CERTIFICATION

This is to certify that this project was written in the department of computer Engineering, faculty of Engineering, Caritas University. I claim the exclusive right and sole authorship of this project work.

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(SUPERVISOR)   DATE

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(HEAD OF DEPARTMENT)   DATE

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(EXTERNAL EXAMINER)   DATE

DEDICATION

This research work is dedicated to the Almighty God for his love, guidance and protection all through the course of my study. Also to my lovely Mum for her care, support and prayers throughout my study.

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My special thanks go to God Almighty for his guidance, protection, strength, wisdom, knowledge and understanding throughout the course of my study.

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ABSTRACT

Drug procurement and distribution tracking system is a set of computer programs that obtains the supplies of drugs, distribute the drugs and monitors the inventory control of the drugs. Using the pharmaceutical department of Port Harcourt University teaching hospital as a case study, the department using manual method to operate lacks good storage of information system for drugs. Recording system tends to be complex and the method of tracking expired drug is poor. The good approach to this problem is to involve the use of computer by designing the form, using Access in developing the database and Visual basic as the programming language, to enable keeping accurate record of drug and prevent sales of expired drug. This guarantees the people's right to good health care and ensures that drugs received are genuine and safe.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

Computerization is defined as the control of processes by computers and its peripherals. Today it would be difficult to think of any process, business or action that could not have profited from the numerous benefits of the computer system. Controlling process or devices with computer started long ago since the invention of computer. In the 20th century inventors tried to make processes easier with the use of computers. Secondly computerization has been greatly applied or used in controlling process that requires frequent action such as drug procurement, drug management, drug tracking and drug distributions in hospital management information system in pharmacy departments of hospitals.

This project which is drug procurement and distribution tracking system provides a computer based information management system in a Pharmacy Department of the University of Nigerian Teaching Hospital (UNTH) Enugu by designing a cost effective, user friendly application, incorporating key attributes of data integrity and system security suitable for use in the pharmacy department of the hospital using Microsoft Access software in developing the database and visual basic as the

programming language. The overall aim of this project is to optimize time and material in the processing of data needed for effective operation of large pharmacy department of a hospital. By this approach, data integrity, data redundancy, and consistency will be ensured.

Drugs are the chemical substances that are administered to patients for curative purposes and prophylaxis. It can also be known as a medicine, because it is the essential part of peoples care.

The ability of the computer to store and retrieve information at a very fast and efficient rate makes its application useful in management operations. Drug management involves drug procurement, drug distribution, drug tracking and its information management. Drug distribution is concerned with distribution of drugs within the different medical units or departments in a hospital, while drug procurement is concerned with the purchasing activities of the drugs by the pharmacy department of the hospital. In the same vein, drug tracking is concern with the continuous monitoring of the actual quantity of drugs held in the hospital pharmacy or any other drug warehouse /store. It also controls the stock level.

Pharmaceutical unit in a hospital is concerned with drug management activities. They carry out the responsibility of making appropriate selection and drugs used by formulating an annual, monthly, weekly or daily list of drugs requirement and

management reports. However, in some hospitals today, some pharmacists still use the manual system of operation which can lead to inappropriate drug management errors due to problems of handling voluminous file within a short period of time. This could make data to be easily inaccessible and also delivery of drugs can lead to misplacement of patients' files.

1.2   STATEMENT OF PROBLEM

Drug procurement, tracking, distribution and information management in this regard are routine processes carried out in various hospitals across Nigeria. It is a common place to observe that these routine processes are still preformed manually or are minimally computerized even in our Teaching Hospitals. This manual approach to these routine operations has a lot of problems associated with it, ranging from poor handling of drug data of patients, lack of good storage information system for drugs and drug dispensary, delays, to the difficulty in retrieving information on drugs and patients' records. In view of all these problems, it becomes necessary to develop a computer based drug information management system and distribution tracking system. This is what this research project is set to address by computerizing the routine processes in our hospitals and in particular that of Pharmacy Department of UNTH Enugu.

1.3   OBJECTIVES OF THE STUDY

The aim of this research project is to design and implement a computerized drug information management system, drug procurement and distribution tracking system. This includes:

(i). To order for drugs without mistake of procuring more than required.

(ii). To take good stock of drugs.

(iii). To prevent dispensary of expired drugs

(iv). To ensure accurate keeping of records of drugs

1.4   SIGNIFICANCE OF THE STUDY

The benefits derivable from this work include the following:

(i) It will provide reliable healthcare services.

(ii) It will guarantee hospital management and patients of genuine and safe drugs.

(iii)   It will ensure an efficient and standard drug dispensary system.

(iv)   It will provide a data base for stock taking of drugs procured and dispensed any moment.

1.5   SCOPE OF THE STUDY

This research work will cover only the Pharmaceutical Department of the University of Nigerian Teaching Hospital (UNTH) Enugu. It will present an up to date and comprehensive design of the following:

(i)   Planning and control system which includes inventory control and drug distribution

(ii)   Drug procurement procedure in a hospital.

(iii)   The expiry status of each drugs at any point in time

(iv)   The Database of all kinds, types and names of some drugs that would be store and operate on.

1.6   ASSUMPTION

It is assumed that all the information gathered with the respect to inventory control is correct as implemented by the university of Nigerian teaching hospital (UNTH) Enugu.

1.7 LIMITATIONS OF THE STUDY

1. Time constraint; There is limited time go and meet the hospital pharmacist for proper information.

2. Due to the sensitive nature of organizational information, there was reluctance to release vital information which may jeopardize the security of the organization.

1.8 PROJECT REPORT ORGANIZATION

This research project covers almost all you need to know about drug procurement and distribution tracking system. Chapter one is the introduction and it covers the statement of problem, objectives of the study, significance of the study, scope of the study, assumption, limitations of the study and definition of terms. Chapter two is the literature review; it gives the detailed meaning of every associated word in my topic. Chapter three is the design and methodology; this involves the operation of the existing system and the method used. Chapter four is the system analysis and implementation; which talked about the operation of the proposed system. Chapter five is the summary, recommendation and conclusion.

1.9   DEFINITION OF TERMS

Database; A collection of logically related data to meet the information need of organization.

DBMS; Database   Management Software that enable the user to define, maintain Control the database.

Application Program; A computer program that interacts with the database.

MENU; This is a list of options presented on the screen with each option identified by short code followed by longer description of its purposes.

Drug; It is referred to as a medicine   or chemical substances that are administered to Patients   for curative measures.

Pharmacy; A placed in a hospital where medicine or chemical substances are kept, stored and prepared.

Flowchart; A diagram that shows connection between the different stages of process of the system.

Primary Key; The candidate key that is selected to identify the individual within the relation

Foreign Key; An attribute or a set of attributes within one relation that matches the candidate key

Relation; A relation is a named table with columns and rows

Attribute; An attributes is a named column of a relation

Domain; A set of allowable values for one or more table

Null; it represents a value for an attribute that is currently unknown or not applicable

Database design; The process of creating a design that will support emprise mission statement and mission required database e system.

Software: These are program for computer which allows certain specific task to be accomplished e.g. word process etc.

