

KAMPALA INTERNATIONAL UNIVERSITY
SCHOOL OF COMPUTER STUDIES

A PATIENT MANAGEMENT INFORMATION SYSTEM

CASE STUDY : NSAMBYA GENERAL CLINIC

BY

BARUNGI MUTENGA ISAIAH
BIT/10994/61/DU

**A PROJECT REPORT SUBMITTED TO THE SCHOOL OF COMPUTER STUDIES IN
PARTIAL FULL FILLMENT FOR THE AWARD OF A BACHELAR'S
DEGREE IN INFORMATION TECHNOLOGY
OF KAMPALA INTERNATIONAL
UNIVERSITY.**

August 2009

DECLARATION

I declare this project with no any duplication or photocopy of it from any institution of higher learning either for the reward of a certificate, diploma, degree, or beyond in the field of computer studies. It is the work achieved from my research and analytical study.

Name..BARUNGI RUVIENGA: ISAIAH

Signature..*cu*

Date:..18/8/2009

Supervisor.

Name..KASUUBO ESTHER

Signature..*[Signature]*


Date:..18/8/2009

APPROVAL

This is my research report and is submitted to the school of computer with the approval of my supervisor from the department of computer studies of Kampala international university.

Names.....KASUUBO ESTHER.....

Date.....12/8/2009.....

Signature..........

DEDICATION

This report project is dedicated to my late mother miss Namata Agnes and to my father George Byakagaba who has been so much supportive towards my education.

ACKNOWLEDGMENT

I wish to acknowledge to Carlo Ghezzi, Meadi Jazayeri and Dino Manddrioli for there foresight regarding the importance of semantic data modeling in developing integrated information systems. The Air forces DEF1 technique and Robert G. Browns the logical database design techniques which are the parents of semantic data modeling techniques used here.

This report project has benefited substantially from the reviewers thoughtfull comments and by conversations and feed back from many colleges, notably Mudashri Habbib, Komakech Phillip and Moses Mugisha.

Thanks go to my elder brother Barungi Davis and My elder sister Barungi Monica who encouraged me to finish it.

Special thoughts to go to Madam Kasuubo Esther gave me continuous support throughout my project.

ABSTRACT.

This research report aimed at developing and implementing a patient information management system at Nasby General Clinic located in Nsambya parish Kampala. This research covers five chapters.

Chapter one is an introduction, it gives an insight into the back ground of the study problem, statement, objectives of the study ,significance ,,scope, conceptual and theoretical frame work and the limitations of the study.

Chapter two is literature review. It gives a thorough analysis of different ideas about the patient management information system from various authors.

Chapter three is research methodology which covers the system scope of the study design instruments, data collection methods, statistical data analysis and requirements.

Chapter four covers system design and implementation.

Chapter five covers discussions, conclusions and recommendations.

ABBREVIATIONS

- PMS..... ..Patient Management System.**
- PMIS.....Patient Management Information System.**
- OS.....Operating System.**
- ITS.....Information Technology Systems.**
- BIS.....Basics of Information Systems.**
- COP.....Change of Passwords.**

TABLE OF CONTENTS

DECLARATION	ii
APPROVAL	iii
DEDICATION	iv
ACKNOWLEDGMENT	v
ABSTRACT	vi
ABBREVIATIONS	vii
TABLE OF CONTENTS	viii
CHAPTER ONE	1
BACKGROUND	1
1.1 INTRODUCTION:	1
1.2 STATEMENT OF THE PROBLEM	2
1.3 RESEARCH QUESTIONS	2
1.4 OBJECTIVES OF THE CASE STUDY	2
1.5 SIGNIFICANCY OF THE STUDY	3
1.6 SCOPE OF THE STUDY	3
1.7 LIMITATIONS	4
1.8 CONCEPTUAL FRAME WORK:	5
CHAPTER TWO	6
2.1 LITERATURE REVIEW	6
2.2. Introduction	6
2.3 Systems	6
2.4 Information database system	6
2.5 <i>Information management</i>	6

2.6 Information technology systems	6
2.7 Analysis design	7
2.8 Conclusion.....	7
CHAPTER THREE	8
METHODOLOGY	8
3.1 INTRODUCTION	8
3.2 DATA COLLECTION METHODS	8
3.2.1 OBSERVATION	8
3.2.2 INTERVIEW	8
3.2.3 QUESTIONNAIRE.....	9
3.2.4 DOCUMENTATION.....	9
3.3 SOURCE OF DATA.....	9
3.4 EXISTING RECORDS	9
3.5 DESIGN INSTRUMENTS.....	10
3.6 INFORMATION FLOW AND SYSTEM DESIGN.....	10
3.8 USER INTERFACE DESIGN.....	12
3.9 OUT PUT DESIGN	14
CHAPTER FOUR	16
4.1 SYSTEM ANALYSIS AND AYSTEM DESIGN IMPLEMENTATION	16
4.1.1 Tools used (languages used).....	16
CHAPTER FIVE	20
ACHIEVEMENTS AND RECOMMENDATIONS	20
5.1 ACHIEVEMENTS.....	20
5.2 RECOMMENDATION AND CONCLUSIONS.....	20

5.3 BIBLIOGRAPHY	21
References:	21
APPENDICES	22
QUESTIONNAIRE GUIDES	22

CHAPTER ONE

BACKGROUND

1.1 INTRODUCTION:

As far as hospitals are concerned, the need to address the problem of managing patients has always been a very big problem on a global basis which has always been leading to poor health care, death, congestion in hospital wards, and high costs and much expenditure by the government on hospitals and besides time consuming has always been the order of the day. Basically the problem has been existing in African countries in particular Uganda; where by a number of people have lost lives during the process of being allocated wards, in a number of hospitals, and hence poor performance in the health sector both financially and in epidemics .

