TITLE PAGE

DESIGN AND IMPLEMENTATION OF AN ONLINE OUTPATIENT MANAGEMENT SYSTEM

A CASE STUDY OF SOKOTO SPECIALIST HOSPITAL.

BY

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CERTIFICATION

This is to certify that, this project entitled ''Design and Implementation of an Online Outpatient Management System'' is carried out by Mahmud Abdulkadir Dan Ute (Adm no: 0911310024) of Computer Unit, department of Mathematics, and meets the requirements governing the award of the Degree of Bachelor of Science in Computer Science and is approved for the contribution to knowledge and literacy presentation.

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DEDICATION

I dedicate this project to Almighty Allah (swt) and his Messenger Prophet Muhammad (saw) and my beloved parents Alhaji Abdulkadir Dan Ute and Hajiya Saratu Ladan who assisted me during this project.

May the almighty god help us, Ameen.

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ABSTRACT

Outpatient management systems in hospital today necessitate a competent administration when handling patients, generating reports, patient details which serves as a key factor for the flow of business transactions in Sokoto State Specialist Hospital. Unfortunately the current outpatient management system leads to misplacement of drug details, and late release of reports and insecurity to records. This research project is aimed at computerizing all the records about patients, staff and doctors management.

In order to achieve this goal, a thorough System Study and investigation was carried out and data was collected and analyzed about the current system using document and data flow diagrams. The concept of report production has been computerized hence, no more delay in report generation to the hospital manager. Errors made on hand held calculators are dealt out completely The method used to develop the system include iterative waterfall model approach, dataflow, logical and entity relationship diagram were used to design the system and finally the language used were MySql and php

CHAPTER ONE: INTRODUCTION

1.0 HOSPITAL

A Hospital is an institution with an organized medical and nursing staff provide a range of medical service, like surgery, for people requiring intensive treatment or observation. It may also include facilities for childbirth as well as various out-patient departments. A Hospital make up of various departments where various cases and handled. For example

1.   The surgery department where patients are operated on in the theaters.

2.   Obstetrics and gynecology unit where pregnant women are taken care of.

3.   Pediatric department where you treat children.

An outpatient is a patient who does not reside in the clinic where he/she is being treated. The registers of the outpatients are used for documentation of the outpatients. The documentation of the outpatients. The data for outpatient registers are registration number, name of patient, age, sex, registration address etc. The outpatient unit is made up of casuality section, records, outpatient, theaters, various clinics etc. The treatment of the outpatients ends in the outpatient department which that of the inpatients ends in their various wards.

1.1   STATEMENT OF THE PROBLEM

It could be very burdensome for someone who is seriously ill. It wounded or weak to queue on hospital line waiting for the doctor to attend to him or to pay for service and also get drugs. But when the designing and implementation of a computerize outpatient information system is achieved, a lot of problems will be documented for the outpatient. These problems include:

-          Time wastage

-       Absence of doctors involved

-       File sorting

1.2   PURPOSE OF THE STUDY

Hospital organization today is an essential part of the medical care scheme, owing to the increasing complexity of medical problem. It is very necessary that medical practitioners and specialists have an up to data and automated services.This study will examine the problem arising from manual operations of the outpatient information system and how these can be conquered by introducing the computer. This research work also aims at designing a statement that can replace the manual operations of the outpatient information system

1.3   SIGNIFICANCE OF THE STUDY

The significance of this study is that it eliminates:-

(i)   Time Wastage: - When this study is practiced the time an outpatient wastes in registering seeing the doctor, buying drugs will be eliminated. Because it will no longer be handled manually rather it is going to be computer based.

(ii)   It also eliminates inconveniency: - In a situation whereby a patient registered in the clinic for the past three and later came back in the fourth year for the check up, the information of that out-patient can be accessed convenient using the computer, rather than searching for the outpatient information or records manually

1.4   SCOPE OF THE STUDY

The scope of this study is limited to the design and implementation of a computerize outpatient information system for the Specialist Hospital Sokoto.

1.5   ASSUMPTIONS

It is assumed that all the data located are true valid. It is also assumed that the basic requirements of the outpatient information system should not be changed often so that the program will score for a very long time.

1.6   DEFINITION OF TERMS

DIAGNOSIS: It means a determination of an individual's disease, illness, or injury, made by a health care provider.

PATIENT: A person who is receiving medical care form a doctor.

OUTPATIENT: A patient who is not an inpatient (not hospitalized), but instead comes to a doctor's office, clinic or day surgery for treatment.

INPATIENT: A patient living in the hospital where he is being treated

FILE: A collection of related records or a folder that is based keep documents

PRESCRIPTION: A written instructions from a physician to a pharmacist stating the form, closage, strength, etc, of a drug to be issued to a specific patient.

DATA: These are raw facts, but when captured or processed, generates information

PROGRAM: A sequence of coded instruction fed into a computer, enabling it to perform specified logical and arithmetical operations on data.

CHAPTER TWO: LITERATURE REVIEW

2.0 INTRODUCTION

In this section the research, location and analysis of the existing knowledge related to the subject of inquiry are explored and cited. It also sells at the relationship of the proposed research for purposes of good representation and critical review of the existing literature. Martin (1976) data within an organization is increasingly being regarded as a basic resource needed to run the organization. As with other basic resources, professional management and organization of data are needed. The importance of efficient use of data for planning, predicting and other functions will become so great in a computerized organization that it will have a major effect on growth and survival of co-operations. In relation to the above argument, the presence of an automated data management system in sokoto state specialist hospital efficiency, timely decisions and responses will be achieved.

2.1   PREVIOUS STUDIES FROM SOKOTO STATE SPECIALIST HOSPITAL

For the last few years the hospital employees have been able to collect data from agents by providing them with a piece of paper with required fields to fill. Its routine for every health worker to collect data, this should be processed and stored completely. They avail the right information and knowledge to the right person and institution in the form at the right time and place. The information ranges from individual patient reports to disease rebalance to mortality rate in the right persons and institutions which include the counties that use the health service, the service provider at local level, ministry of health and the donors. The company's employees and patients are straining to process lots of policy documents every day. Integrating and streamlining policy Application and document processes would ease administrative headaches for patients and greatly strengthen relationships with their customers Streveler (2004) grouped the component making HIS into 2 which are information

processing and management. Information processing involves data collection, transmission, processing, analysis and presentation of information for use in patient care and health care management decisions. Health management system cannot exist alone but as functional unit aimed at improving the health of individuals and that of the community.

2.2 TYPES OF INFORMATION SYSTEM

There are various types of information system of which the following are inclusive:
.Transaction processing system (TPS): these are systems that perform and record daily routine transactions necessary for businesses. As this implies, TPS are designed to process routine transactions effectively and accurately.

. Knowledge work system (KWS): these are systems that aid in the creation integrations of new knowledge in to an organization. KWS exists to help businesses create and share information. These are typically used in an organization where employees create new knowledge and expertise which can then be shared by other people in the organization to create further opportunities. Good examples include firms of lawyers, accounts and management consultants. KWS are built around system which allows efficient categorization and distribution of knowledge. For example, the knowledge itself might be contained in word processing documents, spreadsheets, power point presentation, internet pages or whatever. To share knowledge, a KWS would use a group of collaboration systems such as an intranet. **.
Office Automated System (OAS):** these are systems designed to increase the product of data workers in an organization. Office automation system improves the productivity of employees who need to process data and information. Perhaps the best example is the wide range of software systems that exist to improve the productivity of employees working in an office (e.g. Microsoft office) or system that allow employees to work from home or whilst on themove.

. Management information system (MIS): these are systems that serve planning, control and decision making through routine summary and reports. They are mainly concerned with internal source of information. MIS usually take data from the transaction processing systems and summarize it into a series of management reports.

. Decision support system (DSS): these are systems that combine data, model and analysis tools for non routine decision making DSS are specifically design to help management make decisions in situation where there is uncertainty about the possible outcomes of those decisions. DSS comprises tool and techniques to help gather relevant information and analyze the options and alternatives.

.Executive support system (ESS): these are systems that support non routine decision making through advanced graphics and communications. They gather and summarize the key internal and external information used in an organization.