Hardware: Computer equipment used to perform input processing and system output activates.

Management information system: collection of people, database, and devices produced to use in providing routine information to manager and decision makers of the organization.

CHAPTER TWO

LITERATURE REVIEW

The presence and role of computers in our society cannot be over emphasized. The positive impact of computing in the area of health care services has brought significant help to the society. According to (Silverman, 1990), drug availability, distribution and control are the major concern in health development as drugs constitute an important aspect of health development technology.

Chandrasekaran and Sam Jay (1983:201) described an approach to the design of medical decision making system based on nation of conceptual structures for knowledge representation. They pointed out that within in a decade since the beginning of the modern electronic computer age, many attempt to use the power of computer in the difficult task of medical decision making.

2.1   COMPUTERIZATION IN DRUG MANAGEMENT SYSTEM

The word computerization simply means converting a manual process of an activity to a mechanical or electronic process in such a way that data processing is no longer done manually. Several works or studies have shown that applying computer technology to health centers reduces cost of medication, improves

storage of drugs and can also avoids duplication of records (redundancy). It provides unique identification of clinical data, security and speed.

Experts say that drugs systems can also provides physicians with specific details including the use of dosage, potential reactions to drug and details of drug cost. In a large hospital like UNTH, computerization could improve day to day work. Complex management would be made easier. Computerization could be effectively applied in drug inventory, drug procurement and drug management to ease the manual method of recording data and ensure adequate prescriptions of drugs to each ward respectively.

2.2 GENERAL OVERVIEW OF DRUG MANAGEMENT INFORMATION SYSTEM.

A decade prior to the introduction of National Health Service Trust, the management of hospital drug involved hospital drug and therapeutic committee, then referred to a pharmacy system. This committee set up a research on management of drugs, as part of large evaluative study on the management of drugs. The committee aimed to describe the system that currently existed for managing drugs in a hospital. A non general hospital was used as a case study in 1997. They centered their study at different administrative levels. Greater or lesser emphasis was placed on the chemical directorate and this appeared to demonstrate some difference in pharmacy and medical roles in drug management.

This system will provide a drug inventory control system, which aids in decision on what drug to be ordered. Drugs to order were classified according to their therapeutic value. This system was adopted in Philippine hospital. Problems related to limited financial resources, shortage of drugs and supplies in government hospital like UNTH. Varied prices of drugs purchased by health, non health sectors and non compliance to Philippines national drug formulary (PNDF) prompted the provincial pooled procurement program (PPPP) in 1998. The peoples were to ensure quality drugs were procured systematically at lower costs.

Drug prescription or administration errors are most common cause of adverse effect on patients but drug management information system can be effective in reducing these errors, (Essien E. Daniel B.Sc. project work on Pharmacy).

2.3   DRUG PROCUREMENT

Procurement of drugs should be done in a timely manner and in reasonable quantity in order to minimize interruption in supply while at the same time avoid overstocking. All procurement activities should be performed by qualified staff while special drugs should only be received and handled by staff with relevant training. In Hong Kong, during the drug receipt process, essential information such as brand name and chemical name, potency, dosage form, Hong Kong registration number, etc. of the drug should be checked against the purchase order. The expiry

date, pack size, product appearance and storage condition of drug should also be audited. Should there be any non-conformity in product appearance, pack size, volume etc., such drugs will not be procured (Essien E. Daniel, 1997 automated drug inventory control system BSc project work Futo pp14.

2.4   DRUG DISTRIBUTION

Drug distribution is one of the key processes in hospitals. The process involves the continuum of prescribing, reviewing, preparing, dispensing and administering drugs. The physician prescribes a drug in a certain dosage in the name of the patient to support his treatment; the pharmacist checks the information and sends a definitive medication order in the patient's name to the nursing unit. A nurse will administer the drug to the patient on the basis of this definitive order and register that she has done so. The pharmaceutical industry renders the drug identifiable by labeling the drug package with the drug name, strength, and batch and expiry date. The material flow is initiated by the medication order. Drugs are purchased from the pharmaceutical industry or wholesaler, transported to the pharmacy, where they are stored and then delivered to the ward or patient. The drug may be dispensed in either the central pharmacy or the nursing unit. When the drug is administered, the patient and drug information is coupled and registered as a trend in drug distribution (Colen ,2008) Phd,PharmD EP Journal Vol., 12.

2.5   VISUAL BASIC 6.0

Microsoft Visual Basic is a leader among high-level languages in supporting the event-driven paradigm and Rapid Application Development (RAD). More specifically, Visual Basic's acceptance and popularity can be seen in many facets of application development such as database access, Graphical User Interface (GUI) prototyping, building distributable components, Internet scripting, desktop and client/server design, and even game development.

Because of its common commercial uses and ease of learning, Visual Basic has also become popular with higher education institutions all over the world for teaching people how to program. Visual Basic language, is suitable for beginner, programming visual Basic provide the facilities for creating graphical interfaces that can depict the functionality and flow of an application before you start programming with it. Teach yourself visual basic in 21 days by can be of good help for beginners (Greg, 1998).

2.6   SOFTREX FORMULAR

A pharmacy management software, the softrex software, invented by pharmacy technology and services in U.S.A, 2002, provides services and support to a variety of health care providers include community pharmacy, hospital pharmacies. The drug management system here is computerized by this software and it involves:

(i) **Prescription entry for patient;** the prescription entry responds as fast as you can type.

(ii) **Reporting;** the software provides an easy to use embedded report writer allowing quick and easy customization of forms and reports.

(iii) **Inventory;** The software is capable of tracking, ordering and receiving inventory.

It has standard procurement systems, medication, distribution and management of all clinical services. This software also provides medication error detection system, it provides an improved patient medication, increased pharmacy efficiency and enhance quality assurance regardless of workload or operating environment. Softrex integrates with key enterprise including billing, drug wholesalers, point care medication safety system and medication Machines softrex is the most comprehensive hospital drug management system available today. It allows up to date information to be retrieved instantaneously, proving vital facts either displayed or printed on demand.

2.7   MANAGEMENT INFORMATION SYSTEM

It is an organize collection of data, information resources, procedures, people, database and devices used to provide routine information to managers for decision

making in an organization. It provides standard report generated with data and information from the transaction processing system.

These management information systems began to develop in 1960s and are characterized by the use of information to provide managerial reports which can be produced –daily, weekly, monthly or yearly (George and Ralph, 1998).

2.8   BENEFITS OF MANAGEMENT INFORMATION SYSTEM

According to Enwere (1992), the disintegration of record management program in organizations has led to the inefficiency in administration and loss of vital information needed for decision making in hospitals. Therefore to ensure proper records of drug, information management system should be integrated into the pharmacy such that;

(i) Database is seen as a warehouse of information, where large amount of data can be stored. (O' Brien, 1999). The common examples in commercial applications are inventory data, personnel data, etc. it often happens that a common man uses a database management system, without even realizing, that it is being used.

(ii) Changes in schema: the table schema can be changed and it is not platform dependent.

(iii) According to Date (2003), the unique data field in a table is assigned a primary key.

