

**DESIGN AND IMPLEMENTATION OF A WEB-BASED STUDENT
INFORMATION MANAGEMENT SYSTEM (SIMS)**

**(A Case Study Of École Supérieure De Technologie Et De Gestion
University, Fidjrosse Agla Cotonou, Republic Of Benin)**

BY

OGODOGU BLESSING TOSIN

MATRIC NUMBER: ESTG/CSC/018/0057

**ÉCOLE SUPÉRIEURE DE TECHNOLOGIE ET DE GESTION (ESTG)
UNIVERSITY, FIDJROSSE AGLA COTONOU, REPUBLIC OF BENIN.**

JANUARY, 2022

**DESIGN AND IMPLEMENTATION OF A WEB-BASED STUDENT
INFORMATION MANAGEMENT SYSTEM (SIMS)**

(A Case Study Of Ecole Superieure De Technologie Et De Gestion

University, Fidjrosse Agla Cotonou, Republic Of Benin)

BY

OGODOGU BLESSING TOSIN

ESTG/CSC/018/0057

**A PROJECT WORK SUBMITTED TO THE FAULTY OF APPLIED
SCIENCE, DEPARTMENT OF COMPUTER SCIENCE, ECOLE
SUPERIEURE DE TECHNOLOGIE ET DE GESTION (ESTG)
UNIVERSITY, FIDJROSSE AGLA COTONOU, REPUBLIC OF BENIN.**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE
AWARD OF BACHELOR OF SCIENCE DEGREE (BSC) IN COMPUTER
SCIENCE.**

JANUARY, 2022

**CONCEPTION ET MISE EN ŒUVRE D'UN SYSTÈME WEB DE
GESTION DE L'INFORMATION DES ÉTUDIANTS (SIMS)**

(Étude de cas de l'Ecole Supérieure de Technologie et de Gestion

Université, Fidjrosse Agla Cotonou, République du Bénin)

PAR

OGODOGU BÉNÉDICTION TOSIN

ESTG/CSC/018/0057

**UN TRAVAIL DE PROJET SOUMIS AU FAULTY OF APPLIED SCIENCE,
DÉPARTEMENT D'INFORMATIQUE, ECOLE SUPÉRIEURE DE
TECHNOLOGIE ET DE GESTION (ESTG) UNIVERSITÉ, FIDJROSSE
AGLA COTONOU, RÉPUBLIQUE DU BÉNIN.**

**EN EXÉCUTION PARTIELLE DE L'EXIGENCE POUR L'ATTRIBUTION
D'UN BACCALAURÉAT ÈS SCIENCES (BSC) EN INFORMATIQUE.**

JANVIER 2022

DECLARATION

I, **BLESSING OGODOGU** hereby declared that this project **DESIGN AND IMPLEMENTATION OF A WEB-BASED STUDENT INFORMATION MANAGEMENT SYSTEM (SIMS) (A Case Study Of École Supérieure De Technologie Et De Gestion University, Fidjrosse Agla Cotonou, Republic Of Benin)** has been carried out by me under the supervision of Mr. O Philips Nick. It has not been presented for any degree in any institution. All sources of information are specially acknowledged by means of references.

CERTIFICATION

This is to certify that this project research work titled **DESIGN AND IMPLENTATION OF A WEB-BASED STUDENT INFORMATION MANAGEMENT SYSTEM (SIMS) (a case study of école superieure de technologie et de gestion University, Fidjrosse Agla Cotonou, Republic of Benin)** by **OGODOGU BLESSING TOSIN** has been read, recommended and approved in its present form as meeting the partial fulfillment of the requirement for the degree of Bachelor of Science in Computer Science faulty of Applied Science.

Egnr. O. Philips Nick
(Supervisor)

Date

Egnr. O. Philips Nick
(Head Of Department)

Date

DEDICATION

With absolute and sincere gratification, it is worthy to dedicate this work to God Almighty. All Glory, Honor and Majesty belong to Him.

ACKNOWLEDGEMENT

First and foremost, I am distinctively so grateful to the Almighty God for being with me all the time, and in particular for His grace, favour, love, care and protection throughout my entire study at ESTG University and for bringing me this far. I consequently owe all my achievements to Him.

I am forever grateful and appreciative to my parents Mr. and Mrs. Ogodogu who instilled in me the spirit of valuing education as a precious investment. Thank you so much for your prayers. Thanks to my brothers (Mayowa and Tolu). I really appreciate so much for your prayers, support and encouragement throughout my study. Special thanks to Routehunt company for their investment in me and also, special thanks to my colleagues and friends.

I am also grateful to my supervisor Engr. Philips Nick for his advices, contribution and guidance from the first draft of the proposal and throughout the whole process of coming up with this dissertation. My exceptional and profound gratitude goes to Mrs.Ologbenla Taiwo and to the Owoeye's family who has been supportive and influential throughout my entire work. Thank you so much for your unflinching support, and financial support you jointly offered for the course.

Big thanks to the Registrar of ESTG University Dr. Ayodele Igbalaiye Wasiu for his great support throughout my stay in the university. To the Dean of ESTG University Dr Amusan Segun, thank you sir for the opportunity. And to all my course lecturers, thank you all for the immeasurable knowledge which I have acquired from you all.

TABLE OF CONTENT

DECLARATION

CERTIFICATION

DEDICATION

ACKNOWLEDGEMENT

TABLE OF CONTENT

ABSTRACT

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND OF STUDY

1.2 STATEMENT OF THE PROBLEM

1.3 OBJECTIVE OF THE STUDY

1.4 SIGNIFICANCE OF THE STUDY

1.5 RESEARCH QUESTION

1.6 SCOPE OF STUDY

1.7 PROJECT SCOPE

1.8 LIMITATION

1.9 DEFINITION OF TERMS

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

2.2 REVIEW OF RELATED LITERATURE

2.3 LOCAL NETWORK AND THE INTERNET

2.4 STUDENT INFORMATION MANGEMENT SYSTEM

2.5 ARCHITECTURAL DESIGN

2.6 INTERFACES

2.7 ARCHITECTURAL STYLE/ PATTERN

2.8 OVERALL DESCRIPTION

2.9 USER CLASSES AND CHARCTERISTICS

2.10 OPERATING ENVIRONMENT

2.11 CONSTRAINTS

CHAPTER THREE

3.0 RESEARCH METRHODOLOGY, SYSTEM ANALYSIS AND SYSTEM DESIGN

3.1 INTRODUCTION

3.2 SYSTEM ANALYSIS

3.3 METHOD OF DATA COLLECTION

3.4 METHODOLOGY

3.5 PROPOSAL OF NEW SYSTEM

3.6 SYSTEM DESIGN

3.7 TOOLS FOR SYSTEM NLYSIS AND DESIGN

3.8 INPUT AND OUTPUT DESIGN

CHAPTER FOUR

4.0 IMPLEMENTATION AND TESTING

4.1 INTRODUCTION

4.3 TESTING

4.4 RESULT

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 SUMMARY

5.2 CONCLUSION

5.3 RECOMMENDATION

REFERENCE

ABSTRACT

The problem that gave rise to Design And Implementation Of A Web-Based Student Information Management System was from the continuous use of manual or less standard methods of dispensing and managing students' information in the university. The purpose of this research is to implement and maintain a Student Information Management System for École Supérieure de Technologie et de Gestion University to be functional, reliable, usable, efficient, maintainable and more secured student information management system. With the objectives of evaluating the performance of the developed system information system during enrolment procedures and keeping the records of students in terms of: the personal information, requirements submitted, class schedules and subjects, and the overall performance of a student. The implementation system was modeled using Unified Modeling Language (UML) diagrams such as Use Case diagrams, Sequence diagram and Activity diagrams. The system was developed using HTML, CSS, BOOTSTRAP, PHP and MYSQL. With the web-based student information management system, the performance of the developed system is superior, efficient and effective. And also, there is a level of security and integrity on the system.

