O.S.

### Functional requirement

**Web Interface**: Provides interaction between the users and the system.

**Database**: Stores details of students and the school in general.

### Non- functional requirement

**Consistency**: The database of system will always be updated at any point where a new valid data entry is made.

**Security:** To ensure that all records are full inaccessible by unauthorized, system has a login module which authenticate different system user have been granted to use the system.

**Usability:** The system should be much friendly to use and easier too to understand.

**Throughput:** The system should process the input fed by user faster, and produce output to with no delay.

# Project Management

## Feasibility Study

The aim of the feasibility study activity is to determine whether it would be financially and technically feasible to develop the system or not. A feasibility study is carried out from following aspects;

### Operational feasibility

The system will be developed for any user who wants to use this system.

### Technical feasibility

Technical feasibility corresponds to determination of whether it is technically feasible to develop the software. It refers to the ability of the process to take advantage of the current state of the technology in pursuing further improvement. The technical capability of the available technology should be considered.

The following technical feasibility areas will be probed during the feasibility study phase:

* The necessary technology i.e. front end development tools, back end database technology for developing the system are already available within the organization.
* The front end tool proposed is easily compatible with the current hardware configuration in the organization.
* The back end tool proposed has the capacity to hold the data required for using the new system.
* The system is expandable in many dimensions with respect to addition of more functionality, features etc.
* The front end and back end technologies provide a way to preserve the accuracy, reliability and ease of access and data security.

### Economical feasibility

Finance matters can restrict to the level of development. However I’ll make sure that any needs will be fulfilled immediately. From the financial point of view the project is feasible. I guess there will not be any bigger monetary requirement for our project.

### Implementation feasibility

This project can easily be made available online without much consideration of the hardware and software. The only required thing at the applicant’s side is the internet connection and e web browser, which are not difficult issue these days. A database server and application server are required to set up at the admin side. After setting up the project online, even the administrator can access the system from anywhere.

## Requirement Validation

## Requirement validation examines the specification to ensure that all system requirements have been stated unambiguously; those inconsistencies, errors have been detected and corrected and the work products conform to the standard.

* Source of the requirements are identified. Final statements of requirement will be examined by original source.
* Requirements related to main requirements are found.
* Requirements are testable.
* Requirements are clearly stated and are not misinterpreted.
* All sources of requirements are covered to get maximum requirement.
* All methods of finding requirements are applied.
* Requirements are not duplicated and each one them gives distinct idea of processes within project.
* Requirement associated with system performance, behavioral and operational characteristics are clearly stated.
* Requirements are being discussed with the client in order to remove the misinterpretations if they exist.
* Each requirement is being analyzed to prove its feasibility for the current system.

## Use Case diagram

School

Admin

Student

Fig. Use case diagram of SMS

## Project Planning

Project planning is part of project management which relates to the use of schedules such as Gantt charts to plan and subsequently report progress within the project environment. Initially the project scope is defined and the appropriate methods for completing the project are determined.

Following this step the duration for the various tasks necessary for complete the wok are listed and grouped in a breakdown structure. The logical dependencies between tasks are defined using an activity diagram that enables identification of the activity. At this stage the project plan may be optimized to achieve appropriate balance between resources usage and project duration to comply with the project objectives. Once established and agreed, the plan becomes what is known as the baseline.

Project will be measured against the baseline throughout the life of the life project. Analyzing progress compared to the baseline is known as earned value management.

### Project Development Approach

I will use **Iterative and Incremental development model** (IID) for my project development. This development approach is also referred to as Iterative waterfall Development approach. Iterative and Incremental Development is a software development process developed in response to the more traditional waterfall model.

**Life Cycle**

**Requirement Analysis & Design**

**Planning Implementation**

**Initial planning Deployment**

**Evaluation Testing**

Fig. Iterative and Incremental life cycle

The basic idea behind iterative enhancement is to develop a software system incrementally, allowing the developer to take advantage of what was being learned during the development of earlier, incremental, deliverable versions of the system. Learning comes from both the development and use of the system, where possible. Key steps in the process will be to start with a simple implementation of the subset of the software requirement and iteratively enhance the evolving sequence of versions until the full system is implemented.

At each iteration, the [procedure itself consists of the initialization step, the iteration step and the project control list. The initialization step creates a base version of the system. The goal for this initial implementation is to create a product to which the user can react. It should offer a sampling of the key aspects of the problem and provide a solution that is simple enough to understand and implement easily.

During the implementation of the project by this approach, a step called V&V i.e. Verification and Validation is carried out at a certain intervals.

* Verification: “Are we building the product right?”
* Validation: “Are we building the right product?”

### Schedule Representation

Scheduling the project tasks is an important project planning activity. It involves deciding which tasks would be taken up when. In order to schedule the project activities, a software guide needs to do the following;

* Identify the entire task needed to complete the project.
* Break down large tasks into small activities.
* Determine the dependencies among different activities.
* Allocate resources to activities.
* Plan the starting and ending dates for various activities.
* Determine the critical path. A critical path is the chain of activities that determine the duration of the project.

