

**A COMPUTERIZED STUDENTS' RECORDS MANAGEMENT SYSTEM**

**A CASE STUDY OF FACULTY OF SCIENCE AND TECHNOLOGY**

**KAMPALA INTERNATIONAL UNIVERSITY**

**WESTERN CAMPUS**

**BY**

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**BCS/0001/123/DU**

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**TECHNOLOGY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS**

**FOR THE AWARD OF BACHELORS OF COMPUTER**

**SCIENCE DEGREE OF KAMPALA**

**INTERNATIONAL**

**UNIVERSITY**

**OCTOBER, 2015**

### DECLARATION

I Bob John declare this work titled "*Computerized Students' Records Management System*" a case study of Faculty of Science and Technology Kampala International University is mine and has never been submitted in any university or any other higher institution of learning for any award or any other purpose.

Signature  Date: 29<sup>th</sup>/10/2015

Bob John

**Researcher**

### APPROVAL

This research report has been submitted for examination with the approval of the supervisor.

Signed  Date 29<sup>th</sup> October 2015

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## DEDICATION

I dedicate this work to my Sponsors (Dr. Kalenzi David, Dr. Barugahare Banson, Dr. Tanayen Julius Kihdze, Mr. Tibyangye Julius, Mr. Maseluka Richard, Mr. Kiplagat David, Mr. Langati), my Father Mr. Ruboobo Ssalongo Adriano, my Mother Miss Bashanyukire Jasinta, my close Friends Miss Komugisha Christine, Mr. Gyezaho Angello and Mr. Natwijuka Stuart, My Brothers and Sisters, who gave out most of the necessary requirements to have me financially supported to undertake this course.

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I wish to also thank all the academic staff of Faculty of Science and Technology Kampala International University for all the guidance offered to me during the research development.

In a special way, I wish to express my sincere appreciation to Mr. Turiabe Victor for the expertise and intelligence he has displayed while supervising this project.

May GOD reward them abundantly!

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## ABSTRACT

A computerized students' records management system (CSRMS) is a computer program designed to capture, store, manage the creation and maintenance of students' records in an organisation. Records management (RM) is the practice of controlling records of an organization from the time they are created to the time of disposal which includes indentifying, creating, classifying, using, storing, securing, retrieving, and destroying or permanently preserving records. Records management system (RMS) is a collection of elements in an organization managing records. The activities in this management include the systematic and efficient control of the creation, maintenance and destruction of the records along with the business transaction associated with them, for this case which is students' records management system.

The major objective of the study was to design a Computerized Students' Records Management System that would help the Faculty of Science and Technology KIU-WC to efficiently and effectively manage Students'.

The specific objectives of this study were to investigate the current system of students' record management. gather requirements for designing a computerized students' records management system, design and develop a computerized records management system, test, implement and validate the system. Data was gathered using interviews, observation and questionnaires. The collected data was sorted and analyzed using Microsoft excel software and it was found out that the current manual system is in efficient, time and space consuming in addition to being insecure hence judged not good for the management of records.

After gathering the requirements, entity relation diagrams and dataflow diagrams were used to design the computerized system. Microsoft Visual basic was used to create user interface while Ms- Access was used to create the database.

The Computerized system developed enables electronic capturing of students' data, storing of this data in an electronic database which eases the retrieval of the same data, any time by only authorized people. The developed computerized system also allows the backup of data on movable devices like flash disks, memory cards and external hard drives which increases the capacity of backup. The computerized system reduces a burden of over compiling of papers and the need for more shelves which reduce congestion in the Faculty of Science and Technology.

## LIST OF ABBREVIATIONS AND ACRONYMS

CSRMS	Computerized students' records management system
CS	Computer Science
KIU	Kampala International University
KIU-WC	Kampala International University Western Campus
RM	Records Management
RMS	Records Management System
H.O.D	Head Of Department
IT	Information Technology

## DEFINITION OF TERMS

**A system:** It is a group of components (people, objects and processes) that work together to achieve a common goal, or multiple goals, by accepting input, processing it and producing output in an organized manner.

**Records:** They are specific pieces of recorded information generated, collected or received in the initiation, conduct or completion of an activity and which comprises sufficient content, context and structure to provide proof or evidence of that activity’.

**Records management (RM):** Is the practice of controlling records of an organization from the time they are created to the time of disposal which includes identifying, creating, classifying, using, storing, securing, retrieving, and destroying or permanently preserving records.

**Records management system:** Is a collection of elements in an organization managing records. The activities in this management include the systematic and efficient control of the creation, maintenance and destruction of the records along with the business transaction associated with them, for this case which is students’ records management system.

**A computerized students’ records management system:** Is a computer program or set of programs designed to manage and store records. The software can be used to manage the creation and maintenance of records with in classification schemes, apply retention and disposal schedules, and control access and use.

## **CHAPTER ONE:**

### **INTRODUCTION**

#### **1.0: Introduction**

This chapter includes the background of the study, problem statement, objectives of the study (both general and specific objectives), scope of the study and significance of the study.

#### **1.1: Background of the study**

Records management (RM) is the practice of controlling records of an organization from the time they are created to the time of disposal which includes identifying, creating, classifying, using, storing, securing, retrieving, and destroying or permanently preserving records.

Records management system (RMS) is a collection of elements in an organization managing records. The activities in this management include the systematic and efficient control of the creation, maintenance and destruction of the records along with the business transaction associated with them, for this case which is students' records management system.

Kampala International University Western Campus is situated in Ishaka town, 58KM along Mbarara-Kasese Road in western Uganda. This campus was opened on 1<sup>st</sup> November 2004 with the aim of introducing many faculties and the first faculty introduced was the Faculty of Science and Technology.

Currently, the faculty of science and technology at KIU western campus is one of the Faculties with the highest number of students. For easy management of records, it is a must for every new student to register with the faculty at Kampala International University. When a student visits the faculty for registration, he or she is given a sheet of paper with particulars like names, gender, age, course applied, nationality, and contacts for him or her to fill. The student fills all the required information on the sheet (registration form) of paper, buys a file, puts his registration form in the file and then submits the file to the faculty secretary. A file is then kept in the cabinet for future retrieval. Records management is important because it helps the administration in decision making by determining the progress of the project. If records are not well managed it is difficult to determine whether the project is successful or not.

The Faculty of Science and Technology also use the traditional method (use of pens, papers and paper files) to register students and keeping them in files and there is also use of computers at a small extent.

Under the above mentioned method of record keeping, the faculty members get hard time to update, manage and retrieve the files and it takes them long time to arrange and search for the needed files. There is also a challenge of loss of some files because every semester the numbers of students keep increasing which leads to the misplacement of files. This also results into the need for more cabinets/shelves which consume a lot of space congestion in the faculty.

The Faculty will continue to lose much to in hiring extra manpower, fail to deliver timely services and delay in decision making. However, CSRMS has proven to be more reliable, effective and efficient since it allows easy retrieval, security of the data, easy to back up, ease capturing and storage.

The above background inspires the researcher to develop a Computerized Records Management System for the Faculty of Science and Technology at KIU-WC.

## **1.2: Problem statement**

The Faculty of Science and Technology at Kampala International University Western Campus use the traditional methods of data management that is the use of pens, paper file (paper based system) and papers, to manage and record students' information.

The information is captured on paper, stored in a file(s) which are in turn kept in wooden shelves. Since the number of students keeps increasing, the records become too many and are compiling. For this matter, it becomes hard to access a specific file, tiresome and time wasting since one has to go through all the files. It becomes inefficient, time wasting during the generation of reports and retrieval of files also becomes very hard. The records are hard to backup because it needs writing again which wastes time and photocopying which is costly and consumes space, with time the ink gets washed and papers are easily attacked by rodents. These methods of keeping records are outdated according to today's technological level.

This compromises the critical principles of information which include security, confidentiality and availability. Therefore the aims of designing a computerized based records management system that would ease the capturing, storage, security and retrieval of students' records.

### **1.3: General objective of the study.**

To develop a computerized system that would ease the management of the students' records effectively and efficiently to enable timely decision making under the Faculty of Science and Technology at KIU-WC.

#### **1.3.1: Specific objectives of the study.**

- i. To investigate the current system of students' record management under the Faculty of Science and Technology at Kampala International University western campus.
- ii. To gather requirements for designing a computerized students' records management system.
- iii. To design and implement a computerized records management system that will enable easy storage, timely retrieval and security of students' records
- iv. To test, and validate the system.

### **1.4: Scope of the study**

The researcher centered his study to the faculty of science and technology at Kampala International University Western Campus located in Ishaka town, Bushenyi district along Mbarara-Kasese road.

The research was carried out from the month of January to October 2015 and came up with a computerized students' management system which would enable the faculty to manage the students' records with ease.

### **1.5: Significance of the study**

Electronic backup. The use of computerized system helps the faculty to record students information easily and improves backed up which also improves security of data and information because in case of any destruction, copies of that information can easily got on backups.

The study helps other scholars who will come up with the idea of doing research in a related field and they can use it as a reference to their research.



Cost saving and cost avoidance. CSRMS helps to reduce the costs of handling the paper work associated with record keeping because once the system is fully functional, however, the back-up paper system is no longer needed. This saves the cost of space, buying papers and cardboards as the records accumulate.

Physical space required by the paper based system is minimized since computers don't take much space compared to the existing system.

Data Integrity: CSRMS maintains data integrity and thus eliminates accidental duplicate entry by organizing information throughout all system modules. This helps the management by minimizing the time spent searching and retrieving for a particular file.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0: Introduction**

This chapter contains the surveys of previously concluded studies and documentations that are in existence, which attempt to explain the importance of computerized students Record Management systems in faculty of science and technology at KIU. The literature in this chapter rendered contribution to the validity and completion of the research, design and implementation of this project.