2.3 QUALITIES OF A GOOD INFORMATION SYSTEM

An information system includes the following: Efficiency: a good information system should allow for input and output by providing an objective for recording and aggregation information. It should be able to quickly collect and edit data, summarize results, and adjust as well as correct errors promptly. Effectiveness: a good information system should be able to attain its goals or the goals of the organization. To simplify prompt decision making, an organization's information system should be capable of providing current information to appropriate users. Performance: A good information system should be able to enhance communication among employees, deliver complex material throughout an organization. Time lines: Information system should be designed to expedite capturing, storing and reporting information in a real time scale when needed. Consistency: A good information system should be reliable. Data should be processed and compiled with consistency and

uniformity. Variations in how data is collected and reported can distort information and trend analysis.

2.4 FUNCTION OF PATIENT RECORD MANAGEMENT SYSTEM

These are incorporated in the technical (clinical) and business (administration) component of health service these are divided into three (3); transactional control reporting, operating planning and strategic planning. Transactional functions: handle day to day operational and administrative task of the organization example of this include the following; order entry, service scheduling, treatment and other personal staffing and scheduling. Control reporting and operating function: provides summarized data about the operation of the organization to the manager and health care professional that permits the monitoring of various activities. These tasks include medical record tracking, medical audit and peer re Strategic planning function: provides a frame work from decision making with long range implications which include patient care strategy like level of care, occupancy and service demand, requirement and project cost. Thus the outpatient management information system in this study ideally consists of integrated approach to maintain patient related administrative and hospital data considering the continuum of care dependent on the services provided.

2.5 RELATED CASE STUDY PIONEERING SECURE ON LINE PATIENT RECORD

Management and collaboration between doctors clinical and hospital using secured internet transmission according to Mennel (2006). In this project doctors are able to view patient medical records immediately at their private offices using secure internet transmission. The project aimed at increasing competitiveness of the medical profession by improving the accuracy of medical records and efficient retrieval and usage of medical records. Patient medical records are very critical for doctors to establish their diagnosis, with detailed and on-hand patients" medical records; doctors can make appropriate medical decision efficiently.

Security was a critical issue in the storage and transferring of patient medical records between hospitals and doctors" offices. All clients were authenticated with a 2 patient identity number.

2.6 STATE OF ART OF PATIENT RECORD MANAGEMENT SYSTEM

Llan (2002) defined a medical record as confidential information kept for each patient by heath care professional or organization. It contains the patients" personal details such as name, address, date of birth, a summary of the patient medical history and documentation of each event including symptoms, diagnosis, treatment and outcome. Relevant documents and correspondence are also included.

Traditionally, each healthcare provider involves in patient care kept an independent record usually paper based, the main purpose of the medical record of the summary of a person's conduct with the health care provider and treatment provided to ensure appropriate health care, information from medical record also provide essential data for monitoring patient care, clinical audit and accessing patterns of care and services delivered. The management information system enables the medical record to form a first link in the information chain producing the depersonalized aggregated coded data for statistical.

Weakness Hackers: information sent by use of the internet can easily be hijacked and terminated by unauthorized persons before reaching its destination. Virus: this can destroy files by replicating themselves in the document hence losing the meaning of the file.

2.7 ADMINISTRATION OF OUTPATIENT MANAGEMENT SYSTEM

The patient Record Management System is a system that can manage multiple users of the system and can have the track of the right assigned to them. It makes sure that all the users function with the system as per the rights assigned to them and they can get their work done in efficient manner. It is a Customizable and strong administration system i.e. changes of

password of users at the administration point. The information management system will be able to capture information about an old patient the information captured will be easily managed by the administrators more easily.

2.8 PROBLEMS OF ADMINISTERING THE OUT PATIENT MANAGEMENT SYSTEM

According to Gordon the following are possible problem to encounter while administering OPMS. It is not suitable for computer illiterate people. The user must be a member in order to make use of the system. The systems do not do away with paper work completely; the papers are still used at some point.

CHAPTER THREE: SYSTEM ANALYSIS AND SYSTEM DESIGN

3.1 INTRODUCTION

The chapter describes the system study, analysis, design, strengths and weaknesses of the current system, Context level diagrams, Entity Relationship Diagrams, Architectural design

3.2 SYSTEM STUDY

The study was carried out at sokoto state specialist Hospital the main purpose of the study was to find out how the process of recording patient's data is carried out. The system that is currently being used in sokoto state specialist Hospital is entirety manual. When a patient requests drugs from the staff, all the information is recorded manually from the drug dispenser similarly when the supplier delivers drugs all the information from the dispenser to the account on drugs is recorded manually. For cases that cannot be resolved are posted to the respective staff to handle them and the status is sent to the concerned receivers.

 System Analysis During the system study phase, requirements of OPMS was categorized into user requirements, system and hardware requirements.

3.3 EXISTING PATIENT RECORD MANAGEMENT SYSTEMS

Refer to the literature review, observation, interviews and questionnaires as explained in chapter 3 it should be noted that at sokoto state specialist Hospital we were able to analyze existing systems as discussed below. The current system was manual where data is written on different papers and transferred to the different departments, human errors were vulnerable since it was paper based and retrieval of files was time consuming as they had to manually locate files some of which were even lost and thus finding such information was hard. Per the statistics carried 90% of the users were not contented with

the system reason that it was not secure in terms of security and storage as it was prone to damages like loss of important information, worn out papers, outbreak of fire, The speed of recording and retrieval patients" information was average yet 10% were somehow okay with the system reason that the paper work can used for future reference. The users recommended that the proposed system should be user friendly, multipurpose enough to handle a number of users at a go, could generate feedback when request is submitted and use of passwords which could deny access to unauthorized users of system which ensured security. Context diagrams, Data flow diagrams and Entity Relationship Diagrams (ERDs) were used in the analysis and design of the system.

3.4 REQUIREMENTS SPECIFICATIONS

After analyzing the data collected, we formulated a number of requirements namely user requirement, system hardware software attribute. These were grouped as user, functional, non-functional and systems requirements.

3.5 USER REQUIREMENT DURING DATA COLLECTION

There we investigated and found out how the current system operates, not only that but also tried out which problems are faced and how best they can be settled. The users described some of the basic requirements of the system this includes Search for patients, Register staff, Update, staff records, patients and View all types of reports

3.6 NON FUNCTIONAL AND FUNCTIONAL REQUIREMENTS

The following is the desired functionality of the new system. Accept of submissions in form of raw patients, staff, and drug supply at submit point, Perform analysis of financial, drug inventory, patients, and drug supply, To authenticate the users of the system.

And non functional requirement include the following The system must verify and validate all user input and users must be notified in case of errors detected in the course of using the system, The system only allows the administrator to delete records in the database, The system should allow room for expansion.

3.7 SYSTEM REQUIREMENT

This section describes the hardware components and software requirements needed for effective and efficient running of the system

Table 3.0 Hardware Requirement

HARDWARE	MINIMUM SYSTEM REQUIREMENT
PROCESSOR	2.4 GHZ processor speed
MEMORY	128 MB RAM (256 MB Recommended)
DISK SPACE	80 GB (including 20 GB for database Management system)
DISPLAY	800 x 600 colours (1024 x 768 High colour-16 bit Recommended)

Table 3.1 Software Requirements

SOFTWARE	MINIMUM SYSTEM REQUIREMENT
OPERATING SYSTEM	WINDOWS 2000 OR LATER
Database Management System	MYSQL
Run-time Environment	Apache/tomcat5 server

The table above shows software requirements recommended to enable the system to run as required for using PIMS

3.8 PROPOSED FEATURES FOR THE NEW SYSTEM

The system should captured patients initials at the receciptionist that can be used by all departments of the hospital. The system should generate patient's identity number automatically. The system should identify treated and untreated patients at doctor and pharmacist control panel concerning drug issuing.

3.9 SYSTEM DESIGN

After interpretation of the data, tables were drawn and process of data determined to guide the researcher of the implementation stage of the project. The tools, which were employed during this methodology stage, were mainly tables, Data Flow Diagrams (DFDs) and Entity Relationship Diagrams (ERDs). The design ensures that only allows authorized users to access the system's information.