(iv)   The database can be used simultaneously by a number of users. Various users can retrieve the same data simultaneously. The data in the database can also be modified, based on the privilege assigned to users.

(v) Data security: According to Kenny (2008), data is the most important asset. Therefore, there is need for data security. Database management system help to keep the data secured.

2.9   COMPONENT OF A DATABASE MANAGEMENT SYSTEM

Codd (1970) explains that DBMS engine accepts logical request from the various other DBMS subsystems, and it convert them into physical equivalent, and actually accesses the database and the data dictionary as they exit on a storage device.

He further stated that the Data Definition Subsystem helps a user to create and maintain the data dictionary and define the structure of the files in a database.

Data Manipulation Subsystem helps users to add, change and delete information in a database and query it for valuable information (Seltzer, 2008). Software tools within the data manipulation subsystem are most often the primary interface

between user and the information contained in a database. It allows user to specify its logical information requirements.

Application Generation Subsystem contains facilities to help users to develop transactions-intensive applications (Nkiro, 2007). It usually requires that user perform a detailed series of tasks to process a transaction. It facilities easy-to-use data entry screens, programming languages and interfaces.

Data Administration Subsystem helps users to manage the overall database environment by providing facilities for backup and recovery, security management, query optimization, concurrency control and change management.

CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN

3.1 METHODOLOGY

Software Engineering Methodology (SWEM) is the body of methods, rules, postulates, procedures and processes that are used to manage a software engineering project (Osuagwu, 2009). He classified software engineering into the following categories;

i.   The pragmatic system analysis and design methodology(SSADM)

ii.   Object oriented analysis and design mythology (OOADM)

iii.   Prototype Methodology

iv.   Expert System

3.1.1 STRUCTURED SYSTEM ANALYSIS AND DESIGN METHODOLOGY (SSADM)

This project work is developed with this methodology (SSADM). The pragmatic system analysis and design methodology consist of investigation of the present system, definition of the new system, establishment of constraints and system analysis documentation which should provide the following.

1. Cost/ Benefit/Schedule report for each suitable system

2. Database requirement

3. Physical requirement of hardware and personnel

4. Conversion requirement

This methodology (SSADM) involves: developments such as system flow chart, Job steps, Program narratives which enhances organization for computer execution

i.   Prototype Methodology

ii. Object Oriented Analysis and Design Methodology

iii. Pragmatic System Analysis and Design Methodology

3.1.2 Expert System

Expert system methodology is a type of methodology in software Engineering where a set of programs manipulates encoded knowledge to solve problems in a specialized domain that usually requires human expert. This methodology obtains their knowledge from expert sources and encodes them in a form suitable for system to use. It required much training and experience in a specialized field like medicine and system configuration.

Some of expert system factures are that, it used knowledge rather than data to control the solution processes. It used symbolic representation for knowledge and reason with meta knowledge (knowledge about knowledge) and the knowledge is encoded and maintained as an entity separate from the control program.

3.1.3 PROTOTYPING

A prototyping methodology is a methodology in a software development process which allows developers to greater portions of the solution to demonstrate functionality and make needed refinements before development the final solution. It is somewhat similar; it produces a "throw away" solution that is designed for the sole purpose of verifying user functionality and for demonstration capability.

Prototyping is an excellent way for the development term to confirm understanding of the requirements and ensure that the proposed solution is consistent with business expectation. This type of methodology is normally used or work very well with online transaction processing system (TPS) WEB BASED Development and also very useful for confirming business intelligence analytic requirement.

Some of its services steps or age of a classical computer system are

    (i) Problem recognition/identification

    (ii) Feasibility study

    (iii) Analysis

    (iv) Implementation

    (v) Testing

    (vi) Maintenance

The implementation stage of the system development process involves program coding. Testing and debugging, conversion, trading and hand over. While maintenance deals with ensuring the system is operational after change over form old system to new system Osuagwu O.E (2009) SWEM pp 273 2ND edition FUTO Nigeria.

3.2 DATA COLLLECTION

 In this project research work, there are two main type of data collection, which include primary collection and secondary collection. These two categories of data collection type were used in this research work.

3.2.1 THE PRIMARY COLLECTION

The primary collection which is also known as interview method are the original collection of material or study unit from which information is to be collected on first hand basis through interview, measurement, observation and questionnaire completion. But here the researcher only interviews the director of pharmacy (Chief Pharmacist) and various staff in the department in UNTH, reviewing and sharing their experience about the problem of the existing system. Through this; useful information is collected, analyzed and recorded. Also questionnaire were

shared to the director pharmacy and various staff in the department, in order to get vital information for analysis and recording.

3.2.2   THE SECONDARY COLLECTION

The secondary collection is a method whereby the data are collected or obtained indirectly unlike the primary collection. Here the researcher reviews the existing document and forms. The drugs master list file and patient medication forms were reviewed and data were collected. Also make use of existing literature, research report, internet downloads and so on, in order to understand the diagnosis system.

3.3   ANALYSIS OF EXISTING SYSTEM AND DESIGN

System analysis is a process of investigating, analysis, design, installation and evaluation of information system either for change or modernization. The main objective of a system analysis is to study the requirement of UNTH by putting into consideration what the hospital is doing, its problem's and ways of improving their differences.

Drug management system, drugs is gathered on the facing of the existing system (manual).

3.3.1 THE PHARMACY DEPARTMENT

This department manages (control) drugs procurement, distribution and inveinformation system in UNTH. It is under the supervision of the director of pharmacy which deals with the maintenance and control of drug procurements and distribution in the hospital. The functional of this module include inventory management of drugs, proper procurement and distribution of drugs. The pharmacy modules ensures that there is availability of sufficient quantity of drugs and consumables, materials for the patients in a mode that neither hinders efficient clinical work, non becomes a threat to the survival of the pharmacies.

Drugs usually comes into the pharmaceutical department through multination's and also from private registered pharmacy the drugs go through a process of documentation that allows them to be taken into the main store when drugs arrive fan inspectorate team being led by the assistant director of pharmacy looks at the drugs and make assessments and approves them before they are registered (key in) and store it in the pharmacy main store.

3.3.2 UNTH INPATIENT DRUG MANAGEMENT

The inpatients are those patients admitted in the hospital for treatment with a given period of time; they pay and receive their drugs at the ward supply. The inpatients

have a drug prescription card called "Drug receiver store requisition /issue voucher (DRIV) which the senior pharmacist assesses, checking the incompatibility, what might cause drug reaction, dosage of drug and records of all the data in a file register for patients.

3.3.3 DRUG PROCUREMENT SYSTEM IN UNTH

The Chief pharmacist prepares an annual budget request for drugs to suppliers, different quotations are raised and a purchased order is given to the best supplier, for supply of drugs. An inspectorate team receives and for selection of drugs which include:

a) Evidence of performance in UNTH

b) Proven efficiency and safely.

c) Preference for Drugs that are well known.

3.3.4 THE PATIENT MEDICATION SHEET AND TREATMENT

Each sheet contains information on the patients' drugs prescription. The nurses schedule treatment for each patient and provide a permanent record of medication.