#### **2.1: Investigation of the current system of students' records management.**

##### **2.1.1: A System**

A system is a group of components (people, objects and processes) that work together to achieve a common goal, or multiple goals, by accepting input, processing it and producing output in an organized manner. There are people, objects and processes in computer systems, the processes are for example computer programs and the objects are the computer hard ware. Every system – be it computer based or not has to accomplish the activities required for it. Therefore, what all systems have in common is a goal out of some desire to overcome a certain set of tasks. (Webster and Watson 2002) noted.

The faculty of science and technology at KIU-WC registers student by use of traditional methods where by students are sent to buy paper files, use pens to record their information on papers (registration form) and the files are kept in shelves for later retrieval. For this matter therefore, as the number of students keep increasing, the papers and the registration file also increase which therefore demand for more shelves which occupy too much space hence inconsistency. Accessing specific information is tiresome and time wasting since one has to go through all the files hence becoming inefficient, time wasting during the generation of reports, retrieval also becomes very hard and papers are attacked by rodents like cockroaches.

According to the above mentioned problems of the current system and how Webster and Watson explained about how a system should behave, the Faculty of Science and Technology needs a computerised system that will help them accomplish the activities required to register students.

### **2.1:2: Records**

International Standardization Organization for (ISO), 2001 Defines records as ‘information created, received, and maintained as evidence and information by an organization or person, in pursuance of legal obligations or in the transaction of businesses.

The International Committee on Archives (CIA) and Electronic Records defines a record as, ‘a specific piece of recorded information generated, collected or received in the initiation, conduct or completion of an activity and which comprises sufficient content, context and structure to provide proof or evidence of that activity’.

While the definition of a record is often identified strongly with a document, a record can be either a tangible object or digital information which has value to an organization. According to the above definitions, I therefore recommend that the records should be kept by use of a good method for the final completion of any given activity.

### **2.1:3: Records management**

Obrien (2002) defines Records management as an activity established by an organization to achieve economy, efficiency and effectiveness in the creation, distribution, use, maintenance, storage, and disposition of all types of records created or received by that organization in the course of its business. These functions enable processes within the system to achieve the objectives of maximizing information benefits while minimizing related costs. In essence a records management system provides the right information, to the right person at the right time, for the right length of time, at the lowest possible cost.

A computerized students’ records management system should be able to capture students’ records created by the faculty of science and technology.

## **2.2: Requirements for a computerized students’ records management system**

### **2.2:1: Computerized students’ records management system**

A computerized students’ records management system is a computer program or set of programs designed to manage and store records. The software can be used to manage the creation and maintenance of records with in classification schemes, apply retention and disposal schedules,

and control access and use. The requirements for a Computerised records management system are of two types: nonfunctional requirement and functional requirements.

Functional requirements describe what the software system should do or the behavior of the system as it relates to the system's functionality while nonfunctional requirements describe how the system will do its intended work in other words the performance characteristics of the system.

Functional requirements are grouped according to the clusters in the high-level model: Create which includes capturing, identification and classification. Design which includes ease of use, performance, system availability and interoperability. Maintenance which includes control and security of the system, hybrid records, retention, migration and disposal. Disseminate which includes search, retrieve and render. Administer which covers administrative tools. (ICA, 2008)

Nonfunctional requirements include ease of use, performance and scalability, system availability, technical standards, legislative and regulatory requirements, outsourcing and third, party management of data, long term preservation and technology obsolescence. (Bruxelles-Luxembourg, 2001)

## **2.3 Designing and developing a computerized records management system.**

### **2.3.1: Steps in Developing a Records Management System**

O'Brien (2002) recommends the following steps while developing a records management system:

- a) Review the existing system
- b) Defining the data needed for relevant units within the organization
- c) Determine the most appropriate and effective data flow
- d) Design the data collection and reporting tools
- e) Develop the procedures and mechanisms for data processing
- f) Develop and implement a training program for data providers and data users

- g) Pre-test, and if necessary re-design the system for data collection, data flow, data processing and data utilization
- h) Monitor and evaluate the system
- i) Develop effective data dissemination and feedback mechanisms
- j) Evaluate the system

According to the above steps, the researcher recommends that following them while designing a system may lead efficient and effective one.

#### **2.4 Testing and validating of the system designed.**

Assurance of reliability of software is achieved by execution of quality plans and testing during the software development process. This involves unit code testing and integration testing in accordance with the principles of (ISO 12207) and (IEEE 1298 and IEEE 829). The development and testing of hardware and software should be done, documented and formally agreed between the various parties. This can ultimately provide evidence in support of good quality compliance. Locations and responsibilities for testing (depending on the category of the software and system) are outlined.

One of the most critical aspects of development of software is the integration testing phase where individual elements of software code (and hardware, where applicable), are combined and tested during or prior to this stage until the entire system has been integrated. Extra benefits may be achieved by code walkthroughs including evaluation of critical algorithms and/or routines, prior to testing. Errors found at the integration testing phase are much cheaper to correct than errors found at a later stage of testing. Code review (walk-through) is best done as early in the process as possible, preferably before submitting a module to test. Code reviews are best performed before formal unit code testing (i.e. before a unit or module is frozen and enters formal testing).

Test scripts should be developed, formally documented and used to demonstrate that the system has been installed, and is operating and performing satisfactorily. These test scripts should be related to the User Requirements Specifications and the Functional specifications for the system. This schedule of testing should be specifically aimed at demonstrating the validation of the system. In software engineering terms satisfactory results obtained from the testing should

confirm design validation. Any processing equipment and activities related to or controlled by the computer system would require additional IQ (installation qualification), OQ (operational qualification) and PQ (performance qualification) testing regimes. It may be appropriate to combine test phases and test scopes for a group of equipment or activities, and this should be defined in a test plan or strategy. Regulated Users should be able to demonstrate formal acceptance of systems after testing and controlled transfer into the live operational environment.

For the validation of computerised systems there should be a system in place that assures the formal assessment and reporting of quality and performance measures for all the life-cycle stages of software and system development, its implementation, qualification and acceptance, operation, modification, requalification, maintenance and retirement. This should enable both the regulated user, and competent authority, to have a high level of confidence in the integrity of both the processes executed within the controlling computer system(s) and in those processes controlled by and/or linked to the computer system(s), within the prescribed operating environment(s). (PIC/S GUIDANCE, 2007) (PA/PH/OMCL (08) 88 R, 2009)

According to the above testing and validation steps, if they are used properly, the system can run very well.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Introduction**

This chapter discusses the type of research methodology that was used by the researcher; the data gathering techniques that were done during the interview and the evaluation of the respondents. It also covers the research design that was used, the study population, sample selection and size, research instruments, validity and reliability testing of the instruments, the procedure that was used to collect data. The method and technique that was used to process, analyze and design the Computerized Records Management System.

#### **3.1 Research method**

This study was grounded upon descriptive research design principles in order to capture, analyze and interpret necessary information which eventually led to the completion of a computerized Students' Records Management System (CSRMS). This type of research is more of analytic or statistical type of research wherein the data descriptions must be factual, accurate and justifiable. In order to identify and define the existing process by which the system was based upon, the researcher used questionnaires, observations and interviews. The researcher first conducted a series of observational activities and surveys that ensured that all of the underlying principles and plans were carefully set and planned into achieving a Computerized Students Records Management System.

#### **3.2 Area of the study**

The study was conducted in the faculty of science and technology at KIU Western Campus specifically in the Faculty Dean's office and Heads of Department's office which determined the accuracy, efficiency, reliability, security, user-friendliness, flexibility, validity of the system and supported the ideas and concepts of the researcher.

#### **3.3 Procedure of data collection**

The researcher obtained an introductory letter from the Faculty of Science and Technology. This helped in personal identification to the respondents as a student carrying out a research study to benefit me. At the end of data collection, questionnaires, notes taken, and documents collected were compiled/ put together which helped in data processing.

### **3.4 Study population**

The study population consisted of 10 staffs that included Faculty Deans, Heads of Departments (H.O.D), data entrants and lecturers in the faculty of science and technology.

### **3.5 Sample size**

The sample size was eight (8) and this size consisted of the following; 1 Faculty Dean, 2 Heads of Departments (H.O.D of Basic Sciences and H.O.D of Computing Department), 2 data entrants and 3 lecturers from different departments. The above people chosen were interviewed with the use of questionnaires whereby questions were printed out on sheets of papers and given to them and also interviews were used as data collection tools.

### **3.6 Research instruments and technique**

To bring about the effectiveness of the project, the researcher used questionnaire, interviews and document reviews.

#### **Questionnaire**

This was the dominant primary data collection method in the study. Under this part, the questionnaire was given to the respondents and this was the main data collection instrument in the study. The questionnaire was designed to gather information and explore the key variables addressed to management of staff records. Both open and closed ended questionnaires were used and they encouraged respondents to give their own opinions about the research problem and the information got was used for decision making during the design of the computerized system. This method was chosen because it gives first-hand information to the researcher. More to that, large amounts of information was collected from a large number of people in a short period of time and in a relatively cost effective way.

#### **Interviews**

The researcher conducted face – to- face interviews with the stake holders. An interview schedule was drawn and guiding questions prepared which also acted as a tool for collecting data. The interviews were conducted on the study population in the Faculty of Science and Technology. The interview method was chosen because it's reliable, accurate and gives



satisfactory results. It helps to discover how individuals think and feel about a topic and why they hold certain opinions.

### **Document review**

A thorough review of the documents was done in the Faculty of science and technology with the intent to study how students' records are managed and discover the loopholes in the system. A number of documents were reviewed including personal files, daily routines per student. This method was chosen because it's cheap as data is already available thus it permits examination of trends over the past and there are few biases about information

### **3.7 System Analysis.**

Data collected was analyzed using Ms Excel software which gave the researcher the way forward of coding and represents descriptive data which is in terms of numbers.

### **3.8 System design**

The system was designed basing on windows environment and Microsoft visual basic 2005 was used to design the user interfaces while Microsoft Access was used in designing a database (DBMS) for storing data thereafter a logical connection was established which helped in sharing data between all the platforms of soft wares used.

