

**“DESIGN AND IMPLEMENTATION OF MANAGEMENT  
INFORMATION SYSTEM OF HEALTH CENTER”  
CASE STUDY: HEALTH CENTRE OF ISLAMIC UNIVERSITY IN UGANDA**

**BY**

**CHESANG KURUS HUSSEIN  
05/BIT/186**

**MR. OMUGAL GEORGE MARTIN  
SUPERVISOR**

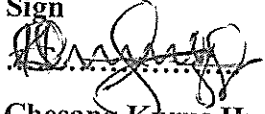
**A PROJECT REPORT SUBMITTED TO THE FACULTY OF SCIENCE IN THE  
DEPARTMENT OF COMPUTER SCIENCE IN PARTIAL FULLFILLMENT  
OF REQUIREMENT FOR THE AWARD OF A BACHELORS  
DEGREE IN INFORMATION TECHNOLOGY  
OF ISLAMIC UNIVERSITY  
IN UGANDA**

**JUNE 2008**

## DECLARATION

I **Chesang Kurus Hussein**, hereby declare that the information in this report is my personal research findings for academic purpose. It has never been submitted for any award to any of the higher standards of learning.

Sign



**Chesang Kurus Hussein**

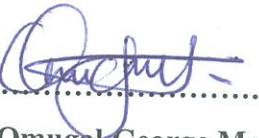
17/06/2008

Date

### APPROVAL

I approve that this work was carried out by **Chesang Kurus Hussein** under the topic "*Design and Implementation of a Management Information System of a Health Center*" under my supervision and is ready for submission for the award of bachelors degree of Information Technology of the Islamic university in Uganda.

Sign

.....

Mr. Omugal George Martin

.....

Date

## DEDICATION

I affectionately dedicate this work to my favorite Uncle and Auntie, **Mr. Haruna .K. Chemisto** and **Mrs. Sharifa Chemisto** respectively, who tirelessly worked day by day to perceive that I attained education so as to obtain the necessary skills and awareness to appreciate the gross of the world and formulate me of use to myself and the community, may **ALLAH** recompense them abundantly.

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First and foremost my greatest gratitude goes to the Almighty for his grace and mercy that has enabled me to successfully complete this study.

My discrete also goes to my beloved **Uncle Mr. Haruna K. Chemisto** and **Auntie Sharifa Chemisto** for their heartfelt love towards me and their financial propose without which this would be hard for me to reach to my studies. I also adore assigning my great thanks to them together with their families. May the greatest **Allah** reward them the best on this earth and the hereafter.

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Special thanks and recognition goes to the rest of my lecturers in the faulty of science for their commitment that they have completed, in particular **Mr. Omujal George Martin** for his positive criticism and guide in presenting this research.

My respondents can also greatly be highlighted for the great deal played, students, staff and of many others for whom have not been mentioned. Specifically here without those whose co-operation to make relevant information available, this work should not have been possible.

I will also not fail to remember my neighboring associates via the entire course Kato Hassan, Asaba Yasin Amru, Marashi Luqman, Wasige Sadat, Sokuton Edrisa, Shifra Naluzze, Bwanika Charles, Namutebi Ruth, Alinawe Prossy and Kibanyi Lillian to reveal but a few who have extremely helped and guided me towards the achievement of this work may **ALLAH** yield them the best.

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## ABBREVIATION

HCIS	-	Health Center Information System
AHC	-	Academic Health Center
IT	-	Information Technology
IMS	-	information Management System
DBLF	-	Database Life Cycle
DBMS	-	Database Management System
ER	-	Entity Relationship
SQL	-	Structured Query Language
FD	-	Functional dependencies
DDL	-	Data definition language
DML	-	Data Manipulation Language
RDBM	-	Relational Database Modeling
SDLC	-	System Design Life Cycle
DFD	-	Data Flow Diagram
ADODB	-	Activate Data Object
DBA	-	Database Administrator
MIS	-	Management Information System

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## **ABSTRACT**

The Islamic university health center was founded when the university started its operation in 1988 as a sickbay. The health center's major aim is to provide medical services to the patients in the university plus the surrounding community.

Islamic university health center works hand in hand with other departments that help it to enable its work move smoothly that is to say the bursary department.

Since Islamic university health center is offering medical services but its using manual based system to store its data. Therefore the need for a computerized management system that help both the employees in the health center and the patients.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0 Introduction**

The Health Center of the Islamic University in Uganda was established in 1988 when the university started its operation. The University Health Center started as a sick bay with one room and one Clinical Officer the sick bay was established to deal with small medical problems faced by students and staff with their relatives.

As the years went by the sick bay has expanded, changed into a health center, the number of staff has increased in that it has 2 Medical Officers, 2 Clinical Officers, 1 Senior Nursing Officer, 3 Enrolled Nurses, 3 Enrolled Midwives, 2 Laboratory Technicians, 1 Laboratory Assistant, 1 Secretary, 1 Cleaner, 1 Ground Worker and 1 Askari.

Due to the development of the sick bay into a Health Center it's services have also increased whereby it provides outpatient and inpatient services, immunization (static), antenatal clinic, going for outreaches, maternity, laboratory services and many more.

Despite of all the many years of existence of this department in the university, it has basically remained managing its patients mainly the outpatient which study was mainly focusing on with a manual system which was a file based system. Therefore the research or study of the development of a management information system of a Health Center of the Islamic University In Uganda (out-patient department) main was provide means of automating or computerizing the outpatient department of the Health Center due to the increasing number of patients in the health center that was the students, teaching and non teaching staff plus their relatives.

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

The Health Center of The Islamic University in Uganda has a problem of managing it's out outpatients due to its associated problems of using the manual system of file based since the students, staff and surrounding community. The patients were supposed to present their files which are kept in the records room to the Medical or Clinical Officer before they are treated. Due to some disorder in records room, these files were sometimes misplaced and updating them was

problem and this was caused by the file based system used in the health center which needs a better management system for managing of records in the Health Center.

The Health Center was the department responsible for medical problems that is to say treating students, staff and their relatives. The health center comprises of the Medical Officers, Clinical Officer, Senior Nursing Officer, Enrolled Nurses, Enrolled Midwives, laboratory technicians, a messenger, cleaner and an askari.

The health center also was responsible for treating the surrounding community, immunizing children, immunize mothers, immunize women at reproductive age (15 and above) carry outreaches.

### **1.2 Statement of the problem**

For the existing system in the health center which was manual, it has got a lot of problems since it involved in managing patients' records basically the outpatients on which study covered.

Due to the increasing population of patients mainly students and staff in the university, the health center services and facilities have to expand to meet rapidly increasing population including a better management system which is an automated system of which the study was to be carried out.

Since the health center came into existence and the developments it has achieved, it has not improved on its management system since it used the manual way for managing patients records and yet the manual system which file based has some related problems that include the following:

#### **Misplacement of files**

Since the files are got from the inquiry room to be presented to the medical or clinical officers, sometimes they are not brought back to the inquiry room hence being misplaced.

