



WEB-BASED STUDENT INFORMATION AND REGISTRATION SYSTEM

Case study: International University of East Africa

By:

Group-BIT-J/14/021

DEPARTMENT OF INFORMATION TECHNOLOGY
FACULTY OF SCIENCE AND TECHNOLOGY

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For the Study Leading to a Project in Partial

Fulfillment of the Requirements for the Award of the

Degree of Bachelor of Information Technology

of International University of East Africa.

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Declaration

We members of group **BIT-J/14/021** declare that this is our original work and has never been submitted anywhere for any award.

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Dedication

This project work is dedicated to our beloved parents and loved ones at the same time is a dedication to His Excellency the Executive Governor of Kano State Eng. Dr. Rabiu Musa Kwankwaso and all those who have contributed to our studies and very many thanks to Almighty Allah for His support and guidance that enabled us worked together as a team to accomplish this project.

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May God bless you all !

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List of Abbreviations

Admin	System Administrator
CSS	Cascading Style Sheet
CPU	Central Processing Unit
DFD	Data Flow Diagram
HTML	Hypertext Markup Language
Id	Identity
IT	Information Technology
IUEA	International University of East Africa
LAMP	Linux Apache MySQL PHP
MAC	Macintosh
MySQL	My Simple Query Language
OS	Operating System
RAM	Random Access Memory
WAMP	Windows Apache MySQL PHP

Abstract

The process of handling the student information and registration services in academic institutions such as International University of East Africa is attached with considerable problems of additional expenses as a result of the manual operations involved. In line with that there is a demand to bring about a solution that can automate the processes and cater for the needs of both the management, staff and the students. This project looked at these issues and carried out the tasks of integrating the information and registration records of students by automatically registering a student, generating registration number with the IUEA format i.e the year of enrolment, nationality, individual number, the course and the intake month. The project also brought about an avenue for registering courses by the student and at the same time allocate classes or venues for each course. In addition to that the system administrator can be able to view every student's records and to keep the records in databases for future analysis and report.

To come up with the automated system of student information and registration; data about the current system and operations was collected and analyzed, a system design was developed using Data Flow, Work Flow and Entity Relationship Diagrams and implemented using PHP, MySQL, JavaScript, HTML and CSS. The implemented system was tested and validated to ensure the system works effectively. Advantages of the system includes high accessibility, availability, security and responsiveness together with reducing the operational costs and the cost of accessories.

Chapter 1

1.0 Introduction

1.1 Background

International University of East Africa is one of the private institutions in Uganda that draws students from East Africa, Central Africa, and the rest of the world with the vision of being the Technological University of choice in East and Central Africa. Rogers (2002) stated that apart from academics, Universities and Institutions of learning are expected to provide various services to its students. Apart from education being the main goal, students also need to be supported in the areas of getting access to rich and convenient systems that can ease normal and routine activities like convenient student registration, financial and information services, as this will provide lifelong benefits not only to the students but to the institution and the management as well.

According to Maki (2008) higher education's access to information assets, whether they support core missions of research and teaching or management is increasingly central to enhancing reputation, competitiveness, client satisfaction, revenue, and accountability. Consequently, creative ways to facilitate a unique student management system with features of student registration, financial records, and automatic report generation will provide lifelong benefits to students and the University as a whole.

Currently most of the student information and course registration services used in IUEA are manual and to achieve the university's vision there is need to streamline critical operations with an online system because majority of the University activities demand Information Technology (I.T) integration so as to take advantage of its benefits. With these therefore a robust and integrated system network that will unify management of student activities is among the basic needs, because the initiative will continually refine campus technical architectures to accommodate the University's evolving population and support growing and diverse campus needs.

1.2 Problem Statement

With the rapid student population increase in IUEA combined with the current trends and developments in information technology (IT), Providing a high-quality student information and registration system that is reliable, secure, adaptable, scalable, and fault tolerant becomes a fundamental issue. It is therefore very clear to state that there are several problems with the current manual system of managing student records and information especially when it comes to the registration processes and these are time consuming which brings about delays and long number of student queues and increased workload to both the students and staff together with costly processes in terms of purchasing accessories like paper, files and shelves combined with dissatisfaction from students and staff as a result of redundancy of work that may lead to inadequate accountability and cases of redundant registration number allocation to students.

1.3 Objectives

1.3.1 Main Objective

The general objective of the study is to develop an information and registration system for International University of East Africa.

1.3.2 Specific Objectives

- i. To carry out an investigation and make analysis on the student information and registration system in International University of East Africa.
- ii. To design an Information and registration system for International University of East Africa. To implement the system.
- iii. To test and validate the system.

1.4 Scope

The study is scoped within the environment of International University of East Africa and Faculty of Science and Technology was sampled.

1.5 Significance

- (i) The study provides a clear understanding of the current registration system and its related problems and deliver reliable findings that are not only helpful to IUEA but also to a number of academic institutions.
- (ii) The study delivered a technological solution to the problem of student registration in academic institutions and specifically to IUEA.
- (iii) The system developed easily and efficiently manage and control student information and registration processes
- (iv) The solution provided by this project will enable IUEA and other Institutions of learning to keep and manage student records and solve the problems of manual student registration.

Chapter 2

Literature Review

2.1 Introduction

This chapter attempts to identify and locate completed articles, journals, reports, and formerly developed systems about student information and registration. And it is true that student information and registration problem existed and some solutions were developed accordingly to respond diligently to this matter.

2.2 Information systems

M.Z Hashim (2013) defines an information system as an organized combination of people, hardware, software, communication networks and data resources that collect transform and disseminate information in an organization.

2.2.1 Student Information Systems:

According to Geeta R.B. and S.G.Totad (2013) a Student Information System (SIS) is a system used by educational institutes or colleges to provide an interface for capturing and maintenance of student information or records. This type of information systems deal with student details either personal or academic related and it should be available through a secure online or web-based interfaces. A number of institutions today use student information management and registration systems to record and maintain information relevant to the student. Moreover web-based or online systems allow students, staff and teachers to access the information they need round the clock through the internet and this also makes it easier to provide data for accountability.

Greg Johnson (2008) stated that the traditional student information systems used by many schools are unable to keep pace with the desired demands, likewise the pressure for information integration and unified access is making it difficult to cope with the old systems. But with the advent of a common online student information and registration systems there will be new improvements that can provide all the information needed by institutions to manage education effectively, improve student achievement, and ensure accountability. The systems also enable and support policy change and new education delivery methods to achieve the targeted outcomes.

According to Zain and Idris (2004), for every educational institution that focuses on student achievement, accountability, flexibility, and autonomy, improving student management has to be its overarching goal in all directions. Such goals are achieved by funding and supporting systems and models that allows achieving any idea needed to enable timely access to data and information and as a result there is high requirement for improved information management systems.

2.3 Student Registration

Atis (2005) stated that the word registration means the accurate positioning of, or the degree of accuracy in the positioning of an entity relative to (a) another entity, or (b) an independent frame of reference. Students register in order to be allowed access to the academic and administrative sectors of an academic institution. It is through registration that they are allowed to choose the courses and subjects they intend to be taught and hence examined

2.3.1 Student Registration Systems

Temple (2006) describe student registration systems as systems that involve step-by-step interdependent actions of formally assigning and recording student's enrolment and other records and it is open to those who have already been enrolled or applying to be enrolled into an academic institution.