System design was done in two different levels, i.e. logical design and physical design. Under the logical design, sequence diagrams were used to show the interactions between the users and system, under the physical design programming languages Microsoft visual basic 2005 was used and Ms Access for data base management.

### **3.9 Implementation**

The system was implemented using Microsoft visual basic 2005 for the creation of user interfaces and Microsoft access for database design after which a logical connection was made.

### **3.10 Testing and Validation**

Testing was meant to prove that the completed system would do what it was meant to. Testing was carried out at each phase to identify errors and keep track of the changes made to the system. The system was tested using sample data collected from the Faculty which helped to meet the required specifications.

There are three main types of testing namely unit testing which involved testing individual software components or modules. This was done by the programmer because it required detailed knowledge of the internal program design and code. Integration testing which involved testing the integrated modules to verify combined functionality. And functional testing which involved focusing on the output as per requirement. This type was geared to functional requirements of an application ignoring the internal parts of the system.

## **CHAPTER FOUR**

### **SYSTEM ANALYSIS AND DESIGN**

#### **4.0: Introduction**

This chapter discusses how the researcher presented and analyzed data and how the new system was designed.

#### **4.1: Data Analysis**

Data was collected using questionnaires, interviews and observation from different individuals in the faculty and was analyzed using Microsoft excel. The results got were presented in form of frequency tables, pie charts and graphs.

##### **4.1.1: Results obtained by interview**

The researcher conducted interviews where most of the people including H.O.Ds, lectures and the Dean in the faculty were asked questions related to the current Students' Records Management System, how it works and the challenges being faced while using it. The researcher found out that the current system of records management was not perfect to the Faculty in terms of time management, file retrieval and storage.

The interview results are presented in the tables as follows: -

#### 4.1.2: Education level of respondents

N = 6

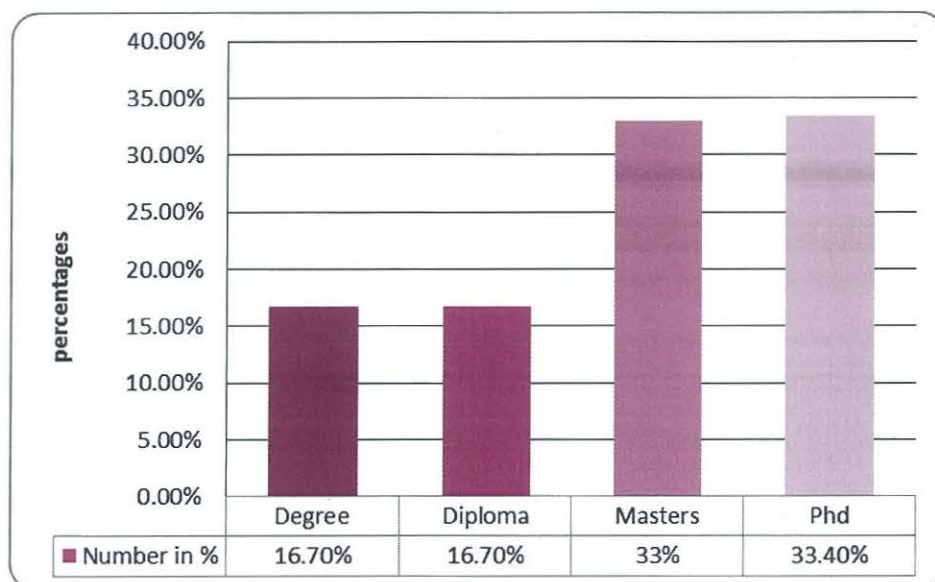


Figure 1: Education level of respondents

The above figure shows levels of Education according to the Faculty members. The percentage of the faculty members having Bachelors was 16.7, those having Diplomas were 16.7, those with Masters were 33.4 and those with PhDs were 33.4.

This encouraged the researcher to design and implement the Computerised Records Management System since all the members in the faculty are literate

#### 4.1.3: Key records management functions performed in the Faculty of Science and Technology

N = 6

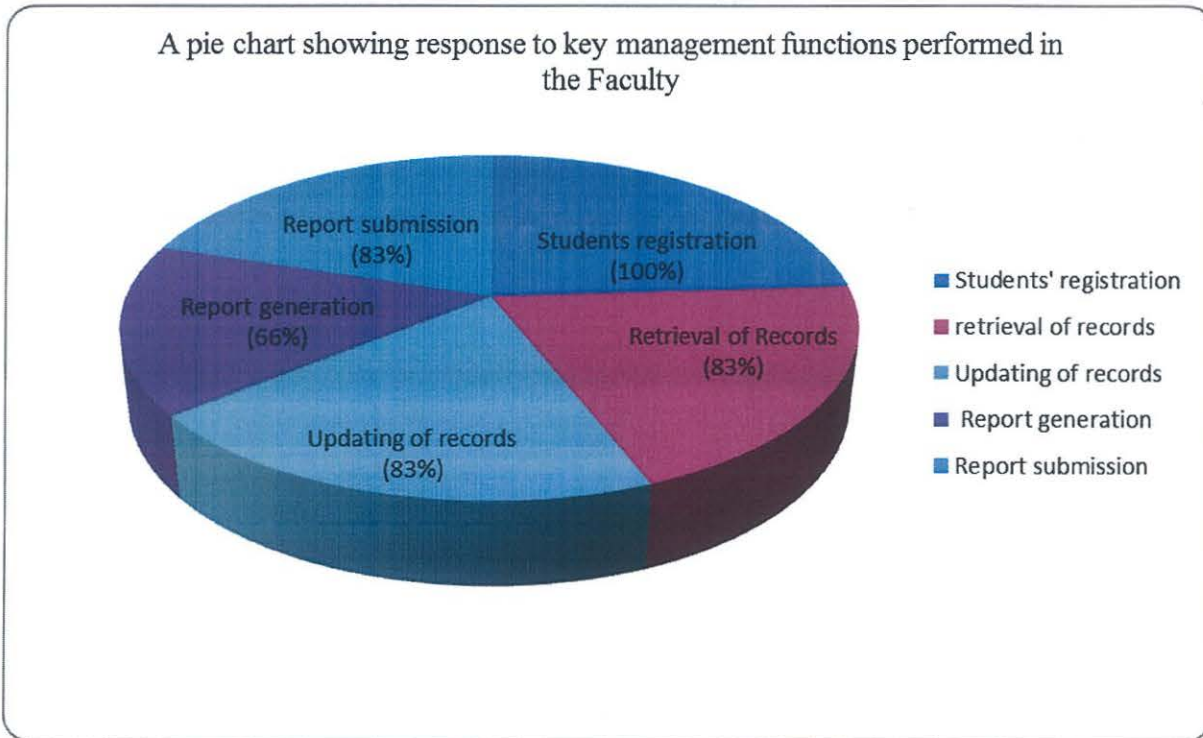


Figure 2: Key records management functions performed

All respondents (100%) supported students' registration, 83% supported records retrieval, 83% supported updating of records, 83% supported report submission, 63% supported report generation and this gave a researcher an appropriate view of what and how the system should work such that it could fully help to achieve users' needs.

#### 4.1.4: How students' records are captured and reports generated in the Faculty

According to six (6) respondents got from the Faculty of science and technology, 4 said that they use a traditional method (use of pens, papers and manual file) and 2 said that they use both computers and traditional method. But they emphasized that though they use computers to capture students' records, traditional method covers a big range in relation to computers.