This problem has always been caused by poor technology, lack of enough funds to higher experts such as programmers and system developers, and insufficient funds to inject in the technology sector in order to come up with proper solutions .The major problems particularly were time wasting and congestion in the hospital wards. Congestion in hospital wards is one of the major problems that required agency and immediate attention. Nsambya general clinic is one of the health centers located in Kampala along Gabba road and this problem has been the same problems hence a need for improvement in the treatment services.

Patient management system is to provide hospital management information services for patients, saving on the government expenditure in the health sector. Patient Management System was to provide a fresh innovative approach to medical services acting as liaison between the end user and patient.

1.2 STATEMENT OF THE PROBLEM.

The delays in medical service provision to various patients in the clinic that some time leads to some patients losing life was one of the major problems faced by Nsambya general clinic. Information concerning the patients was some times not stored and managed properly which could lead to patients getting poor treatment. Congestion was yet another problem where by patients could be congested in clinic and some time getting to the extent of sharing beds which could lead to some of them getting more diseases, during the time they spend in the wards getting treatment. Treatment time that a patient takes to get services was yet another problem that called for the system to be implemented in the clinic in order to make work easier so that patients get the right treatment in time and to reduce on the costs of services. The clinic needed a system that is computerized in order to reduce on much paper work for the large numbers of patients.

1.3 RESEARCH QUESTIONS.

- How can manual data compilation be eliminated from the clinic?
- How can the delay in ward assignment be eliminated?
- How can hospital records be ensured using the computerized system?
- How can people with their patients be able to access the information about the patients using the computerized system?

1.4 OBJECTIVES OF THE CASE STUDY.

General objectives.

- To develop and implement a patient management information system in the clinic in order to enhance service delivery.
- To improve on service delivery to the patients

Specific objectives.

- To enable the clinic be able to store patients' records maintaining payments bills and treatment guides.
- To enable patients attendants access information about the patients easily.
- *Privacy of medical and treatment details (records).*
- Compute the number of patients in the ward and the clinic at large from gender, type of sickness, room and bed bed numbers.

1.5 SIGNIFICANCY OF THE STUDY.

- Due to the development of the system quick services could be offered to the patients hence providing a wide range of services to a number of patients in the hospital.
- Users such as secretaries and other persons entitled to use the system wil find it easier to use hence providing a quick capacity towards work efficiency.
- Easy record keeping will be enhanced where by the system will handle recording and retrieval of the information about the patient who are on treatment for a long time in the hospital.

1.6 SCOPE OF THE STUDY.

The system was to cover basically the patient section which includes the following areas as given bellow.

Patient managing section:

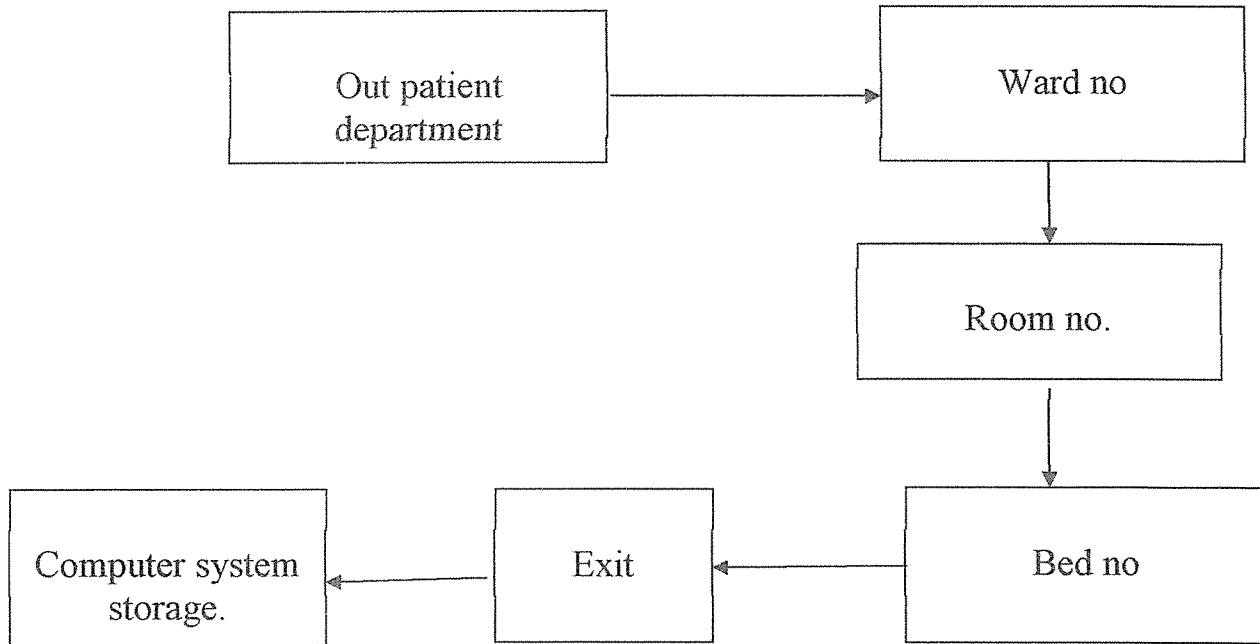
This system handles receiving, diagnosing, assigning of wards and discharging patients in the clinic. The system is to assign wards and beds with a number in order to enable the doctor gets the quick allocation of his or her patients. Now after treatment the patient has to exit and gives space for other patients and the system continues like that.