3.9. LOGICAL MODEL

This figure shows the logical flow of events in the system, it caters for the time when the user logs in and signs out from the system.

Figure 3. 0 Logical flow of data in OPMS
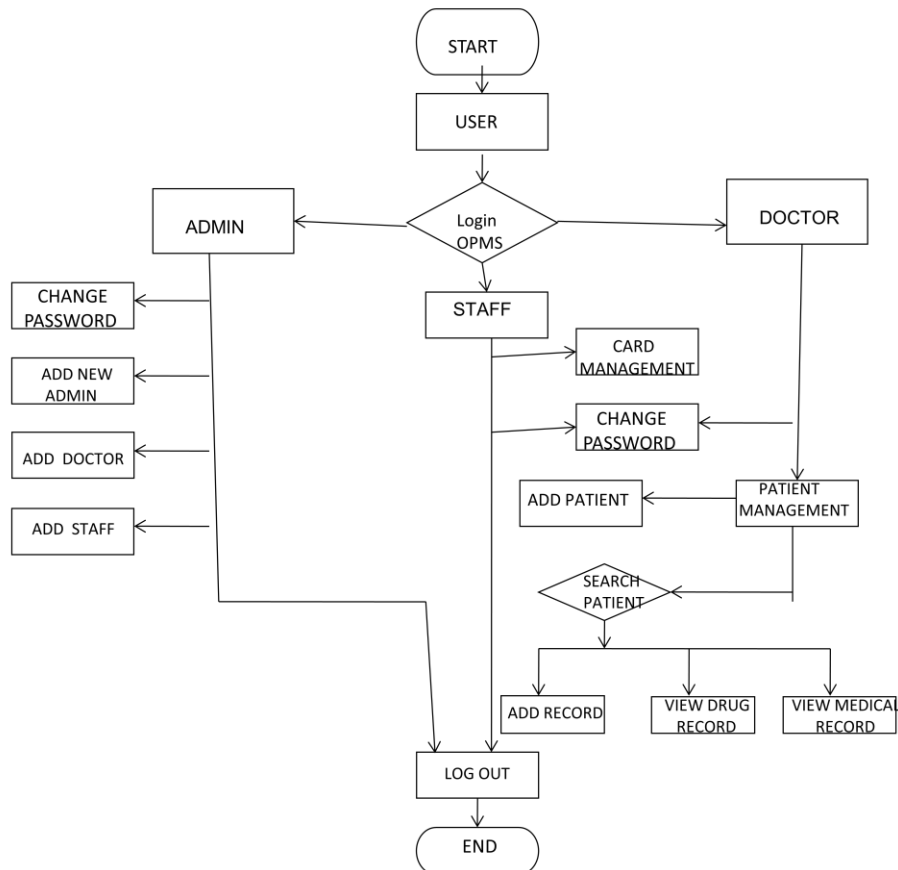
3.10 SYSTEM ARCHITECTURE

This gives a high level view of the new system with the main components of the system and the services they provide and how they communicate. The system is implemented using a

three-tier architecture that comprises of user interface, process management and DBMS as illustrated below.
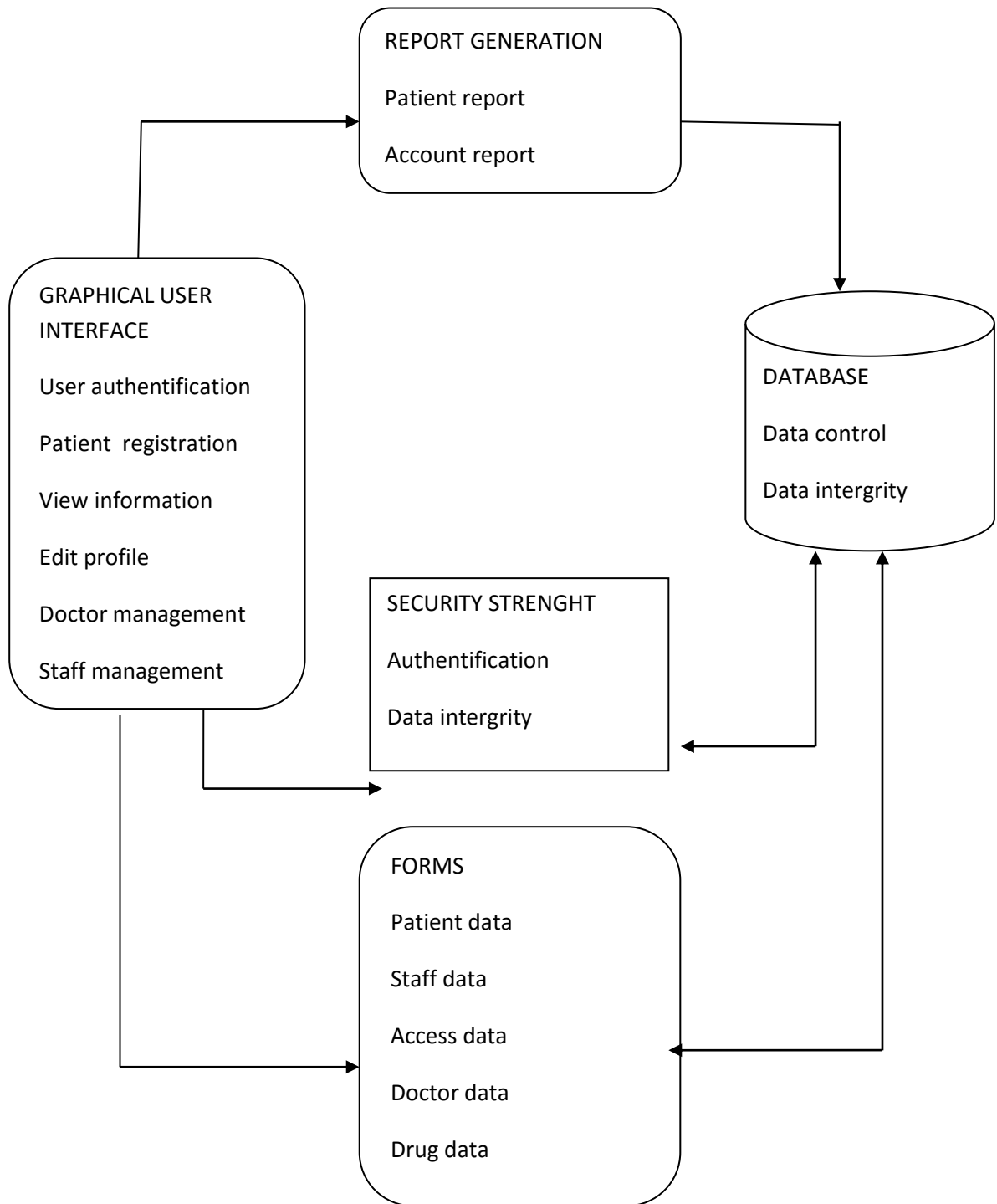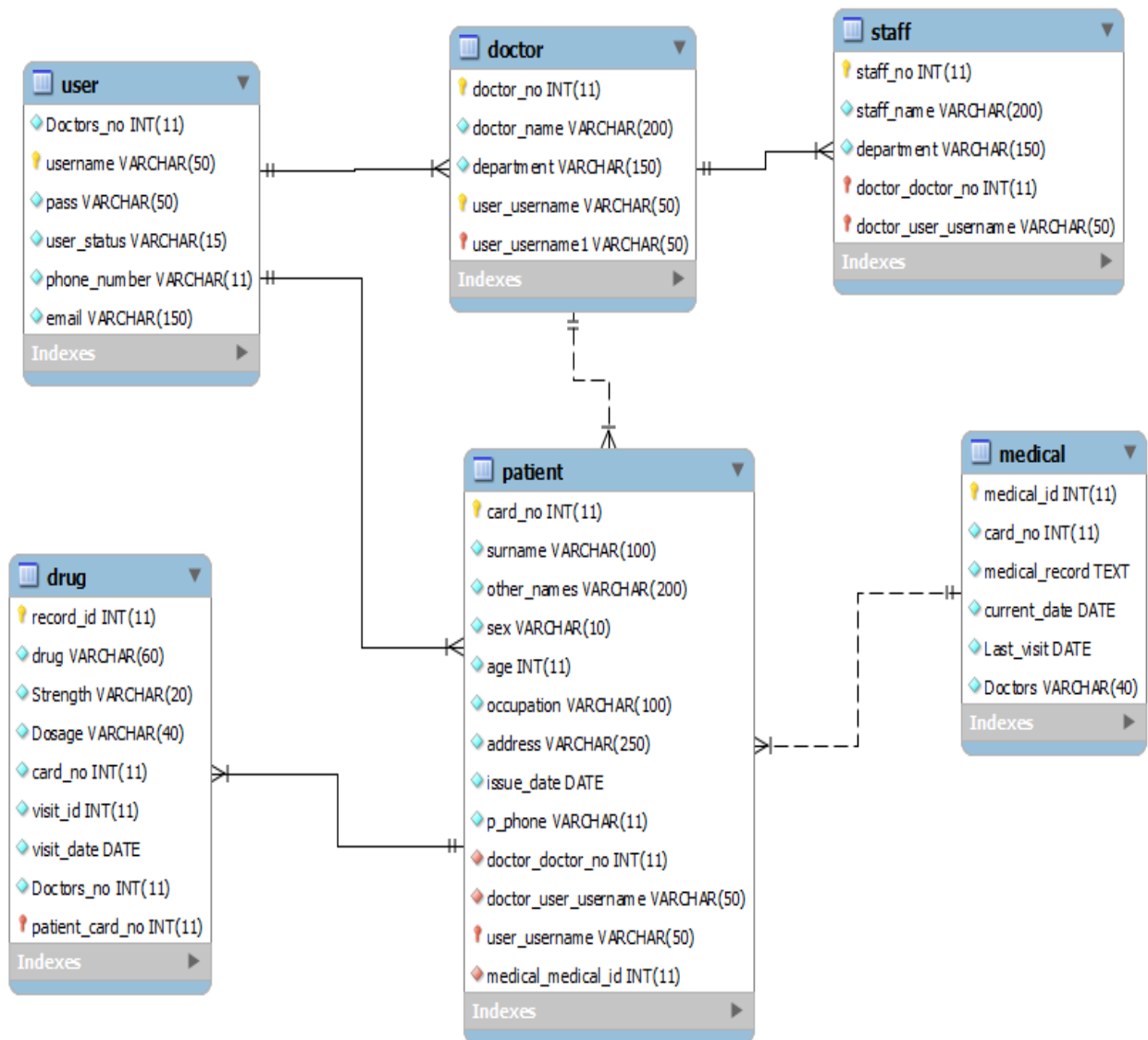