RÉSUMÉ

Le problème qui a donné lieu à la conception et à la mise en œuvre d'un système web de gestion de l'information des étudiants provenait de l'utilisation continue de méthodes manuelles ou moins standard de distribution et de gestion de l'information des étudiants à l'université. Le but de cette recherche est de mettre en œuvre et de maintenir un système de gestion de l'information des étudiants pour l'École Supérieure de Technologie et de Gestion De l'Université afin qu'il soit fonctionnel, fiable, utilisable, efficace, maintenable et plus sécurisé système de gestion de l'information des étudiants. Dans le but d'évaluer le rendement du système d'information développé pendant les procédures d'inscription et de tenir les dossiers des étudiants en ce qui concerne : les renseignements personnels, les exigences soumises, les horaires et les sujets de classe et le rendement global d'un élève. Le système d'implémentation a été modélisé à l'aide de diagrammes UML (Unified Modeling Language) tels que des diagrammes de cas d'utilisation, des diagrammes de séquence et des diagrammes d'activité. Le système a été développé en utilisant HTML, CSS, BOOTSTRAP, PHP et MYSQL. Avec le système web de gestion de l'information des étudiants, la performance du système développé est supérieure, efficiente et efficace. Et aussi, il y a un niveau de sécurité et d'intégrité sur le système

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

There is an outgrowing need for electronic accessories in a world where there is great necessity speed efficiency and perfection of work. Information factor of efficiency access to electronic devices and relevant information is usually considered in the setting up of a relational database. Intranet that is a private network set up by an organization or company that reassemble the www (World Wide Web) but which is not accessible by external users.

Now, the internet represents one of the most successful examples of the benefits of sustained investment and commitment to research and development of information infrastructure. Starting with the early stage of research in packet switching, the government, industry and academic have been partner in evolving and developing the existing new technology, terms like “<http://www.google.com>, www.estg.edu.ng” trip off the wings of the random person on the street. Thus, this project is a conceivable effort to ameliorate the pressing need for more system-centric environment. We use has become more strong in use and so developing web application is a promising way of reaching great audience.

The primary goal of an Information Management System is to provide leverage to the organization strategy whereby it positively impacts its administrative, operational and the competitive roles (Henderson and Venkatraman, 1999; Morgan, 2002; Premkumar et al., 1992). The student database is an integral part of the University’s IS and strategy. A robust student database successfully fulfills the various demands of allied computer based IS system and caters

to the interwoven information system requirements of the University. Therefore, an IS has become an integral part of all business model. It is indispensable aspect of the organization to overcome competition from the various forces in the market and to synergize the competitive advantage of the business to a higher level. The modern IS application have played a significant role in organizational transformation (Henderson and Venkatraman, 1999; Luftman and Brier, 1999; Prahalad et al, 2002) simultaneously, provide feedback to the management to enhance the IS capabilities thereby sustain its competitive advantage.

With the proposed design, registrar, students and any authorized person can get all the available information from the university internet integrated database. Furthermore, to brighten or bring out efficient and effective administration of academic information system like students results, students personal information, syllabus, register course etc.

1.2 STATEMENT OF THE PROBLEM

The problem that gave rise to this study system was from the continuous use of manual or less standard methods of dispensing students' information in the university. The core is the information system. As the adage says "if you are not informed, you are deformed and he who is deformed cannot perform". It will not be an exaggerated statement if I say students are deformed because they are not well- informed due to inadequate information acquisition facilities. It can be seen that information is not only important in this stage but also the method of accessibility.

According to Powell (2005), "Lack of information breeds analysis paralysis". Without adequate information on any subject matter, it would be difficult to handle. To eradicate this to its opinion, a robust information system should be implemented where the information can be shared easily among the students and also being kept so that it can be retrieved at anytime by anybody who is

in need of it. Again, it makes the information remain authentic without adding or removing anything.

The problems of the study are;

1. The problem of being deformed in the society.
2. The problem of keeping untidy records.
3. To determine ways which information can process a large volume of data such as academic tedious and details and repetitive denial work done with manual method in some information.
4. Method of accessibility.
5. The problem of managing information thereby accessing it to make something out of it.

1.3 OBJECTIVE OF THE STUDY

The general objective of the proposed study is to implement and maintain a Student Information Management System for École Supérieure de Technologie et de Gestion University to be functional, reliable, usable, efficient, maintainable and more secured student information management system. The system would be able to help the acting Registrar reduce his tasks especially on the delivery of enrolment procedures and the keeping of student's records. Thus, eliminate the problems of the current manual system.

SPECIFIC OBJECTIVES

1. To identify and know the characteristics of the existing student's information system as assessed by the respondents along the following characteristics of software in terms of: reusability, maintainability, security, usefulness and evaluation on the system appeal.

2. To develop the system and procedure for the university that ensures end-users are provided with equisetic tools and data that are not cost effective and are easily accessible.
3. To describe the tools required to design and implement a functional information system for the institution using HTML communication.
4. To identify the characteristics of the developed student information system as access by the respondent along the following characteristics of the system.
5. To evaluate the performance of the developed system information system during enrolment procedures and keeping the records of students in terms of: the personal information, requirements submitted, class schedules and subjects, and the overall performance of a student.

1.4 SIGNIFICANCE OF THE STUDY

The study will go long way to cutting down on time wastage, inefficient use of statistical data, manual errors and duplication of efforts by both admin and students. It will also enhance efficient query and inquiring; ensure security of records and assist the university with daily work based.

Designing an information system for an educational institution entails more of data collection than traditional programming. Nevertheless, the outcomes and benefits of well planned software cannot be emphasized. Although many factors contribute to effective software, yet there are so many that one could not but to think of them all. The internet with all its functionality has indeed changed the way people live and interact politically, socially, economically and otherwise the internet combines audio, video and texture contents while eliminating time and space of traditional media.

This has enable information system an interactive media when integrated with database making it a cost effective one on educational tool. To this end, the researcher suggest the following recommendations

1. Implementing an information management system for ESTG university Benin Republic not only enhance management communication but also accomplished effective resources utilization in terms of information sharing and decision making. The proposal is 70% achievable considering the already existing equipment which only required little manpower.
2. Undoubtedly, a well incorporated information system for ESTG University, Benin Republic would improve the customer support by saving money and time while expanding on its educational distribution.

1.5 RESEARCH QUESTION

1. What are the characteristics of the existing student information are, as assessed by the respondents along the following characteristics of the software: reusability, maintainability, security, usefulness and functionality and evaluation of the system appeal?
2. What are the tools required to design and implement a functional information system for the institution through HTML communication?
3. What is the system and procedure for the university to ensure that end-users are provided with equisetive tools, and data that are cost effective and easily accessible?
4. What the characteristics of the developed student information system are, as assess by the respondents along the following quality characteristics of the system?
5. What is the performance of the developed student information system during enrolment procedures and keeping the records of students in terms of: the personal information,

requirements submitted, class schedule and courses, and the overall performance of a student?

1.6 SCOPE OF THE STUDY

This study is limited to students in École Supérieure Technologie et de Gestion (ESTG) University in Fidjrosse Agla Cotonou, Republic Of Benin. The proposed study is carried out to access the design and implementation of student information management system (a case study of école supérieure de technologie et de gestion university, fidjrosse agla cotonou, republic of benin). And to end this, the study will focus on the student together with its accompanying system interface, students' registration details and academic results. In its most common forms, the wide application of computers in accessing remote files make way for adoption of more superior days of making information available to users.

1.7 PROJECT SCOPE

The aim of the project is to create a student information system. There will be at least two levels of users. Administrators will be able to add student details i.e their personal details, academic issues and course information. Students, on the other hand, will be able to view their own records as well as changing them.

1.8 LIMITATION OF THE STUDY

Data notwithstanding of its size cannot be too large to process. However, a guided approaches to say within limits or easy comprehension. This also exposes the researcher to the core about the difficulties of database programming for the system, as all-round technology but because of the following constraints, the study may not be completed. They include;

- Time constraints
- The university does not have enough necessary software and extended network of computer.
- It lacked the projected operational hardware.