1.7 LIMITATIONS.

- Financial where by I could not have enough money to enhance me carry on the project some times.
- Time was yet another factor that could not enable me go on with the project research where by I had to attend my normal lectures at the same time do the project.
- Language was one of the problems that I faced mostly during the fact finding process about the problem where by I interviewed a number of patients in the clinic where by most of them could not understand English so it become had for to get appropriate information about the problem.
- Money shortage was yet another problem that I faced where by I could not have enough money to purchase the equipments, design questioniers that where to be answered by the workers in the clinic.
- Time was yet another serious problem that could harden my task of system development where by I could find it hard to get time for my project and attending my lectures at the same time.
- Change of supervisor was yet another challenge that I faced where by my first supervisor left the university without informing me therefore it gave me hardships getting a new supervisor who made changes.
- Consulting people in the hospital also become a problem to me where by they could mistake me as some one who wanted to misuse there information for other purposes.

1.8 CONCEPTUAL FLAME WORK:

The data flow in the (PMIS)



A patient enters, the ward number is to be allocated for him or her were in the ward there will also be a room number and in the room there was beds with numbers which includes all the account and payment details after he she was allocated the Ward and in the ward there is to be allocated a room and within a room there were to be beds with each bed having a number and the doctor comes in to offer treatment services and after treatment the patient exits and gives space for other patients.

CHAPTER TWO.

2.1 LITERATURE REVIEW.

2.2. Introduction.

This chapter introduces you to the basic concepts and knowledge of other people views as far as information systems are important in the management and handling of patient's information.

2.3 Systems.

Systems, are computer designed programs or resources meant to perform particular tasks that enable users to solve particular problems in order to carry out quicker and fast output using small input and getting much output at a limited cost.

2.4 Information database system.

. According to Jenifer Rowley, "the basics of information systems (BIS)" page 3; information systems are concerned refers to the acquisition, processing, storage and dissemination of vocal, pictorial, textural and numerical information by a micro electronics based combination of computing and telecommunications.

2.5 Information management.

This aims at promoting organizational, effectiveness by enhancing the capability of the organization to cope up with the demands of its internal and external environments in dynamic as well as stable conditions.

2.6 Information technology systems.

According to, James A senn information technology big systems are developed in models or by prototyping where by different programmers handle different sections of the system and after coming up with a fully joint program or system that is running and able to solve a problem.

2.7 Analysis design.

Analysis and design refers to the process of examining a problem situation with the intent of solving it through better procedures and methods. This section over views information system design and also describes the work of the system.

According Philip J Praft, Joseph, J Admski with there book “database system management and design” page 245 a patient information management system is really a two step process. In the first step user requirements are gathered and a database is designed to meet the requirements as cleanly as possible, this step is called information-level design and is independent of any DBMS. In the second step this information –level design is transformed into a design for PMIS that will be used to implement the system in question.

According to Ulka Rojas with his book “database guide developers successful 2nd Edition” page 6; shows that well developed systems like the PIMS are not sufficient fir success there are many factors that make the system application successful and one of the primary factors is understanding the role OF the application in achieving the objectives and another factor is gaining the users’ as champion of the application rather than passive accepting your offering.

According to C.J Date with his book titled “An introduction to database systems” page 43; a PMIS can be defined as a software that handles all access to the information systems.

2.8 Conclusion.

All in all the PMIS design steps are critical, and a poor effort made with regard to system-level design is extremely difficult to counteract when it comes to physical level design. on the other hand even an excellent information level design is not enough to avoid poorly performing systems if the physical level design is not done well.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION.

The methods and tools to used in the development, debugging, updating up to the process of implementing the system in the clinic, were to be much analyzed by the developer to enable the user find the system user friendly and enhance them to freely interact with it. The following methods were used in following manner as analyzed bellow.

3.2 DATA COLLECTION METHODS.

The researcher was able to gather information from the patient handling section of the clinic. This section handles allocation of as far as allocating wards, rooms and beds. I was able to carry out the analysis using the fact finding methods which are observation, interview, questionnaires, and documentation as described bellow.

3.2.1 OBSERVATION.

By making a proper observation a round several corners of the clinic, much information was got about the problem I was able to obtain at least 45% of the information where it was found out that a number of patients get treatment late compared to their time of arrival beside the hospital lacks adequate care due to much congestion of patients yet there is no proper schedule for attending to them hence the need of a PMIS.

3.2.2 INTERVIEW.

Using this technique, I was able to interview 14 medical people around the clinic , these included, 6 nurses , 4 doctors, 1 receptionist, 2 security guards and one physician , further more I was given a chance to interview some of the patients a round where also covered and there was need to solve the problem of congestion of most of the patients. was able to find out that a number need a specified solution of the problem that affected

the patients. Nanva Josephine was one of the pregnant women ward who had visited the maternity ward and this what she said “we need a verified system that can make doctors offer us treatment in time, other wise we might loose lives” under this fact finding technique, I was able to get 50% about the problem.

3.2.3 QUESTIONNAIRE.

Under this method, I set 20 questionnaires and gave them out to 20 workers of the clinic these were doctors, nurses and physicians. It took me one week to get back the questionnaires, but finally facts within the questionnaires gave me 30% analysis of the problem most of these questionnaire were given out individually to each of these workers however most of the answers were almost similar as far as the problem was concerned. Hence carrying at least 30% of the problem.

3.2.4 DOCUMENTATION.

By the use of the documentation method, I had to gather information from several documents of the clinic mostly those concerning patient details these included their arrival time treatment and exit time using this information, I was able to back up my idea of coming up with justifications simply because the comparison of this technique was not far away from the other methods.

3.3 SOURCE OF DATA.

The source of data was got in two ways which are primary and secondary.