Figure 3.1 System Architecture of sokoto state specialist Hospital

3.11 ENTITY RELATIONSHIP DIAGRAMS

Entity Relationship diagrams is a specialized graphics that illustrate the interrelationship between entities in a database. Here diagrams always use symbols to represent different types of information.

user
- Doctors_no INT(11)
- username VARCHAR(50)
- pass VARCHAR(50)
- user_status VARCHAR(15)
- phone_number VARCHAR(11)
- email VARCHAR(150)
- Indexes

doctor
- doctor_no INT(11)
- doctor_name VARCHAR(200)
- department VARCHAR(150)
- user_username VARCHAR(50)
- user_username1 VARCHAR(50)
- Indexes

staff
- staff_no INT(11)
- staff_name VARCHAR(200)
- department VARCHAR(150)
- doctor_doctor_no INT(11)
- doctor_user_username VARCHAR(50)
- Indexes

drug
- record_id INT(11)
- drug VARCHAR(60)
- Strength VARCHAR(20)
- Dosage VARCHAR(40)
- card_no INT(11)
- visit_id INT(11)
- visit_date DATE
- Doctors_no INT(11)
- patient_card_no INT(11)
- Indexes

patient
- card_no INT(11)
- surname VARCHAR(100)
- other_names VARCHAR(200)
- sex VARCHAR(10)
- age INT(11)
- occupation VARCHAR(100)
- address VARCHAR(250)
- issue_date DATE
- p_phone VARCHAR(11)
- doctor_doctor_no INT(11)
- doctor_user_username VARCHAR(50)
- user_username VARCHAR(50)
- medical_medical_id INT(11)
- Indexes

medical
- medical_id INT(11)
- card_no INT(11)
- medical_record TEXT
- current_date DATE
- Last_visit DATE
- Doctors VARCHAR(40)
- Indexes

The diagram above is an entity relationship diagram that is a major data modelling tool that helped database analysts to organize data into entities.

3.12   DATABASE DESIGN

The DBMS used was MySQL and this section includes details of the database design. The conceptual and physical database design and the data dictionary are described. After system investigation and analysis, the concept of the new system was designed and all the relevant entities involved in the system were identified. Therefore the following entities were chosen to capture this information i. Staff and payment. ii. Patient details

3.13   STRENGTH OF THE CURRENT SYSTEM

These were introduced to solve problems with the existing manual systems. The automated Patient information Management system has many advantages over the manual system. This can be explain as follow The major benefit with this is that it helps the staff to accomplish their daily functions more efficiently. No more need for paper work.

 Quick access to the required information as it is only „one click away.

 It solves the problem of time consuming, hence customers are served on time.

It also enhances security as access to the system requires authentication. This means that only authorized users can access that system.

3.14 WEAKNESS OF THE CURRENT SYSTEM

After a thorough investigation of the present system, the following loopholes were identified. Regular complaints by patients, hospital administrators, staff and drug supplier concerning misplaced or lost financial payment forms. The hospital administration finds it tiresome and time consuming when computing patient, drug supplier and staff payment receipts and voucher cards respectively, this leads to late release of reports concerning the performance in the hospital the hospital Administration currently uses health record files for storing patients", drug suppliers", and staffs" records on payment respectively. This system of information storage is susceptible to security problems such as illegal modification and update of records.

CHAPTER 4: SYSTEM IMPLEMENTATION AND TESTING

4.1 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 to meets the user requirement.

4.2 USER REQUIREMENT FOR EFFECTIVE USE OF THE SYSTEM

it is important that users are fully involved and are given opportunities to participate as much as possible This rectifies numerous problems associated with change management, users getting accustomed to using new way of doing things as opposed to traditional system of patient records management system. During data collection, the researcher investigated and found out how the current system operates, not only that but also tried out which problems are faced and how best they can be settled. The users described some of the basic requirements of the system as;

.Search for patients

.Register staff.   .

Update, staff records, patients

.View all types of reports.

.Assign access rights and privileges to the system users.

4.3 FUNCTIONAL REQUIREMENT

The following is the desired functionality of the new system.

.The system should accept have submissions in form of raw patients, staff, and drug supply at
the submitting point.

.The system should perform analysis of ,drug prescribed and patients.

.The system should authenticate the users of the system.

.The system should generation of reports on request.

.The system should only allow the administrator to delete records in the database.

4.4 NON FUNCTIONAL REQUIREMENT

.The system should must verify and validate all user input and users must be notified in case
of errors detected in the course of using the system.

.The system should allow room for expansion.

.A system should have a high performance and reliability level.