1.9 DEFINITION OF TERMS

SIMS: Student Information Management System.

Algorithm Design: Specific method to create a mathematical process in solving problems

Architectural Design: Establishing the overall structure of software system.

AS: Applied Science.

Database: A collection of stored related data.

ER diagram: Entity Relationship Diagram; Data model for describing a data base in an abstract way.

ICT: Information & Communication Technology.

SDS: System Design Specification.

Sequence Diagram: An interaction diagram that shows how a process interacts with one another and in what order.

SRS: Software Requirements Specification.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

Student Information Management System (SIMS) is a type of Information Systems (IS) and it is also known as Student Management Systems, School Administration Software and Student Administration Systems. SIMS have lots of functions such as providing record management of past, present and future students covering aspects of enquiry, application, enrolment, academic performance and history, allowing for billing and fees management, processing important events such as graduations and examinations, programming classes, reporting operational and management issues and feeding data into numerous other specialist systems.

Student information system should be able to provide users with sufficient information and fast query tool. But there has been the way people use the traditional manual management of paper files, this management approach, there are many shortcomings, such as: low efficiency, poor security, the other over time, will produce a large number of files and data, which find, update and maintain have brought a lot of difficulties. Therefore, the students of computer information processing, networking, school management is to achieve modernization and an important part of information technology.

2.2 REVIEW OF RELATED LITERATURE

2.2.1 DATA AND INFORMATION

Ugorji (2006), Dimoji (2005) and Okafor (2009) are at the view that data and information are terms people use interchangeably in everyday speech, but they mean different thing. Data are facts such as a Name, a Number etc while the term information is simply a processed data, that is when data is converted into a more useful or intelligent form.

According to Engr. P. D Joseph (2006) said that there was a time in the primitive and barbarian days before computer, the amount of information shepherded by a group of people could be collected in the wisdom and the stories of its older members. In this world of story tellers, magicians and grandparents were considered a great and honoured storehouse for all that was known.

It gets to a stage when the data are too much to be managed in the minds of the elders. And so in order to store all the new information, humanity invented the technology of writing and then great scholars like Aristotle warned that the invention of the alphabet would lead to the subtle but total demise of the creativity and sensibility of humanity, data began to be stored in voluminous data repositories called books. As we know, eventually books capsulated with great speed and soon whole communities of books migrated to the first real “database” libraries, standard by which data could be stored and retrieved. After all, without standard for accessing data, libraries will be like closet, endless and engulfing swam of chaos, books and the data within books, had to be quickly accessible by anyone , if they were to be useful.

According to Brenden (2005), the usefulness of a library or any base of data is proportional to its data storage and retrieval efficiency. This one corollary would drive the evolution of database over the next 2000 years to its current state. Thus, early libraries defined standardized filing and retrieval protocols, perhaps, if you could visit the college library, you will see its cute little indexing system (card catalog) and pointers (dewy decimal system) and more complex that simple library grew and grew along with associated storage /retrieval technologies such as the filing cabinet, colored tabs and three ring binders. The computer was born almost instantly and was applied to the age old problem of information storage and retrieval.

The first attempt at information storage and retrieval followed traditional lives and metaphors. The first systems were based on discrete files in a virtual library. In this file oriented system, a bunch of files would be stored on a computer and could be accessed by a computer operator. Files of achieved data were called table because they looked like record and column in the data. The archival data were called tables because they look like tables used in traditional file keeping, rows in the table were called "Record and columns were called "Field".

Adopted from Nwosu and Dimoji (2005) says that "flat" system was a start and however was seriously in-efficient essential, in order to find a record. Now, a record can be defined as a collection of related fields.

Fields- is a group of collected characters and

Data – can be defined as any number, letter or symbols which are fed into the computer as raw material for processing.

Meanwhile Dimoji (2006) "Introduction to Cobol Programming" says that data can be seen in the aspect of every business in spite of the size and purpose is concerned with processing facts or data about its operations in order to provide current and accurate information to management.

Decisions in college are based on data such as students result, inventory level and other quantities factors. Data are also facts, events, transactions, and so on. It is only after these data have been examined; compared, classified and summarized do they become useable information. Someone would have to read through the entire file and hope it was not the last record, with a hundred thousand records you can imagine the dilemma. What was needed are computer scientists and according to Dimoji and Okafor (2005) defined computer as an "electronic device

which accepts data as “input”, store them as “storage”, process them as “processor” decoding to precise or logical instruction as “program” to produce a fast and accurate result “information” as the output.

2.3 LOCAL NETWORK AND THE INTERNET

As Nigerian born scientist Engr. Philip Emeagwali (1999) put it that the internet is the greatest of all networks, the network of several networks (usually local networks) in its pool. The internet was not invented in 1993 by a single individual as it widely believed. The internet is product of a succession of invention that occurred in the 1970's and 1980's.

The dream behind the web is of a common information space in which we communicate by sharing information its universality is essential. The fact that a hypertext link can point to anything, be it personal, local or global, be it draft or highly polished. there was second part of the dream too dependent on the web being, so generally used i.e. because a realistic mirror (a fact of the primary embodiment) of the works in which we work, play card and socialize that was once the state of our interactions was online, we could then use computer to help us analyze it, make sense of what we are doing, here we individually fit in how we will better work together.

With the dramatic flood of rich material of all kinds onto them in which 1990's, the first part of the dream is large realized, although still very few people in practice have access to initiative hypertext creation tools. The second part has yet to happen, but there are signs and plans which makes us confident, sort, pay for, own information is during the design of languages for the web design for processing by machines rather than people. The web of human readable document is being merged with a web of machine understandable data. The potential of the mixture of human and machines working together and communication through the web could immense.

According to Owo Abidemmi .E (2002): “there has been lot of improvement on the web programming concepts. We had the top-down and bottom-up, the procedural and structures. The object oriented and event driven programming methods of software application and information generator to meet the user requirements.

Ndukwe and Chike (2005), says that internet is a system of computer network, connected to one another from different parts of the world, forming a very large network, hence it is a global connection of networks both big and small.

Okafor and Dimoji (2009), says “internet which is an example of national information highway, is a huge computer network available to nearly everyone who has a computer and all the accessories to connect it. Internet is a network connecting thousands of other network and computers. You can use internet to transfer electronic mail, public discussion, copying files (upload and download) and even run programs on a computer in a remote place.

Ndukwe and Chike(2006) says that a web is a series of interconnected servers that support specially formatted documents. It contains a server which is a program that responds to request from other programs and delivers the requested documents.

A major initial motivation for both the early network ARPNET and internet was resource connecting the two together was far more economical than duplicating these very expensive computers. However, while file and database transfer and remote login (Telnet) were very important applications, electronic mail has probably had the most significant impact of the innovations. From that era, e-mail provided a new model of how people could communicate with each other and change the nature of collaboration. The internet is generally to promote a product

or service or actually sell a product or service over the network, be it local or global (Bob, BLM 1996). Thus, attracting and keeping a target audience is an important aspect of web programming.

2.4 STUDENT INFORMATION MANAGEMENT SYSTEMS

As PCs and the Internet have become a ubiquitous part of school districts, the education community's desire for anytime, anywhere access to data has burgeoned. Can vendors keep up with districts' changing needs?

Today's schools can purchase and implement administrative systems that provide easy and secure access to student records, enrollment, scheduling, and attendance; eliminate the need for duplicate data; easily integrate with other applications; and offer an array of online features for students and parents. However, this level of sophistication did not occur overnight.

2.4.1 REVIEWS

According to Swartz(2013), SIS process is typically completed into students school career and encapsulates each of the facets of knowledge built up and literacy value, including learning what type of SIS is available, finding and accessing system sequence, evaluating tools for the information and then synthesizing the student information system into certain and product for a better career patterns as it seemed like the ideal project to focus SIS and relate it to ample literacy instruction around. While the students had all performed database searches before, they were less likely to have taken advantage of the search management tools available to them through educational database, how to set up automatic searches to help streamline the research process.