#### 4.1.5: How long it takes to register and retrieve a form/report of a single student

N=6

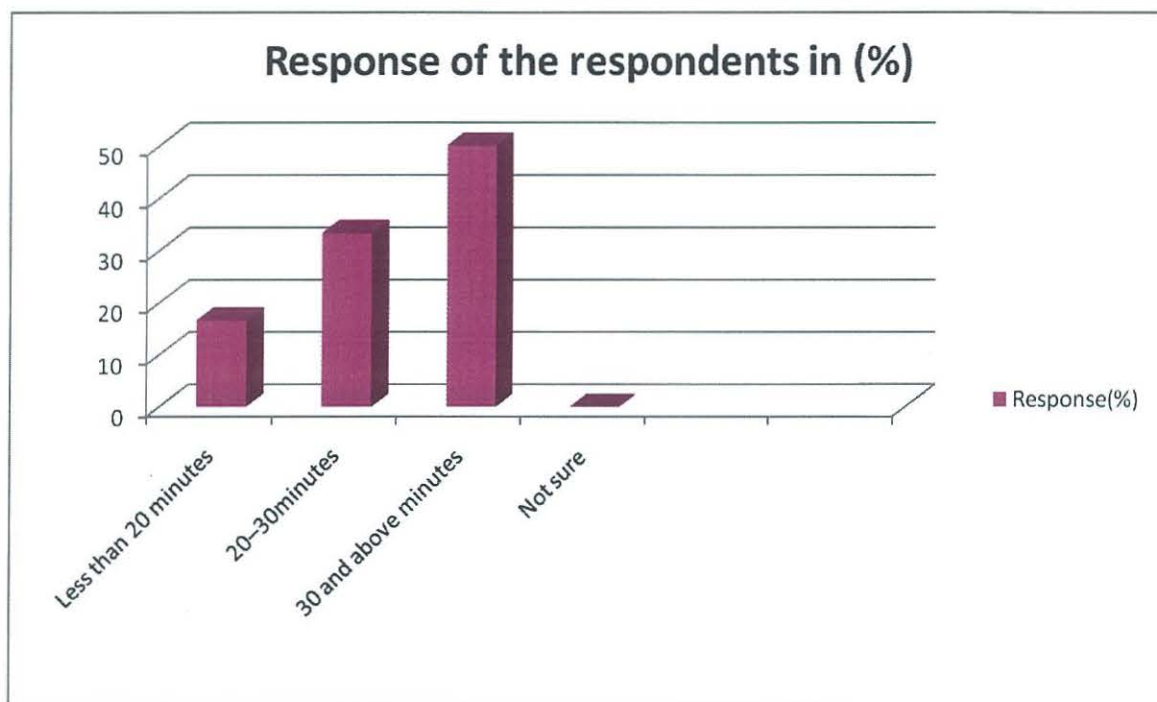


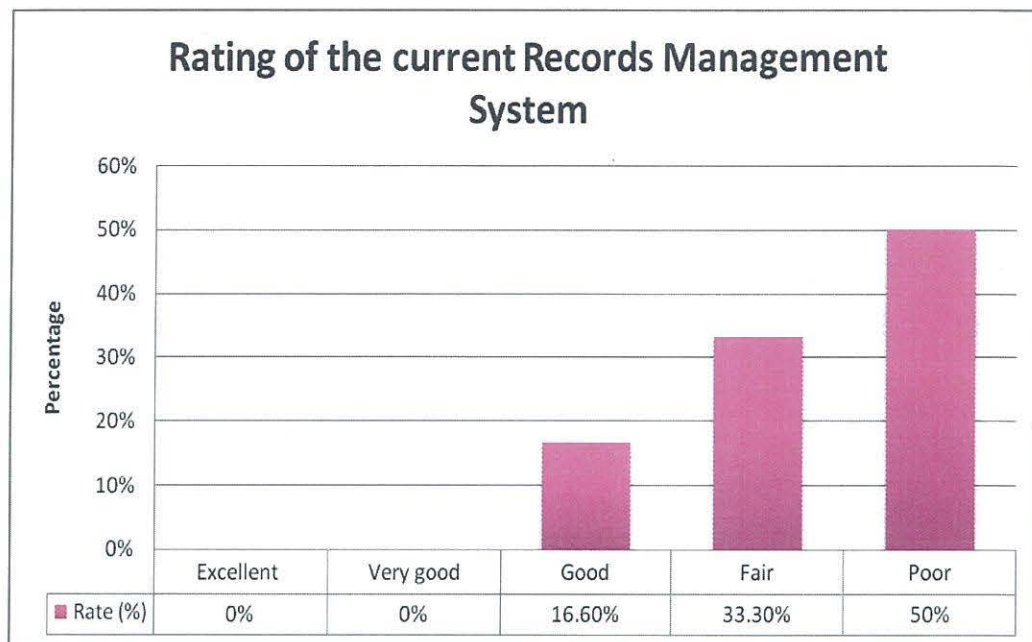
Figure 3: How long it takes to register and retrieve a form/report

Out of the 6 respondents, 1 respondent (16.67%) said that it takes less than 20 minutes to generate a single report, 2 respondents (33.33%) said it takes 20-30 minutes, 3 respondents (50%) said it takes 30 and above minutes and none (0%) of the respondents was not sure.

According to the above response about the time taken to generate or retrieve report for a single student, it is clearly shown that many respondents said that it takes more than 30 minutes which is too much for only one student which indicates a need for a Computerised system that reduces time taken to generate a report of a single student.

#### 4.1.6: How the current records management system was rated by respondents

N=6



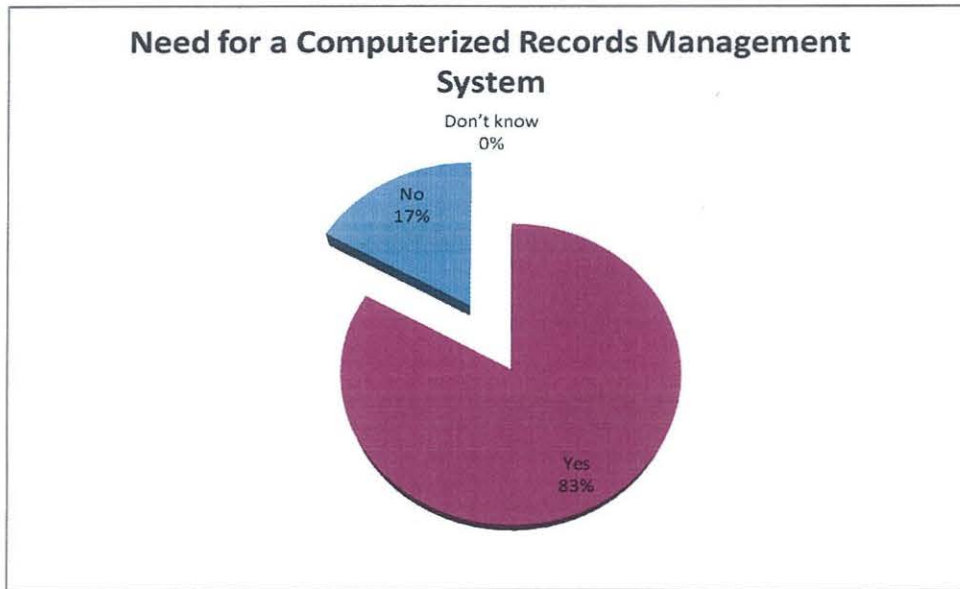
*Figure 4: How the current records management system was rated by respondents*

Out of 6 the respondents, none of the respondents (0%) rated the current system as excellent or very good, 1 respondent (16.67%) rated the current system as good, 2 respondents (33.3%) rated the current system as fair while 3 respondents (50%) rated the current system as poor hence citing the need for a better system.



#### 4.1.7: Need for a Computerized Records Management System

N = 6



*Figure 5: Respondent's need for a computerized records management system*

Out of 6 respondents, 5 respondents (83.33%) expressed the need for a computerized records management system, 1 respondent (16.17%) responded that there was no need for a Computerised system. This motivated the researcher to develop a computerized records management system.

## 4.2: Systems Analysis and design

### 4.2.1: Existing system

The Faculty of Science and Technology was using traditional method (use of pens, papers and paper files) to register students and keeping them in files and there was also use of computers at a small extent.

Under the above mentioned method of record keeping, the faculty members used to getting had time to update, manage and retrieve the files and it used to take them a lot of time to arrange and search for the needed files. There was also a challenge of loss of some files because every semester the numbers of students keep increasing which leads to the miss use of files. This also



results into the need of more cabinets/shelves which used to consume a lot of space hence congestion in the faculty. This proves the current manual system inefficient and insecure hence not able to enhance business in today's technological era

#### **4.2.2: Weakness of the current system**

The current system uses a lot of paperwork which takes much time as compared to other methods of records keeping. It also makes it difficult for the users to retrieve a particular file because one has to go through all the files first. Congestion was also another weakness since files kept increasing as the number of students also was increasing and this resulted into need of more shelves which increased congestion in the faculty. Another weakness is loss of some files because as files increase in number, the old ones are seen as useless hence misused. The current system was insecure in terms of data access and confidentiality. This was more so because there are no strict measures implemented that denies unauthorized people from accessing the information and this led to data being distorted or compromised with.

To solve the above weaknesses of the current system, it requires good measures to ensure that the system can meet users' needs.

It required a computerised students' records management system to solve all the above problems.

#### **4.2.3: The Designed System**

The system designed was a computerized system which would help in storing a lot of data/information and carry out automatic report generation. The new system was more advantageous than the old system in the following ways; the new system generates reports within minimum time and with minimum errors as compared to the old system. The new system used computerised methods in capturing and processing of data which were cheaper as compared to the old system which used papers and pens that take a lot of time and space during processing and capturing and consumes a lot of space. Since the new system does not occupy a lot of space, it made it easy for the faculty to overcome the problem of congestion.

All the records/particulars like (names, gender, Nationality, age) concerning students were captured electronically in the new system stored in the database for the efficiency of the system.

#### **4.2.4: System Users and their requirements**

During analysis of the system, different user categories were identified with their requirements. The system users include; Heads of Departments, data entrants (secretaries) and the Faculty Dean.

Authorized users have certain roles that determine their usage. The user requirements for each user were identified and are as follows:

The authorized data entrants can use the system to:-

Register a new student into the system

Update and edit information of individual student

Search and view student's reports

The system administrators (H.O.Ds and the Faculty Dean)

Add new users to the system

Delete users from the system

View all the reports

#### **4.3: System requirements**

There two categories of requirements namely; Functional and Non-functional requirements.

**Functional requirements are grouped according to the clusters in the high-level model:**

- The system should authenticate the users of the system.
- The system should only allow the administrator to delete records from the database.
- The system should allow the users to create reports which include capturing, identification and classification.
- The system should be able to carry out maintenance which includes control and security of the system, hybrid records, retention, migration and disposal.

- The system should be able to disseminate which includes search, retrieve and render.

**Nonfunctional requirements include;**

- Ease of use which includes speed of the system
- Performance and scalability,
- System availability,
- Technical standards, legislative and regulatory requirements, outsourcing and third party, management of data, long term preservation and technology obsolescence.