4.5 SOFTWARE REQUIREMENTS PHP (HYPERTEXT PRE-PROCESSOR)

PHP is a server-side scripting language designed specifically for the web. The goal of the
language is to allow web developers to write dynamically. PHP allows interfacing to many
different database systems that provides an open database connectivity standard (ODBC)
such as. MySQL, Oracle, Microsoft products and others. Other advantages are low cost and
availability. PHP is portable across multiple platforms and is created as an open-source
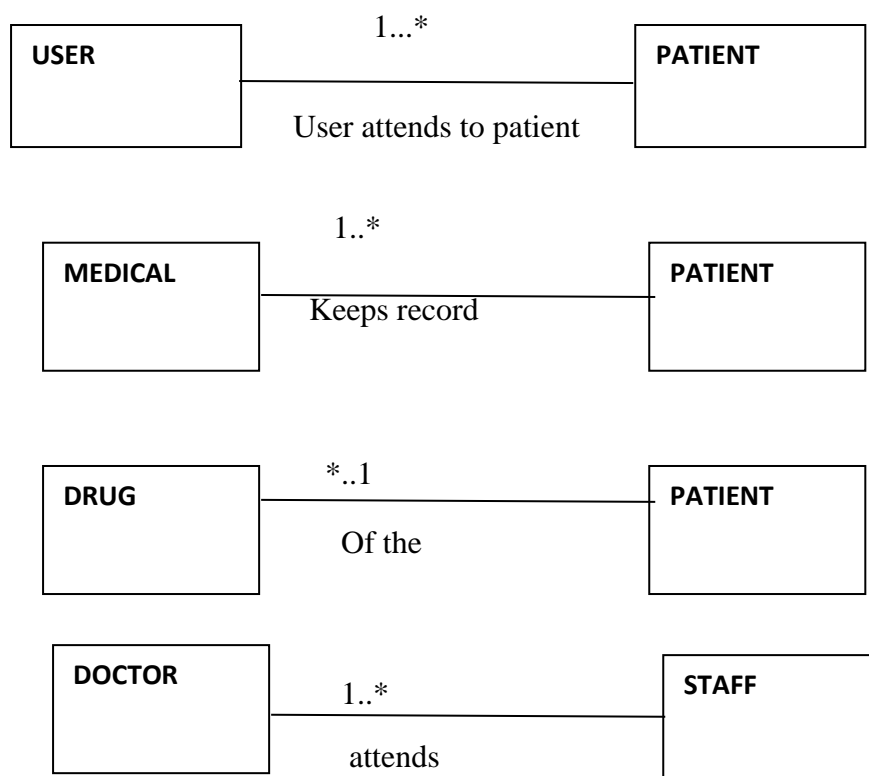
MySQL (My Structured Query Language)

MySQL is an open source relational database management system (RDBMS) that uses
Structured Query Language (SQL), the most popular language for adding, accessing, and

processing data in a database. MySQL is noted mainly for its speed, reliability, and
flexibility. It is fast, robust and scalable relational database management system. MySQL is a
true multi-user, multi-threaded SQL (structured programming language) database server.
Apache web server the apache web server is the software that responds to client requests by
providing resources, such as XHTML documents. Apache has other powerful features
included in a large set of modules, including mod Perl, and many authentication modules.

4.6 ENTITY RELATIONSHIP AND THEIR CARDINALITY

This section demonstrates the binary relationships between two entities of the system.


```
+-----------+           1...*            +-----------+
|   USER    |---------------------------|  PATIENT  |
|           |    User attends to patient |           |
+-----------+                           +-----------+


+-----------+           1..*            +-----------+
|  MEDICAL  |---------------------------|  PATIENT  |
|           |    Keeps record           |           |
+-----------+                           +-----------+


+-----------+           *..1            +-----------+
|   DRUG    |---------------------------|  PATIENT  |
|           |    Of the                 |           |
+-----------+                           +-----------+


+-----------+                           +-----------+
|  DOCTOR   |           1..*            |   STAFF   |
|           |---------------------------|           |
|           |    attends                |           |
+-----------+                           +-----------+
```

4.7 DATA DICTIONARY

This section contains different relational tables, entities, attributes and data types

Table 4.0 Doctors Table

Doctors No.	int	The doctors identification No	5	Primary Key
Doctors Name	text	The doctors name	20	
Department	text	The Department of the doctor	20	

The table above shows the structure of the doctors table in the database.

Table 4.1 Staff Table

Staff no	Int	The staff identification number	5	
Staff Name	Text	The name of the staff	20	Primary Key
Department	Text	The department of the staff	20	

The table above shows the structure of the staff table in the database.

Table 4.3 Users table

User ID	Int	The users identification number	5	
Username	Text	The name of the user	25	Primary key
Password	Text	Users name	11	
User status	Text	The status of the	6	

		user male or female		
Phone number	Int	The nymber of the user	11	
E mail	Text	Email address of the user	25	

The table above shows the structure of the users table in the database.

Table 4.4 Patients Table

Card No	Int	The card identification number	5	Primary key
Surname	Text	The second name of the patient	25	
Other names	Text	The first names of the patient	25	
Sex	Int	Gender of the patient	6	
Age	Int	The age of the patient	3	
Occupation	Text	Job of the patient	11	

Address	Text	Patients home address	25	
Issue date	Int	Date	10	
Phone number	Int	Phone	11	
Doctors name	Text	The name of the doctor who treats the patient	25	Foreign key

The table above shows the structure of the patients table in the database.

Table 4.5 Medical Records Table

Medical ID	Int	The identification number of the medical	5	Primary key
Card No	Int	The identification number of the card	5	Foreign key
Medical record	Text	Keeps records	25	
Current date	Int	Date at the time	10	
Last visit	Int	The last time they visited	10	
Doctors name	Text	The name of the	25	

		doctor		

The table above shows the structure of the medical records table in the database.

Table 4.6 The Drugs Table

Record ID	Int	The identification number of the record	5	Primary key
Drug name	Text	The name of drug prescribed	25	
Strength	Int	The strength of the drug	4	
Dosage	Int	Number of times to take drugs	3	
Card No	Int	The card identification number	5	
Visit ID	Int	Visit	5	

| Last visit date | Int | The last time they visited | 10 | |
| Doctors name | Text | The name of the doctor that prescribed the drugs | 25 | Foreign key |

The table above shows the structure of the drugs table in the database.

4.8 **SYSTEM IMPLEMENTATION**

This describes the tools used to implement the graphical user interface and the database. MySQL was used to create and connect relational tables to the database. HTML was used to develop the GUI. PHP was used to process queries and integrate interfaces was done to develop the model that meets all the requirements of this system.

4.9 **SYSTEMS TESTING**

Testing was done after the system was put in place. This was done in two ways namely Unit Testing and integration testing.

4.10 **TEST PLAN**

The Software Test Plan (STP) is designed to prescribe the scope, approach, resources, and schedule of all testing activities. The plan will identify items to be tested, the features to be tested, the types of testing to be performed, the personnel responsible for testing, the resources and schedule required to complete testing. The purpose of the software test plan is such as:

.To achieve the correct code and ensure all Functional and Design Requirements are implemented as specified in the documentation.

.To provide a procedure for Unit and System Testing.

.To identify the test methods for Unit and System Testing.

4.11 **PROCESS OF TEST PLAN**

.Identify the requirements to be tested. All test cases shall be derived using the current design specification.

.Identify particular test to use to test each module.

.Identify the expected results for each test.

.Perform the test.

.Document the test data, test cases used during the testing process. The following explain the ways in which testing is done.

4.12 **UNIT TESTING**

Unit testing was carried out on individual modules of the system to ensure that they are fully functional units. We did this by examining each unit, for example the Underwriter's page. It was checked to ensure that it functions as required and that it adds patient's data and other details and also ensured that this data is sent to the database. The success of each individual unit gave us the go ahead to carryout integration testing. All identified errors were dealt with.

4.13 **INTEGRATION TESTING**

We carried out integration testing after different modules had been put together to make a complete system. Integration was aimed at ensuring that modules are compatible and they can

be integrated to form a complete working system. For example we tested to ensure that when a user is logged in, he/she is linked to the appropriate page, and also could access the database.

4.14 SYSTEM VALIDATION

As one of the specific objectives of this study, validation of the system was very important. Validation of the system was done by comparing it to the questions asked by the users at sokoto state specialist hospital. Most of their answers matched with what the system can do. JavaScript was used to validate user input and the respective input. For example the system does not accept blank field; the system also discriminate between numerical and numerical characters.

4.15 PRESENTATION OF RESULTS

The presentation of the results of PRMS is analyzed in terms of the interfaces of the system and output from the backend of the system. This includes activities of the users. The following are the results after the implementation of the OPMS.

4.16 SYSTEM INTERFACES

All system interfaces in this chapter were created in Dream weaver and PHP coder while creating HTML and PHP interfaces.

4.17 LOGIN FORM FOR THE DIFFERENT USERS

Only authorized user with the right user name and password has right to access the services to particular department he or she intent to view. When wrong user name and password is used the system rejects access to the services.