Pacio (2013) on her thesis entitled "Online Student Information System of Benguet State University" gave emphasis that as main goal of the school to generate and disseminate new

knowledge and technologies that will promote sustainable resource development and enrich the competent and effective services geared towards efficiency and economy. It was also emphasized that information about students is vital, but time-consuming to manage and it is essential that the most effective tools be used to aid both staff and students go about their work and studies.

According to Perret (2012), the integration of SIS in the U.S.A. setting with resources to higher education systems determining that certain group of students can acquire and gain effective knowledge literacy skills through the SIS process and understanding the value of education service crafted to provide best teachings as possible.

2.4.2 IN THE BEGINNING

Computerized administrative systems began as huge mainframes operated by programmers with highly specialized knowledge during the mid-1970s. Since school districts could not afford these massive resources, they had to rely on regional service agencies to develop and time-share those administrative systems. By the mid-'80s, the arrival of minicomputers, which had the computing capacity of a mainframe but without the mainframe's need for specialized environments and programming, gave districts a degree of autonomy.

However, although districts were busy creating internal IT staff and collecting data, neither school sites nor classrooms were impacted by this technological change. "Flexibility" and "ease of use" were not watchwords in the field of student information systems until recently. Furthermore, even though several vendors were offering student information systems, they were proprietary solutions that only worked on particular mini-computers. In short, districts were

stuck with all-or-nothing solutions. At that point, personal computer base solutions were been explored.

The introduction of PCs provided the possibility for educators to quickly and easily access, input, and modify student information, particularly with the convenience of drag-and-drop technology. At first, PCs were used primarily for instruction, but by 1996-1997, districts had added 500,000 computers for administrative use. However, users of DOS and Macintosh computers still had to resign themselves to proprietary solutions until the introduction of cross-platform administrative systems.

2.4.3 ADJUSTING TO CURRENT DEMANDS

As the Internet became more pervasive in school districts, the easy accessibility and flexibility of browser-based information systems made them the major players in the field. The trend was bolstered by E-Rate, which was created by Congress under the Telecommunications Act of 1996 to fund schools' plans to be wired for Internet connectivity. The E-Rate program was so successful that most schools did not have enough applications to use on their new systems and began looking for ways to improve on what they had.

In addition, next-generation student information systems are Web-based and have an internal message center with access to outside e-mail. Of course, legislative requirements are not the only forces behind the development of student information systems. It is believe that in order to properly meet current demands and prepare for future trends, developers of student information systems should include customer outreach in their processes, as well.

2.4.4 PRESENT AND FUTURE TRENDS

NCLB has also changed the core functionality of the student information system, because educators are now required to track students' mastery of state standards. In fact, more and more schools are using mastery of standards instead of regular grading to mark student progress— a trend that is a vital part of the future of student information systems.

Another important trend that we see is interoperability. Student information systems now need to take information from different sources such as the media center, special education, or Head Start. And as for the immediate future, we believe that student information systems should continue to expand their capabilities, becoming systems that can incorporate both student information and performance management. While many districts are still purchasing both student information systems and data analysis as separate modules, accountability requirements and the push for data-driven decision making require that the school information system not only serve as the core for all data gathering and analysis, but it also must be customizable and easily integrated so that it can change as districts' needs change. That is the next step in the evolutionary process.

2.5 ARCHITECTURAL DESIGN

2.5.1 HIGH LEVEL COMPONENTS AND INTERFACES

2.5.2 COMPONENTS

❖ Student component

This is one of the key components of the Student Registration System. This is where the student subject selection option is implemented. This also includes the result preview, semester preview and profile functions.

❖ Authentication and user management component

This is the major sub system that is responsible for the security of the Student Registration system. It authenticates users and also handles the user management activities such as creating new user accounts, removing accounts from the system etc. Furthermore this component implements the “control access privilege matrix”.

❖ Courses component

This is the key component that implements the functions related to the course operations of administrator such as adding a new course, editing credits of an existing course and removing courses etc. Courses component is also responsible for displaying the available courses list for every semester.

❖ Publish component

Publish component is the component responsible for publishing notices created by the administrator and also the time tables. This component has the ability to publish multiple notices and time tables at the same time.

❖ Public component

This is a relatively small sub-system compared to the other components of the Student Registration System. This is the component which is responsible for the guest viewer (public) to view student results.

2.6 INTERFACES

Student component

Student Select Courses: This interface will provide the available subject list for the semester. This allows the student to choose the courses, hence a busy interface. This interface is the bridge between the student component and the course component.

Student Profile: This interface is used for the student to view and edit personnel information.

Authentication and user management component

Authenticate User: This is the interface that allows the users to login to the system. This will guide the user to the relevant home page.

Courses component

New Course: This interface is where administrator adds new courses to the courses offered. The courses and student components are connected.

Edit Subject: In this interface the administrator edit existing courses. The Courses and student components are connected.

Publish component

Get notice: This is the interface where the notifications are published. It is connected with the subject component

Get timetable: This is the interface where the time table is published. This is connected with the subject component.

Public component

View Results: This is the interface which shows the results of a student to a Guest user, therefore connected with the Student component.

2.7 ARCHITECTURAL STYLES / PATTERNS

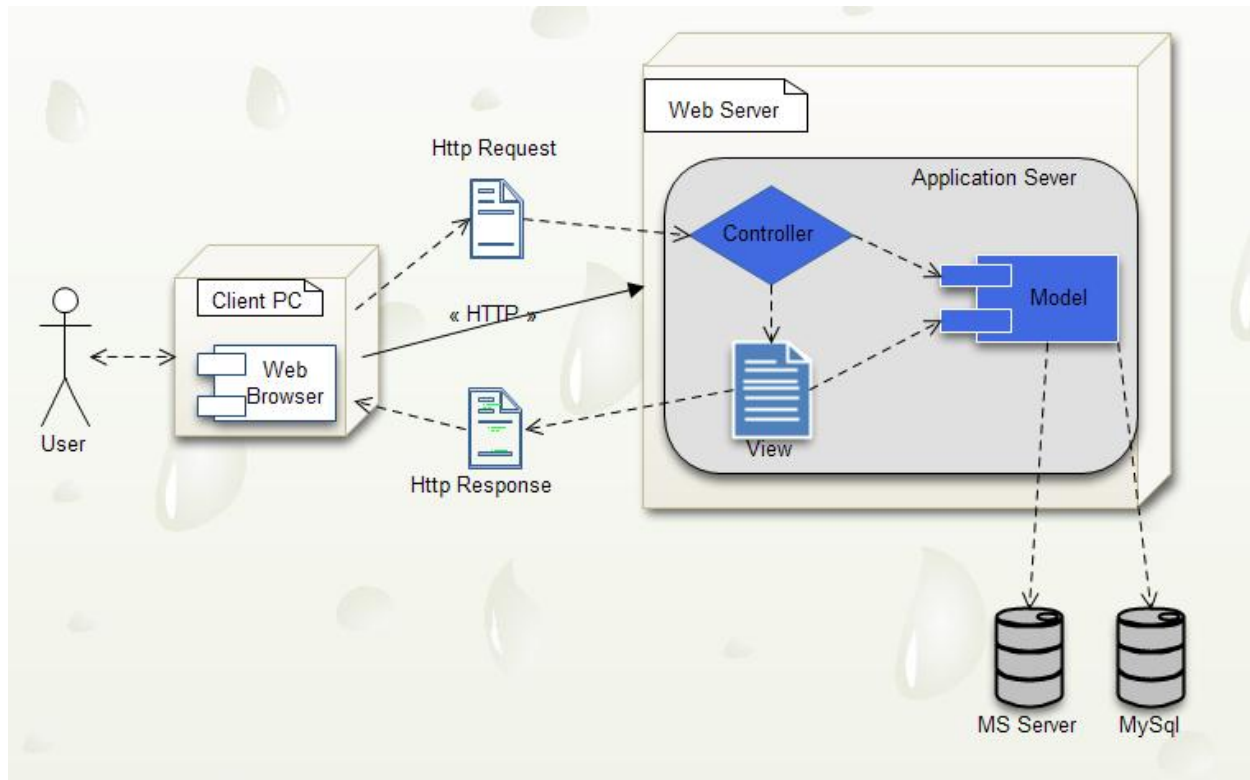
The Student Registration System will be developed under two main architectural styles/ patterns. Development of the project will be done in MVC architectural style and also 3 tier Client/Server Architecture. Client can browse the internet and access the Student Registration System provided within the local area network of the University.