**4.3.1: Minimum hard ware and software requirements**

Hard ware	Minimum system requirements
Cycle speed	100 Mega Hertz (MHZ)
Display monitor	800x600 colors (1024x768 high color 16 bit recommended)
Memory/RAM	128 MB RAM (256MB recommended)
Processor	Intel Pentium, Intel Celeron
Hard Disk space	40 GB

*Table 1: Hardware requirements*

**Software requirements**

Software	Minimum system requirements
Operating System	Windows environment (Windows XP, Windows 7, Windows 8, Windows 10)
Database Management System	Ms Access
Firewall/Antivirus	AVG, Kaspersk, Avast and any other

*Table 2: Software requirements*

4.3.1.1: Data Flow Diagram

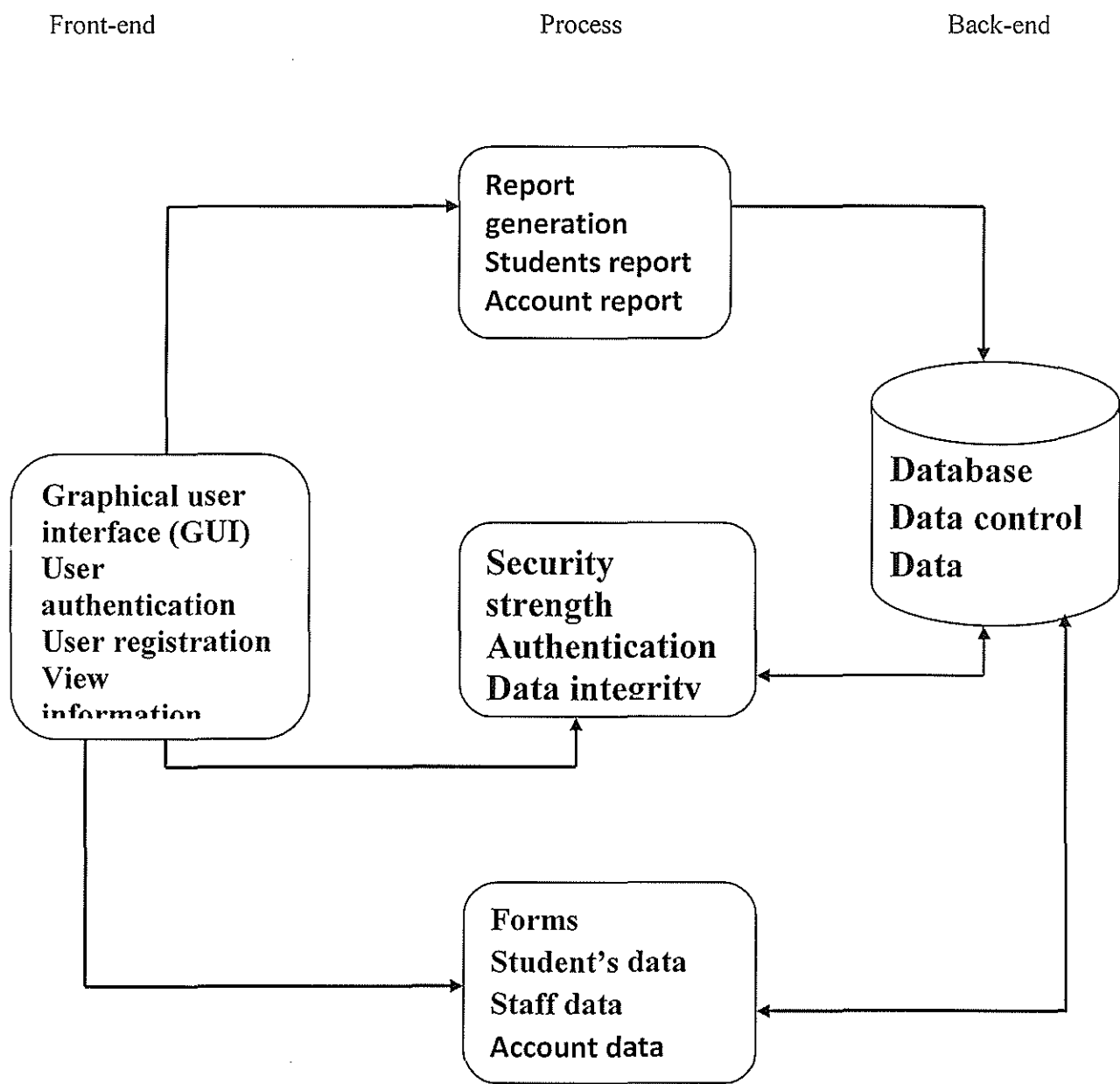


Figure 6: Data flow diagram

#### 4.3.1.2: Context Diagram for the Proposed System

This diagram describes the system data flow from the users to the administration which is the final user stage of the system.

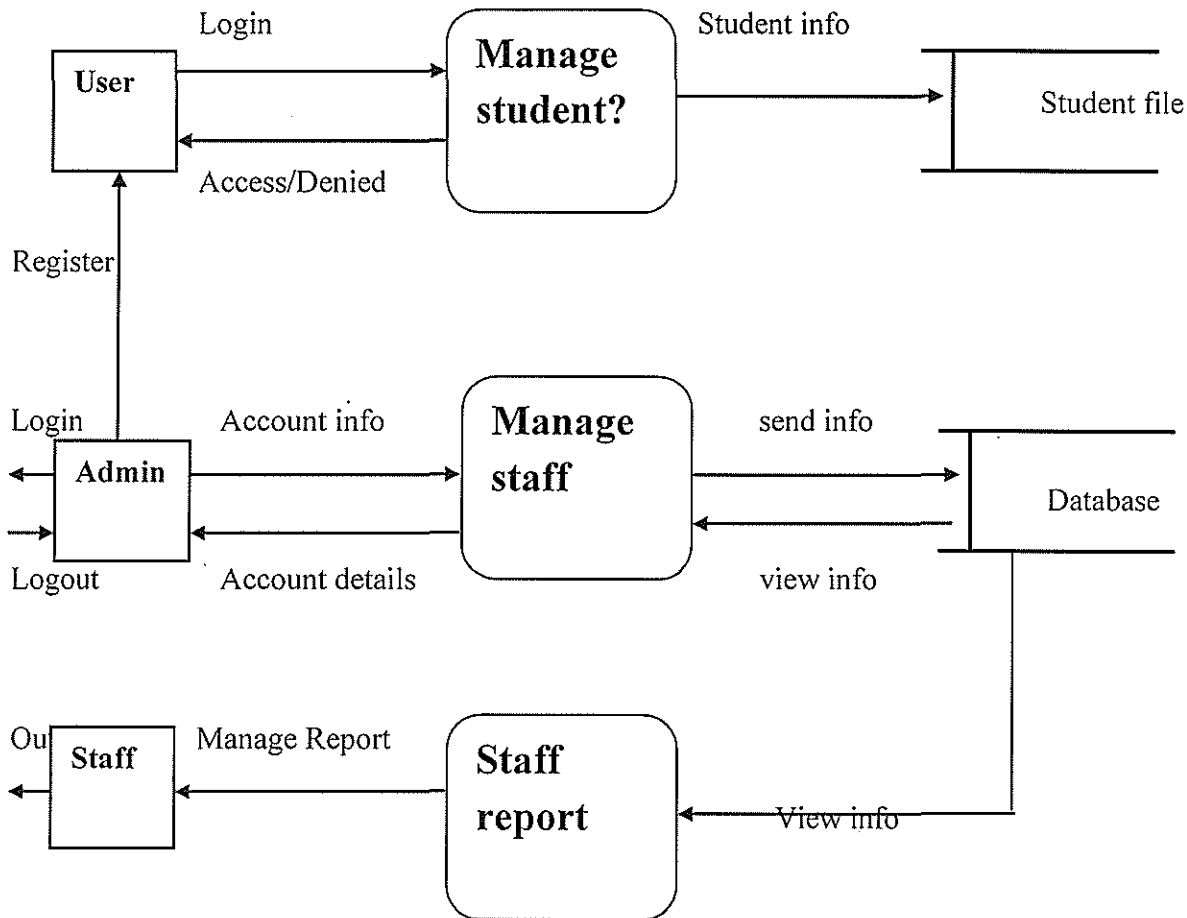


Figure 7: Context Diagram for the Proposed System

During the registering process, the students' information is captured by the staff and stored in the students' records files. During the assessment process the student is assessed and records kept in the assessment records. During the reporting process, the student receives the reports while the staff manages those reports.

#### Key of symbols



Entity



Process



Data storage



Data flow

#### 4.4: Data dictionary of the DFD

Name	Description
Staff	This entity represents authorized member that can make interactions in the system
Student	This represents a person that receives a service from the system.

*Table 3: External Entities of the DFD*

Process name	Description
Registering	This process indicates how a student is registered into the system
Retrieving	This process indicates how staff searches for the available reports in the system.
Reporting	This process indicates who makes and receives reports from the system.

*Table 4: Process in the DFD*

## 4.5: Data Modeling

### 4.5.1: System Entities and their associated attributes

<i>Entity</i>	<i>Attributes</i>	<i>Data type</i>	<i>Size</i>	<i>Constraint</i>	<i>Null</i>
<i>FacultyStaff</i>	<i>Staff_name</i>	<i>Varchar2</i>	<i>20</i>	<i>Primary Key</i>	<i>No</i>
	<i>Staff_title</i>	<i>Varchar2</i>	<i>12</i>		<i>No</i>
	<i>Staff_id</i>	<i>Varchar2</i>	<i>12</i>		<i>No</i>
	<i>designation</i>	<i>Varchar2</i>	<i>13</i>		<i>No</i>
	<i>Address</i>	<i>Varchar2</i>	<i>15</i>		
<i>Student</i>	<i>Student_name</i>	<i>Varchar2</i>	<i>30</i>	<i>Primary key</i>	<i>No</i>
	<i>Student_age</i>	<i>Int</i>	<i>2</i>		<i>No</i>
	<i>Student_nationality</i>	<i>Varchar2</i>	<i>15</i>		<i>No</i>
	<i>Student_gender</i>	<i>Varchar2</i>	<i>8</i>		<i>No</i>
	<i>students_RegNo</i>	<i>Varchar2</i>	<i>12</i>		<i>No</i>
	<i>Phone_no</i>	<i>Int</i>	<i>10</i>		<i>No</i>
<i>Registration</i>	<i>reg_no</i>	<i>Varchar2</i>	<i>15</i>	<i>Primary key</i>	<i>No</i>
	<i>documents</i>	<i>Varchar2</i>	<i>30</i>		<i>No</i>