According to MADDISON and DARTON (2007) web based or online student registration services offer users convenient access to and the ability to manipulate information that is of concern to them. Due to the high requirements in functionality and performance, these systems are often very large in demand because of the size of the benefits they provide. The development of integrated and online systems comes into play for various reasons, not only does it address the manageability issues but it also ensures greater consistency and high usability of components, these advantages in turn lead to better productivity and hence better outcome when the overall design of the system is accomplished. Student information systems are the primary systems used widely by institutions to collect the information they need to manage student services and provide the underlying infrastructure needed to improve management of information and record keeping.

2.3.2 Examples of the existing information and registration systems

a) Bayero University Kano, Student Application and Registration System

(i) Description:

Bayero University Kano is one of the best federal universities in Nigeria, The University has a web based-online system with an application and registration system functionality. The system is made up of a number of links for application, registration and course lists.

(ii) Interface

In terms of interface, the system does not contain much multimedia, the interface is very clear and attractive and the text is legible. The banner is also good in which it contains the logo together with the name of the university, which is the first thing that someone visiting the site will see. Therefore, the entire interface will be considered while designing the interface our system.

(iii) Usability:

The site is available anytime someone wants to use it. But in terms of application and registration there are specific time for that, which means that if a student fails to apply or register within that time, the system will not provide that function.

(iv) Accessibility:

The access to registration is by obtaining a registration card with login PIN. Moreover one has to create an account before logging into the system by providing username and password. Therefore whenever a registered student wants to login in to the account, the username and password must be provided.

b) University of Dataville Florida Online Course Registration system.

(i) Description:

According to Tolstoy and Aditya (2010), the University of Dataville student registration system is developed with a front-end web interface and a back-end database and the system allow each student to insert a unique student identity (ID) and a profile. The profile includes first/last names, gender, date of birth, local address, department, enrolment year, username, login password, and a picture photograph of the student

(ii) Usability

The use of the system is to maintain records of all the courses a student has already taken or registered. The system also check course prerequisites when registering.

(iii) Accessibility:

For the system to be accessed each student is requested by the system to login with a unique student identity (I.D) and create a profile by entering their details.

c) Tabular comparison between the discussed student registration systems and the system under study

Features	Bayero University Kano Registration system	University of Dataville Registration system	The system under study
Accessibility	Medium	Medium	High
Availability Level	Medium	Medium	High
Customization Possibility	No	No	Yes
Database structure	Good	Good	Better and Easy
Easy Navigation	No	Yes	Yes
Easy update	No	No	Yes
Easy upgrade	No	Yes	Yes
Mobility	Could be possible	Can be possible	Possible
Automatic Student I.D generation	No	No	Yes
Login PIN	Present	Not present	Present
User interface	Good	Not bad	Good and interactive
Web System	Yes	Yes	Yes

Table 1: Comparison between student different student registration systems

2.3.3 Conclusion

By comparison our system is unique because it can provide features and functionalities that other similar systems doesn't provide and it can automatically generate student identity.

Chapter 3

Research Methodology

3.0 Introduction

This chapter provides detailed description of the tools and techniques used during the development of this system. The study applied different methodologies which includes collection techniques like interviews, questionnaires with the concerned parties. The data collection techniques and tools will helped to get a clear understanding of the problems faced by the current system and identify clear facts to help in coming up with the solution.

3.1 Data collection:

This method addresses the techniques employed in gathering of information for research operations. The study make use of Interviews, questionnaires, and observation which are the major tools used for data collection for the system development.

3.1.1 Interview:

According to Grazianno (2010) an interview is as a method of data collection where the researcher/investigator follows a rigid procedure and seeks answers to pre-conceived questions through face to face conversation between the researcher and the respondents for the purpose of obtaining information. Therefore interviews are used to get first hand information from the respondents about the topic under study.

We conducted interviews with the stakeholders; to identify and specify functional and non-functional requirements to determine requirement specification. Our interviews were both semi-guided and unguided and also contained both closed and open ended questions as we obtained the data mainly about the operation of the existing system; its problems, strength, information flow and processing of the current system.

3.1.2 Questionnaires:

This involves using a predetermined set of questions designed to collect information from a respondent on the subject under study. It is believed that the use of this tool can be useful in exploratory studies in which various dimensions and facts of a problem are examined.

3.1.3 Observation:

The University of Harvard defines observation as the unobtrusive method of gathering data. This involved a purposive or intentional examination of something, particularly for the purpose of gathering data. Observation was used to get a personal judgment about the current student information and registration system so as to compare with the findings obtained from questionnaires and interviews as this will provide the researcher with a richer and more direct account of the phenomena under study.

3.2 System Analysis

Systems analysis is the process of identifying and summarizing data with the intent to extract useful information and develop conclusions. In system analysis requirements were determined. The requirements includes the functional and non-functional base on the system study.

3.3 System Design

i. Process Modeling: This was achieved by use of Data Flow Diagrams to show processes and external entities in the system and the end product was a detailed description of processes involved (process models). The information used in building the Data Flow Diagram was obtained from the Data Dictionary.

ii. Data Modeling: This was achieved using Entity-Relationship Diagrams to show the data requirements and model. This yielded the structure of relations in the relational schema (database).

3.3 System Implementation

This is whereby the physical realization of the database and the application design was done. This involved the implementation of both the database and the application programs. It was achieved using the Data Definition Language (DDL) of the selected Database Management System (DBMS). Following are the tools used in the implementation methodology.

3.4.1 PHP (Hypertext Preprocess)

PHP being a very powerful server-side scripting language for developing dynamic web applications was used in this project in order to build an interactive and dynamic system. PHP script can be embedded straight into the html code and due to its compatibility and support to various web servers and databases like MySQL it is therefore applicable to this project.

3.4.2 MySQL

MySQL was used in order to allow access and manipulate the database at the same time it will be used to execute queries, create, insert, retrieve, update and delete record from the system's database.

3.4.3 CSS

CSS Stands for "Cascading Style Sheet." Cascading style sheets are used to format the layout of Web pages. CSS was used in this project to define text styles, table sizes and CSS will also be used to organize, customize the page content, add special effects and manage the body alignment and position of body items within the pages thus keeping a uniform appearance throughout the navigation.

3.4.4 JavaScript

JavaScript, by definition, is a Scripting Language of the World Wide Web. It is going to be used in this project to add various Web functionalities, Web form validations, browser detections, creation of cookies and confirmation of alert messages.

3.4.5 HTML

HTML is a hypertext markup language which is in reality a backbone of a website. In this project HTML was used to make the web pages more effective as well as efficient. HTML was also be used to define and display the normal body content such as forms, text, divisions and many other body items.

3.5 System Testing and Validation

3.5.1 Testing

In testing process the intention is to find errors and correct using carefully planned test strategies and realistic data. The system will be rigorously tested to uncover faults in the application programs and the database structure. The testing is repeatedly done until the system was proven to be working according to users' specification and performance requirements. This following are the tested functions:

- i.** Testing the system performance, efficiency, disk space and its throughput to ensure proper functioning of the system.
- ii.** Checking the compatibility of the system with different operating systems for example Windows XP, Linux and Windows 7.
- iii.** Testing for security issues like resistance to remote attacks and authentication procedures.

3.5.2 Evaluation

The evaluation process provided a high degree of assurance that specific processes consistently provide products which met predetermined specifications and quality attributes. It involved identifying compliance to quality management procedures, life cycle definition, specifications, for example; user requirements specification and functional specification, documentation controls and various items of documentation for example user manuals and administrator documentation and testing procedures.

Chapter Four

System Study, Analysis and Design

4.0 Introduction

This chapter provides a clear and structured description of the findings from the investigation carried out. Such findings are the user and the system requirements, and from the acquired findings a functional representation of the system is derived.