#### **Storage space**

This file based system occupies a lot of space and this was caused by increased number of students in university and files of the students who have completed were not transferred from the inquiry room hence a lot of space being consumed.

### **Time consuming**

Since the system was manual search of files and registration would take a lot of time since it is one student a go to enter in the treatment room hence time wasting.

### **Disorder of files in the inquiry room of the health center.**

Since the files are arranged according to halls and year of study, in some cases a file may be put in a hall or year of study that it doesn't belong hence disorder of files in the health center.

### **1.3 Objectives of the study**

The study was based and guided by the following objectives;

The main objective was to develop a management information system of an outpatient in the health center that the researcher assumed that this system would handle the problem that existed which was manual file based system.

1. To Design a system that would be used for regularly updating outpatient's records.
2. To develop a system that would automate the management of outpatients' records in the health center.
3. To modify the system to a computerized outpatients system that performed faster input and output data processing system that would handle tasks in time and minimize on the errors.
4. To design a system that that would be generating reports of a patient's task performed.

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

The study was being carried out in the health center of the Islamic university of Uganda main campus in Mbale. The researchers collected data from the students, staff of the health center, staff from other departments, patients from the surrounding community. Thus the scope of the study was specialized in the outpatient of the university health center, so the researchers intend to find out if the automated system would be utilized by the health center.

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

The study hopes to provide information for easy implementation of a computerized outpatient record keeping.

Use of paper work and files will be reduced in the department since the file based system is to be reduced by a computerized system.

The problem of storage space will be wiped out since files will no longer be used

The problem of time wasting will be reduced since the medical or clinical officers will be having databases of their patients.

The system will be a user friendly and reduce on duplication.

### **1.6 Limitations of the Project**

The major challenges that were faced during the study are;

- i) **Limited time:** - The research was carried out within a short period of time and putting into consideration the size of the department and the various activities that take place, the duration of time was limited.
- i) **Insufficient funds:** - The fact that the researchers are students, they were not in a position to raise enough funds to finance the whole research.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter reviews research that are related to the topic. It s vital and recommended that the researchers review on other reports and text books which have related topics. The literature review therefore is extracted from other sources that is text books (Internet) and reports.

According to Donald E. Maypole, in the human services field, over the last ten years, the calls for accountability by various funding bodies at the federal, state and local levels have increased (Newman) and Turem 1974). Accountability is generally shown by providing information which justifies the expending of monies and the meeting of program objectives. At the same time, administrators and boards of directors have taken steps to improve the management of their agencies. The improvements however, sometimes get bogged down as a result of inter-agency political problems.

Accordingly, this paper describes how one rural community mental health center developed a management information system and responded to the pressures for accountability from finding bodies and collateral agencies in the community. After a discussion of the programs provided by the center, the steps followed in developing the management information system are described and that of the project is analyzed. It should be noted that the writer was the executive director of the center from 1971— I 976. Donald E. Maypole is Assistant Professor and Coordinator, Social Work Program, Department of Social Sciences, College of St. Teresa, Winona, Minnesota 55987.

#### **The University of the West Indies at Mona, Jamaica Projects**

##### **The Health Center Information System (HC1S)**

The UWI Health Center, Mona Campus is our client for this project. This project was initiated a few years ago with the introduction of the Life of Jamaica Insurance Scheme for students. The system therefore had to be online to provide a way to validate students accessing the service. It later grew to a full fledged application covering many of the services offered by the Health Center. It is currently in the final stages of implementation.



## **2.1 Aims of the system**

1. Validate staff, students and dependant's re-eligibility for accessing the Health Service.
2. Collect data online to generate patient's history online
3. Use data collected to generate daily and periodic reports on diagnoses
4. Identify areas which may need attention and generate statistics that may used for planning purposes
5. The building blocks of the system
6. From the Health Service perspective:

## **Administration including Medical Records**

The Nurses Station

Public Health

Medical Doctors

Counseling Unit and a recent addition — the Dentist's office

### **Other systems:**

Banner Finance

People Soft HR system

## **The University of Minnesota returns to the Information Systems**

The University of Minnesota returns to the Information Systems which provides the Academic Health Center office with desktop support, server operations, and application development services. Formal desktop support service is available to offices and areas within the AHC.

This support minimizes the time and effort required to resolve computer problems, making it simpler for individuals and offices to share information across the organization, resulting in a reliable level of support. Servers are provided for the purpose of backing up and sharing files as well as housing AHC web sites and other computerized applications throughout the AHC. Software development is also available in conjunction with database software. Web sites, curriculum and registration programs, facilities reports, and patient discharge programs are among the many services currently provided.

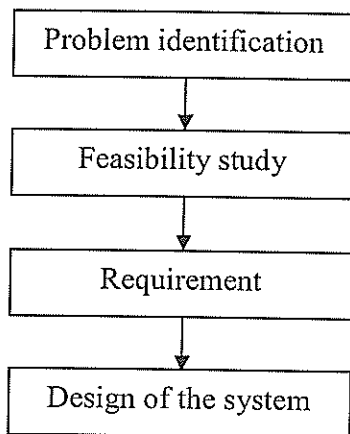
## 2.2 Analysis of the system

System analysis is process of gathering information as the system (called the as-is system. which may or may not be computerized, identifying its strengths and problems and analyzing them to produce a concept for the new system (called the to-be system).

The goal of analysis phase is to truly understand the requirement for the new system and develop a system concept that address them or decides that a new system is not needed.

System analysis is always the step in the development life cycle (SDLC).followed by the design of the system.

Below is an illustration of the four stages of system analysis



### 2.2.1 Problem identification

Sometimes it is referred to as fact finding. It is concerned with findings about the existing system and identifying it real problems. This demands getting to know what they can and what is expected if a new system was developed. Since IT always offers new ideas to solve problems and exploit new opportunities when technology.

### 2.2.2 Feasibility study

Feasibility study is the preliminary investigation to determine whether to improve the existing system or to develop a completely new system. However the feasibility study of Islamic university in Uganda health center includes the following:

- a) Description of what the system is required to do and the objectives of the system
- b) Preliminary design was laid down to estimate the cost of the system

- c) There should be alternative designs so that the most suitable one is chosen, however this may not be possible because of limited time.

### **2.2.3 Requirement analysis**

The requirement analysis determines what is required for the system to be designed and the following help the researcher.

#### **Resources to use**

The researcher discovers vital resources to design an automated computerized health center system. At least one modern computer system with a minimum of 64mb RAM and at least windows XP operating system should be used. Scanner, digital camera, a printer, Microsoft office 2007 and visual basic 6 programs.

Generally system analysis is the process of analyzing, investigating and critically study the current system and find out a way to modify, recreate a new system that meets a user needs.