Table 5: Entities and their associated attributes

### Relationship sets

This is a list of the major relationships between the data in the system

FacultyStaff *manages* Student

Student *registers with* Faculty

Facultystaff *registers* Students

#### 4.5.2 Entity Relationship Diagram (ERD)

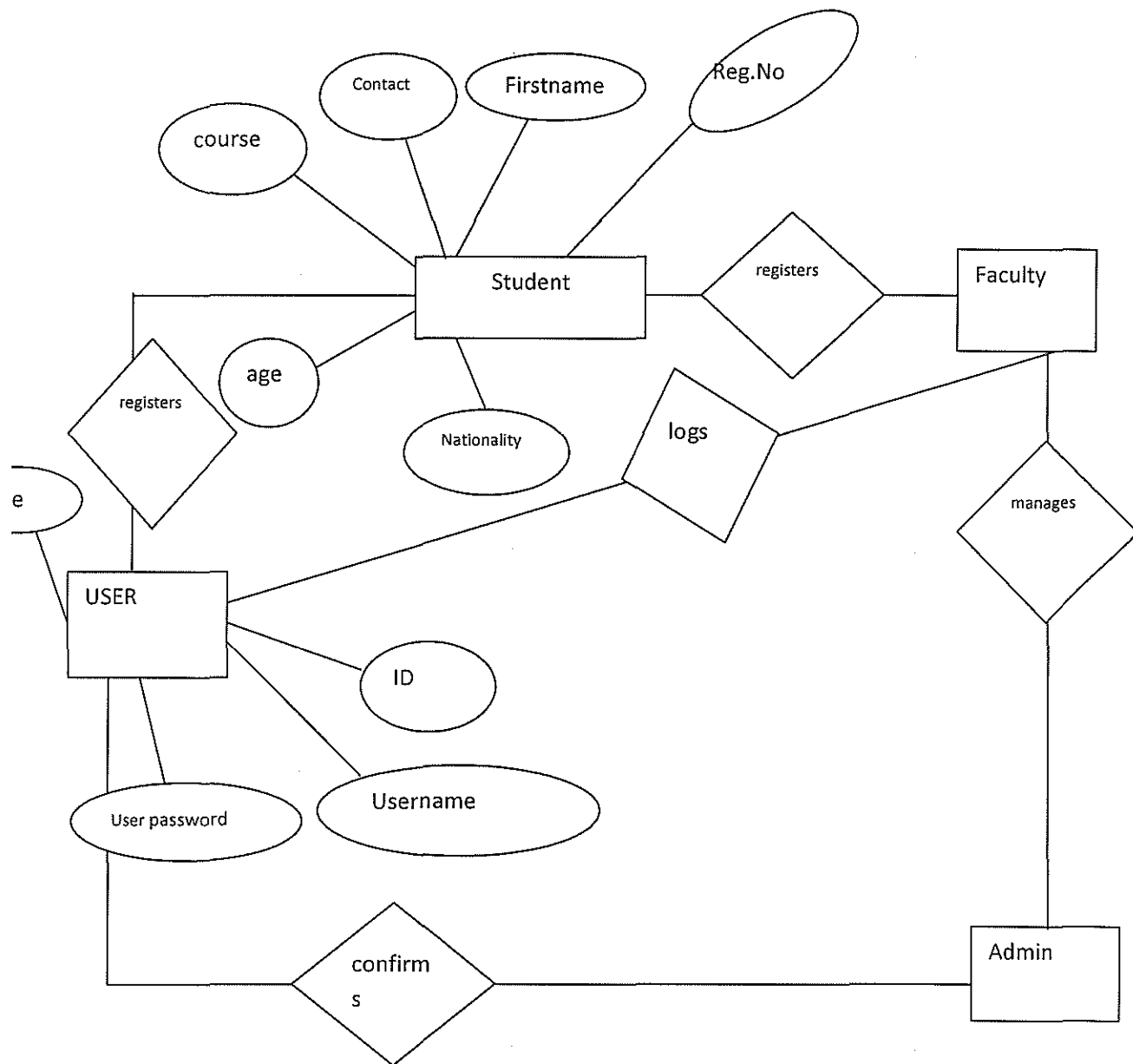


Figure 8: Entity Relationship Diagram



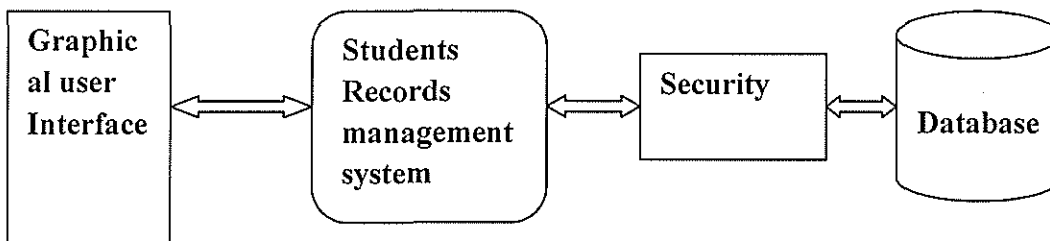
## 4.6: System Design

### 4.6.1: Architectural design

The structure of the students' records management system is divided into four components

- Database
- Students' Records System
- Security
- Graphical user interface.

The user interface helps the user to interact with the system. Any information entered into the system is stored in the database. In between all the components there are security measures for authentication purposes as show in the diagram.



*Figure 9: Architectural Design of the system*

### 4.6.2: Database

This houses the data in the system and data about it (Meta data). It consists of tables, which make up the database schema. Primary keys identify each entry in the table while foreign keys link the tables with each other. Data consistence checks such as data types, illegal or null submissions or duplicate entries are checked at this level. It was designed based on the three structures that is the Conceptual database, Logical database and physical database design phases.

### 4.6.3: Graphical User Interface (GUI)

This is where information kept in the database is viewed. It also displays forms where data is entered and saved to the database.

#### 4.6.4: Security

This ensures access rights to the information kept in the database. It allows login details to the system for authentication.

#### 4.7: Database design

The database design composed of the following objects: tables, security, indexes, keys, columns.

##### 4.7.1: Database Tables

###### Staff Table

<i>Field Name</i>	<i>Data type</i>	<i>Constraint</i>	<i>Null</i>
<i>StaffId</i>	<i>Varchar(15)</i>	<i>Primary key</i>	<i>No</i>
<i>StaffName</i>	<i>Varchar(20)</i>		<i>No</i>
<i>StaffTitle</i>	<i>Varchar(12)</i>		<i>No</i>

Table 6: Staff Table

###### Student Table

<i>Field name</i>	<i>Data type</i>	<i>constraint</i>	<i>Null</i>
<i>Student_Reg</i>	<i>Varchar(15)</i>	<i>Primary key</i>	<i>No</i>
<i>Student_Name</i>	<i>Varchar(25)</i>		<i>No</i>
<i>Student_Nationality</i>	<i>Varchar(15)</i>		<i>No</i>
<i>DateOfEntry</i>	<i>Varchar(12)</i>		<i>No</i>
<i>Phone_no</i>	<i>Varchar(12)</i>		<i>No</i>

Table 7: Student Table

## Login table

<i>Field name</i>	<i>Data type</i>	<i>Constraint</i>	<i>Null</i>
<i>Username</i>	<i>Varchar (15)</i>		<i>No</i>
<i>Password</i>	<i>Varchar (10)</i>	<i>Primary key</i>	<i>No</i>
<i>Level</i>	<i>Varchar (5)</i>		<i>No</i>

Table 8: Login table

### 4.8: Implementation

In this stage, the whole system is converted into a computer understandable language. Coding the new system is an important stage where the defined procedures are transformed into control specifications with the help of a computer language. The programs coordinate the data movements and control the entire process in a system. It is generally felt that the programs must be modular in nature. This helps in fast development, maintenance and future change, if required.

This system has been developed using the Visual Basic 2005 (VB) in the interface i.e. the front end and Microsoft Access as database management software, has been used at the back end. These are user-friendly programs and easy to use.

Database (Ms Access) allows accessibility of data and retrieval of data easily. It allows elimination of duplicated data and also security of the database is possible.

CHAPTER FIVE

## CHAPTER FIVE

### SYSTEM IMPLEMENTATION AND TESTING

#### 5.0: Introduction

This chapter emphasizes the actual system implementation. The system was transformed from user requirement into a workable product. The purpose of system implementation was to make sure that the correct application is delivered to the end user. Besides that, this chapter also emphasizes on how the testing is done to confirm it meets user requirements.

#### 5.1: System Implementation

The system was designed basing on windows environment. Microsoft visual basic 2005 was used to design the user interfaces (front end) while Microsoft Access as a DBMS was used to design a database for storing data thereafter a logical connection was established.

##### 5.1.1: Login page

This is the first form that comes first when the program is launched. It's mainly meant for security and authentication purposes. When loading the system, one should go to all programs, choose science and Tech and then select SIM to open the login page.