By the use of primary data I was able to get the information by visiting the clinic in other wards by going to the clinic, using the interview method I was able to gather information primarily.

By the use of documents and reading several written information I was able to find information about the problem in the clinic. Therefore my source of data was through reading documents and visiting the clinic to interview a few people.

3.4 EXISTING RECORDS.

The information was stored manually on papers and receipts and carbon papers were by records were made being made using manual system that is(pen and papers).

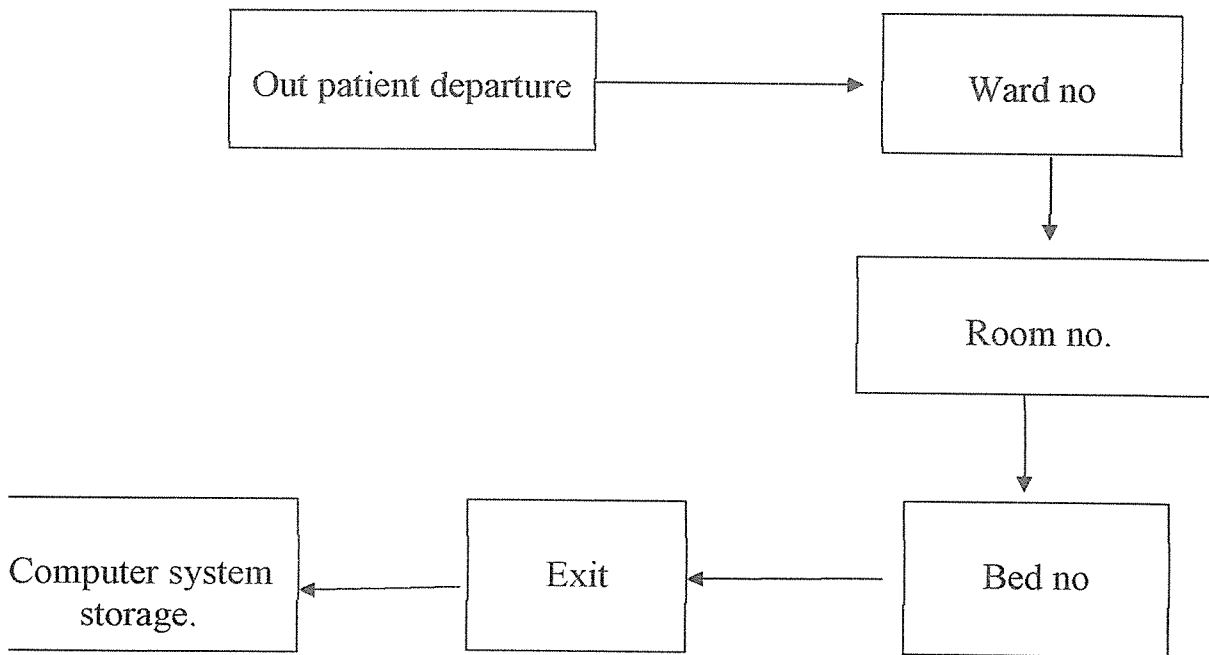
3.5 DESIGN INSTRUMENTS.

Operating system Microsoft windows xp. This was to help me get access to computer resources and install software's that I was to use during the developing process of the system.

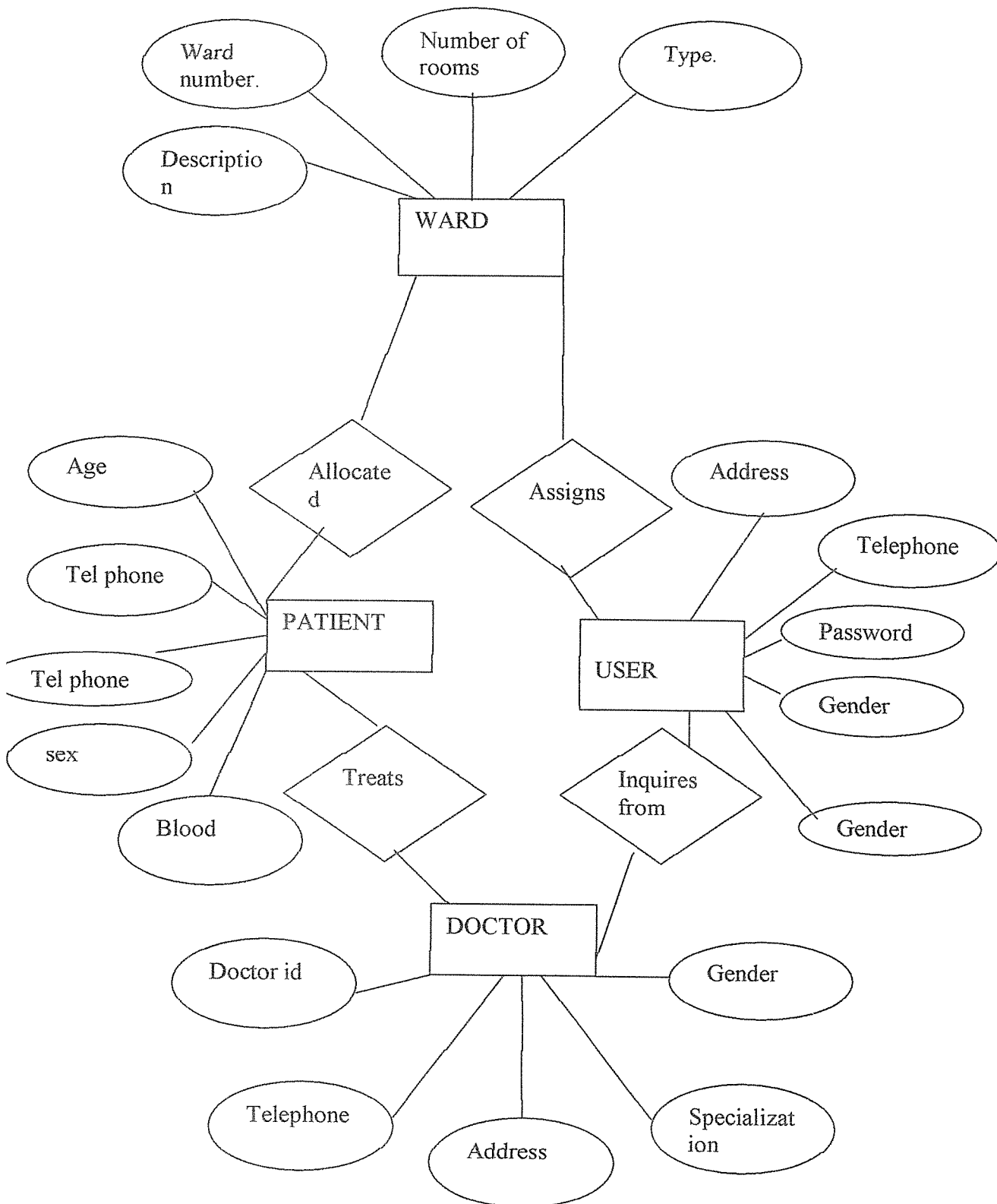
A Pentium 4 computer and a printer. This was to help me by providing access or entering data programs and out putting it on hardware's such as the screen.