#### Work Breakdown structure

SMS System

Requirement specification

Document

Test

Design

Code

Graphical user interface part

Graphical user

Database part

Database part

Figure 1 Work breakdown structure of SMS System

Code database part

Design database part

Design GUI part

Code GUI part

Integrate and Test

Specification

Write user manual

Finish

Figure 2 Activity Network representation of SMS system.

#### Timeline Chart/Gantt chart

As a consequence of this input, a **Timeline Chart** also called a **Gantt chart** is generated. A Gantt chart can be developed for the entire project as in my case my entire project duration is of size months. Thus developing a **Gantt Chart or Timeline Chart** for **online SCHOOL MANAGEMENT SYSTEM** of four months duration which is as shown below.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Task Name | Month 1 | | | | | Month 2 | | | | | Month 3 | | | | | Month 4 | | | | |
| 1 | System Analysis and problem Definition |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 | Hardware & Software requirements |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 | Requirement Gathering |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | System Design (UML diagram) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5 | System Design (GUI Design) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 | Coding |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 | Testing |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8 | Final documentation & presentation of project report |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Fig. Gantt Chart.

# Testing

## Testing Plan

Software testing is a critical element of software quality assurances and represents the ultimate review of specification, design and coding. It is an important phase. It involves user training, system testing and successful running of developed system. The user tests the developed system and changes are made according to the needs. Testing is a process of executing a program with the intent of finding an error. Testing demonstrates that software functions appear to be working according to specification that performance requirements appear to have been met. in addition, data collected testing is conducted provide a good indication of software reliability and some indication of software quality as a whole.

The testing of the system will be done with the intention of finding all the possible errors bugs in the developed program. In data-driven applications, like Online LIC Age­­­­­­­­­nt System Management, data accuracy is having more significance. We have to control it programmatically.

After clearance at this stage, the programs will be put up for approval in front of the system manager who will look at them from view point of user and suggested changes to the presentation.

The different levels of testing are as follows, it includes the four type of testing – Unit Testing, Integration Testing, Validation Testing and System Testing. The following test strategies will be used during the course of the testing cycle described above.

Unit Testing

Module Testing

Sub-system Testing

System Testing

Acceptance Testing

Testing Step

## Testing Strategy

There are types of testing that I will implement. They are as follows;

* While deciding on the focus of testing activities, study project priorities. For example, for an online system, I will pay more attention to response time. I will spend more time on the features used frequently.
* I’ll decide on the effort required for testing based on the usage of the system. If the system is to be used by a large number of users, I’ll evaluate the impact on users due to system failure before deciding on the effort.
* A necessary part of the test case is a definition of the expected result.
* I’ll write test cases for invalid and unexpected as well as valid nd expected input conditions.
* I’ll thoroughly inspect the result of each test.

### White Box

White box testing is a method of testing software that tests internal structures or workings of an application, as opposed to its functionality (i.e. black-box testing). In white box testing an internal perspective of the system, as well as programming skills, are used to design test cases. The tester chooses inputs to exercise paths through the code and determine the appropriate outputs.

While white-box testing can be applied at the unit, integration and system levels of the software testing process, it is usually done at the unit level. It can test paths within a unit, paths between units during integration, and between subsystems during a system-level test. Though this method of test design can uncover many errors or problems, it might not detect unimplemented parts of the specification or missing requirements.

White-box test design techniques include:

* Control flow testing
* Data flow testing
* Branch testing
* Path testing
* Statement coverage
* Decision coverage

### Black Box

Black-box testing is a method of software testing that examines the functionality of an application (e.g. what the software does) without peering into its internal structures or workings. This method of test can be applied to virtually every level of software testing; unit, integration, system and acceptance. It typically comprises most if not all higher level testing, but can also dominate unit testing as well.

Typical black-box test design techniques include:

* Decision table testing
* All-pairs testing
* State transition Analysis
* Equivalence partitioning
* Boundary value analysis
* Cause-effect graph
* Error guessing

### Unit Testing

Unit testing concentrates on each unit of the software as implemented in the source code. Initially tests focus on each module individually, ensuring that it functions properly as a unit. This method examines the code (logic) of the program. Special data is prepared which when processed makes use of all modules of the program, thereby testing them. The system analyst in charge of the project will be involved at this level of testing.

### Integration Testing

Integration testing (sometimes called integration and testing abbreviated I&T) is the phase in software testing in which individual software modules are combined and tested as group. It occurs after unit testing and before validation testing. Integration testing takes as its input modules that have been unit tested, groups them into larger aggregates, applies test defined in an integration test plan to those aggregates, and delivers as its output the integrated system ready for system testing.

### Validation Testing

Validations are independent procedures that are used together for checking that a product, service, or system meets requirements and specifications and that it fulfills its intended purpose. The words “verification” and “validation” are sometimes preceded with “Independent” (or IV & V), indicating that the verification and validation is to be performed by a disinterested third party.

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# Supervisor Approval

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