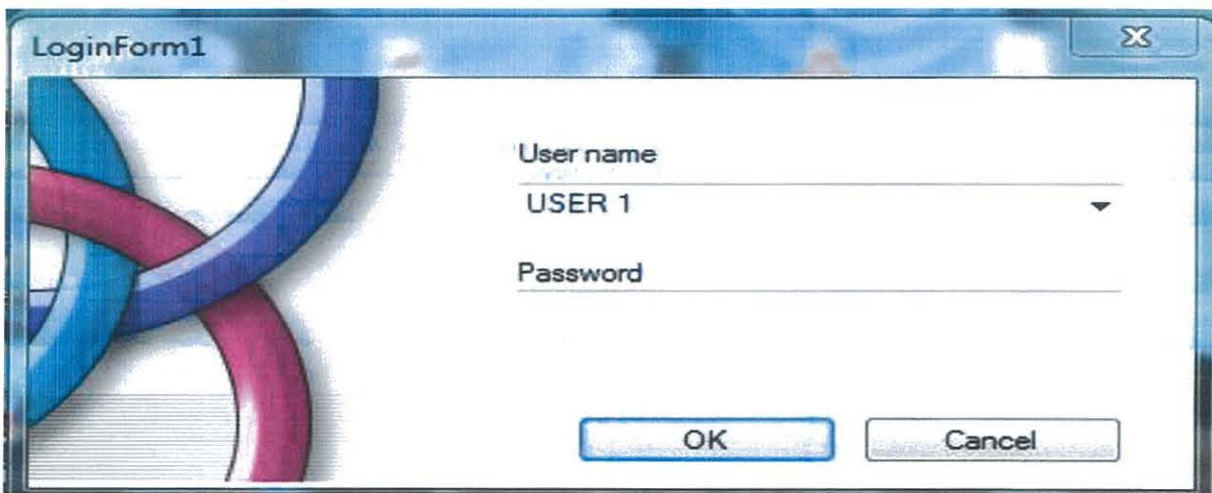


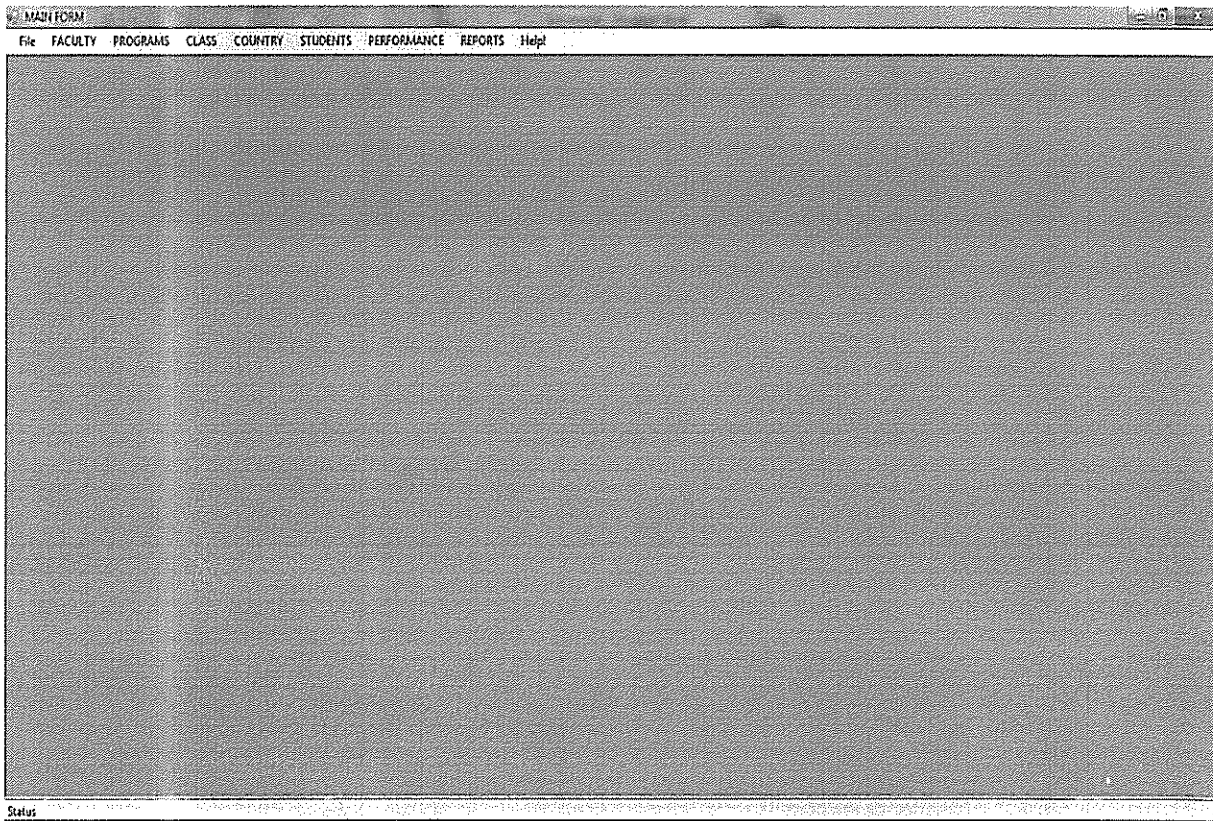
Figure 10: Login page

Only the authorized user with the right or correct user name and password has a right to access the services of the faculty about students. When wrong user name and wrong password are used,

the system rejects access to the service. And when the correct username and password are used and the ok is pressed, the main page is displayed. You can click cancel button to close the window.

### 5.1.2: Main page

This is the window that appears after a successful login. It contains a menu bar which also contains menus that help the user to navigate to different areas of the system like file, FACULTY, PROGRAM, CLASS, COUNTRY, STUDENTS, PERFORMANCE REPORTS and Help.



*Figure 11: Main page for all tabs*

Under file, USERS and exit options are shown. USERS option helps to look for available users of the system and also helps to register new users. Exit option gives a chance of closing the program at any stage.



5.1.3: User Page

This page is displayed when the user opens file tab and the choses USERS. It helps in capturing new users of the system and viewing the current users.

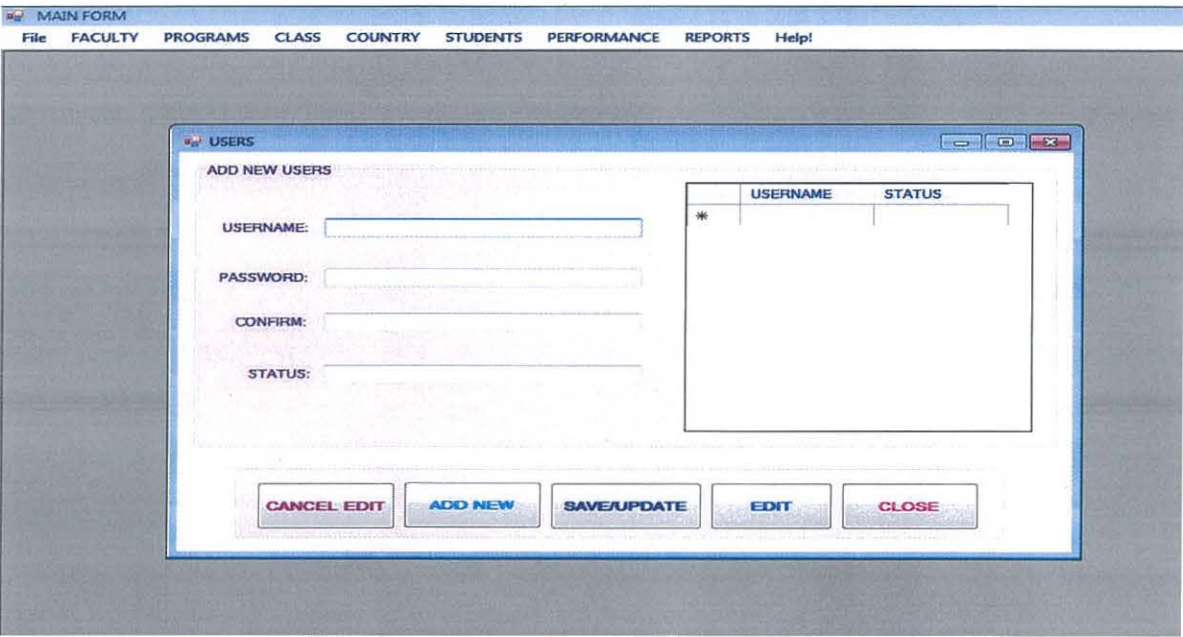


Figure 12: User Page

5.1.4: Students’ registration form

This page provides options to the user for registering new students and searching for the available students in the system. It contains sections for capturing bio data of the students that is registration number, gender, nationality, names and country code.

After filling all the fields on the form, the user saves the information by pressing the “ADD NEW” button. The user can also search for the students by the use of registration numbers, surnames and other names.

MAIN FORM

File FACULTY PROGRAMS CLASS COUNTRY STUDENTS PERFORMANCE REPORTS Help!

STUDENTS

1 of 10

ADD NEW STUDENTS

REG NO: CONTACT: 0704467378

SURNAME: MUGUME ADDRESS: ISHAKA

OTHER NAMES: DAN

GENDER: MALE EMAIL: VCVCCCCCCCCC DFFDDF

PROGRAM CODE: BIT

COUNTRY: UGANDA

DOB: 6/15/1999

DATE OF ENTRY: 10/13/2015

SEARCH

REG NO: BIT/0001

SURNAME: MUGUME

OTHER NAMES: DAN

CANCEL EDIT ADD NEW SAVE/UPDATE EDIT CLOSE

Status

Figure 13: Students' registration form

### 5.1.5: Program Page

This page is displayed after clicking on program tab. On it there are options for capturing new programs. It contains program code space, program title, duration for the program and the faculty.

PROGR	PROGRAM TITLE
BIT	BACHELOR OF INFORMATION TEC...
DCS	DIPLOMA IN COMPUTER SCIENCE
BCS	BACHELOR OF COMPUTER SCIENCE

Figure 14: Program Page



5.1.6: Performance Page

This form is displayed after clicking on performance button. On it there are options for searching, closing, adding and saving the performance of the students.