4.1 System Study

From data gathered about the existing systems through interviews, questionnaires and observation was found that the current student information and registration system is manual and the further study shows that there is clear need to develop a system that can improve the efficiency of the registration processes.

4.1.1 Results from questionnaires

Twenty five questionnaires were distributed (see appendix II) and students were chosen randomly in order to gather their response and the tables below summarizes the results obtained.

#	Questions	Yes	NO	Total number of respondents	Deduction
1.	How are you finding the current registration process, is it satisfactory or not?	2	23	25	92% find the current registration process unsatisfactory
2.	Do you face challenges while making registration with the university's current system?	21	4	25	84% stated they face challenges while making registration with the current system.
3.	Does the current information and registration system in the University need review?	19	6	25	76% agree that the current University's information and registration system needs review
4.	Are you comfortable that your documents and information are managed and stored using files and shelves?	7	18	25	72% of the respondents are not comfortable with the current handling of their documents and information.
5.	We are introducing a web-based system for student information and registration, do you think it's a good idea?	24	1	25	96% of respondents support the development and use of the proposed system.

Table 2: Description of results obtained from questionnaires

4.1.2 Results from interviews

Staff members and students were interviewed. Each person was interviewed separately so as to avoid people giving inconsistent answers. An interview guide was designed (see appendix I) and included the set of questions to be asked similar to those in the questionnaires and respondents gave their answers which were recorded, below are the findings.

Questions	Answers		Deductions
	(Student)	(Staff)	
How is the current student information and registration system done in the University ?	It is mostly paper based and students have to join queues to make the University registration and course registration activities	We are currently recording student information in a register-like book and then allocate them registration numbers manually and then allow them students register for their various courses also manually.	The system should try to avoid the manual and paper based processes involved while making registration.
What are the difficulties and challenges you are facing with this current system ?	Sometimes the registration process seems to be tiring and the number of queues brings about a lot of delays.	The process is time consuming as we have to get all the student information, create a file, allocate numbers and sometimes the same registration number can be allocated to different students which bring about identity clash and redundancy in our work.	The system should be as fast as possible and the system should provide quick access and quick response
Do you think it is a good idea to come up with a new system that will ease your work and that of students?	It is a great idea and once this idea is developed it will ease so many of students difficulties	Its really very good to bring about this idea and for us doing this registration services will ease our tasks.	The system should answer queries in a way that all parties are satisfied and none complains
If a web based system is developed how do you think it will ease your tasks?	The major solution this system will bring is that it can be accessed from anywhere to allow registration and ease of students activities while registering with the university.	The system will ease our job and it will reduce the expenses on stationery materials and reduce or eliminate the rate of redundant work and eliminate the registration number clash	The system should be universally accessible meaning it should be accessible by all and each anywhere.

Table 3: Results obtained from interviews

4.1.3 Results from observation

Checklist	Status
ICT environment and infrastructures in the University	There is availability of the ICT equipments and the infrastructure can accommodate facilities
Students population and the trend	Student population is medium but on high trend of increase
The way records are kept and managed	Majority is paper based
Time spent to record and store information	Long process and is taking
Time spent to perform registration by student	Is a long process and time consuming

Table 4: Observation results

4.2 System Analysis

Data collected was analyzed in order to identify user, functional, non-functional, software and hardware requirements that guided the design and implementation of the integrated student information and registration system.

i. User requirements

These are statements, of what services the system is expected to provide and the constraints under which it must operate. Below are the user requirements for the system;

- a) Process user's tasks as fast as possible
- b) Allow users login and logout efficiently.
- c) Provide a user friendly interface with easy navigation option
- d) Be able to provide error control and recovery process to a user in case errors are committed in data entry; so as to allow for error-free and accurate data input.
- e) The user shall expect predictable results/information from the system after a given request.

ii. Functional requirements

These are statements of services the system should provide, how the system should react to particular inputs and how the system should behave in particular situations.

- a) The system shall enable the Admin to view and manage the users and their login detail
- b) The system shall authenticate users provided once correct credentials are supplied.
- c) The system shall generate a registration number for new student when registered.
- d) The system shall generate the registered personal details report.
- e) The system shall dynamically provide examination results.

iii. Non-functional requirements

These are requirements that are not directly concerned with the specific functions delivered by the system. They relate to emergent system properties such as reliability, response time and storage capabilities of the system.

- a) The system shall provide fast processing to all user requests.
- b) The system shall use IUEA colors
- c) The system shall be platform independent
- d) The system shall be available and accessible to the authorized users all the time.

4.3 System Design

System design defines the architecture, components/subsystems, modules, interfaces and data for the system to satisfy specified requirements. It defines a physical/diagrammatical representation of the system and what processes are involved. In system design the following tools and techniques were used; process modelling and data modelling.

4.3.1 Process Modeling

In process modelling a Context Diagram (Figure 1) and the Level 1 DFD (Figure 2) were modelled. The context diagram shows the overall context of the system and how it interacts with the external entities while the Level 1 DFD shows the major sub processes identified in the Student information and registration system. Data obtained from the DFD and context diagram are collectively used to yield the data dictionary.

4.3.2 Context Diagram (Dataflow diagram – level zero)

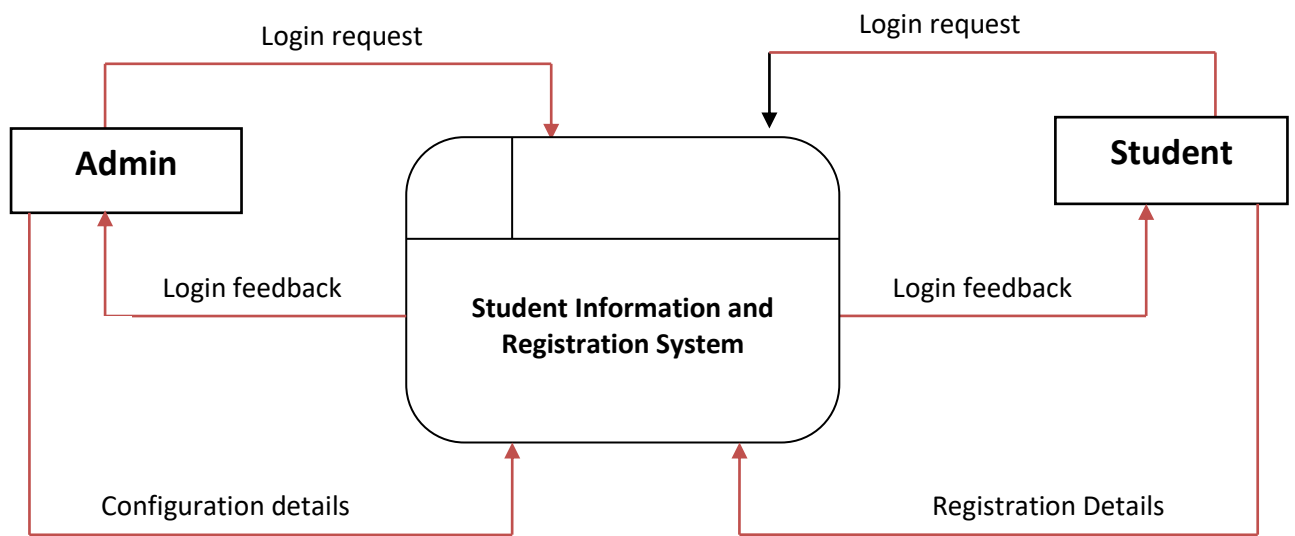


Figure 1: Context diagram (Level zero dataflow diagram)