THE PHARMACEUTICAL ORGANIZATION FLOW CHART

Director of the Pharmacy

↓

Chief Pharmacist

↓

Assistant Chief Pharmacist

Senior Pharmacist		Principal Pharmacist

Techniques Pharmacist	Junior Pharmacist	NYSC Pharmacist	Intern pharmacis
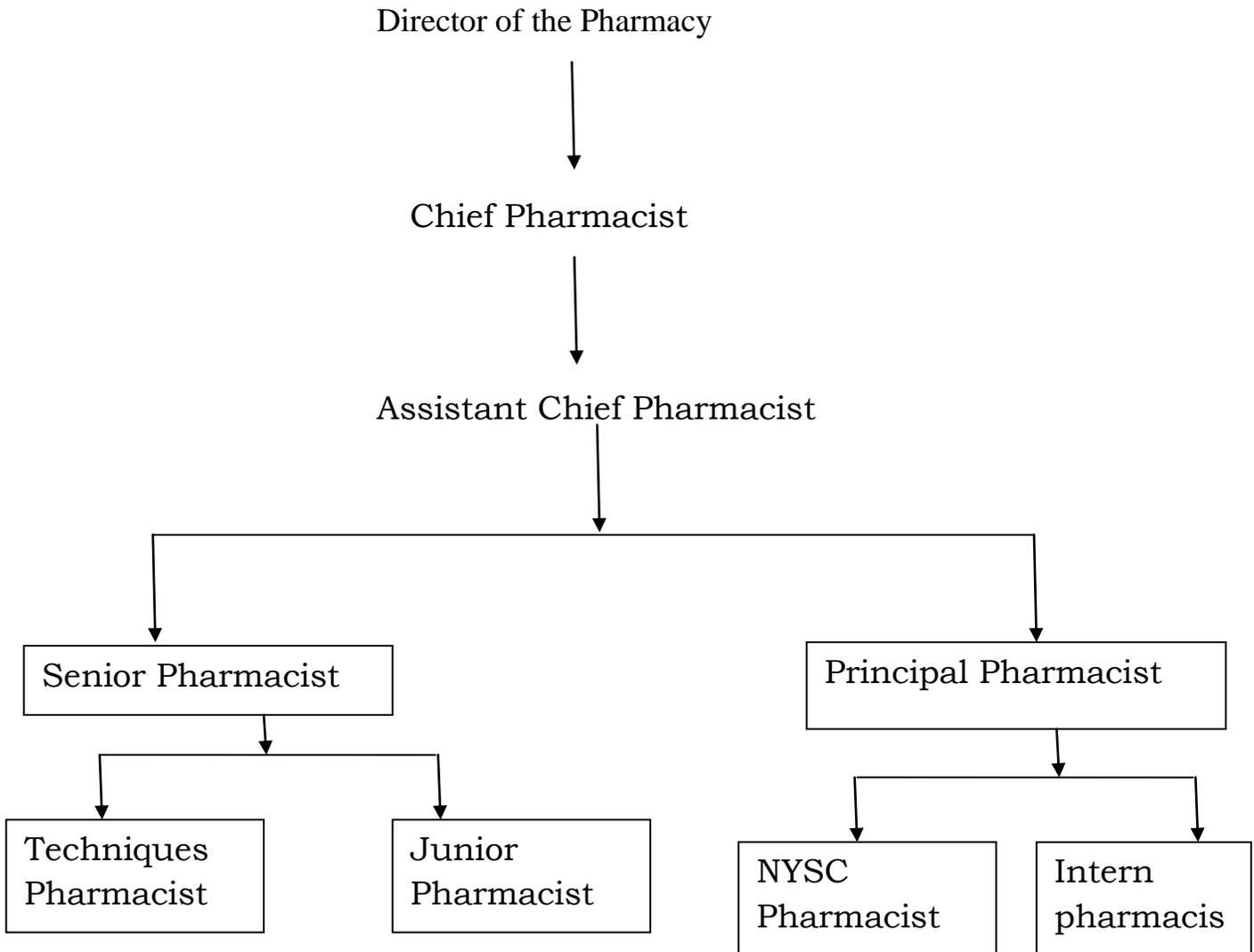
Fig 3.1 The Pharmaceutical Organization Flow Chart

3.3.5 PRESENT SYSTEM APPROACH TO DRUG MANAGEMENT

Presently, the manual method is used for management of drug the hospital has a drug procurement system, drug inventory control and distribution system.

I.   **The Procurement System**

Procurement involves buying; it also involves the activities of identifying the agency's needs. The input specifications for the procurement system are as follow

a. Drug name

b. Quality

c. Price

d. Delivery

e. Description of drugs

f. Source of drug

g. Supplier

h. Purchase order

i. Quaintly

j. Date of production /data issue

k. Expiry date

l. Receipt voucher

II Drug Categorization And Inventory

Drugs are categorized according to their pharmacological use. They are stored in the main store records taken are:

a. Drug name

b. Drug pharmacological use

c. File number

d. Quantity

e. Location

f. Total annual usage

g. Unit of measure

h. Description

i. Purchase date

III Drug Distribution (Issues and Returned)

The inputs specification

a. Drug name

b. Quantity issued and returned

c. Source unit

d. Data and time of issue or retime

IV Patient Medication And Treatment Records

a) Name of patients

b) Category (inpatient /out patients)

c) Prescription date

d) Sex age, height, weight

e) Dosage

f) Ward of room number

g) Date of admission

3.4 LIMITATIONS OF THE EXISTING SYSTEM

i. Staff not being punctual to work, due to the lateness of staff there is a late delivery of drugs to patients.

ii. Due to annual method of recording which is tedious and sometimes leads to inaccurate records of data.

iii. Numerous files makes search of a particular date or record difficult, which could lead to late delivery of drugs. Some files could also get missing.

iv. The facts of not being able to select out expired drugs that could be harmful to patients.

v. In accurate records of number of drugs & patients.

3.5   SYSTEM DESIGN

System design is the process whereby information developed through system analysis is synthesized with related knowledge in order to achieve the desired goal. As the new system is focusing on how to create computerized inventory control system, effort was made to present designs that will suite the research objectives. So, the design of the software will help the user achieve the following objectives.

   a.   Have a workable form through which all the inputs will be made to the system.

   b.   Generate a report that will be more meaningful to the management.

   c.   Design of a menu driven program so that the forms will be neatly arranged and utilized.

   d.   Create a modular programming interface for easy debugging.

   e.   Design a system that will be very fast in operation.

3.5.1 EXPECTATIONS OF THE NEW SYSTEM

Due to problems observed, a new software will be designed to easy up the problems of manual recording of drug (data), location of files, patients prescription and record files for better distribution and management of drugs, that will enable the system to be;

a) Flexible

b) User friendly

c) Ease to use

- The following must be achieved;

a) To order for drugs without mistake of procuring more than required.

b) To know the quantity of drugs remaining.

c) To prevent sales of expired drugs.

d) To ensure accurate keeping of records of drugs.

3.5.2 DESIGN OF THE NEW SYSTEM

Design of software is a creative task which has its objectives as the implementation of a system creative benefits and improvements superior to those achieved over named produces.