Micro soft word: was yet another program that helped me during the process of developing the system this gave me an interface which I could use to write, edit and save information.

3.6 INFORMATION FLOW AND SYSTEM DESIGN.



3.7 ENTITY RELATIONSHIP DIAGRAM.



The entity relation diagram shows the patients patients details, the clinical storage base and the assignment of patients ward when the are admitted.

3.8 USER INTERFACE DESIGN. PATIENT FORM.

The image shows a screenshot of a software application window titled "Patient : Form". The window contains a form with five input fields, each with a label to its left:

- PatientId
- Patients name
- address
- Telephone.
- Blood group

At the bottom of the form, there is a record navigation bar that reads "Record: 1 of 1". The window has standard Windows-style window controls (minimize, maximize, close) in the top right corner. Below the window, the text "Form View" is visible.

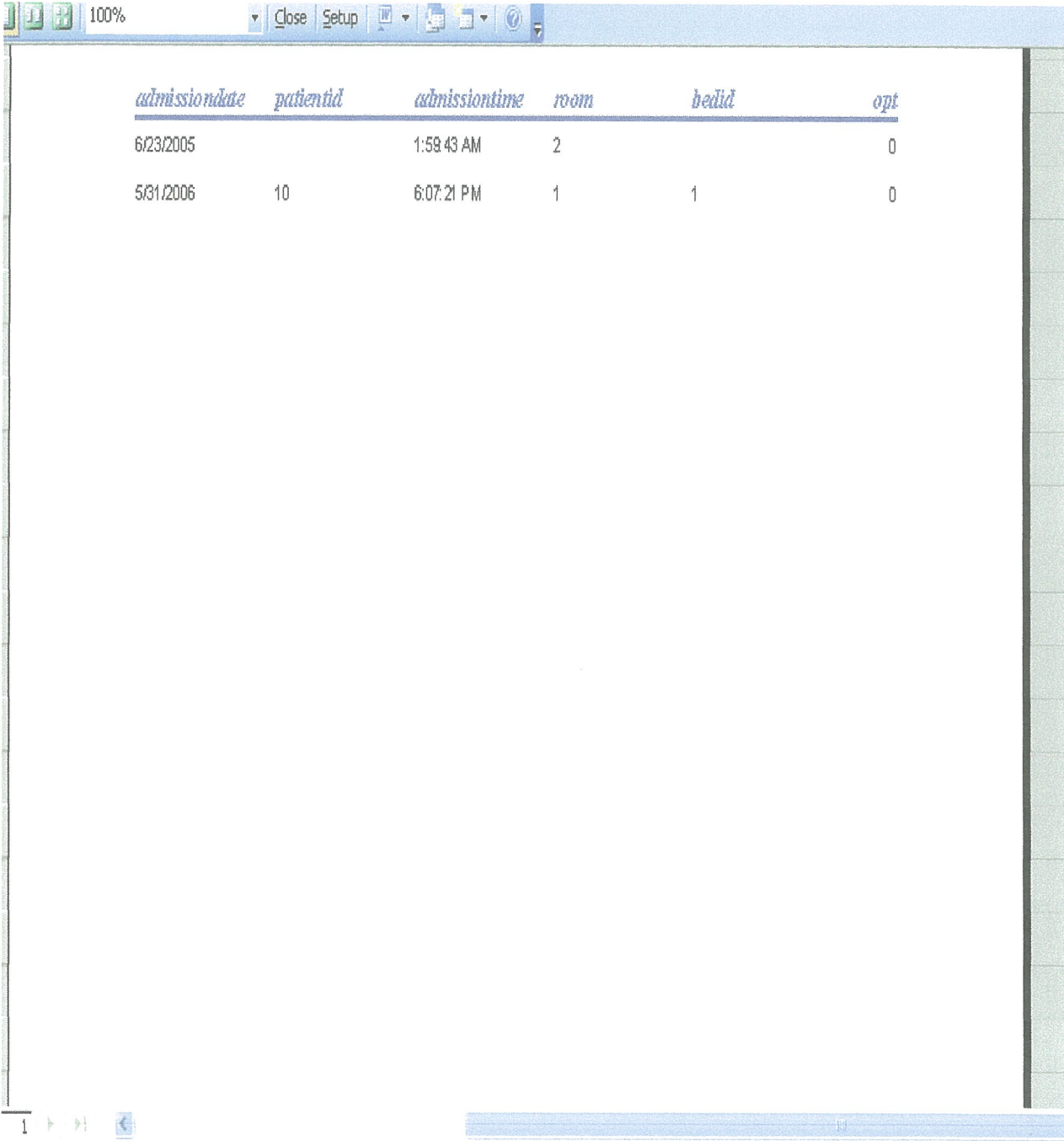
USER FORM.