4.3.3 Dataflow Diagram - Level One

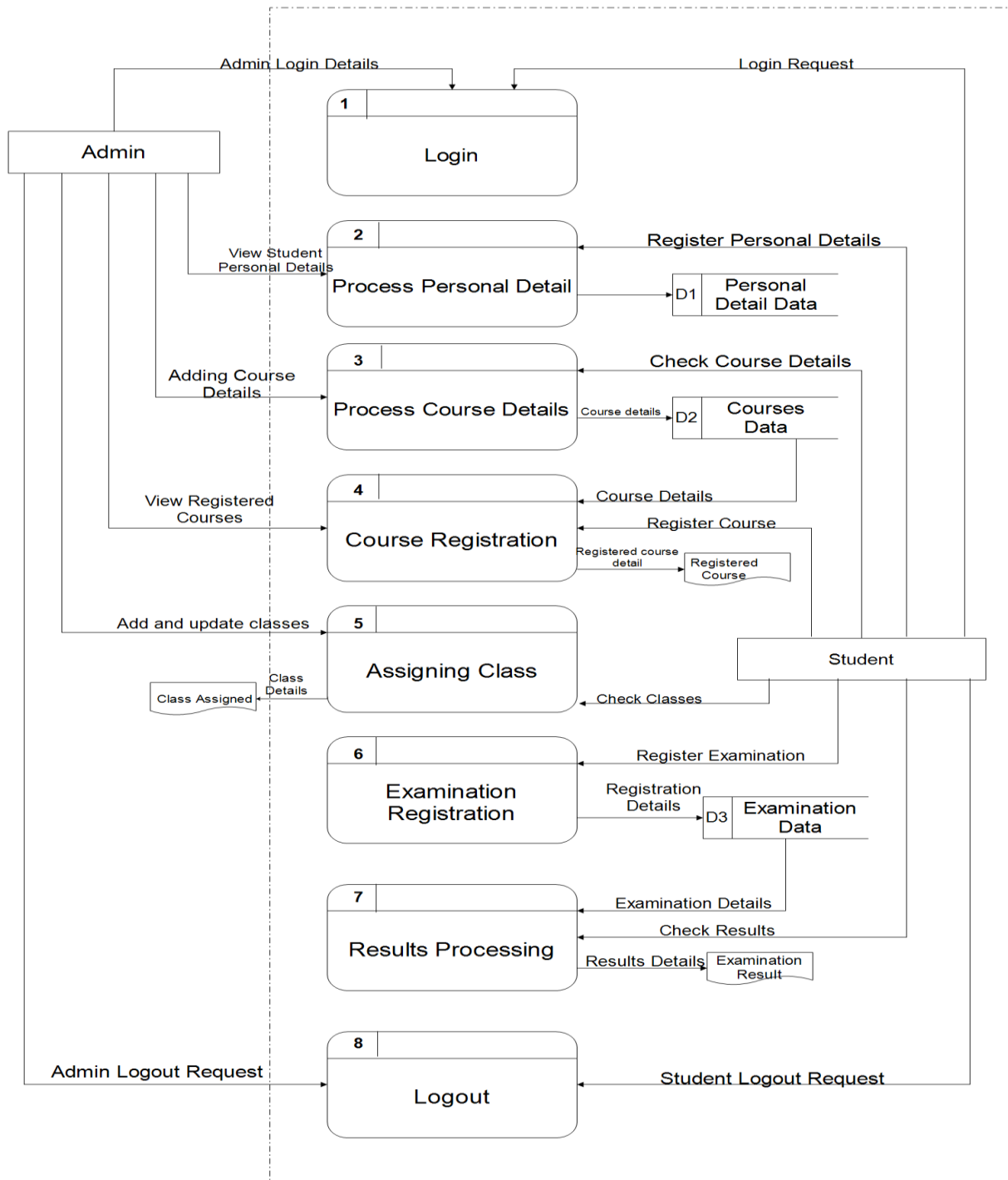


Figure 2: Level one dataflow diagram

a) Description for the level 1 DFD

The tables below give a description of all design objects used in developing the system. They include Processes, Data flows, Data stores, Data reports and the External entities involved in the system. The following tables describes the level one Dataflow diagram components

i) Data dictionary for External entities

Entity name	Description
Admin	Super system user who can configure the system and manage users
Student	Basic system user who can only browse the system, add personal details, browse courses and make course registration and examination registration.

Table 5: Description of External entities

ii) Data Stores Dictionary

Data store name	Description
Personal Detail data	Storage for personal details and information for the student
Courses data	Storage for courses to select and the courses registered by the student
Examination data	Storage for examination details and courses to be examined for.

Table 6: Description of Data stores

iii) Data Reports Dictionary

Data Report name	Description
Registered course	This is the report of the courses assigned by the Admin, applied and registered by the student
Class Assigned	This is a report of assigned class to be attended by the student and where a course will be taught
Examination Results	This is a report on the registered examination and grades obtained after examination

Table 7: Description of Data reports

iv) Dictionary for Processes

Process name	Description
Login	Activity of authenticating a user to in order to access the system's information
Process Personal Details	Activity whereby the Admin (Super User) can view other users' details, reconfigure them or log any user out and the other user can insert their personal details for processing
Process Course Details	Activity whereby a guest or any other basic user can view course details and check the availability of a given course
Course Registration	Activity of registering courses to a student, a student select the desired courses to register and the system process and allocate the courses to be registered.
Assigning Class	Activity of allocating a class to be attended by a student, an Admin can assign a class and a student can check and view their assigned classes
Examination Registration	This is an activity of applying and registering for an examination at the end of the semester by he student, the admin is responsible to approve or not
Results Processing	Activity of checking and providing the results obtained by the student after examination
Logout	Action whereby a user decides to leave the system

Table 8: Description of processes

v) Data Dictionary for used symbols

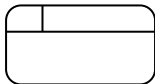

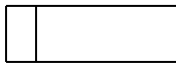


Symbol	Description
	Process
	External entity
	Data Store, holding data from processes
	Data Report
	Arrow showing data flow between the system and the external entities as well as between the processes and the data stores

Table 9: Description of symbols

4.3.4 Data Modeling

From the information obtained from the data dictionary, a data model was built. This was done by identifying data requirements for the system database, identification of entities and their attributes making up the system and relationships between these entities. From this an Entity Relationship Diagram (ERD) was obtained.

a) Data Requirements

The table below shows the data requirements that were based on to obtain entities for the system database.

Entity Name	Description	Attributes
Admin	A User with the highest access level to the system, able to login, manage other Users and manage Rooms (Add, Edit or Delete). The Admin can manage one or many Users.	Admin_id, username, password
Student	A standard User who login to browse, add personal information, register with the University Or register a course and makes examination registration.	student_id, email, LoginPin, password, date of birth
Course	A unit or subject a student registers and taught	CourseId, CourseName
Class	A venue or place where a course can be taught and student receives the lessons.	ClassId, CourseAssign
Examination	An assessment of a student for a particular course	ExaminationId, Course
Result	The outcome of an assessment of a student about a particular course	ResultId, Course

Table 10: Description of Entity's names and attributes

4.3.5 Modeling relationship between entities

Relationships between entities identify all possible associations between the entities. It also gives the corresponding multiplicities (participation and cardinality).