Once the above stages complete the analyst presents a recommendation to management to design a new system

### **2.2.4 Design of the system**

The design phase show how the system will operate in terms of software's, hardware and network infrastructure. User interface forms and reports that will be used and specific programs, databases and files that will be needed.

Although strategic decisions about the system were made in the development of the system concept during the analysis phase, the steps in the design phase determines exactly how the system will operate.

The first step in the design phase is to develop the strategy whether the system will be developed by software or will be bought from an existing software package.

The leads to the development of basic architecture design of the system that describes hardware and software infrastructure.

The interface design specifies how the user's will move through the system (navigation methods such as menus and on screen buttons) and forms and reports that the system.

Finally the analyzing team develops the program design that defines what program needs to be written and exactly what each program will do.

At the end of design phase, the feasibility analysis and project plan are reexamined and revised and another decisions is made the project sponsor.

As the years have gone by the field of databases system has undergone a lot research, which has resulted in different models and databases design techniques to emerge.

Below is what some scholars have to say about databases manual file based system and database design.

### **2.3 History of database**

Database technology began to replace file system in the mid 1960' since that time database modeling and design have slowly dissolved from an art to a science that has been partially implementable as a set of software design aids. Many of these design aids have appeared as the database component of computer Aided software engineering tool and many offer interactive modeling capacity (by (3ary.G.Hansen and James Vilansen in database management and design 2 edition)

Evolution of database technology and design (1990) Toby J.Teokey in the book database modeling said that a sophistication of modem database technology is the result of a decade long evolution in processing and information management tugged on one side by the needs and demands of management and restrained on the other by the limits of technology, data access technology, has developed from the primitive methods of the fifties to the powerful integrated system of today.

Data modeling and databases design have undergone significant evolution in recent years since the domination of business application by the relational data model and relational database system.

Before the relational are, the dominating data models where the hierarchal and network model, characterized by IMS and CODSYL — style database systems .however the relational database model has allowed database designers life cycle which focuses on design of a database system and described below

## **2.4 Database life cycle**

The database life cycle (DBLC) incorporates the basic steps involved in the designing of the global schema of the logical database allocating data across a computer network and defining local DBMS specific schemas.

The DBMS has the following steps;

### **i. Requirement analysis**

These are determined by interviewing both the producers and users of the data and producing formal requirement specification. Specification includes data required for processing, relationships and software platform for the database implementation.

### **ii) Logical design**

This is the global schema and shows all the data and their relationships as developed using conceptual data modeling techniques such as ER models. The global schema development is the same and it includes the following

#### **a) ER modeling**

Data requirements are analyzed and modeled by an entity relationship diagram

#### **b) View integration**

This occurs usually when the design is large and more than one person is involved in requirement analysis, multiple views of data and relationships result.

#### **c) Transformation of ER model to SQL tables**

Based on categorization of ER constructs and a set of swapping rules, each relationship and its associated entities are transformed into a set of DBMS specific candidate relation tables.

#### **d) Normalization of tables**

Functional dependencies (FD's) are derived from the ER diagram and semantics of data relationships in the requirement analysis.

### **iii) Physical design**

This is the last step in design phase for a centralized database and is to produce the physical structure of the database, this involve the selection of indexes and clustering of data.

### **iv) Data distribution**

Data fragmentation and allocation are also forms of physical design but this stage applied for only distributed databases.

### **v) Database implementation, monitoring and modification.**

Once the design is completed. the database can be created through the implementation of the formal schema using the data definition language (DDL) of a DBMS and data manipulation language (DML) can be used to query and update the database as well established constraints such as referential integrity. The SQL language used contains both DDL and DML constructs e.g. “create table” command represents DDL and “select” command represents DML

## **2.5 Database**

A database is complex object it is a collection of interrelated store data that serves the needs of multiple users within one or more organizations that is interrelated collections of many different types of tables.

### **2.5.1 Database management system (DBMS)**

DBMS is a generalized software system for manipulating databases. A DBMS support logical view (schema subschema) physical view (access methods data clustering data definition language data manipulation language and important utilities such as transactions management and concurrency control data integrity crash recovery and security).

### **2.5.2 Manual file based system**

A file based system is a collection of application programs that perform services for the end users, such as the production of reports, in manual file system if anything was needed .the entire file cabin (folders) would be searched from the first entry until what is needed is found or an

index may be used (may be divided into the filing systems or separate folders for different types of items that are in the same way logically related).

The manual file system works the items to be stored is small or when the numbers of items to be stored are large and there is need to cross reference or process separate files then the manual system breaks down.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Introduction**

This section presents the instruments that were used by the researchers when collecting data from different sources. The study designs adopted by the researchers were based on quantitative and qualitative methods for them to obtain information.

#### **3.1 Data collection**

The methods that were employed during data collection were basically interviews and observation.

##### **3.1.1 Interviews**

The researcher used this method in collecting primary information I data and it involved direct Interaction between the researcher and the students and some staff from the health center.

The researchers carried out the interviews themselves on the above respondents.

Interviews involved analysis and functioning of the existing system.

##### **Advantages of interviews**

- They allow more detailed questions to be asked
- They usually achieve a high response rate
- Respondents own words are being recorded
- Ambiguities can be clarified and incomplete answers followed up.
- Interviews are not being influenced by others within the group
- They are useful to obtain detailed information about personal feelings perceptions and opinions
- Some interviews may be less self conscious in one to one situation

##### **Disadvantages**

- They are time consuming
- They can be costly
- Different interviews may understand and translate interviews in different ways.



### **3.1.2 Observation**

Observation is a technique of fact finding with the researchers understanding of the system in question. This method was used in primary data collection. It involved observing actual activities of the information flowing in the process as well as the physical setup of the system in the health center and the environment surrounding it, time consuming by the students in sorting out their files, how they carry out activities and the drawing of conclusions about the existing system. The researcher here used non participant method of observation.

With the interviews and observations, the researchers were able to come up with the structure of the existing systems.

#### **Advantages**

- This method tends to provide a greater understanding of the organization through-audit involvement with operational personnel.
- Information collected reflects actual behavior.
- Information collected is current not retrospective.

#### **Disadvantages**

- The method tests typically need to be collaborated with other procedures.
- It is potentially time consuming
- It is very difficult to record data and observe large number of peoples or activities
- Random observation may not provide an adequate evaluation of process due to fluctuations in volume or activity.

## CHAPTER FOUR ANALYSIS AND DESIGN

### 4.0 Introduction

This chapter concentrates on the analysis and interpretation of data collected. This section of the system analysis, design and interpretation illustrates the flow of data of the expected system extracted or diverted from the existing arrangement of service.

Development in which system hardware and software are required developed and installed, the system is tested and documented. People are trained to operate and use the system, and an organization changes to the use of a newly developed system.