The image shows a screenshot of a software window titled "user : Form". The window has a blue title bar with standard minimize, maximize, and close buttons. The main content area is white and contains five input fields, each with a label to its left and a horizontal line for text entry. The labels are "user id", "user name", "password", "address", and "telephone". A vertical scrollbar is visible on the right side of the form area. At the bottom of the window, there is a record navigation bar with the text "Record: 1 of 1" and several navigation icons (back, forward, first, last, refresh).

user id	<input type="text"/>
user name	<input type="text"/>
password	<input type="text"/>
address	<input type="text"/>
telephone	<input type="text"/>

Record: 1 of 1

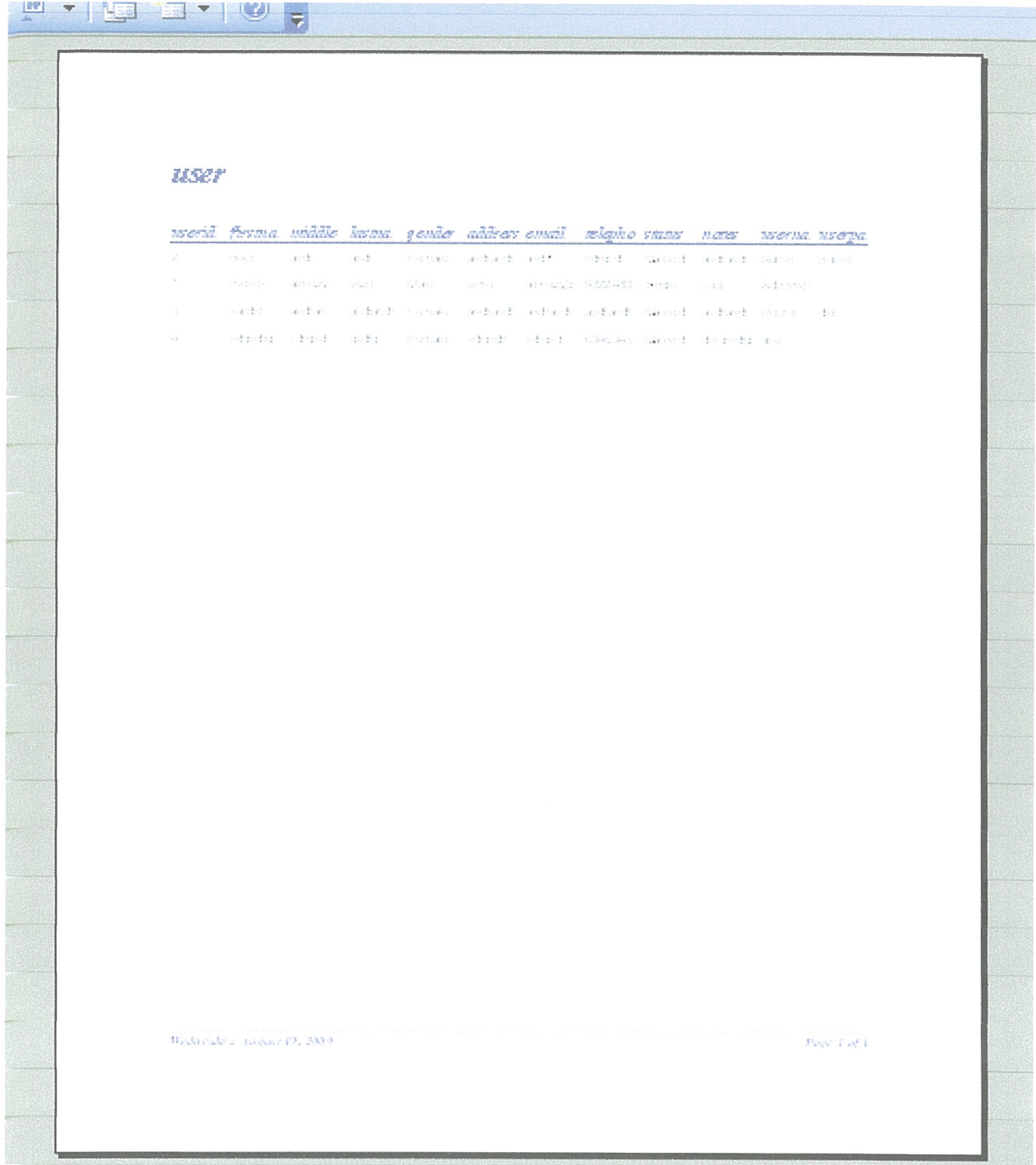
3.9 OUT PUT DESIGN ADMISSION REPORT.



The screenshot shows a software application window with a menu bar containing 'Close' and 'Setup'. The window displays a table with the following data:

<i>admissiondate</i>	<i>patientid</i>	<i>admissiontime</i>	<i>room</i>	<i>bedid</i>	<i>opt</i>
6/23/2005		1:59:43 AM	2		0
5/31/2006	10	6:07:21 PM	1	1	0

USER REPORT.