A software programmer/developer uses programming language to develop his software and write programs. I wrote my program with Visual Basic 6.0 as my front and Microsoft Access as my back end to call up my database. In this design, am interested in its major stage, I took into consideration the people involved (users) and the level of complexity of their jobs; it is more of a network relational

model which defines relationship and links between the job of one worker and another.

3.5.3 FILE SPECIFICATION

3.5.3.1 FILE OPERATION

This module comprises of other sub-model like, receipts and drug procurement. In this module it controls all the activities involved in registering new drugs and how the drug is being procured.

3.5.3.2 EDIT MENU

This Module is more like a file maintenance menu where by drugs can be update, delete, append new factures and also search or view already existing drugs in the database. It comprises of the following sub-menu –update/Edit drugs, Delete Drugs, search and Save Drugs.

3.5.3.3 ADMINISTRATOR

This module can also be called the program assets module. It comprises of three things, administration set, log in /out and Edit user account sub-module. It helps in controlling assets to the software like creating a password, changing password and

delete password. This entire password helps in controlling access towards the program. This module grants access to the entire menu.

3.5.4 THE REGISTRATION FORM

This form is used for registration of all drugs. All drugs approved by the hospital for use are registered with help of this form. This form is concerned with information about the drugs, its manufacturer, types, location and distribution

3.5.5 DRUG STATISTICS AND STOCK BALANCING

This involves the managerial aspects, Drugs statistics tells one about the drugs in the system, their total cost, those remaining etc.

3.5.6 PROGRAM ASSETS

The program assets file has three forms, create password form, change password form and delete password form. All these form help in controlling access right of each person using the program with password form. The administrator creates password for users of the system with assets level that will make control access granted.

3.6 DATABASE FILE

TABLE 3.1 LOGIN MENUS

FIELD NAME	DATA TYPES
User name	Varchar
Password	Varchar

TABLE 3.2 DRUG TABLE

FIELD NAME	DATA TYPE	FIELD SIZE	CONSTRIANT
Drug Name	Text	25	Primary
Date of purchase	Text	25	Required
Manufacturing date	Text	25	Required
Expiring date	Text	25	Required
Quantity	Text	25	Required
Manufacturer	Text	25	Required
Cost	Text	25	Required
Add New	Text	25	Required
Save	Text	25	Required
Cancel	Text	25	Required

TABLE 3.3 PROCUREMENT TABLE

FIELD NAME	DATA TYPE	FIELD SIZE	CONSTRIANT
Drug Name	Text	25	Primary Key
Quantity	Text	25	Required
Price	Text	25	Required
Delivery	Text	25	Required
Drug description	Text	25	Required
Drug source	Text	25	Required
Supplier	Text	25	Required
Purchase Order	Text	25	Required
Date of production	Text	25	Required
Expiring date	Text	25	Required
Receipt voucher	Text	25	Required

TABLE 3.4 DRUG DISTRIBUTIONS

FIELD NAME	DATA TYPE	FIELD SIZE	CONSTRINT
Drug name	Text	25	Primary key
Quantity issued	Text	25	Required
Quantity returned	Text	25	Required
Source unit	Text	25	Required
Date issued	Text	25	Required
Time issued	Text	25	Required

TABLE 3.5 NEW PATIENTS

FIELD NAME	DATA TYPE	FIELD SIZE	CONSTRIANT
Name of patient	Text	25	Primary key
Category	Text	25	Required
Sex	Text	25	Required
Prescription	Text	25	Required
Age	Text	25	Required
Date of Admission	Text	25	Required
Ward number	Text	25	Required

TABLE 3.6 PATIENT MEDICATIONS

FIELD NAME	DATA TYPE	FIELD SIZE	CONSTRIANT
Name of patient	Text	25	Primary key
Category	Text	25	Required
Prescription date	Text	25	Required
Age	Text	25	Required
Height	Text	25	Required
Weight	Text	25	Required
Dosage	Text	25	Required
Date of Admission	Text	25	Required
Ward number	Text	25	Required

3.7 SYSTEM FLOWCHART
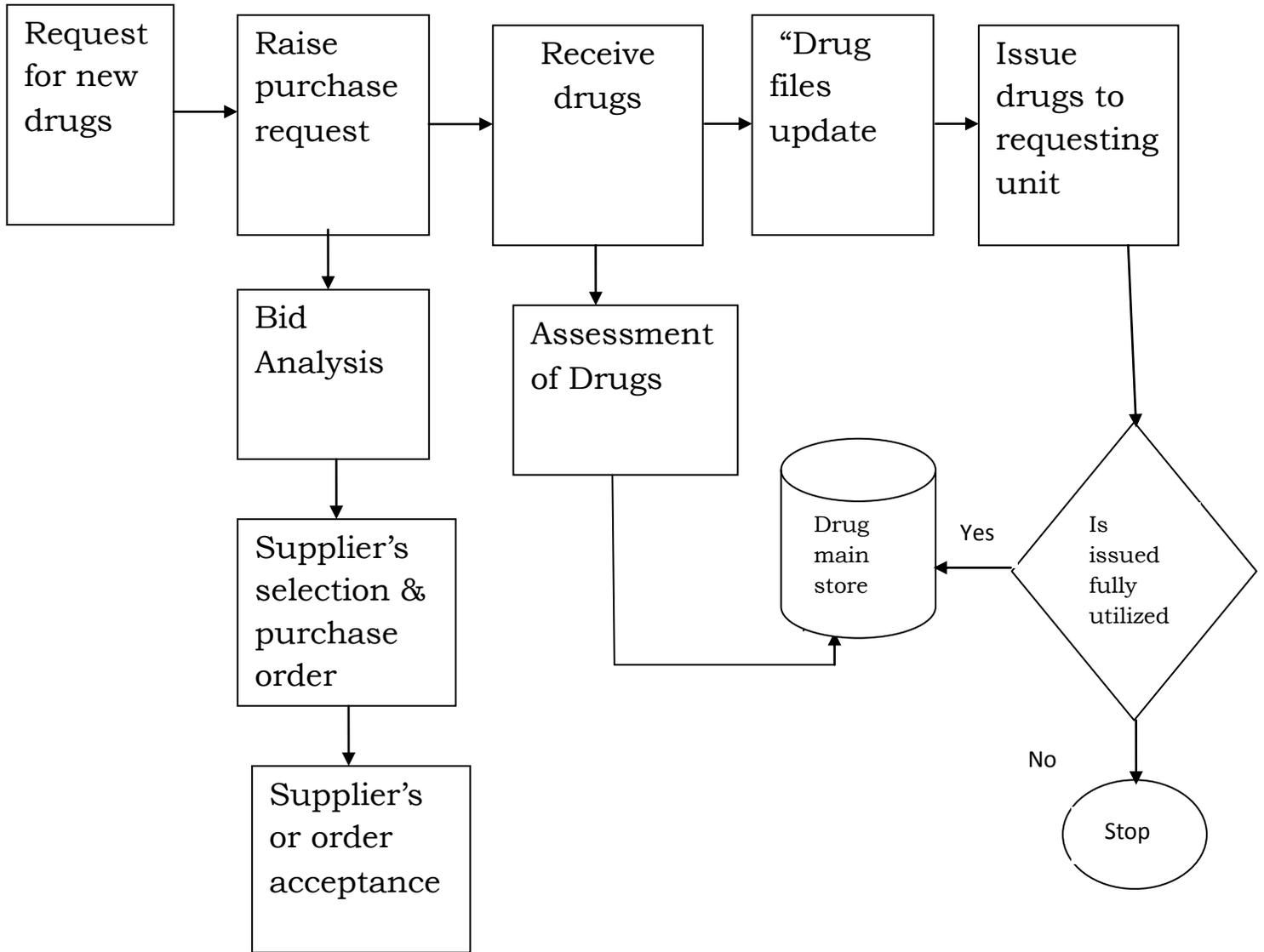
FIG 3.2 DATA FLOW DIAGRAM: This is how data flows from the request for