### 4.1 Data analysis and interpretation

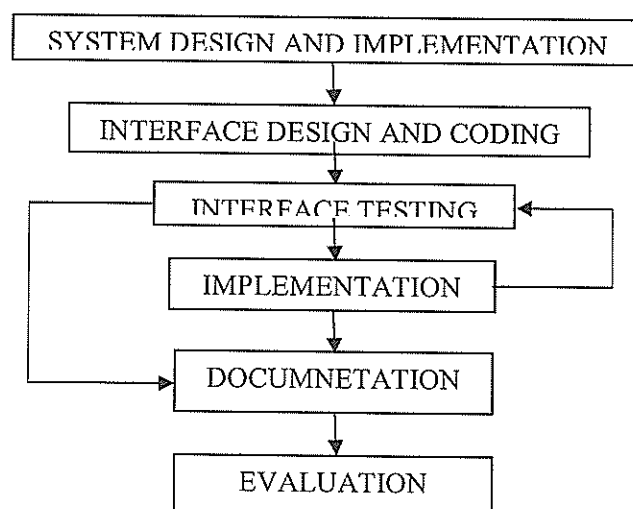
The interviews of research were centered on the existing file system studied plus the observation of the health center that paved a way for the appropriate conclusion of the new development and implementation of a computerized records management information system.

### 4.2 System design

This sub-section resulted after a persuasion that a new system was worthy building; further investigation made to determine what inputs, processes, and out puts were required

System design is the process or art of defining the hardware and software architecture, components, modules, interfaces and data for a computer system to satisfy specified requirements. One could see it as the application of system theory to computing. Some overlap with discipline of system analysis appears inevitable. On the other hand implementation is coding. Putting a planned system into action.

Nevertheless, the following steps of system design and implementation were applied



#### 4.2.1 Database design

The method that was used in the design of the database system limitations of the relational database modeling (RDBM).

This system implements the patient's details, records, employee registration

#### 4.2.2 Design technique

The procedures used in the database design include the E-R modeling of the entities, attributes and later relationships, validation of tables or attributes.

The data modeling design technique that was used to achieve the new system include; E-R diagrams, data dictionary, dataflow diagrams, relationships among tables.

#### 4.2.3 Entity-Relationship Diagrams (ERD)

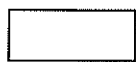
Data models are tools used in analysis to describe the data requirements and assumptions in the system from a top-down perspective. They also set the stage for the design of databases later on in the SDLC.

There are three basic elements in ER models.

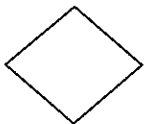
**Entities** are the “things” about which we seek information.

**Attributes** are the data we collect about the entities.

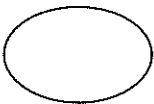
**Relationships** provide the structure needed to draw information from multiple entities. The following symbols are used in developing an ER diagram;



Donates an entity

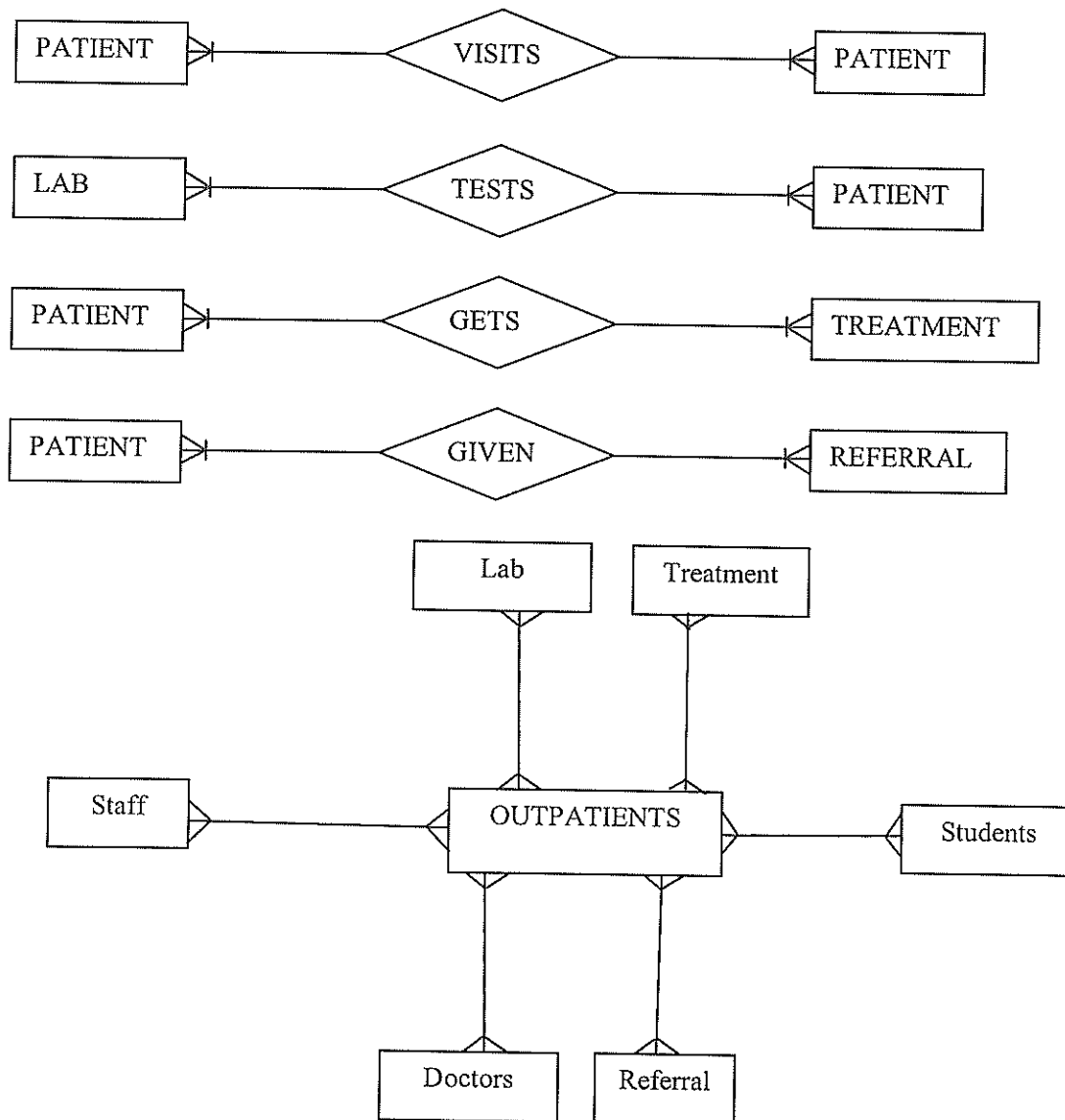


Donates a Relationship



Donates an Attribute

#### 4.2.4 E-R model for management system

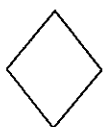


The E-R model helped me as a designer to accurately capture the real data requirements needed because it looks at semantic details and data relationships that are to be provided by the DFD, E-R diagram that culminated into the process of data design.