2.7.1 MVC Architecture Style (Model – View – Controller)

MVC Style separates presentation and interaction from the system data. The system is structured into three logical components that interact with each other.

- ❖ The Model component -Manages the system data and associated operations on that data.
- ❖ The View component- Defines and manages how the data is presented to the user.
- ❖ The Controller component- Manages user interaction and passes these interactions to the View and the Model. .

We will use this MVC Style for the Student Registration System because, there are multiple ways to view and interact with data. Also used when the future requirements for interaction and presentation of data are unknown. In some software systems the code between the process logic and interface are mixed. This will reduce the modularity of application and make the system more difficult to maintain. To avoid this problem we have decided to use MVC architectural style to separate the application logic with the interface. The main advantage of this is style allows the data to change independently of its representation and vice versa. Support presentation of the same data in different ways with changes made in one representation shown all of them.



Arrangement of devices and servers

Our University Student Management System needs some specific set of servers and devices.

Such as:

- ❖ Server to host web applications and web services applications.
- ❖ Database server to store and manage data.
- ❖ Computers to access the website.
- ❖ Modem/ router/ switch/ hub/ Wi-Fi network/ cable network etc... and also need an Internet Service Provider to have the internet connectivity.

2.8 OVERALL DESCRIPTION

2.8.1 PRODUCT PERSPECTIVE

The website Student Information Management System is aimed towards recording a considerable number of student records and needs online assistance for managing records of students. Website should be user-friendly, 'quick to learn' and reliable website for the above purpose.

Student Information System is intended to be a stand-alone product and should not depend on the availability of other website. The system will also have an administrator who has full-fledged rights with regards to performing all actions related to control and management of the website.

2.8.2 PRODUCT FUNCTIONS

There are two different users who will be using this product

Administrator, who can view and edit the details of any students.

Students, who can view their details as well as, they can edit their details.

The features that are available to the Administrator are:

An Administrator can login into the system and perform any of the available operations.

- Can enable/disable student.
- Can add & remove front page notifications.
- Can add & remove the faculty as well as student.
- Can edit student information to the database. Can make search for a specific student.
- Add & Update Academic calendar.
- Allocate the subjects to the faculty.
- Can access all the details of the student.

The features that are available to the Students are:

- Can view their profile.
- View their attendance in individual subjects.
- View their test or exam marks.
- Update their basic contact details.
- Send or view the message to the classmates.
- View the departmental notification which they are belongs to.
- Submit Leave application or other application.

2.8.3 Database Management System

Strictly speaking, database management system (DBMS) is one kind of system products and the core part of database system, which carries on the unified management to the database resources, and is responsible for all request orders the users send out. It can do the scientific organization data, the perfect data storage, the highly effective data capture, convenient data maintenance. According to the data relation, the database can be divided into the hierarchical model, the network model, the relational model and object-oriented model. Correspondingly the database management system is divided into the hierarchical database management system, the network database management system, the relational relations database management system and object-oriented database management. The completely object-oriented database management system is not mature at present yet, therefore the relational database management system is widely used currently. The advantage of relational database management system is its structure simple, the form unique, the rationale strict, moreover the data sheets relatively independent in which it could carry on the increase, the revision or the deletion of the data without affecting the other data sheets. When carrying on the inquiry, it also can inquire the extraction related information from several data sheets according to the relation of the data sheets.

2.9 USER CLASSES AND CHARACTERISTICS

There is just one main user; the student.

2.10 OPERATING ENVIRONMENT

The product can run on any browser (preferable to use Chrome browser).

2.11 CONSTRAINTS

Every user must be comfortable using computer.

All operations are in English so user must have basic knowledge of English.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY, SYSTEM ANALYSIS AND SYSTEM DESIGN

3.1 INTRODUCTION

Therefore, research is considered as the process of arriving at a dependable solution to a given problem through the systematic collection, analysis and interpretation of data. This section discusses the methodology used in designing and developing the proposed system. It also explains the data gathering procedures, the different techniques and different sources of data.

3.2 SYSTEM ANALYSIS

The existing system operational dedicated from the investigation made, shown that the École supérieure de technologie et de gestion (ESTG) uses manual course registration and as well as computerized automated process method form with high level database system which tends to be slow and inconsistent. Many hours are spent on grapping student result computing and storage of result data which leads to late release of results. In the existing system, the manual approach conventional database system hampers fast decision making due to slow manual nature of processing of data, retrieval of data and overall control of data. The system is cumbersome and cost of labor at high rate, thereby affecting the measure resource of the institution.

The system analysis entails the proper analysis of the existing system into actually developing a modern and technological pattern to replace the old procedures.

3.3 METHOD OF DATA COLLECTION

There were numbers of approaches to data collection in this research conducted. In this project work, the methods adopted include the following: Interview, World Wide Web, references to

published and unpublished collection. The data collected for this research can be broadly classified into two types, namely: the primary and secondary data.

3.3.1 PRIMARY DATA

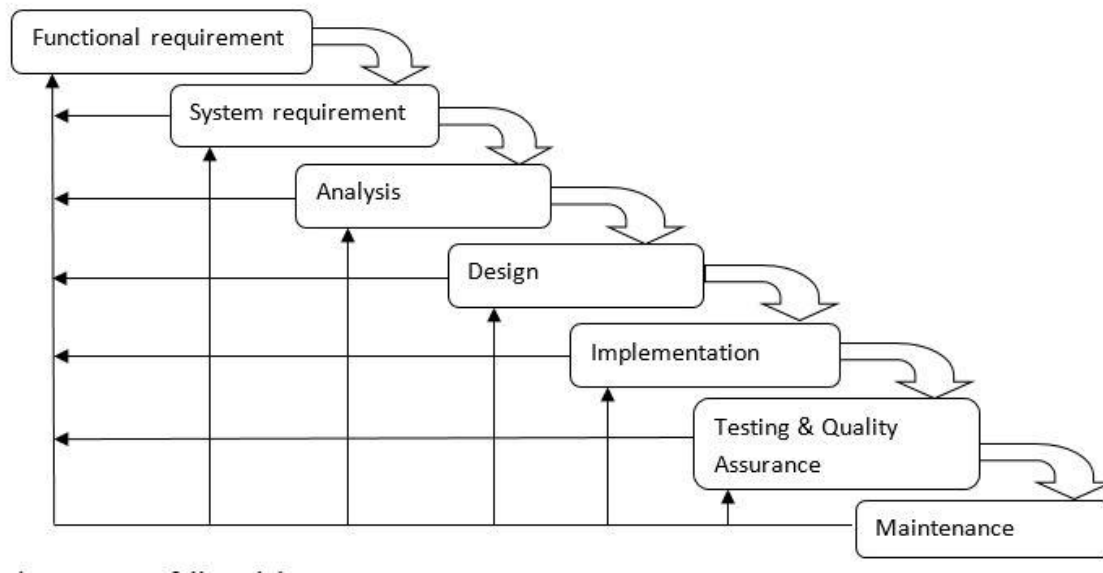
Primary data can be defined as data collected directly from respondent relevant to the subject under investigation. The primary data used in this case is interview method according to Engr. D. O Dimoji (2009) which says that primary source data collection is sourced from first hand information obtained. The tools for gathering the primary source of data collection include interview and observations.