drug to how is be received and updated, how drug is been issued.

```
            ┌──────────┐
            │  Start   │
            └────┬─────┘
                 │
                 ▼
      ┌──────────────────────┐
      │   Set up hospital     │
      │     parameters        │
      └──────────┬────────────┘
                 │
                 ▼
      ┌──────────────────────┐
      │     Load Drugs        │
      │    Information        │
      └──────────┬────────────┘
                 │
                 ▼
      ┌──────────────────────┐
      │ Load User Information  │
      │                        │
      └──────────┬────────────┘
                 │
                 ▼
      ┌──────────────────────┐
      │  Return to higher level│
      │       module           │
      └──────────┬────────────┘
                 │
                 ▼
      ┌──────────────────────┐
      │  Perform Varies Task   │
      │        Option          │
      └────────────────────────┘
```
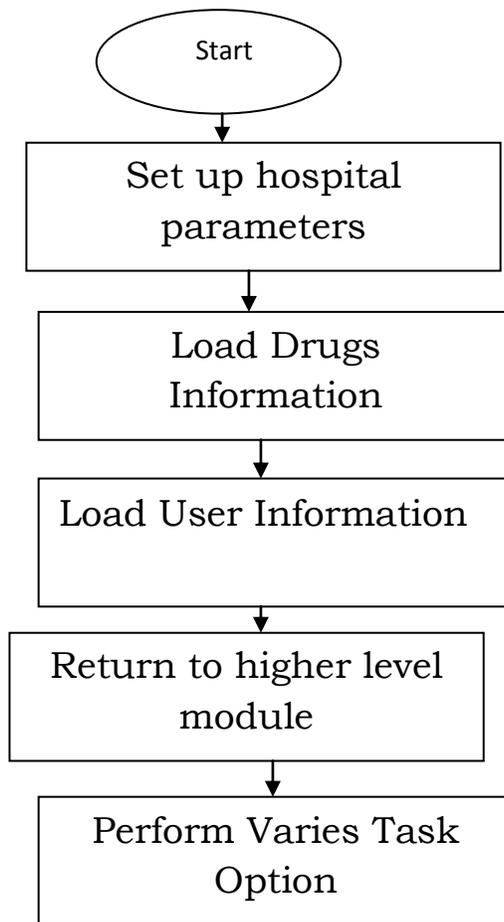
Fig 3.3   LOGIC SCHEME FOR THE NEW SYSTEM

Logic scheme for the new system shows how the program is loading from the start to the information process.
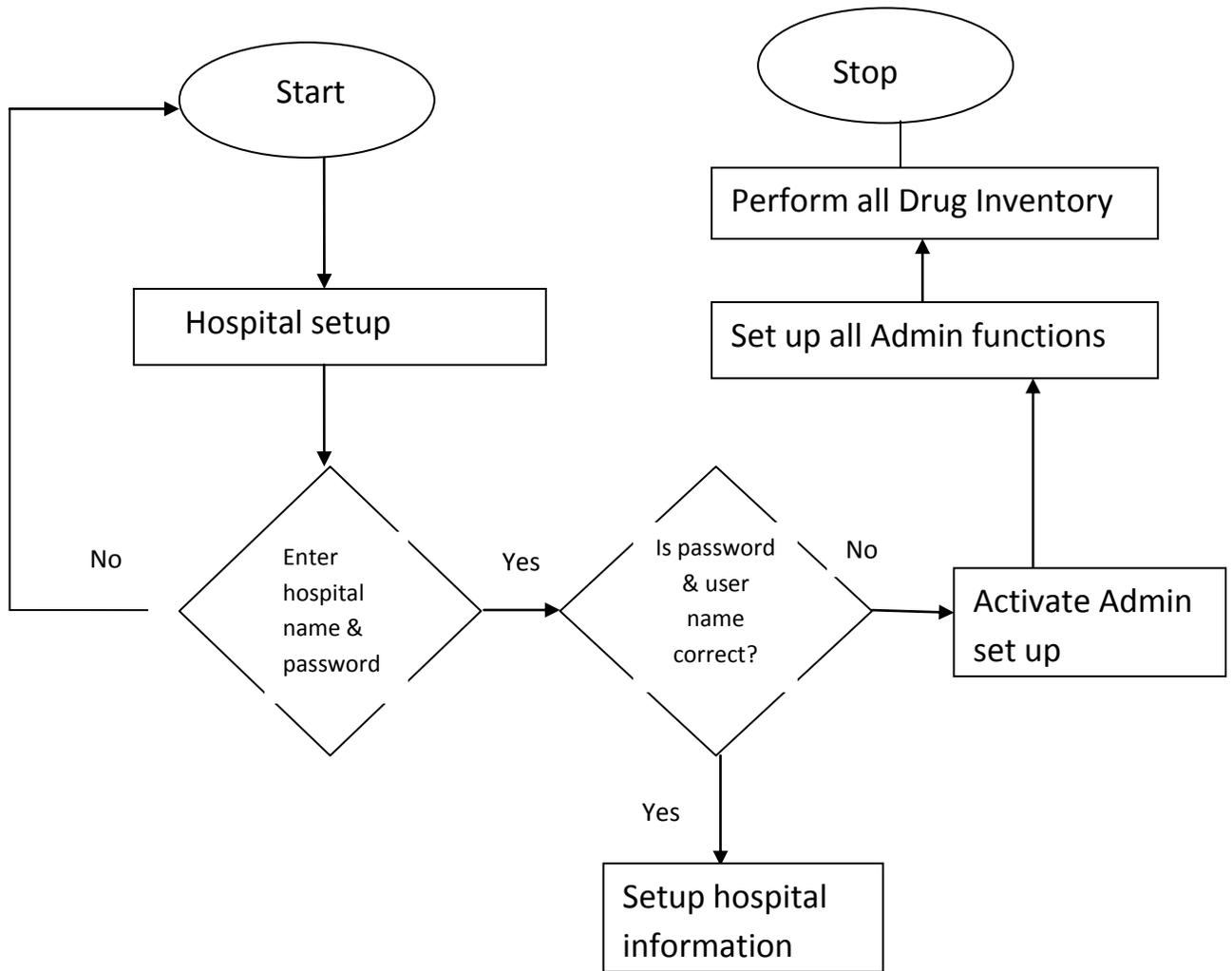
Fig 3.4 FLOW CHART PROGRAM SET UP/HOSPITAL SET UP