The screenshot shows a web browser window with a table titled "USER". The table has 12 columns: *userid*, *fname*, *middle*, *lname*, *gender*, *address*, *email*, *telephone*, *status*, *notes*, *username*, and *password*. There are four rows of data displayed.

<i>userid</i>	<i>fname</i>	<i>middle</i>	<i>lname</i>	<i>gender</i>	<i>address</i>	<i>email</i>	<i>telephone</i>	<i>status</i>	<i>notes</i>	<i>username</i>	<i>password</i>
1	john	and	smith	male	1234567890	john@smith.com	555-1234	active		john	password
2	mary	anne	doe	female	9876543210	mary@doe.com	555-5678	active		mary	password
3	john	and	smith	male	1234567890	john@smith.com	555-1234	active		john	password
4	mary	anne	doe	female	9876543210	mary@doe.com	555-5678	active		mary	password

At the bottom of the page, there is a footer with the text "Wednesday, August 19, 2009" on the left and "Page 1 of 1" on the right.

CHAPTER FOUR

4.1 SYSTEM ANALYSIS AND AYSTEM DESIGN IMPLEMENTATION.

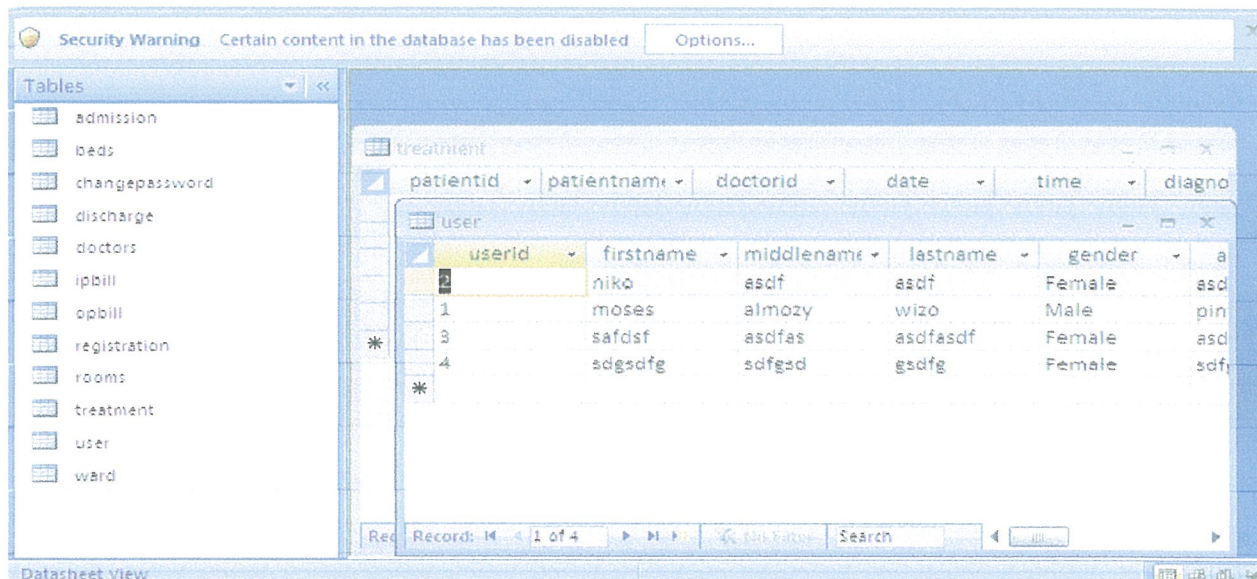
4.1.1 Tools used (languages used).

Microsoft access .this was used in the development of he database where by one creates tables relates them and comes up with full and complete database.

Reasons for using Microsoft access.

- I was able to make relations of my tables where by I eliminated un wanted tables that where not matching with the system resources.
- It helped me to create the database faster than sql because it could make relations automatically and it could allocate the primary key automatically.
- It handles a bigger database than sql it helped me to clearly come up with organized data tables.

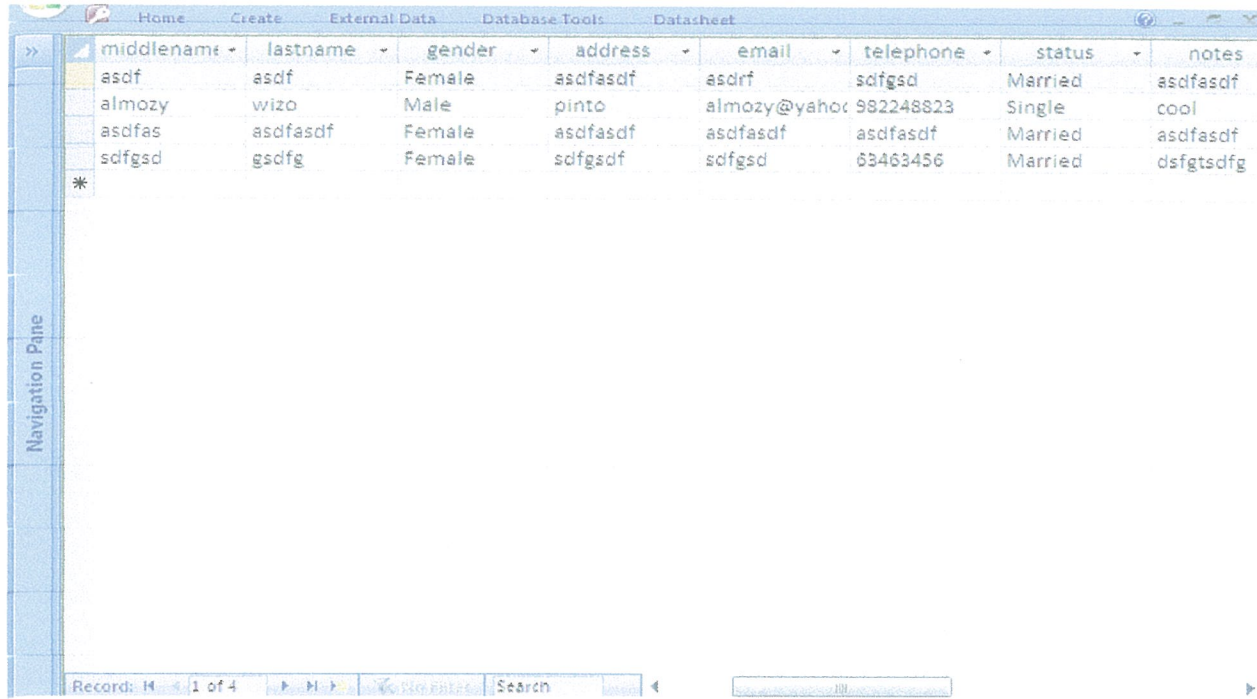
The following illustration bellow is the out look of the database.