Figure 4.1 Login Form for the Different Users

4.18 System Administration Home page

The system administrator can add, edit system users and has access to view the services

offered by the different departments for easier tracking in case of mismanagement in the

hospital.

Figure 4.2 System Administration Home page

4.19 **Doctors Management Home Page**

This is where the doctor can search for registered patient, view his medical report and also

drugs report.

Figure 4.3 The Doctors Management Homepage

4.20 DATABASE OF OPMS IMPORTED IN PHP MYADMIN

The system cannot run unless wampserver is installed in the machine (laptop or computer)

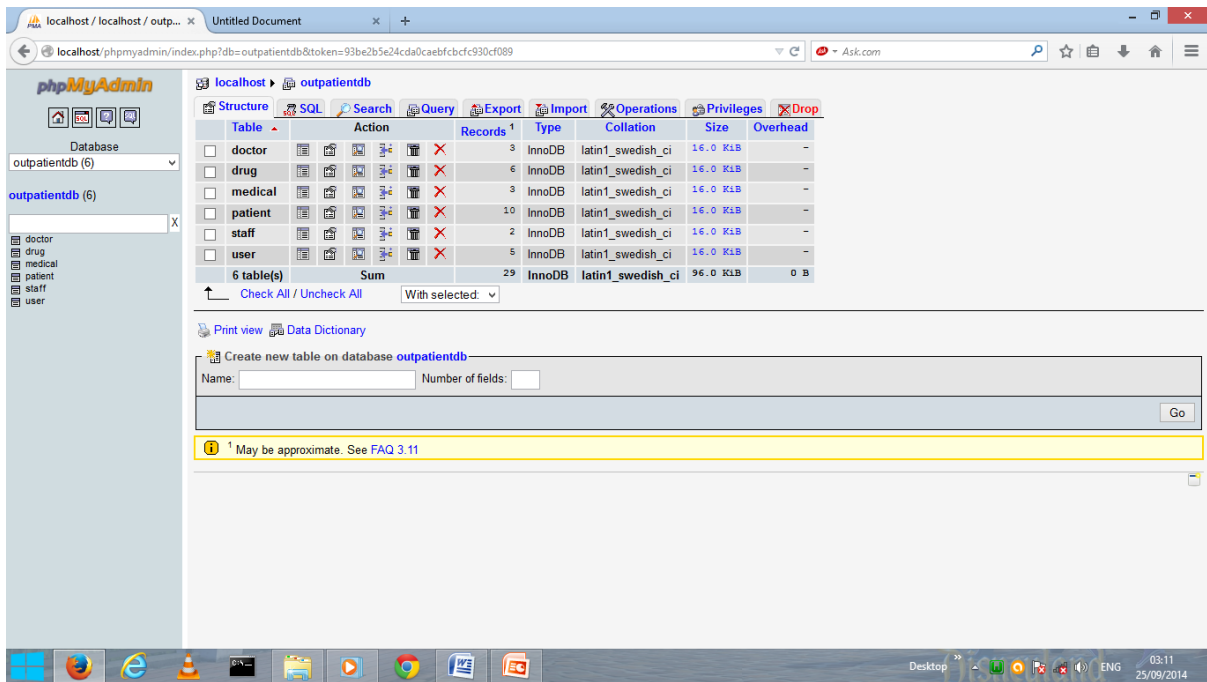then the system database is created and imported from where it's saved to the phpMyAdmin.

Figure 4.4 Database of opms imported from phpMyAdmin

4.21 DATABASE OF OPMS CREATED IN MYSQL CONSOLE

When the system is successfully created and imported to the phpMyAdmin, the tables can be manipulated by the system administrator into detailed in the MySql for instance he or she can be selected, described, updated, and altered tables.

			Doctors_no	username	pass	user_status	phone_number	email
□	🖊	✗	20011	20011	20011	doctor	08035499856	sharhabilbabi@gmail.com
□	🖊	✗	20012	20012	20012	doctor	09096497201	ashiru@gmail.com
□	🖊	✗	201	201	201	staff	07031803980	faskari@gmail.com
□	🖊	✗	4344	admin	specialist	admin	08030000014	abdulkadir@gmail.com
□	🖊	✗	1	username	222222	admin	07039644709	zooyouxng1@gmail.com

			doctor_no	doctor_name	department
□	🖊	✗	20011	Abdulkadir dan Ute	Medicine
□	🖊	✗	20012	Ashiru Batsari	Surgery
□	🖊	✗	20013	usman bello	Medicine

←T→	card_no	surname	other_names	sex	age	occupation	address	issue_date	p_phone
□ ✎ ✗	1	Muhammad	Iliyasu	Male	25	Student	Dubsaye Area	2014-09-22	08056545455
□ ✎ ✗	2	umar sani	bello	Male	28	student	sokoto area	2014-09-22	08060403012
□ ✎ ✗	3	umar sani	bello	Male	28	student	sokoto area	2014-09-22	08060403012
□ ✎ ✗	4	umar sani	bello	Male	28	student	sokoto area	2014-09-22	08060403012
□ ✎ ✗	634	umar sani	bello	Male	28	student	sokoto area	2014-09-22	08060403012
□ ✎ ✗	2655	nasi	sada	Female	12	student	sokoto0	2014-09-22	08060403044
□ ✎ ✗	3091	nasi	sada	Female	12	student	sokoto0	2014-09-22	08060403044
□ ✎ ✗	7322	Muhammad	Iliyasu	Male	25	Student	Dubsaye Area	2014-09-22	08056545455
□ ✎ ✗	9339	umar sani	bello	Male	28	student	sokoto area	2014-09-22	08060403012
□ ✎ ✗	9819	umar	badamasi	Male	20	student	Rigachukwum kaduna	2014-09-24	08030771345

Figure 4.5 Database of opms created from MySql Console

CHAPTER 5

SUMMARY, LIMITATION, CONCLUSION AND RECOMMENDATIONS

5.0 INTRODUCTION

This chapter describes discuss the objectives of the system stipulated in earlier chapter, limitation of the system conclusion and recommendation of the system

5.1 SUMMARY

As discussed in the previous chapters the main problem that we addressed was dealing with patient medical document. It is the above situation that drove us to techniques of developing this Outpatient Management System to be used at Sokoto state specialist hospital to enable them to handle details on policies efficiently and effectively. The project has implemented Most of the objectives stipulated in earlier chapter. The Outpatient management system offers a number of benefits to the user and can capture data, store, view, add and delete the records entered the data can also be posted information to the database.

PROBLEMS ENCOUNTERED DURING DATA COLLECTION: sensitive information released to us, few projects and books written about patient records management system.

PROBLEMS ENCOUNTERED DURING SYSTEM DESIGN: Limited time to finish up the work, limited numbers of computers with the internet in the faculty hence it becomes difficult down load PHP codes from the internet and In adequate financial support to facilitate the project.

5.2 LIMITATIONS

This section describes those services that are not provided by the system and those include the following. It does not auto generate alarm to alert the pharmacist manager of the

expiring date of drugs at a given period of time. Reason that we use MySql program to develop the system which cannot support the triggers which can only be found in Oracle program.

5.3 CONCLUSIONS

The core reason for the establishment of computerizing patient records management system is to enable the hospital administrators in a convenient, fair and timely manner. Therefore the IT used should support the core objective of the system if it is to remain relevant to the hospital. A lot still needs to be done in the IT department in order to make available technology effective. This may involve training of the staffs on how to enter data in the right and relevant data in the system and the management to keep updating the hardware and software requirements of the system. IT and computer systems need to be kept being upgraded as more and more IT facilities software are introduced into days IT market. The researcher acknowledges the fact this system does not handle all staffs the hospital like the security and asset section. The researcher therefore suggests that for further research, the following can be researched on. The most cost effective way of handling all staffs and interlinking Sokoto state specialist hospital.