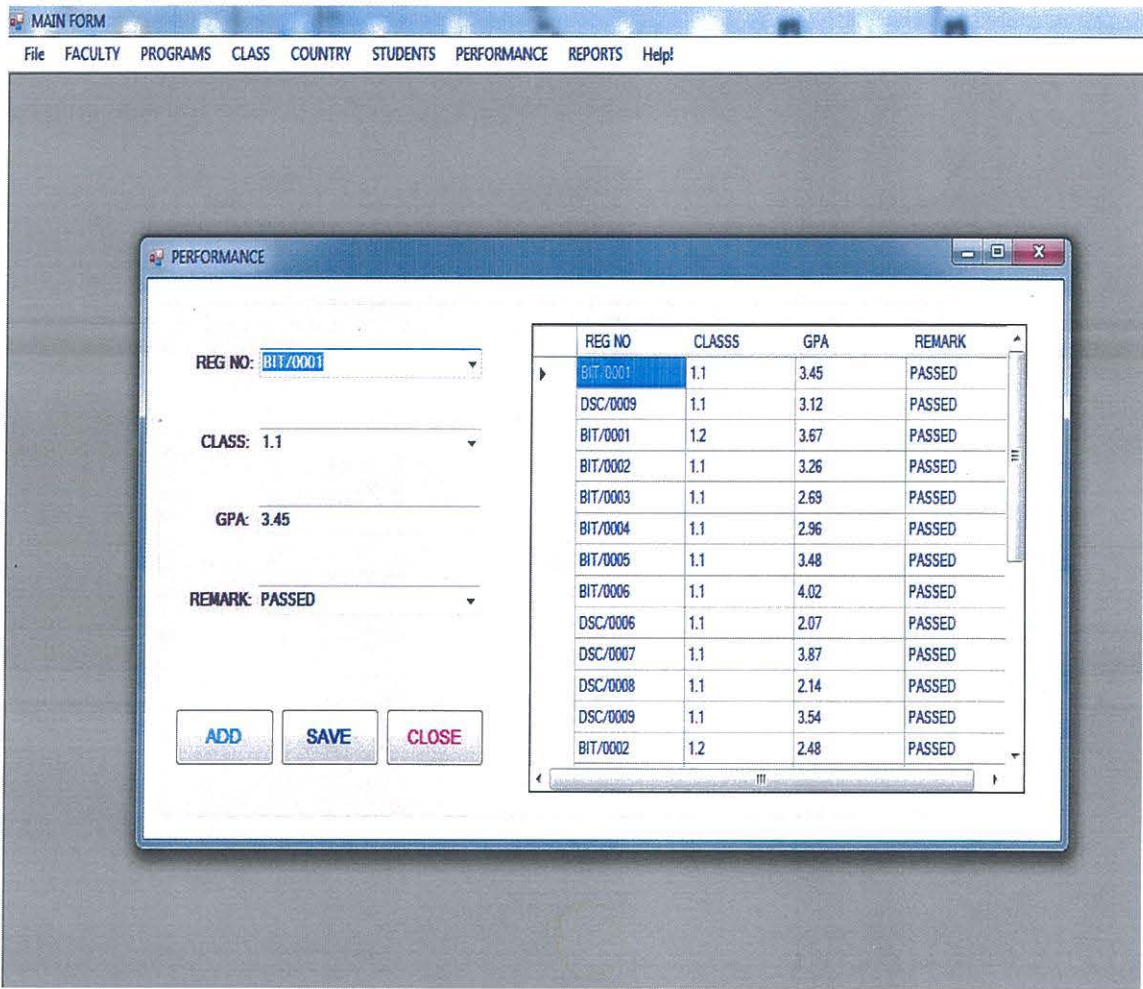


Figure 15: Performance Page


### 5.1.7: Performance page of all students per class in the faculty

This shows the performance of all students per class in the faculty

PER CLASS

1.1

Main Report1.1



KAMPALA INTERNATIONAL  
UNIVERSITY-WC  
P.O.BOX 20000  
FACULTY OF SCIENCE AND TECH

CLASS PERFORMANCE

FACULTY OF SCIENCE AND TECHNOLOGY

BIT

BACHELOR OF INFORMATION TECHNOLOGY

1.1

NO	REG NO	SURNAME	OTHER NAMES	GENDER	GPA	REMARK
1	BIT/0002	GFJTRGF	nxbvn	MALE	3.26	PASSED
2	BIT/0003	FGHSth	vbrvn	FEMALE	2.69	PASSED
3	BIT/0004	ADHFDAH	czbnc	MALE	2.96	PASSED
4	BIT/0001	MUGUME	DAN	MALE	3.45	PASSED
5	BIT/0005	FFDGEij	cbfgm	MALE	3.48	PASSED
6	BIT/0006	RTUJNJ	cbnfim	MALE	4.02	PASSED
TOTAL NUMBER OF STUDENTS:				6		

Current Page No: 1

Total Page No: 1

Zoom Factor: 100%

Figure 16: Performance page of all students per class in the faculty

### 5.1.8 Performance page showing results per student

The screenshot shows a web application window titled 'PER STUDENT'. The main content area displays the KIU logo and university details: KAMPALA INTERNATIONAL UNIVERSITY-WC, P.O.BOX 20000, FACULTY OF SCIENCE AND TECH. Below this is the section 'INDIVIDUAL STUDENT PERFORMANCE' for student REG NO: BIT/0001. The student's details are listed: FIRSTNAME: MUGUME, OTHER NAMES: DAN, COUNTRY: UGANDA, CONTACT: 0704467378, and EMAIL: VCVCCCCCCCCC DFFDDF. The program is BACHELOR OF INFORMATION TECHNOLOGY. A table shows the student's performance across three classes (1.1, 1.2, 2.1) with GPAs of 3.45, 3.67, and 3.56 respectively, all marked as 'PASSED'. The overall CGPA is 3.56. The page footer indicates 'Current Page No: 1', 'Total Page No: 1', and 'Zoom Factor: 100%'.

PER STUDENT

BIT/0001 Main Report BIT/0001

**KIU**

KAMPALA INTERNATIONAL  
UNIVERSITY-WC  
P.O.BOX 20000  
FACULTY OF SCIENCE AND TECH

**INDIVIDUAL STUDENT PERFORMANCE**

REG NO: BIT/0001 COUNTRY: UGANDA  
FIRSTNAME: MUGUME CONTACT: 0704467378  
OTHER NAMES: DAN EMAIL: VCVCCCCCCCCC DFFDDF  
PROGRAM: BACHELOR OF INFORMATION TECHNOLOGY

NO	CLASS	GPA	REMARK
1	1.1	3.45	PASSED
2	1.2	3.67	PASSED
3	2.1	3.56	PASSED
		CGPA: 3.56	

Current Page No: 1 Total Page No: 1 Zoom Factor: 100%

Figure 17: Performance page showing results per student

### 5.2: System validation

This was carried out using a sample population of six (6) members in the faculty. The above members worked and responded positively towards developing a new system because they all found out that the new system meets all the user requirements. Below are the results from the study showing the percentage number of staffs that agree that the system meets all the user requirements.

## System validation

Requirements	Yes	No
Performance	80%	20%
Ease of use	90%	10%
Record Capturing and Identification	90%	10%
Control and security	95%	5%
Storage	90%	10%
system availability	82	18%
Reliability	90%	10%

*Table 9: System validation*

The results from the validation table indicated that the system meets all the user requirements at a greater extent both functional and non-functional requirements.

## **CHAPTER SIX**

### **DISCUSSION, CONCLUSION AND RECOMMENDATION**

#### **6.0: Introduction**

In this chapter, the researcher looks at the summary of the findings, conclusions, and recommendations of the study on designing a Computerised Student Management System.

#### **6.1: Discussion**

The research was conducted successfully from the month of January to October 2015. However the researcher met some challenges which include the following;

Most of the faculty members were not realizing the weakness of the traditional method which was being used therefore it was difficult to get the right information from them.

The researcher faced a problem of expenses when buying equipments like pens, flash disks, paper, printing expenses and binding materials which facilitated the development for the new system. There was also a problem of time because the researcher was a student so he could get hard time to manage both studies and carrying out research.

#### **6.2: Conclusion**

The study was carried out in order to solve the problem of the faculty about records of the students. Accordingly, the faculty of science and technology at KIU-WC found out that the idea of design and implementation of a computerised system in the faculty was very helpful and efficient as compared to the traditional method of record keeping. The faculty found out a lot of benefits with the use of the new system that will not only serve the faculty but also the member of the faculty. Benefits to the staffs include; ease of use, time saving, easy retrieval and creation of reports.

#### **6.3: Recommendation**

#### **6.3: Recommendations**

Training of all the members of the faculty of science and technology to get accustomed to the system serves as a priority. This being a new system, some members of the faculty get threatened that the computerized students' management system will replace them. The researcher recommends that the management of faculty of science and technology should educate the staff

on how this system operates and how it supplements their efforts. For the efficiency of the faculty, users of the system need to be thoroughly educated about the use of the passwords and the user names, not only that but also not to be careless of them. They should be kept confidential. Access to the server room should be physically guarded against unauthorized person; the server room should be dust free and should be carefully protected and should have an air conditioner to prevent the server from overheating. Backup media like CDs, Diskettes and Flash disks can be used for backups and storage of data.

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## Appendix I: Questionnaires

### Section 1: Introduction

Dear Sir/Madam,

My name is Bob John, a student of KIU pursuing a Bachelors Degree in computer science, carrying out a research project titled a Computerized Students' Records Management System in the Faculty of Science and Technology at Kampala International University Western Campus (KIU-WC). This questionnaire is meant to help me gather data that will help me in the designing of a computerized students' records management system which will be used to enhance the mode of record management at KIU-WC. I therefore request you to respond honestly to the following questions to help me in the process. The information you give will only be used for this purpose and will strictly be treated confidential.

I would like to ask you some questions, and be assured that all the information you will share with me will be kept confidential - and neither your names nor contact will appear anywhere in the research findings.

Do you have any question for me?

May I ask you some questions? ☐ Yes ☐ No (If no, end the session)

### Section 2: Respondent's bio data

(a) Gender: .....

(b) Level of education: .....

(c) Designation: .....

### Section 3: Study Questions

(Please tick where appropriate)

1. What is your job title?



.....

2. How are the Students' records captured in the Faculty?

- a) Manually (Use of papers, pens and files) ☐
- b) Use of a computerized system ☐

3. How long do you take to register and retrieve a form/report of a single student?

- a) Less than 20 minutes ☐
- b) 20 – 30 minutes ☐
- c) 30 and above minutes ☐
- d) Not sure ☐

4. Explain briefly what happens when a student comes for registration

.....

.....

.....

.....

5. How do you rate the above system in terms of effectiveness?

- a) Excellent 1
- b) Very Good 2
- c) Good 3
- d) Fair 4
- e) Poor 5

1	
2	
3	
4	
5	

11. What would you like to see in the improved records management system?

.....

.....

.....

.....