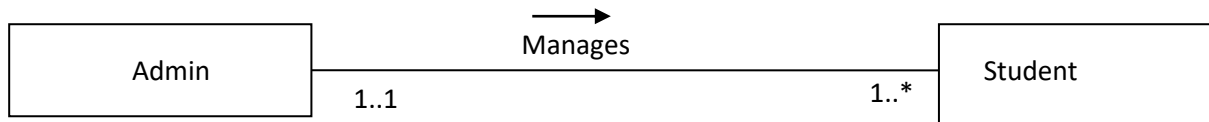


Figure 3: Relationship between Admin and Student

In figure 3 an Admin can manage a minimum of zero and a maximum of many student and a student can be managed by only one Admin at a given time.

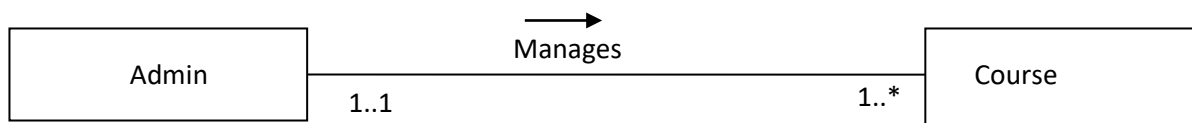


Figure .4: Relationship between Admin and Course

In figure 4 An Admin can manage a minimum of one and a maximum of many Courses and a Course can be managed by only one Admin at a given time.

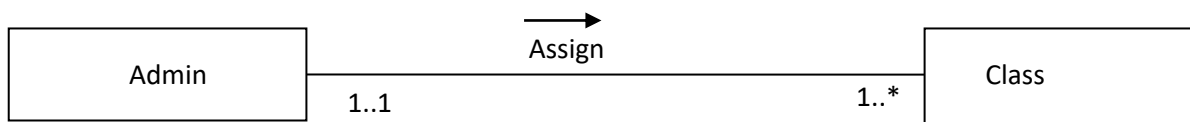


Figure 5: Relationship between Admin and Class

In figure 5 Admin can assign one to many Classes at a time



Figure 6: Relationship between Student and Course

In figure 6 One or many student can register for one course



Figure 7: Relationship between Student and Examination

In figure 7 An examination can be registered by one or many Students

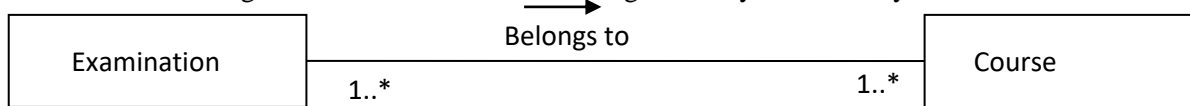


Figure.8: Relationship between Examination and Course

In figure 8 One or many Examinations can belong to one or many Courses

4.3.6 Entity Relationship Diagram (ERD)

The ERD below shows the entities, their attributes and the relationships between these entities. The relationships further indicate the multiplicities between these entities.

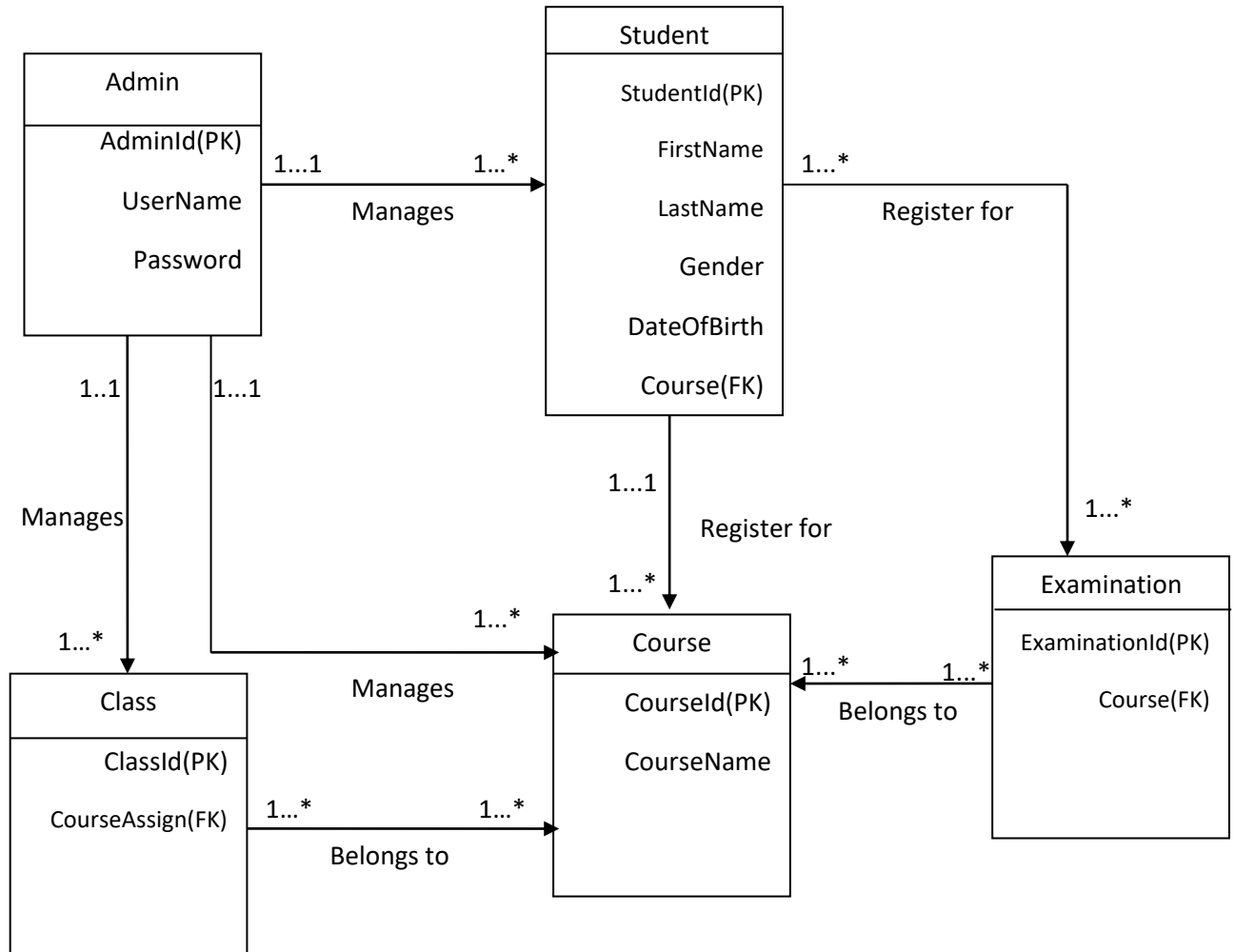


Figure.9: Entity Relationship Diagram

4.3.7 Mapping ERD to Relationship Schema

Admin:

Attributes	Datatype	Constraint
Admin_id	int(6)	Primary Key, Not Null
Username	Varchar(32)	Not Null
Password	Varchar(32)	Not Null

Table 11: The Admin table

Student:

Attributes	Datatype	Constraint
Student_id	Varchar(16)	Primary Key, Not Null
Username	Varchar(32)	Not Null
StudentName	Varchar(32)	Not Null
Password	Varchar(32)	Not Null
Date of birth	Varchar(32)	Not Null
Nationality	Varchar(32)	Not Null
Gender	Char(1)	Not Null
Email	Varchar(64)	Not Null

Table 121: The Student table

Course:

Course	Datatype	Constraint
CoursId	int(6)	Primary Key, Not Null
CourseName	Varchar(64)	Not Null

Table 13: Course table

Class:

Attributes	Datatype	Constraint
ClassId	int(6)	Primary Key, Not Null
ClassName	Varchar(64)	Not Null

Table 14: Class table

Chapter 5

System Implementation and Testing

5.1 Introduction

This chapter describes the implementation of the design models in of the system based upon the findings from the study undertaken and the requirements of the end-users of this system and the system design and also shows the different results generated by the system. Therefore screenshots of the system will be displayed to show how the system displays results given a command.