SECURITY FEATURES OF THE SYSTEM.

User names, by the use of user name the user will be able to protect there information from being accessed by an authorized users who are likely to damage the system and misuse the information. Bellow is an table of users and how they should allocate in there details into the system.

User.



middlename	lastname	gender	address	email	telephone	status	notes
asdf	asdf	Female	asdfasdf	asdrf	sdfgsd	Married	asdfasdf
almozy	wizo	Male	pinto	almozy@yahoo	982248823	Single	cool
asdfas	asdfasdf	Female	asdfasdf	asdfasdf	asdfasdf	Married	asdfasdf
sdfgsd	gsdfg	Female	sdfgsd	sdfgsd	63463456	Married	dsfgtsdfg

Records: 1 of 4

Change of passwords (COP), is yet another security feature of the system where by users can change there passwords incase there is any change or any updates made on the system in order to protect it. Given bellow is the table in the data base showing change of password in the system.

username	oldpassword	newpassword	renewpassw
secretary	umali	gerald	sekuma

The other tables are those of patient registration, reference doctor, treatment, bed number and room number as shown bellow.

doctorid	doctorname	gender	type	address	homephone	mobile
1	miukjk	Male	neurosurgeon	xcvz	46745766	222222222
2	mikolo	Female	teetdoctor	nkeyoy	436745674	576456745
3	thelf	Male	pocketdoctor	near your pock	982238823	100000000
4	vcxb	Female	xcvbtgsdfg	sdfgsdfgsdfg	3463563463	3456356346

gender	height	weight	bloodgroup	address	homephone	mobile	notes
		45		asdfasd			
		34	AB	asdfasd			
		---	AB	asdfascdascd			
		---		sdfgsdfgsdf			
Male	45	345		sdfgsd	4563463456	3456345635	dfghsdfgsd
Male	4	44	B	clafsd	32453453	345345345	dsfgsvdrtw

*

 Record: 14 of 6

 Search

 []

 []

CHAPTER FIVE.

ACHIEVEMENTS AND RECOMMENDATIONS

5.1 ACHIEVEMENTS.

- I was able to know how to use the technique of fact finding and how to use those methods in order to get appropriate facts about the problem which gave me the strategies of developing the system.
- I was able to interact with different people, I got more friends who helped me to get adequate facts about the problem and the system that developed and besides I was introduced to new areas and fields of the problem study.
- I was able to generate more knowledge from different colleges who portrayed to me more ideas about the system.
- I was also able to find out more and simplified views about patient information management system mostly in books, data from the internet and other materials.

5.2 RECOMMENDATION AND CONCLUSIONS

I recommend the future researchers to hold a critical and thorough analysis when developing an information management system or improving on an existing one, to first draw structure for the strategies, they should use also be able to consult various sources concerning the particular system they are to develop including books, internet and other materials that can be of help and lastly team work is yet another factor that should be considered where by if there is a possibility of sharing ideas with deferent colleges within the same department, researchers should do that simply because getting views from different people helps much for a good successful system development they should also look forward for developing web-based patient information management system.

5.3 BIBLIOGRAPHY.

References:

1. Jennifer Rowley: (The basics of information systems 2003).
2. James A senn. (Analysis design of information system 2000 edition)
- 3.Emmax systems and electronics data center.
- 4Wikipedia (2007).
- 5.Thomas colonelly et al (Database systems by 2005).
6. Ulka Rojas.(Oracle database development guide 2nd edition)
- 7.<http://www.googlemail.com>. 7th /o7/2009.
- 8.William A. Shay.(understanding data communication and networks)
- 9.Fred R McFadden (Modern database management, fourth edition).
- 10.Mary .C (The database book)

APPENDICES

QUESTIONNAIRE GUIDES

1. How long do you take to be diagnosed by the doctor by the doctor?

2 minutes.

5 minutes.

15 minutes.

2. Are you satisfied with the doctors the doctors and the nurses services in this clinic?

Yes.

No.

3. Do you need amore justified way of the doctor attending to you?

Yes.

No.

SECTION B

1. How do you keep you records?

.....
.....
.....

2. Do you have computers? If yes , how do you use them to keep records?

.....
.....
.....

3. what is the number of doctors you have in the clinic?

.....
.....

4. How many patients do work on a day?

.....
.....
.....

5. Do you have a schedule for the doctors attending to patients and how many time does the doctor attend to patients?

.....
.....