This program set up/hospital set up shows how you can set up your admin and how

it can be activated if username or password is incorrect.
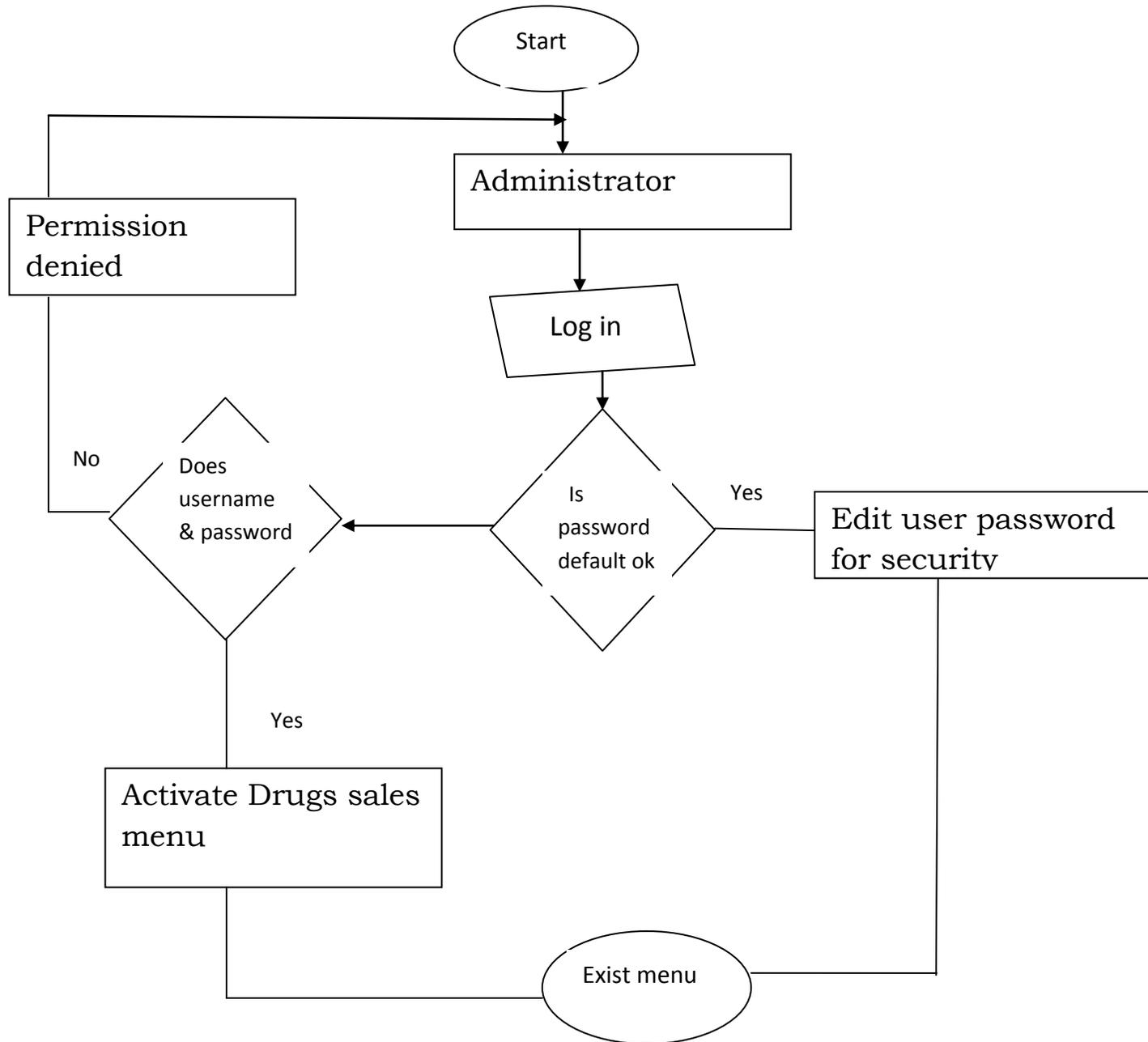
Fig3.5   FLOW CHART FOR LOGIN MODULE: This login module shows

how login can be made, if your username or password is wrong permission will be

denied but if ok or correct permission will be allowed.
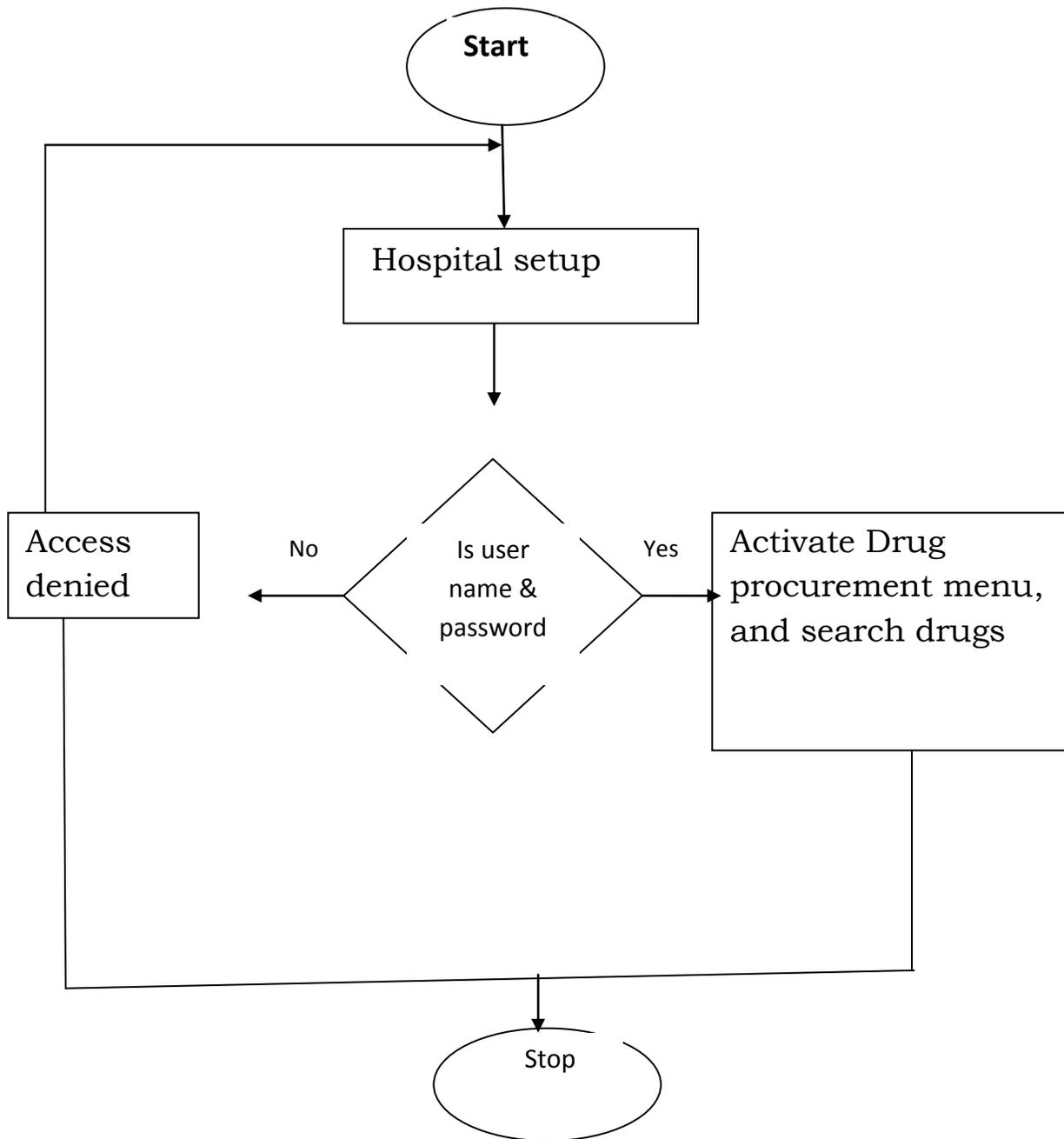
Fig3.6 FLOW CHART FOR DRUG PROCUREMENT