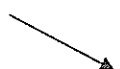
The symbols used in this process included;



**Rectangle**-denotes an entity



**Decision** - table denotes a decision which can be either arithmetic or mathematical expression

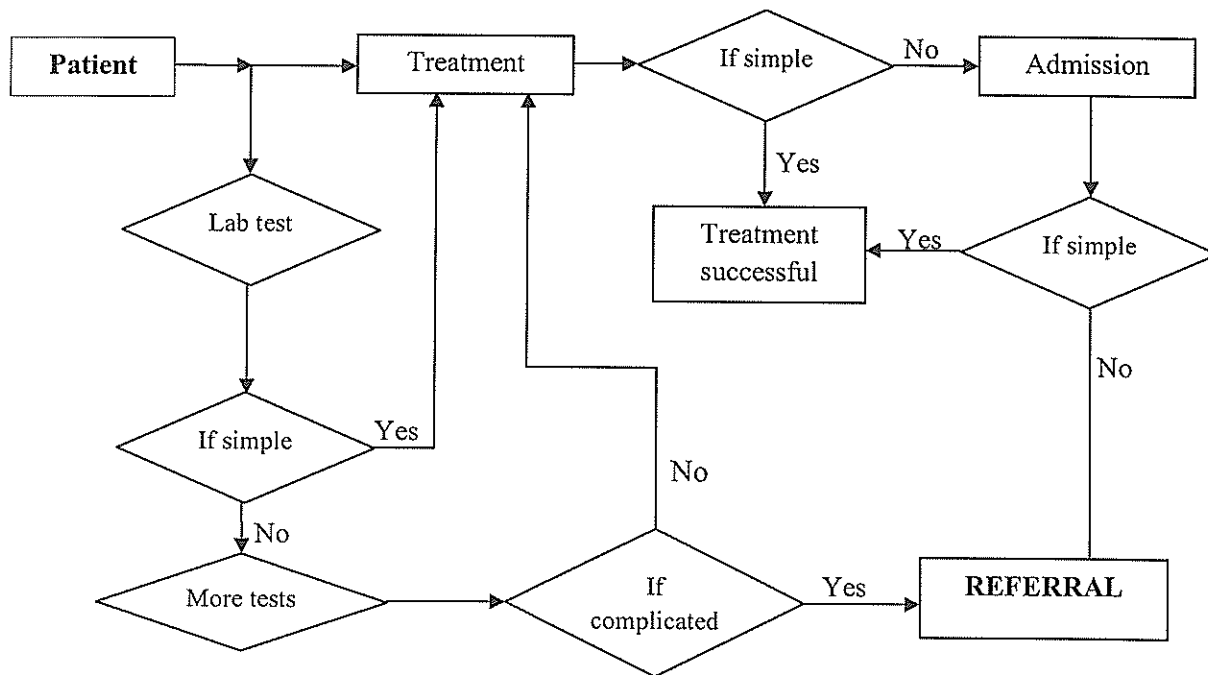


**Arrow** - denotes the direction taken by data

The above are symbols of the E-R diagram for Islamic university health center outpatient department.

#### 4.5 Data flow diagram

The dataflow diagram for the outpatients for Islamic university health is as this one below

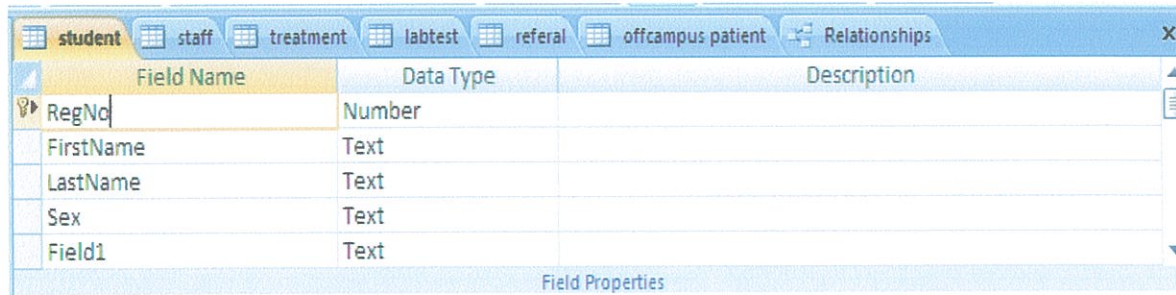


As a system designer, the dataflow diagram has helped me to determine the flow of all documents and the movement of the outpatients made from the time of the patients to the time of either referral or treated.

#### 4.6 Outpatients department tables

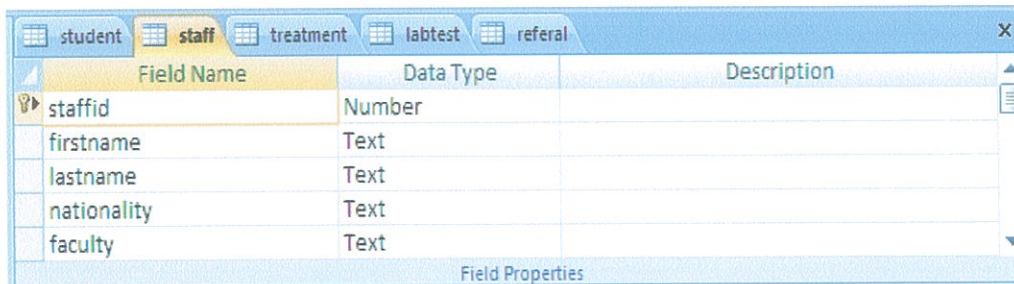
The couple of tables that were used in the development and design of this project include;

**Table 1 Students patients Table**



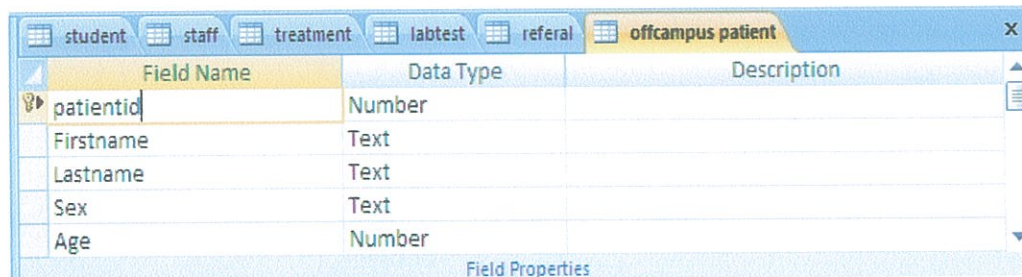
Field Name	Data Type	Description
RegNo	Number	
FirstName	Text	
LastName	Text	
Sex	Text	
Field1	Text	