5.2 Functions provided by the system

This section specifies the functions the system provides to all its users and external entities. The system has two types of users differing by their access levels to the system, their characteristics and also their entitlements. The main users are Admin and student.

5.2.1 Functions provided to the Admin:

Admin is a user having a level of access and the highest level of access to the system means that the admin manages other users. The admin has the power and possibility to logout another user without the consent of the user. An Admin user has his/her own menu different from the one visible to other users. The following are the functions system provided for the Admin.

i. Manage other Users

Admin can use the system to display all registered users specifying which ones are logged in or active or those ones who are logged out and the time these users logged in or logged out. Admin can logout users and edit user details, add new user or remove a user from the system.

ii. Check Student's Personal details

Admin has the possibility of checking the personal details entered by the student and can allow the student to re-open the details to make corrections.

iii. Manage Courses

An Admin can assign courses to be taken by the student and at the same time able to edit or delete a particular course assigned to a student or class in a particular semester.

iv. Manage Examination details

Admin is able to display the examination registration details applied by the student and is able to either approve the request of the student or not.

5.2.2 Function provided to Student:

A student is a name assigned to the basic users of the system whose access levels vary between one and two. A student accesses many pages than the Admin user and the following are the pages and their functions within the student user menu.

i. Registering personal details

Students enter their personal information to register with the university in order to get a registration number before proceeding to the course registration.

ii. Checking Course details

All the courses to be taken by the student are displayed on this page and a student has an option of checking the courses and their details.

iii. Registering a course

In this page a student registers for a particular course and the subjects available in a particular semester.

iv. Checking class

This function allows a student to check the allocated classes or venues for a particular course in a semester.

v. Registering an Examination

This function enables the student to login and register for an examination at the end of the semester, the admin is responsible for approving or not approving the examination courses registered by the student.

vi. Checking Results

This is a feature that allows students to view their results at the end of each examination, a student can use their registration number to view the examination results.

vii. Logging Out

Action whereby a user decides to leave the system

5.3 System screen shots

5.3.1 Student Login page

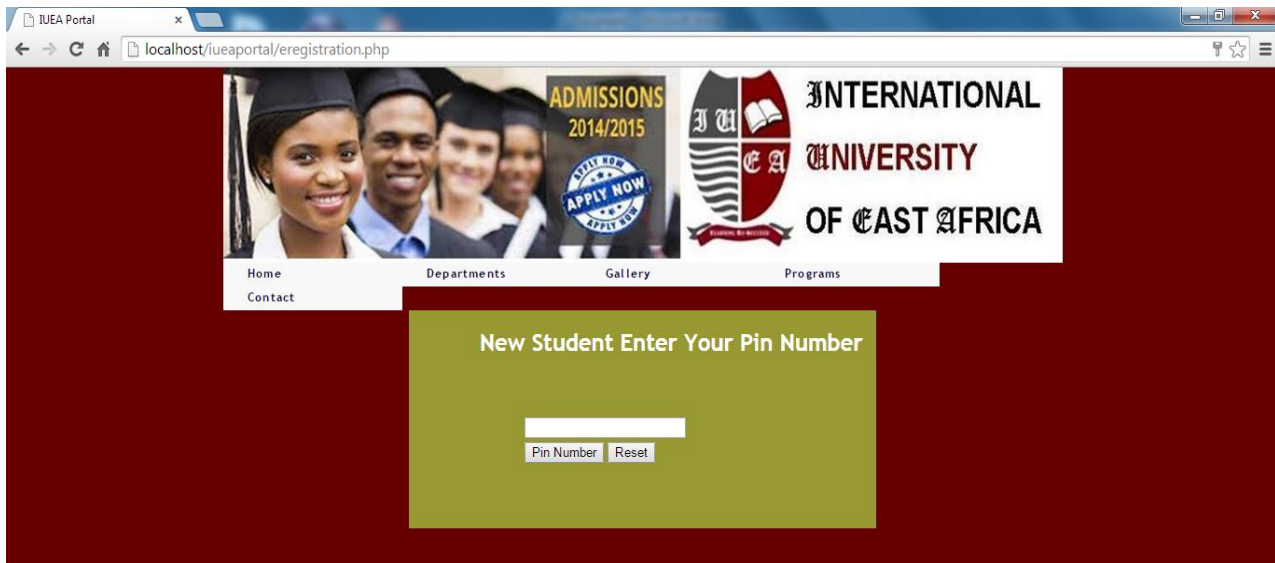


Figure 10:

Figure 10 shows the page that enables a student to login and get redirected in order to register personal information and proceed to course registration .

5.3.2 Student personal details entry page


 Congratulation!!! mujahi ALIYU your Registration Number is: 14/MYS/54/BIT/J			
First Name:	mujahi	Last Name:	ALIYU
Gender:	MALE	DOB:	25/09/1987
Religion:	ISLAM	Marital Status:	MARRIED
Address:	kansanga	State:	kano
L.G.A:	jafar	Email:	mujaheed@yahoo.com
Selected Course:	BIT	Qualification:	Diploma
Sponsor:	GOVERNMENT	Exam Type:	GCE
Credits:	9	Passes:	0
Fails:	0	English Grade:	A

Figure 11:

Figure 11 shows a page where new students enters their personal details for the system to capture and generate registration number

5.3.3 Automated generation of student registration



Figure 12: Automatic registration number generation

Figure 12 shows an automatic registration number is and allocated to a student by the system after entering personal details

5.3.4 Course Registration

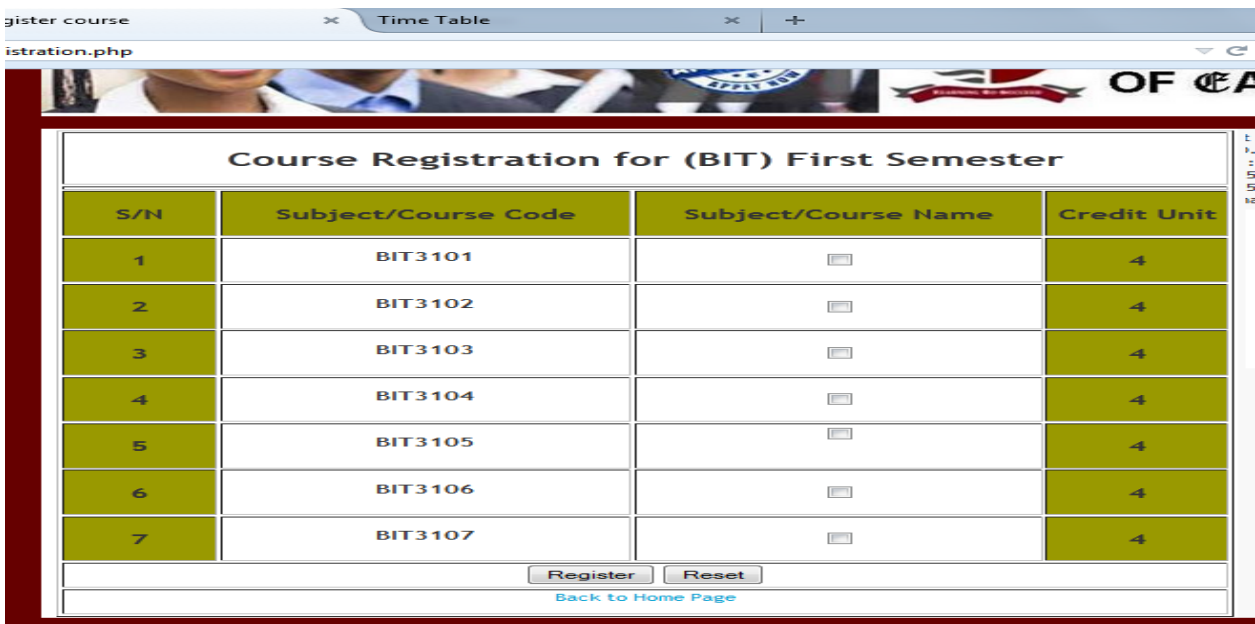


Figure 13: Course Registration page

Figure 13 showing how a student will register for subjects in a particular course