5.4 RECOMMENDATIONS

Training of all the members of the staff in the hospital to get accustomed to the system will be a priority. This being a new system, some members of the staffs management will get threatened that the computerized patient records management system will replace their jobs .I would recommend that management of the hospital educates the staff of how this system will operate and how it will supplement their efforts .For the efficiency of the hospital, users of the system need to be thoroughly educated about the use of the

passwords and staff name, 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 fully protected and should have an air conditioner of 1100BTU to prevent the server from overheating. Backup media like CDs, Diskettes and Flush disks can be used for backups and storage of data.

5.5 OPPORTUNITY AND LESSON LEARNED

During the course of this project, we were able to understand better what goes in the patient records management system in the hospital. This was effectively done through reading of literature and research. The whole process of developing the system was an opportunistic challenge. Seeing the system into a tangible system was a rewarding exercise.

REFERENCES

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Conte (1999) *Information management systems in organizations* information management and technology: prentice hall.

Mengoza, P. and Gyeszly, S.D (2002) *Information overloads.* Collection building 21, 1:32-42.

Bapco, W. (2008) *information management breakdown* information management in organizations

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APPENDIX I

USMAN DANFODIO UNIVERSITY SOKOTO

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS (COMPUTER SCIENCE UNIT)

Questionnaire

The purpose of the questionnaire is to identify and specify functional requirements of our proposed Outpatient Management System to be used by Sokoto state specialist hospital.

The Purpose of the Questionnaire   It's basically intended to solicit for information as regards to the patient record management. This section briefly describes the open end and close end questionnaire to be answered by the user.

Table A1 Respondent Background

NAME: ALHAJI ZUBAIRU ISYAKU
HOSPITAL: SPECIALIST HOSPITAL SOKOTO
GENDER: MALE
CONDUCT: MEDICAL RECORD DEPARTMENT

Table A2 How The Current System Works

1	What type of technique is the system?	Manual		Computerized			
2	Is the current system secured?	Yes		No			
3	What is the speed of the system?	Slow		Medium		Fast	
4	Are you contented with the system?	Yes		No			

Table A3 what are the Loophole of the current

1	What are the loopholes of the system in terms of the following features	nature		limited		unlimited	
		(a)security					
		(b) speed					
		(c)flexibility					
		(d) storage					

Table A4 Recommendation on the Features for the New System

1	Multipurpose enough to handle a number of users at a go	minimum	Maximum			
2	User friendly	To admin	To staff		To all users	
3	Password for security purposes	Not necessary	Necessary			
4	Feedback when request is submitted	Not necessary	Necessary			

The following description enables the respondent to give his/her own opinion about the patient record management system in the hospital

Comment on how the current system works The manual technique was adopted
What are some of the merits of the current system It can be easily used by the staff
Comment on the security of the current system   It is not secured, leads to loss of data
Recommend on the features of the new system It is secured, it can be handled by multiple users, it is user friendly.

APPENDIX II

DESCRIPTION OF THE CURRENT HOSPITAL MANAGEMENT IN TERMS OF DELEGATION OF POWER

In the current hospital management system, a patient presents a copy of his/her report form bearing drug prescription from the hospital or clinic to the nurse who then enters the patient's details in patient form of which is be forwarded to Pharmacy/dispenser to issue out drugs. A patient on before issuing drugs heads to the accounts department for clearance (payment) and finally receives the drugs from the pharmacy where he or she gets the medical report.

APPENDIX III

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Untitled Document</title>
<link href="css.css" rel="stylesheet" type="text/css" />
<style type="text/css">
<!--
.style1 {color: #FFFFFF}
.style2 {
        font-size: 18px;
        color: #000000;
}
.style3 {
        font-size: 24px;
        font-weight: bold;
        color: #0000CC;
}
.style4 {color: #006699}
-->
</style>
</head>

<body>
<div id="wrapper">
<div id="outbar">
<div id="non-printable">
<div id="header"><div class="logo"></div>
<div class="header">Sokoto State Specialist Hospital</div>
<div class="topic">Out Patient Management System</div>
</div>
 </div><style type="text/css">
<!--
.style1 {font-weight: bold}
.style2 {font-weight: bold}
.style3 {font-weight: bold}
.style4 {font-weight: bold; color: #FF9900; }
.style5 {color: #FF9900}
.style6 {color: #339999}
-->
</style>

<div id="page">
<div id="title">
Out Patient Management System Login Page </div>
  <form id="form1" name="form1" method="post" action="log-exc.php">
    <table width="92%" border="0">
      <tr>
        <td width="66%" height="306">
                <div align="center" class="style3">Welcome Sokoto State
Specialist Hospital               </div>
                <div align="justify" class="style2">
                  <p align="center">The administrative side for outpatient
record keeping system which will hold            </p>
                  <div align="center">
```

```html
                    <ul class="style6">
                      <li>
                        <div align="left"> Card Registration record               </div>
                      </li>
                      <li>
                        <div align="left">Doctor's prescription </div>
                      </li>
                      <li>
                        <div align="left">Drug taking</div>
                      </li>
                      </ul>
                    </div>
                  <p align="center" class="style4"> Design by</p>
                  <p align="center" class="style5"><strong> Abdulkadir
Mahmud Dan-ute            </strong></p>
                  <p align="center" class="style5"><strong>0911310024             </stron
                  <p align="center" class="style5"><strong>Supervised By:
</strong></p>
                  <p align="center" class="style5"><strong>Mal. Bello
Alhaji Buhari.            </strong></p>
                  <p align="center" class="style5"><strong>2014
</strong></p>
                </div></td>
        <td width="1%" bgcolor="#FF0000"> </td>
        <td width="33%"><table width="40%" border="1" align="center">
          <tr>
            <td colspan="2" bgcolor="#FF9900"><div align="center"
class="style1">USER LOGIN PAGE </div></td>
          </tr>
          <tr>
            <td>username </td>
            <td><input type="text" name="username" id="username" /></td>
          </tr>
          <tr>
            <td>Password</td>
            <td><label for="textfield"></label>
                <input type="password" name="password" id="password"
/></td>
          </tr>
          <tr>
            <td colspan="2"><div align="center" style="font-style: italic;
color: #FF0000"></div></td>
            </tr>
          <tr>
            <td colspan="2"><label for="Submit"></label>
                <div align="center">
                  <input type="submit" name="Submit" value="Submit"
id="Submit" />
                  <input type="reset" name="Submit2" value="Reset"
id="label" />
                </div>
              <label for="label"></label>
                <div align="center"></div></td>
          </tr>
        </table></td>
      </tr>
    </table>
    <p> </p>
  </form>
</div>
```

```html
<div id="non-printable">
<div id="footer">
<div class="footer">( c ) 2014. Abdulkadir Mahmud Dan-ute (0911310024).
Supervised By: Mal. Bello Alhaji Buhari.</div>
</div>
</div>
</div>
 </div>
</body>
</html>




<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
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<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
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<link href="css.css" rel="stylesheet" type="text/css" />
<style type="text/css">
<!--
.style1 {color: #FFFFFF}
.style2 {
        font-size: 18px;
        color: #000000;
}
.style3 {
        font-size: 24px;
        font-weight: bold;
        color: #0000CC;
}
.style4 {color: #006699}
-->
</style>
</head>

<body>
<div id="wrapper">
<div id="outbar">
<div id="non-printable">
<div id="header"><div class="logo"></div>
<div class="header">Sokoto State Specialist Hospital</div>
<div class="topic">Out Patient Management System</div>
</div>
 </div><style type="text/css">
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.style6 {color: #339999}
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        font-style: italic;
}
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   <form id="form1" name="form1" method="post" action="log-exc">
     <table width="92%" border="0">
       <tr>
         <td width="66%" height="306">
                <div align="center" class="style3">Welcome Sokoto State
Specialist Hospital            </div>
                <div align="justify" class="style2">
                  <p align="center">The administrative side for outpatient
record keeping system which will hold </p>
                  <div align="center">
              <ul class="style6">
                <li>
                  <div align="left"> Card Registration record </div>
                </li>
                <li>
                  <div align="left">Doctor&rsquo;s prescription </div>
                </li>
                <li>
                  <div align="left">Drug taking</div>
                </li>
              </ul>
                    </div>
                  <p align="center" class="style4"> Design by</p>
                  <p align="center" class="style5"><strong> Abdulkadir
Mahmud Dan-ute </strong></p>
                  <p align="center" class="style5"><strong>0911310024
</strong></p>
                  <p align="center" class="style5"><strong>Supervised By:
</strong></p>
                  <p align="center" class="style5"><strong>Mal. Bello
Alhaji Buhari. </strong></p>
                  <p align="center" class="style5"><strong>2014
</strong></p>
                  <p align="center" class="style4"> </p>
                  </div>