**Table 2 Staff patients table**



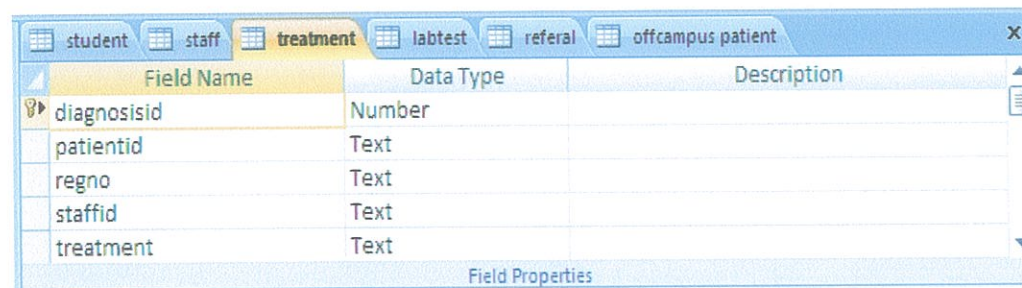
Field Name	Data Type	Description
staffid	Number	
firstname	Text	
lastname	Text	
nationality	Text	
faculty	Text	

**Table 3 Off campus patients table**



Field Name	Data Type	Description
patientid	Number	
Firstname	Text	
Lastname	Text	
Sex	Text	
Age	Number	
	Text	

**Table 4 Treatment table**



Field Name	Data Type	Description
diagnosisid	Number	
patientid	Text	
regno	Text	
staffid	Text	
treatment	Text	

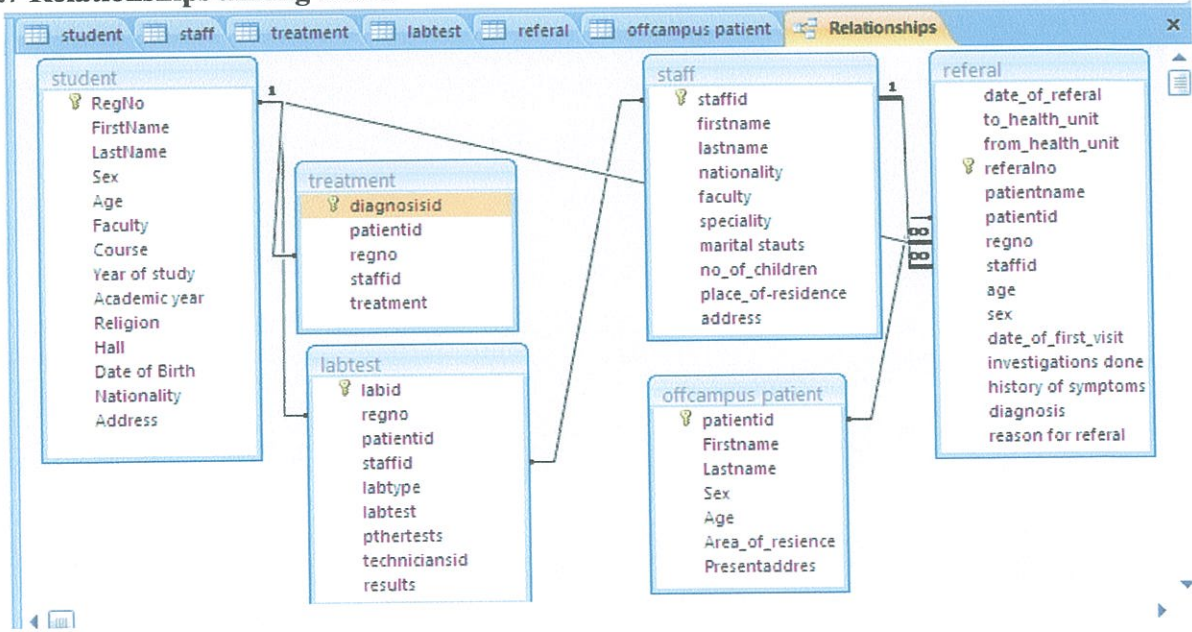
Table 5 Referral patients table

Field Name	Data Type	Description
date_of_referral	Text	
to_health_unit	Text	
from_health_unit	Text	
referralno	Number	
patientname	Number	

Table 6 Laboratory test table

Field Name	Data Type	Description
labid	Number	
regno	Number	
patientid	Number	
staffid	Number	
labtype	Text	

4.7 Relationships among tables





## 4.8 Interface Design and Implementation

The interface design are displayed to demonstrate how information is input and output in the system

How to input and out put

The qualities of the interfaces for outputting information should depict the following

1. User friendly
2. Simple click event
3. Easy to manage
4. Secure for record keeping

## 4.9 User manageable interfaces

### 4.9.1 Welcome form

This is interface that welcomes you and shows you the designer of the project, click the continue button to take you to the main menu or the terminate button that ends the whole program

It has the menu bar from where you can access most of the applications within the system like view you can access any interface, reports option all reports can be viewed and printed among others.





4.9.2 Main menu form

This is the interface which includes all the links to other interfaces called main menu, you click to use those forms/Interfaces and again it has the key that exits and close down the whole system. It has the menu bar from where you can access most of the applications within the system like view you can access any interface, reports option all reports can be viewed and printed among others.

**ISLAMIC UNIVERSITY IN UGANDA HEALTH CENTER**

**MAIN MENU**

LINKING BUTTONS

STUDENTS FORM	LAB REQUEST FORM
EMPLOYEE FORM	TREATMENT FORM
OFF COMPUS PATIENTS FORM	REFERAL FORM
EXIT	

4.9.3 Employee Form

This interface that is used to enter and store data about the employees of the health center it has the navigation buttons that are used for the various functions and help have access to any data in the database.

**ISLAMIC UNIVERSITY IN UGANDA HEALTH CENTER**

**EMPLOYEE FORM**

EMPLOYEE DETAILS

Employee ID	<input type="text"/>
First Name	<input type="text"/>
Last Name	<input type="text"/>
Sex	<input type="text"/>
Employee Speciality	<input type="text"/>
Employee status	<input type="text"/>
Place of Residence	<input type="text"/>
Number of children	<input type="text"/>

NAVIGATION BUTTONS

ADD	SAVE	NEXT	PREVIOUS
FIRST	LAST	DELETE	EXIT

4.9.4 Student form

This is interface that is used to enter and store data about the students of the health center. It has the navigation buttons that are used for the various functions and help have access to any data in the database

ISLAMIC UNIVERSITY IN UGANDA HEALTH CENTER

STUDENTS FORM

STUDENTS DETAILS

First Name	<input type="text"/>	Academic Year	<input type="text"/>
Last Name	<input type="text"/>	Hall	<input type="text"/>
Reg Number	<input type="text"/>	Nationality	<input type="text"/>
Sex	<input type="text"/>	Address	<input type="text"/>
Course	<input type="text"/>	Religion	<input type="text"/>
Year of Study	<input type="text"/>	Diagnosis	<input type="text"/>

NAVIGATION BUTTONS

ADD	SAVE	NEXT	PREVIOUS
FIRST	LAST	DELETE	EXIT

4.9.5 Off Campus Patients

This is interface that is used to enter and store data about the off campus patients of the health center. It has the navigation buttons that are used for the various functions and help have access to any data in the database.