5.3.5 Admin Page

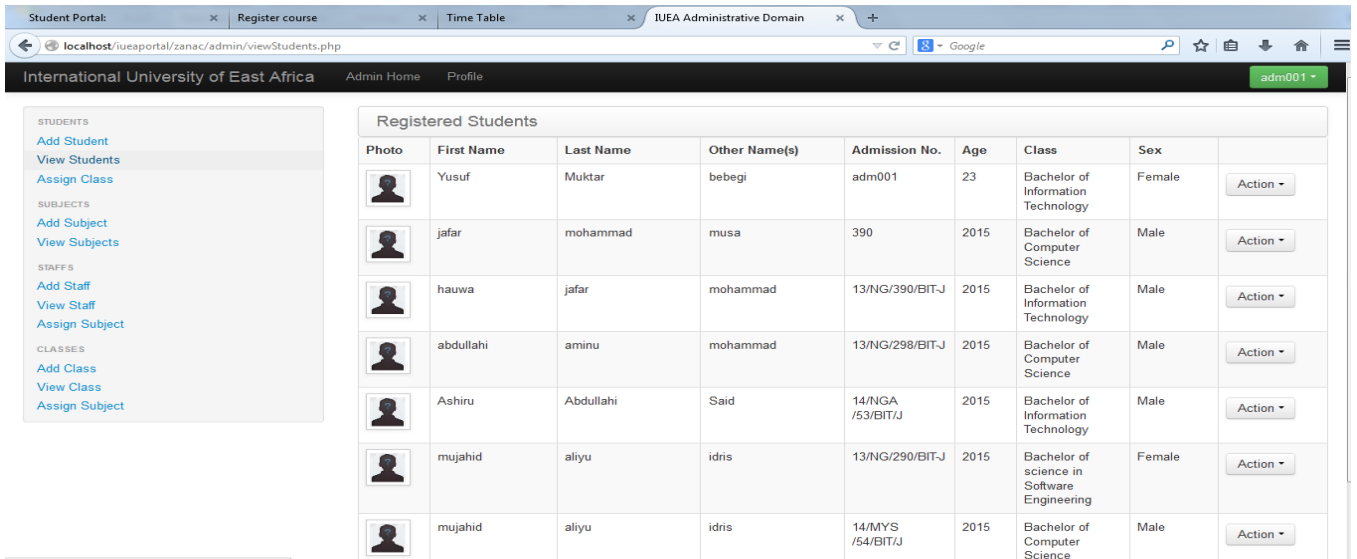


Figure 14: Display of Admin page

In figure 14 an Admin Login to the system and view and manage other user's records

5.3.6 Admin Page

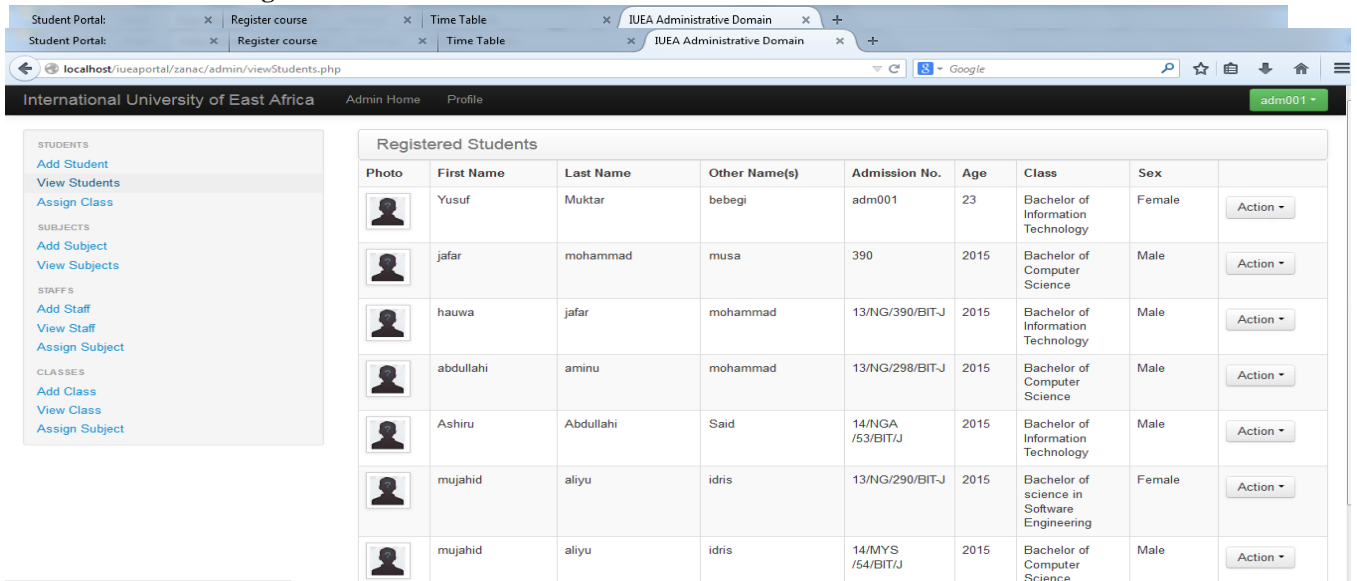


Figure 15: Class assigning page by the admin

Figure 15 shows an Admin assigning classes to be attended by the student.

5.3.7 Admin Assigning courses

The screenshot shows the 'View Subject(s)' page in the IUEA administrative portal. The page contains a table of subjects with the following data:

Subject Code	Subject Name	Assigned Staff	Date Added	Status
Modelling and Simulation	BIT3101	jafar mohammad musa	2014-12-15 09:49:28	Active
2204	Business Intelligence and Data Warehousing	jafar mohammad musa	2014-12-08 01:23:18	Active
2304	Business Technology	fname lname OtherNames	2014-12-08 01:23:41	Active
3303	E-Commerce		2014-12-08 01:20:10	Active
3307	ERP	fname lname OtherNames	2014-12-08 01:22:28	Active
3305	HTML	fname lname OtherNames	2014-12-08 01:21:10	Active
3109	Information System Security	fname lname OtherNames	2014-12-08 01:22:53	Active
3306	Network Administration		2014-12-08 01:21:41	Active
3301	Operating System	fname lname OtherNames	2014-12-08 01:20:51	Active
3302	Project Management	fname lname OtherNames	2013-12-08 01:20:34	Active

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Figure 16: Assigning course

Figure 16 shows how an Admin assign courses to a particular class and a student

5.3.8 Automatic time table generation

The screenshot shows the 'Time Table' page in the IUEA administrative portal. The page features a banner for 'ADMISSIONS 2014/2015' and the IUEA logo. Below the banner is a table showing the generated time table with the following data:

Date	Time	Course Unit	Venue
Monday	10:00am - 2:00pm	BIT3101	LAB F2
	2:00pm - 5:00pm	BIT3102	
Tuesday	10:00am - 2:00pm	BIT3103	LABF2
Wednesday	10:00am - 2:00pm	BIT3104	G14
	2:00pm - 5:00pm	BIT3105	
Friday	10:00am - 1:00pm	BIT3106	G14
	2:00pm - 5:00pm	BIT3107	

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Figure 17: Generating time table

Figure 17 shows how a time table is assigned automatically

5.4 System testing and validation

A system testing was carried out with the aim of finding out errors that were in the system and a validation is to ensure that the system conformed to the then defined user needs and requirements. We presented the system to some of the users so as to get feedback about the system performance in relation to their requirements.