3.3.2 SECONDARY DATA

These are source of data collection in which an already made data are been obtained i.e. those information that is already in printed form. Sources of secondary data include, textbooks, magazines, journals etc in the case of this project, most of the data are published online, documents and references.

3.4 METHODOLOGY

System analysis and design methodology was adopted to design the new system, the waterfall model of the software development process was used. The pure waterfall lifecycle consists of several non-overlapping stages as shown below. The model begins with initiation phase, followed by concept development, creating the plan, establishing system and software requirements and continues with the detailed design, development, testing, implementation, maintenance and disposition.



3.5 PROPOSAL OF A NEW SYSTEM

With the proposal design, admin, students and any authorized persons can get all the available information from the university's integrated database. They can get their syllabus, academic calendars and results, registered courses and whatsoever partaken with the school system.

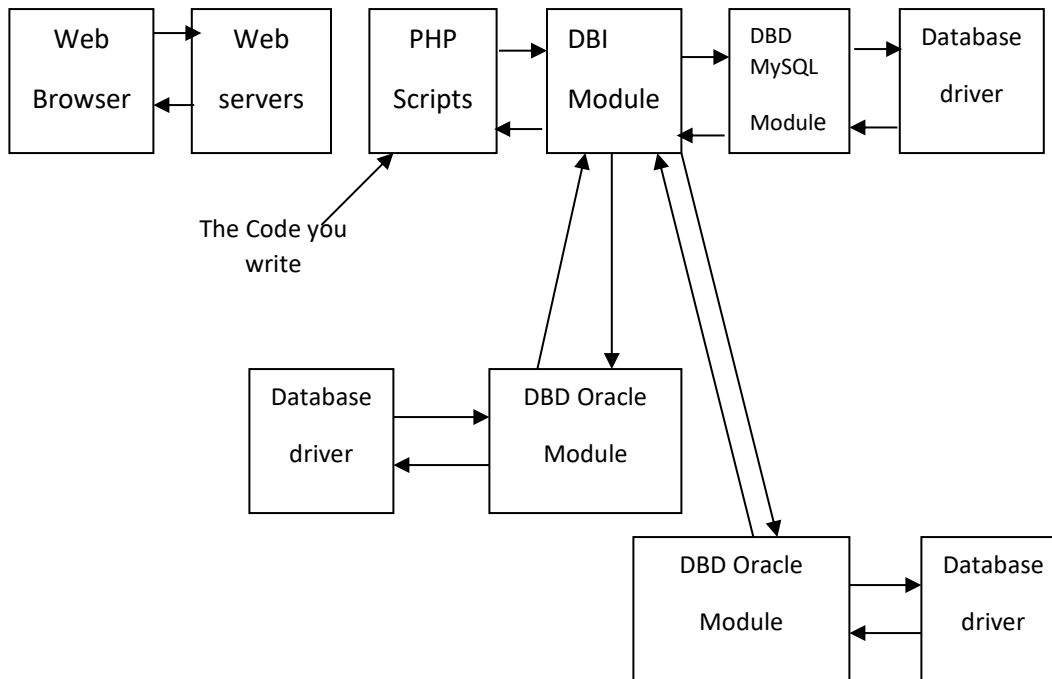
3.6 SYSTEM DESIGN

This phase deals with detailed flow graph, requirement analysis, and the design process of the front and backend of the system. The design will also focus on the objectives, model, constrains, actual programming and installation. In addition, routine testing and report documentation would be determined.

3.6.1 SYSTEM FLOW CHAT

Invariably, this serves as a storage facility. The core of the database structure and it also defines the various files that house the new system and how data will flow within this system. Basically,

the HTML and related SQL forms and tables based configuration is adopted. This will also incorporate customized PHP script for an efficient menu driven and data processing form.



3.6.2 SOFTWARE DEVELOPMENT TOOL

The technology selected for implementing Student Information Management System is PHP/MYSQL.Apache is used as the HTTP server.The development was done in a ‘windows’ environment.

PHP

PHP is a general-purpose scripting language that is especially suited to server-side web development where PHP generally runs on a web server. PHP code is embedded into the HTML source document. Any PHP code in a requested file is executed by the PHP runtime, usually to create dynamic web page content. It can also be used for command-line scripting and client-side

GUI applications. PHP can be deployed on many web servers and operating systems, and can be used with many relational database management systems (RDBMS).

MySQL

MySQL is a relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases. MySQL is a popular choice of database for use in web applications and is an open source product. The process of setting up a MySQL database varies from host to host, however we will end up with a database name, a user name and a password. Before using our database, we must create a table. A table is a section of the database for storing related information. In a table we will set up the different fields which will be used in that table.

APACHE

The Apache HTTP Server is a web server software notable for playing a key role in the initial growth of the World Wide Web. In 2009 it became the first web server software to surpass the 100 million web site milestone. Apache is developed and maintained by an open community of developers under the auspices of the Apache Software Foundation. Since April 1996 and has been the most popular HTTP server software in use.

XAMPP

XAMPP is a small and light Apache distribution containing the most common web development technologies in a single package. Its contents, small size, and portability make it the ideal tool for students developing and testing applications in PHP and MySQL.

WEB BROWSER

It is an application that showcases the websites which is a collection of web pages. Web pages are documents created using the HTML code.

HTML

Hypertext Markup Language (HTML) is the standard text-formatting language for documents on the interconnected computing network known as the World Wide Web.

3.6.3 HARDWARE REQUIREMENTS

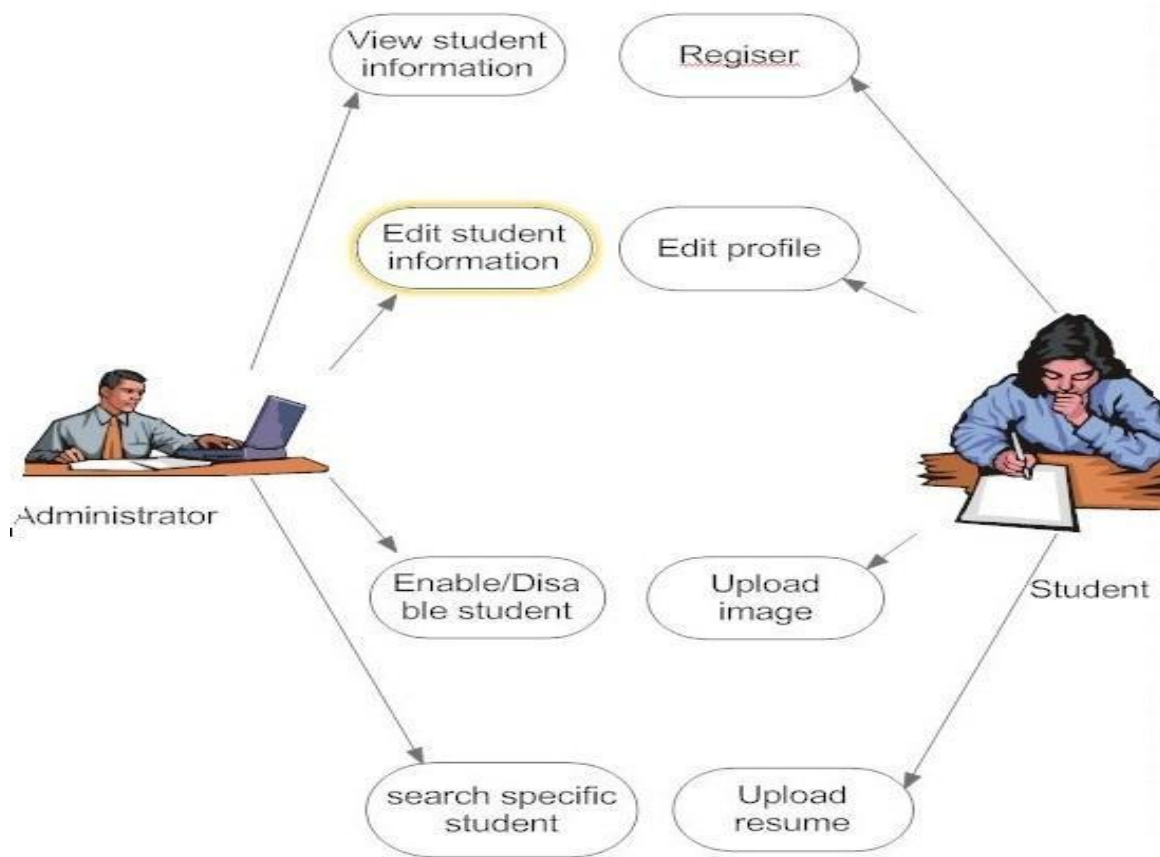
Technically, the following hardware is required.