</td>
         <td width="1%" bgcolor="#FF0000"> </td>
         <td width="33%">
                <div id="menu">
                <ul>
                <li><a href="links.php?p=1">Add Doctors Section </a></li>
                <li><a href="links.php?p=2">Add Staff Section </a></li>
                <li><a href="links.php?p=3">Card Management</a></li>
                <li><a href="links.php?p=5">Doctor Management</a></li>
                <li><a href="links.php?p=4">New Admin</a></li>
                <li><a href="chang_pass.php">Change Password</a></li>
                 <li><a href="logout.php">logout</a></li>
                </ul>
                </div>
                <div align="center" class="style7">        </div></td>
     </tr>
   </table>



   </form>
</div>
```

```html
<div id="non-printable">
<div id="footer">
<div class="footer">( c ) 2014. Abdulkadir Mahmud Dan-ute (0911310024).
Supervised By: Mal. Bello Alhaji Buhari.</div>
</div>
</div>
</div>
 </div>
</body>
</html>




<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
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<html xmlns="http://www.w3.org/1999/xhtml">
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<style type="text/css">
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.style2 {
        font-size: 18px;
        color: #000000;
}
.style3 {
        font-size: 24px;
        font-weight: bold;
        color: #0000CC;
}
.style4 {color: #006699}
-->
</style>
</head>

<body>
<div id="wrapper">
<div id="outbar">
<div id="non-printable">
<div id="header"><div class="logo"></div>
<div class="header">Sokoto State Specialist Hospital</div>
<div class="topic">Out Patient Management System</div>
</div>
 </div><script type="text/javascript">
function valids(){
if(document.form1.no.value==""){
        alert("Number Required");
        return false;
        }

         if(document.form1.name.value==""){
                alert("name Required!");
                return false;
        }
        var name = document.getElementById('name');
 var filter = /^([a-zA-Z '])+([a-zA-Z '])+([a-zA-Z '])+$/;
 if (!filter.test(name.value)) {
```

```
 alert('invalid email address');
 name.focus;
 return false;
   }

        if(document.form1.dep.value==""){
        alert("Department Required");
        return false;
        }


}
</script>
<div id="page">
<div id="title">WELCOME TO ADMINISTRATION </div>
   <form id="form1" name="form1" method="post" action="new_doctors.php"
onsubmit="return valids();">
     <table width="90%" border="0" align="center">
       <tr>
         <td> </td>
       </tr>
       <tr>
         <td height="64"><table width="90%" border="1" align="center">
           <tr>
             <td width="6%">SNo.</td>
             <td width="14%">Doctor Number </td>
             <td width="28%">Full Name</td>
             <td width="25%">Department</td>
             <td width="27%"> </td>
           </tr>
                         <tr>
             <td>1</td>
             <td>20011</td>
             <td>Abdulkadir dan Ute</td>
             <td>Medicine</td>
             <td><a href="delete_doctor.php?p=20011">Delete</a></td>
           </tr>
                         <tr>
             <td>2</td>
             <td>20012</td>
             <td>Ashiru Batsari</td>
             <td>Surgery</td>
             <td><a href="delete_doctor.php?p=20012">Delete</a></td>
           </tr>
                         <tr>
             <td>3</td>
             <td>20013</td>
             <td>usman bello</td>
             <td>Medicine</td>
             <td><a href="delete_doctor.php?p=20013">Delete</a></td>
           </tr>
                       </table></td>
       </tr>
       <tr>
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#000099">Add New Doctors <span style="font-style: italic; color:
#FF0000"></span> </div>

           <label for="textfield">Doctor's No</label>
           <input type="text" name="no" id="no" />
           <label for="label">Doctor's Name</label>
           <input type="text" name="name" id="label" />
```

```html
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            <select name="dep" id="dep">
              <option>-----select-----</option>
              <option value="Medicine">Medicine</option>
              <option value="Surgery">Surgery</option>
            </select>
            <br />
            <label for="Submit"></label>
            <div align="center">
              <br />

            </div>
            <label for="label2"></label>
            <div align="center">
              <input type="submit" name="Submit" value="Submit" id="Submit"
/>
              <input type="reset" name="Submit2" value="Reset" id="label2"
/>
              <a href="admin.php">Back To Admin</a></div></td>
        </tr>
      </table>
    <p> </p>
  </form>
</div>




<div id="non-printable">
<div id="footer">
<div class="footer">( c ) 2014. Abdulkadir Mahmud Dan-ute (0911310024).
Supervised By: Mal. Bello Alhaji Buhari.</div>
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        color: #000000;
}
.style3 {
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        font-weight: bold;
        color: #0000CC;
}
.style4 {color: #006699}
```

```
-->
</style>
</head>

<body>
<div id="wrapper">
<div id="outbar">
<div id="non-printable">
<div id="header"><div class="logo"></div>
<div class="header">Sokoto State Specialist Hospital</div>
<div class="topic">Out Patient Management System</div>
</div>
 </div><script type="text/javascript">
function valids(){
if(document.form1.no.value==""){
        alert("Number Required");
        return false;
        }

         if(document.form1.name.value==""){
                alert("name Required!");
                return false;
        }
        var name = document.getElementById('name');
 var filter = /^([a-zA-Z '])+([a-zA-Z '])+([a-zA-Z '])+$/;
 if (!filter.test(name.value)) {
 alert('invalid email address');
 name.focus;
 return false;
  }

        if(document.form1.dep.value==""){
        alert("Department Required");
        return false;
        }

}
</script>
<div id="page">
<div id="title">WELCOME TO ADMINISTRATION </div>
  <form id="form1" name="form1" method="post" action="new_staff.php"
onsubmit="return valids();">
    <table width="90%" border="0" align="center">
      <tr>
        <td> </td>
      </tr>
      <tr>
        <td height="64"><table width="90%" border="1" align="center">
          <tr>
            <td width="6%">SNo.</td>
            <td width="14%">Doctor Number </td>
            <td width="28%">Full Name</td>
            <td width="25%">Department</td>
            <td width="27%"> </td>
          </tr>
                            <tr>
            <td>1</td>
            <td>201</td>
            <td>Hussaini Faskari</td>
            <td>Admin</td>
            <td><a href="delete_staff.php?p=201">Delete</a></td>
```

```
                  </tr>
                                  <tr>
            <td>2</td>
            <td>202</td>
            <td>belo aliyu</td>
            <td>Medicine</td>
            <td><a href="delete_staff.php?p=202">Delete</a></td>
          </tr>
                                </table></td>
        </tr>
        <tr>
          <td bgcolor="#EDEDED"><div style="font-weight: bold; color:
#000099">Add New Doctors <span style="font-style: italic; color:
#FF0000"></span> </div>

            <label for="textfield">Staff's No</label>
            <input type="text" name="no" id="no" />
            <label for="label">Staff's Name</label>
            <input type="text" name="name" id="label" />
            <label for="select">Staff's Department</label>
            <select name="dep" id="dep">
              <option>-----select-----</option>
              <option value="Medicine">Medicine</option>
              <option value="Surgery">Surgery</option>
            </select>
            <br />
            <label for="Submit"></label>
            <div align="center">
              <br />

            </div>
            <label for="label2"></label>
            <div align="center">
              <input type="submit" name="Submit" value="Submit" id="Submit"
/>
              <input type="reset" name="Submit2" value="Reset" id="label2"
/>
            <a href="admin.php">Back To Admin</a></div></td>
        </tr>
      </table>
    <p> </p>
  </form>
</div>




<div id="non-printable">
<div id="footer">
<div class="footer">( c ) 2014. Abdulkadir Mahmud Dan-ute (0911310024).
Supervised By: Mal. Bello Alhaji Buhari.</div>
</div>
</div>
</div>
 </div>
</body>
</html>
```