ISLAMIC UNIVERSITY IN UGANDA HEALTH CENTER

OFF CAMPUS PATIENTS

REGISTRATION

PATIENT ID	<input type="text"/>
FIRST NAME	<input type="text"/>
LAST NAME	<input type="text"/>
SEX	<input type="text"/>
AGE	<input type="text"/>
AREA OF RESIDENCE	<input type="text"/>
ADDRESS	<input type="text"/>

NAVIGATION BUTTONS

ADD	SAVE	NEXT	PREVIOUS
DELETE	FIRST	LAST	EXIT



4.9.6 Treatment form

This is interface that is used to enter and store data about the treatment of patients of the health center. It has the navigation buttons that are used for the various functions and help have access the data in the database.

ISLAMIC UNIVERSITY IN UGANDA HEALTH CENTER

TREATMENT FORM

TREATMENT DETAILS

Treatment ID

Treatment date

Patient ID

Staff ID

Reg No

Special clinics

Treatment

Doctor ID

NAVIGATION BUTTONS

ADD

SAVE

NEXT

PREVIOUS

FIRST

LAST

DELETE

EXIT

4.9.7 Laboratory form

This is interface that is used to enter and store data about the laboratory tests in the health center. It has the navigation buttons that are used for the various functions and help have access to any data in the database.

ISLAMIC UNIVERSITY IN UGANDA HEALTH CENTER

LABARATORY FORM

LABARATORY DETAILS

Lab ID

Reg No

Patient ID

Staff ID

Lab type

Other Tests

Technician Id

Results

NAVIGATION BUTTONS

ADD

SAVE

NEXT

PREVIOUS

FIRST

LAST

DELETE

EXIT

#### 4.9.8 Referral form

This is interface that is used to enter and store data about the referrals in the health center. It has the navigation buttons that are used for the various functions and help have access to any data in the database.

The screenshot shows a web-based form titled "ISLAMIC UNIVERSITY IN UGANDA HEALTH CENTER" and "REFERRAL FORM". It is divided into two main sections: "STUDENTS DETAILS" and "NAVIGATION BUTTONS".

**STUDENTS DETAILS**

Date of referral	<input type="text"/>	Age	<input type="text"/>
To Health unit	<input type="text"/>	Sex	<input type="text"/>
From Health unit	<input type="text"/>	Date of First	<input type="text"/>
Referral No	<input type="text"/>	Investigation Done	<input type="text"/>
Patients Name	<input type="text"/>	History symptoms	<input type="text"/>
Patient ID	<input type="text"/>	Diagnosis	<input type="text"/>
Staff	<input type="text"/>	Reason for referral	<input type="text"/>

**NAVIGATION BUTTONS**

ADD	SAVE	NEXT	PREVIOUS
FIRST	LAST	DELETE	EXIT

#### 4.9.9 User manageable interfaces

A grid of eight blue buttons with black text, arranged in two columns and four rows:

ADD	FIRST
SAVE	LAST
NEXT	SEARCH
PREVIOUS	EXIT

**Add button:** This helps user to add new record in the record store the record store.

**Save button:** This helps user to save records that are entered in the record store.

**First button:** This helps user to navigate the first record in the record that was entered first in the record store.

**Last button:** This helps user to navigate the last record in the record that was entered first in the record store.

**Next button:** This helps user to move one step forward in the record store.

**Previous button:** This helps the user to one step by one record backwards in through the record store.

**Search button:** This helps to look for any record in the database.

**Delete button:** This button when clicked, it removes that record appearing.

**Exit button:** This button helps user to go to the main menu or terminate the system in the welcome form.

## **CHAPTER FIVE**

### **CONCLUSION AND RECOMMENDATION**

#### **5.0 Introduction**

This chapter gives an overview of this research. Important points are highlighted and end with conclusion and recommendations.

#### **5.1 Conclusion**

In line with the methods research that is interview, documentation, interview and observation that guided me to cue up with a records management information system.

Generally it's found out that for an effective records management for in patient details a centralized/distributed database can perform better comparable to the current file based system or applied the theory of system analysis and management information system together with practical ideas of system development to design and implement a testable and functioning records management information system

These findings must have highlighted and brought a bit of knowledge to the manager and staffs in the inpatients department possibility of data centralization, its efficiency and effectiveness in the RMIS.

#### **5.2 System development software**

The data base accomplished was designed using Microsoft access 2003 which supports up to 4000 of modules, tables, forms and reports.

The application was developed with the help of visual basic 6.0 with the aid of ADODB controls for linking the interfaces to the database. It is a window based application that can run based on minimum computer requirements of Pentium II or maximum speed of 700MHZ, 128MB of RAM & 10GB of hard disk space and windows 98 to XP and above as the operating system environment

#### **5.3 Recommendation**

In the line with the above research findings and conclusions, the following recommendations were observed;

## **Features to consider**

The DBMS features that you should consider include:

1. Database modeling technique
2. Multiple—user access
3. General ease of use

## **Database model**

The data modeling technique that database system uses, such as relational, networked, or hierarchical, is an important aspect to consider. Relational database are the most popular because they can fit almost any need. In relational database, the data resides in multiple tables and the related data is linked together to form the desired relationships.

Advantages include:

- a) Limited redundant data
- b) Fast data access
- c) Cross referenced search results provide easy intuitive use
- d) An efficient query language, such as Structured Query Language (SQL) is usually supported.

## **Multi-user support and scalability**

It is likely that you will need a DBMS that fully supports multiple users. For an active design group, the database must support a high volume of multiple accesses at once. Also, it must be equipped with transaction and concurrency control.

The DBMS you choose should fit your current needs as well as your plans for expansion in the future. One of the biggest limitations a DBMS has is its ability to meet your needs as you grow. It must be scalable. Therefore, it is important that you choose a DBMS that will support simultaneous access by the maximum number of users you expect.

However, if you do reach a point where it no longer meets your needs, many can be migrated to a more capable system.

## **Usability**

As with any software, ease of use is critical. Important usability elements include user- friendly tools for direction manipulation by the administrator, good paper and online documentation, sound technical support and so on.

## **Evaluating databases**

Many companies have chosen the following popular systems to evaluate the databases:

1. Microsoft Access.
2. MY SQL.
3. Oracle.

### **Microsoft Access**

If the initial database will contain fewer than 10,000 parts and support fewer than 25 concurrent users, Microsoft Access is a reasonable choice. Advantages of Microsoft Access are that, it is inexpensive, easy to use and has a broad range of databases it can migrate to. A disadvantage is that some companies can quickly outgrow a 10,000 part Database, which could require you to migrate to something more capable.