Any processor with minimum of (1.6GHz or faster) processor power, at least 512 MB RAM, keyboard and a mouse or some other compatible pointing device, Video adapter and monitor with Super VGA (800 x 600) or higher resolution, at least 32GB Hard disk drive, mobile device and any digital device with internet connectivity and can surf.

3.7 TOOLS FOR SYSTEM ANALYSIS AND DESIGN

The tools used for analysis and design of the proposed system are flowchart and Unified Modeling Language (UML) tools such as the use case diagram.

UML Use Case Diagrams for the Proposed System



3.8 INPUT DESIGN

Input design is the process of converting a user input into a computer-based system. The required data entry will involve HTML forms with adequate validation for onward processing. Forms contain information into themselves (The names of buttons, the ideals for fields, and the values of check boxes and radio buttons). This design is important to avoid error in the data input process and show the correct direction to the management for getting correct information from the system. This can be achieved by creating a user friendly interface for the data entry to handle the required amount of data. The goal is to make data entry easier and to be free from errors.

3.8.1 OUTPUT DESIGN

The output is somehow closely tied to the input design, invariably HTML forms would be adopted for report and message prompt and some output will be formatted HTML pages. The output from the system designed is generated from the systems inputs that are stored in the database. This involves the resultant documentation generated after processing of data supplied to the database.

3.8.2 DATABASE DESIGN

The proposed system used MYSQL because it is a robust and versatile object relational database management system that is an enormous environment with unlimited potential that delivers information with very high precision and dependability. MySQL is the most popular “free” RDBMS in the world, is not an open source product, but it may be used without charge for non-commercial use on non-windows platforms under the terms of the GNU Public License. MySQL is known for its clear and uncomplicated administration, which is also valuable in the academic environment.

CHAPTER FOUR

4.0 IMPLEMENTATION AND TESTING

4.1 INTRODUCTION

Generally, the implementation of a system refers to the transformation of the system specification designed, from the originally obtained requirement into program codes. The implementation of this system, involved the writing of programs in HTML, CSS, BOOTSTRAP and PHP language. The system was designed and programmed to validate input and to handle errors, and appropriate error messages are prompted.

4.2 TESTING

System testing is intended to ensure that the implementation of the system is indeed as the user wants. Test cases are specifications of the inputs to the test and the expected output from the system (the test results), plus a statement of what is being tested, these cases help the developers equip themselves in discovering the program imperfections. Testing usually consists of verification and validation. Testing is usually done to achieve the following purposes:

1. Check for errors and debug appropriately;
2. Verify and validate if the automated system is an actual solution to the problems identified in the existing system.
3. To reveal the availability of the specified functionalities of the new system.

The System Information Management System was tested on a local server (Apache HTTP server) and Mozilla Firefox was used as the web browser.

4.3 RESULT

After several tests, the system was found to be successful and delivered the following functionalities accurately as shown in the figures below:

Fig. 4.3.1 below shows the default page of the system. It is also known as the homepage of the system that automatically loads after the URL has been requested by a web browser on the client system. It contains the menu of the system that lets a user to navigate through the entire system.

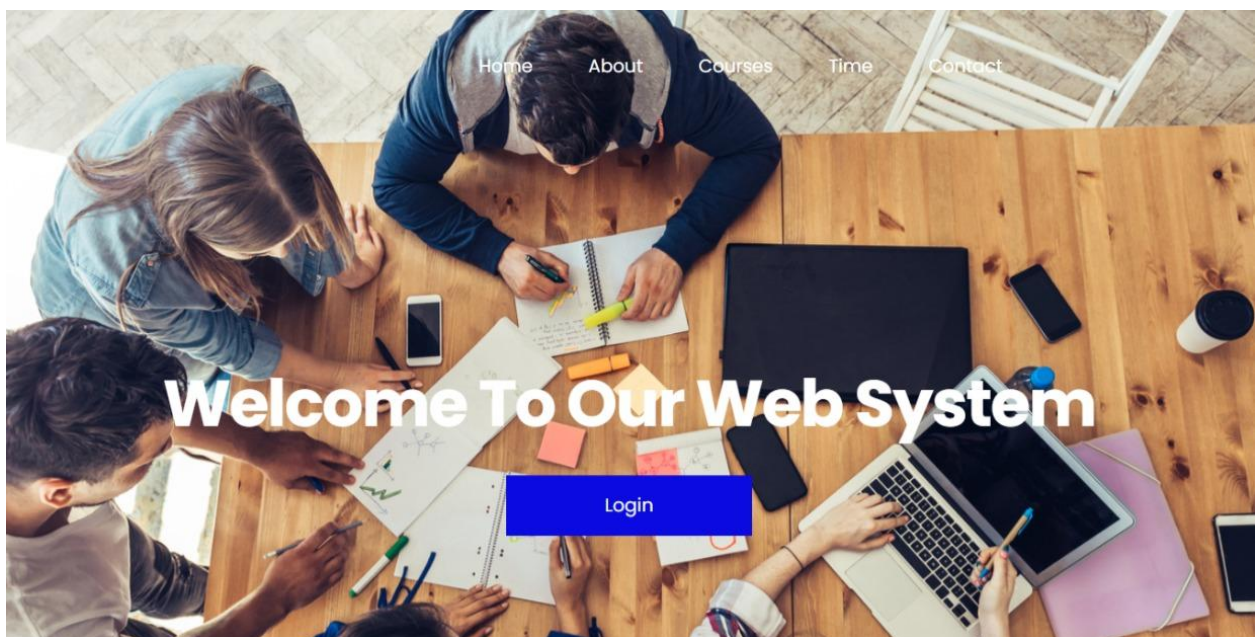
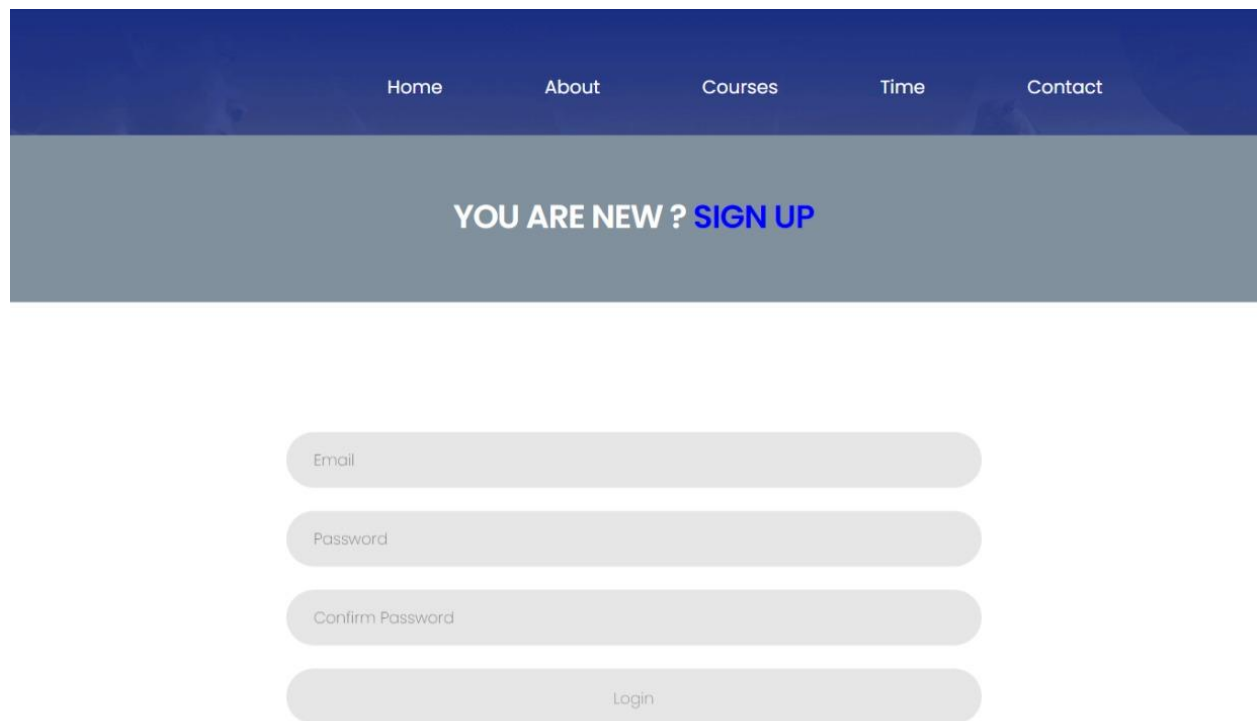