The system was tested in the unit level and integration level. During unit test, unit modules were tested to ascertain that they functioned as individual units. During integration test, the unit modules were linked together and tested to ascertain that they worked together as a system. The authentication of the system could only allow administrative users to access the system information and make the necessary changes.

A test was also conducted to see whether the system is capturing valid data, this was done by putting wrong data and then the system responded by alert messages displaying the type of error. Testing and validation was done successfully.

5.4.1 System Testing Results

The system was tested several times and different number of responses was gathered from different people. Some of the individuals that the system was tested in their presence are IUEA students from different faculties, IUEA Staff and external expertise. Below are the findings from the testing results and responses obtained. Six people were sampled and tested the system in their presence and interviewed them in order to observe how they see the abilities and features of the developed system.

People's category	Feature Tested and response obtained			Total respondents
	User Interface	Validation	System Responsiveness	
IUEA Student	Ease of navigation	Good validation	Quick	5
IUEA Lecturer	It is easy and has clarity	It is good	Fast Enough	3
Student Registration Officer	It is interesting and easy to use	Forms, Session should be enhanced	Very fast response	1
System Development Expert	The interface is good	It is good	Not far from quick	2

Table 25: Summary of system testing results

5.5 System Requirements

System requirements include hardware and software requirements that will be sufficient for the smooth operation of the system.

(i) Software requirements

The system will require supporting software on which it will run. The software requirements range from operating systems to some utility software. The system runs on predominantly Windows Operating Systems including Windows XP, Windows Vista and Windows 7.

MySQL will be required to interpret SQL queries/commands that were used in the implementation of the database and data retrieval from the database. WampServer will be used on windows Operating Systems to process all requests and display results on web pages.

A number of web browsers can be used for this system which include; Mozilla Firefox, Internet Explorer, Opera Browser and Google Chrome. The table below summarizes the software requirement:

Software	Minimum requirements
Web server	Wamp server
Database management system	MySql
Web browser	Firefox, Internet Explorer, Opera, Google Chrome
Operating system	Windows XP, Windows Vista, Windows 7,

Table 16: Summary of system software requirements

(ii) Hardware requirements

These are the minimum requirements of hardware resources required for the system. To ensure faster processing of data, a system with processor speed of at least 1.5GHz, 1GB RAM and storage space of at least 20GB. The table below summarizes the hardware requirements:

Hardware	Minimum requirements
CPU	1.5 GHz
RAM	1GB
Disk space	20GB

Table

17:

Summary of system Hardware requirement

Chapter Six

Summary, Recommendations and Conclusion.

6.1 Summary

This project is aimed at improving the speed, easiness and efficiency in carrying out student registration processes and at the same time provides an avenue for integrating student information and records in a digital way. There is need to guarantee improved quality of service, reduced redundancy of data increase efficiency in registration processes to allow better management of records and this is the area that this project was focused to bring.

We looked at other systems alike and compared them with our system and realized some services were not offered by those systems. So this system targeted to provide a reliable and efficient services that can be used in registration and managing information in academic institutions. Many people both the students and staff will benefit from further development in this area since it is very vital towards success and smooth running of administration and student record keeping purposes.

6.2 Challenges Encountered

- (i) Some people do not provide timely response to the questionnaires allocated to information.
- (ii) There are few authors that directly looked at the student information and registration systems projects therefore it was difficult coming up with the study's literature review.
- (iii) The limited time allocated for the compilation and making the system ready

6.3 Recommendations

We recommend that this system should be used by Universities and other institutions of higher learning such as International University of East Africa (IUEA) because we believe that the system can make the registration process and information management processes effective and efficient.

In future the developed system could be enhanced by from the current status to a mobile application to enable students, staffs and management execute the tasks being carried out by the system using mobile gadgets even on the go. Other modules like Library, payroll and hostel management can be developed and attach to the system to make it cater all the University's information management and record keeping demands.

6.4 Conclusion

It can be concluded that this project was rewarding as it enabled us have a better insight of real world problems and how to go about with solving them. It is also imperative to affirm that the goals we set at the beginning have been met as the system is fully functional as proposed.

Moreover, this system is not only an additional web application on top of the existing multitude of them, but a contributing solution to the problems encountered in student registration and information management services in academic institutions such as IUEA.

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Appendices

Interview Guide: Questions asked during the interview

Appendix I: Interview guide

INTERVIEW QUESTIONS FOR THE STAFF

1. What is the current registration system used in the University ?
2. What are the steps that students take while registering?
3. How do you manage the information and records collected from each student?
4. What are the difficulties and challenges you are facing with this current system ?
5. Do you think it is a good idea to come up with a new system that will ease your work and that of students?
6. If a web based system is developed how do you think it will ease your tasks?
7. Identify the major areas that you will want the new system to cover
8. What impact will the application make to the above areas?
9. Will this benefit the University?
10. Do you think that we can now go ahead with this research study in order to come up with the new system?

THANK YOU VERY MUCH

Appendix II Questionnaire:

Questions asked during the interview

TOPIC: INTRODUCING A WEB-BASED STUDENT MANAGEMENT AND REGISTRATION SYSTEM TO INTERNATIONAL UNIVERSITY OF EAST AFRICA (I.U.E.A)

We are students from the Information Technology department of I.U.E.A currently performing a research study that will enable us come up with a web based student management and registration system. We kindly request for your assistance in answering this questionnaire. Information obtained will be strictly used for educational purpose only.

1. Full Name.....
2. Faculty & Department.....
3. Gender : Male Female
4. Year of study.....
5. Level of study Certificate Diploma Degree Postgraduate
6. How many times do you make registration in this University?.....
7. How do you find the registration process is it satisfactory or not? (please briefly comment)
.....
8. What challenges do you face while registering?
.....
9. Does the current registration system needs review? Yes No
10. If the above is yes please specify briefly.....
.....
11. Are You comfortable that your documents are managed using files and shelves?
.....
12. We are introducing a web-based system for student registration do you think it's a good idea?
Yes No
13. If the above is yes please express your view.....
.....

14. In what ways do you think the system under study will make impact ?
.....
.....
15. Do You think the system under study will benefit both the students and the university?
.....
16. Did you support the idea that we should go on with this system and do you think that the system will help other students like you in this university Yes

THANK YOU VERY MUCH FOR YOUR TIME AND RESPONSE.

Appendix III: Pseudo code

Pseudo code for Admin login

Initialize Parameters to access data (username and password)

If Parameters are equal to null

Alert box, please enter a username and password

Else

Go to Admin page

Pseudo code for Student login

Initialize Parameters to access data (login pin)

If Parameters are equal to null

Alert box, please enter a login pin

Else

Go to personal details page

Pseudo code for Registering New student details

Initialize Parameters to user data

If Parameters are equal to null

Alert box, Please fill in all the required fields

Else

Submit the details and save to database