In summary, Microsoft Access:

1. Is inexpensive
2. Is a desktop relational DBMS
3. Has an easy relational design
4. Handles up to 10,000 parts and 25 concurrent users
5. Is easy to migrate

### **MY SQL server**

If your current or future needs exceed 10,000 parts, MY SQL Server is an excellent choice. It is very similar to Microsoft Access and can also be learned in a short amount of time. MY SQL Server is a very robust and fast.

Relational DBMS and it can handle a number of parts and users. On the down side, it is more expensive. In summary, MY SQL Server:

1. Is a desktop relational DBMS.
2. Has an easy relational design.
3. Handles an unlimited number of parts and users
4. Is moderately expensive.



## **Oracle**

Oracle is another excellent choice. Like MY SQL Server, Oracle is very robust and fast, but it is more complex. Typically, a database administrator (DBA) is required to create user accounts, populate capture CIS tables, create views, and add the appropriate permissions. You can use Oracle's application programming language (PL\SQL) to create the data input forms.

In summary, Oracle:

- a) Is a complete relational DBMS
- b) Is very robust and fast
- c) Can handle huge amounts of data
- d) is more complex

Finally, most DBMS systems are client\server based and operate over the networks. The DBMS is an engine that typically runs a powerful server or cluster of servers, in a SAN (Storage Area Network) environment or mainframe with a high-performance channel to a large data store. The DBMS accepts request from clients that may require sorting and extracting data. Once the server has processed the request, it returns the information to the client.

Based on the fact that this MIS will increase the speed and quality of services. It is believed that it will help to motivate and also change the staffs attribute and I currently recommend that the staff who are computer illiterate begin undergoing training such that later are trained on the use of RMIS with ease.

The system will also create a basis for other greater or fresh researchers who would wish to develop similar or advanced (on line system) for this department.

## REFERENCES

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- . Gerald V. Post (2002). *Database Management Systems* 2<sup>nd</sup> Edition, Irwin- McGraw Hill.
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## **APPENDICES**

### **Appendix I: Interview Guide**

- 1) Introduce yourselves
- 2) Get name of respondent
- 3) Inquire about the background of the department.
- 4) Find out the activities that take place in the department
- 5) Obtain information regarding the hierarchy of the department.
- 6) Make inquiries on how the department captures and stores information.
- 7) Find out the challenges in the department.
- 8) Find out the possible solutions in the department

**Thank you for the valuable time**

## Appendix II: Budget

TASK	QUANTITY	Unit price	AMOUNT
Typing	55 pages x 3	500 @ page	82,500
Printing	55 pages x 3	300 @ page	49,500
Binding	3 copies	10,000 @ copy	30,000
CDs/DVDs	4	1000 @	4,000
Flash disk	1GB	15000@	15,000
Traveling			20,000
Miscellaneous			20,000
<b>TOTAL</b>			<b>221,000</b>

**Appendix III: Timeframe**

	Jan	Jan – Feb	Feb - March	March- June	June
proposal writing					
data collection and analysis					
project design					
project coding					
project report writing and submission					

## Appendix IV: Sample Codes

### EMPLOYEE CODES

```
Private Sub cmdadd_Click ()
```

```
cmdadd.Enabled = False
```

```
cmddel.Enabled = False
```

```
cmdsave.Enabled = True
```

```
txteid.Text = " "
```

```
txtfn.Text = " "
```

```
txtsn.Text = " "
```

```
txtea.Text = " "
```

```
txtes.Text = " "
```

```
cmbes.Text = " "
```

```
txtpor.Text = " "
```

```
txthocText = " "
```

```
txteid.SetFocus
```

```
End Sub
```

```
Private Sub cmddel_Click()
```

```
Dim cnnemployee As ADODB.Connection
```

```
Dim rsernployee As ADODBRecordset
```

```
Dim ans As Integer
```

```
Set cnnemployee = New ADODB.Connection
```

```
Set rsemployee = New Recordset
```

```
employee.ConnecionString= "data source=" & App.Path & "\employee.mdb; "&  
"provider=Microsoft.jet.oledb.4.O;"
```

```
employee.Open
```

```
rsemployee.Open "employee", admi, adOpenKeyset, adLockPessimistic
```

```
If rsemployee.EOF and rsemployee.BOF Then
```

```
MsgBox "no data in c11", vbinformation + vbOKOnly, "put data"
```

```
Exit Sub
```

```

End If
ans = MsgBox("ARE YOU SURE YOU WANT DATA DELETED?", vbYesNo,
"confirmation")
If ans vbYes Then
rsemployee.MoveNext
rsemployee.Delete
txteid.Text = " "
txtth.Text = " "
txtsn.Text = " "
txtea.Text = " "
txtes.Text = " "
cmbes.Text = " "
txtpor.Text = " "
txtnoc.Text = " "
Else
Exit Sub
End If
rsemployee.Close
ernplyee.Close
Set rsemployee = Nothing
Set cnnemployee = Nothing
End Sub

Private Sub cmdexitClick()
mainrmenu.Show
Unload Me
End Sub

Private Sub cmdnextClick()
If Not rsad.EOF then
rsad.MoveNext
Else

```

rsad.MoveLast

End If

End Sub

Private Sub cmdprevious\_ClickO

If Not rsad.BOF Then

rsad.MovePrevious

Else

rsad.MoveFirst

End If

End Sub

Private Sub crmdsaveClick ()

Dim cnnemployee As New ADODB.Connection

Dim rsemployee As New ADODB.Recordset

Set cnnemployee = New ADODB.Connection

Set rsemployee = New ADODB.Recordset

cnnemployee.ConnectionString = "Data source = & App.Path & \"employee.mdb;\" & \"provider = microsoftjet.oledb.4.0\""

cnnemployee.Open

rsemployee.Open "Employee", cnnemployee, adOpenKeyset, adLockPessimistic

rsemployee.AddNew

rsemployee!EmployeeID = txtid.Text

rsemployee!FirstName = txtfn.Text

rsemployee!LastName = txtln.Text

rsemployee!EmployeeAddress = txttea.Text

rsemployee!EmployeeSpeciality = txtes.Text

rsemployee!EmployeeStatus = cboes.Text

rsemployee!placeofResidence = txtpor.Text

rsemployee!NoofChildren = txtnoc.Text

rsemployee.Update

rsemployee.Update



```

rsemployee.Close
cnmployee.Close
Set rsemployee = Nothing
Set enmployee = Nothing End Sub

Private Sub Form Load ()
Dim cnmployee As New ADODB.Connection
Dim rsemployee As New ADODB.Recordset
Set cnmployee = New ADODB.Cennection
Set rsemployee New ADODB.Recordset
cnmployee.ConnectionString = "Data souree='T & AppPath & \"employeeemdb;\" & \"provider
= microsoft.jet.oledb.4.O;\"
cnmployee.Open
ActiveConnection = ennermployee.State
If ActiveConnection I Then
MsgBox "you are now connected", vbOKOnly, "test connetion"
Else
MsgBox "try again to connect", vbOKOnly + vbinformation, "try again"
Exit Sub
End If
End Sub

```