Fig 4.3.1 Home page

Fig. 4.3.2 below shows the login page of the student, this page authenticates and verifies the login details of the student to let him/her have access to the dashboard and profile and also prevents unauthorized users from gaining access.



The image shows a web page layout for a login and sign-up interface. At the top, there is a dark blue navigation bar with a background image of people. It contains five white links: 'Home', 'About', 'Courses', 'Time', and 'Contact'. Below this is a light blue banner with the text 'YOU ARE NEW ? SIGN UP' in white, where 'SIGN UP' is a blue hyperlink. The main content area is white and features a centered login/sign-up form. The form consists of four rounded rectangular input fields stacked vertically, labeled 'Email', 'Password', 'Confirm Password', and 'Login'. The 'Login' field is wider than the others and contains the text 'Login' in the center.

Home About Courses Time Contact

YOU ARE NEW ? [SIGN UP](#)

Email

Password

Confirm Password

Login

Fig 4.3.2 Login/ Sign up page

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 SUMMARY

This project work titled “Design and Implementation of a Web-Based Student Information Management System” is a web based application system developed using HTML, CSS, Bootstrap, MySQL and PHP language and was able to achieve the stated aim. It was able to address the issue delay inefficiency and inaccuracy of data processing and information storing accessing, retrieving and editing.

The study also fostered good perception of information age and developed efficient and effective academic information system for school administration and academic schedules. That is through presenting the rules and protocols of coding, scripting and hosting of data base driven WebPages.

This project consists of five chapters; Chapter one consists of introduction, background of the study, statement of the problem, aim and objectives, significance of the study, scope and limitation of the project. In chapter two I review some related literature of other works. Chapter three consists of the methodology, functional requirement, development tools, input design, database design and system design. Chapter four consist of implementation which consist of the system interfaces, while Chapter five consist of summary, recommendations and conclusion.

5.2 CONCLUSION

The need for available secure and reliable information solution is heightened by the increasing dependence on web like systems and database technologies to provide educational services,

develop efficient academic products, administer daily activities and perform both short and long term management functions.

It is concluded that automation of existing student information system, such as the delivery of enrolment procedures and keeping the records of students information such as: keeping of admission requirements during enrolment, personal information, student subjects enrolled and class schedules, and knowing the overall performance of students will maximize the utilization of the full range of benefits of Information and Communications Technology. The performance of the developed Student Information Management System is superior, efficient and effective.

5.3 RECOMMENDATION

It is recommended that:

- It is recommended that the student information management system be implemented in order to improve the delivery of enrolment procedures and record keeping of student information as well as to address the problems encountered with the existing system.
- The developed system should be given attention for further study and enhancement especially in terms of its usability and efficiency.
- Additional measures to minimize the drawbacks of using the student information system should be studied and adopted, particularly if the online student information system will be realized.
- A full time technically proficient system administrator should be appointed to handle system administration tasks to ensure sustainability of the system. To ensure this, training must be provided.

- The admin and students should be trained or at least be oriented on how to use the developed Student Information Management System.

REFERENCE

- Alice. “Student Information System Project Manager (Admin/Professional Individual Contributor) of Harvard University”. *Harvard Education Review*. Vol. 36, No. 6, pp. 41-48, 2009.
- Amin, A. and Cohendet, P., *Architectures of Knowledge*, Oxford University Press, Oxford, 2004.
- Andres, C. “Admission System and Online Examination for Benguet State University”. *Undergraduate Project Study*. Benguet State University, 2005.
- Basili, V R, and Turner, A J., *Iterative Enhancement: A Practical Technique for Software Development*, *IEEE Trans. Software Engineering*, 1(4), 1975, pp. 390-396.
- Bauer, C and King, G.. *Hibernate in Action*. Manning Publications Co., 2005.
- Benneet, S et al.,. *Object-Oriented Systems Analysis and Design*. (3rd Edition ed.). McGraw-Hill, 2010.
- Burger, R., *Capterra School Administration Blog*. [Online] Available at <http://blog.capterra.com/thetop6freeschooladministration-software/> [Accessed September 29, 2015].
- Benneet, S et al.,. *Object-Oriented Systems Analysis and Design*. (3rd Editioned.). McGraw-Hill, 2010.
- Deaton, JW and Peace, AG., *Journal of Information Systems Education*, 14(4), 2003.
- Galang, A.A.D. “Enrolment Management System for Data Center College of the Philippines”, Laoag City. St. Paul University Philippines, pp. 10-120, 2012.

- *Evangelista. Student Information System (SIS) of Nueva Viscaya State University. St. Paul University Philippines, pp. 20-24, 2011.*
- *Huang, S and Zhang, H. (2008). Research on Improved MVC Design Pattern Based on Struts and XSL. International Symposium on Information Science and Engineering, 2002.*
- *Kusakunniran W, Thongkanchorn K, Kongdenfha W. Review of Student Information System for Basic Education. InBUU-2014 2014 Jul 3.*
- *Laudon & Laudon, C. "Management Information System", Revised Edition. New Delhi: New Age International Publishers, 2010.*
- *Liao. "Student Information System of the College of Hospitality Industry Management." College of Information Technology Cagayan State University. Carig Sur, Tuguegarao City, Cagayan, 2010.*
- *Liang, J, S Guo, L Li, S Yang, The Research and Design of the University Classroom Management Information Platform Based on .NET. Advances in information Sciences and Service Sciences, 4 (21), 2012, pp. 422-427*
- *Laudon & Laudon, C. "Management Information System", Revised Edition. New Delhi: New Age International Publishers, 2010.*
- *Marrero, S. "Student Information System for the University of the Cordilleras". A master project study. University of the Cordilleras.*
- *OPENSIS [online] Available at: from < The official site for OpenSIS. Available from: <http://www.opensis.com/features.php>> Accessed on [Accessed September 14, 2016].*

- *OPUS [online] Available at: from < The official site for OPUS- College. Available from: <http://www.opuscollege.net/OPUS.php?page=docsENG>> Accessed on [Accessed September 14, 2016].*
- *Pacio, R. “Online Student Information System of Benguet State University”. (OSIS-BSU), Philippines, 2013.*
- *Simons, E., OPUS-College: Student Information and Registration System. Radboud University Nijmegen (NL), 201.*
- *Sommerville, I., Software Engineering (9th Edition ed.). Boston: Pearson Education, 2011.*
- *Vecchioli L. A process for evaluating student records management software. ERIC Clearinghouse on Assessment and Evaluation; 1999.*
- *Walls, C., Spring In Action. (3rd Edition). Dreamtech Press. Manning Publications, 2011.*
- *Yang, C., Design and Implementation of Students' Information Management System (SIMS) Based on ASP. International Conference on Economic Management and Trade Cooperation (EMTC 2014). Atlantis Press.*