This procurement chart is how drug is being procured and how to locate procurement in the the program.

3.8 TOP- DOWM DIAGRAM
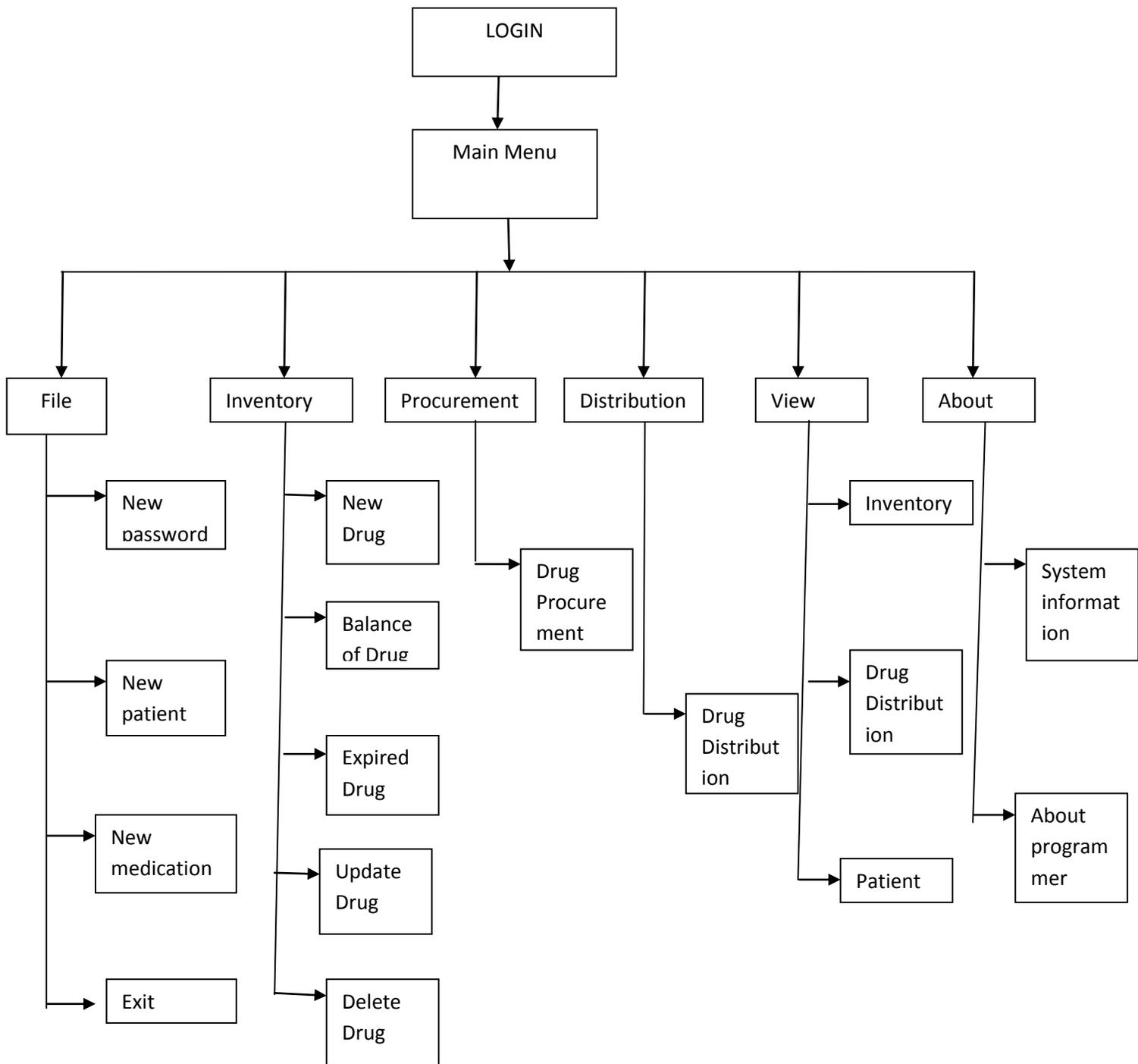
FIG 3.7   TOP- DOWM DIAGRAM

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This top- down diagram shows how the whole program is designed. From the main menu you will get the following sub-menus file, inventory, procurement, distribution, view and about, under this you will get other sub menus.

CHAPTER FOUR

IMPLEMENTATION AND TESTING

4.1 CHOICE OF DEVELOPMENT TOOLS

To ensure a standardized object oriented program in its entire ramification, I used visual basic 6.0, after which I used Microsoft office Access to call up my database which is a pseudo relational database management system from Microsoft that combines the relational Microsoft jet Database Engine with Graphical interface and software development tools. I used it because of its interoperability with visual Basic (my front end) which is also an event driven programming application. Using Microsoft Access one can

i) Add new data to a database such as a new item in an inventory.

ii) Edit existing data in the database such as changing current location of an item.

iii) Delete information, perhaps if an item is sold/ discarded.

iv) Organize, view and share data in a different way using e-mail.

4.2 SYSTEM REQUIREMENTS

The major requirements for the smooth use of this system are better described under two types; the hardware requirements and the software requirements

4.2.1 SOFTWARE REQUIREMENTS

The following software is required for the adequate implementation of the new design;

1. Windows operating system(window 98, window 2000, window XP, window 7)

2. Visual Basic 6.0.

3. Microsoft Access.

4. Anti-virus program (updated).

4.2.2 HARDWARE REQUIREMENTS

The new design will need the following hardware requirement to work effectively. They include:

a. A complete computer set of at lest Pentium II with a reasonable and sizeable hard disk space of at least 2GB and above.

b. A networked environment to ensure the collection of data and records to central database storage device.

c. The share able resource such as printers fax machines, scanners etc. Can

  Also be connected so that users can make use of it.

d. A 15" svga colored monitor.

e. An enhanced keyboard.

f. Cd Rom 48X and above, 3.5(1.44) FDD Drive.

g. Enhanced parallel or serial mouse.

h. Memory of about 128 megabyte and above.

4.3 IMPLEMENTATION

System implementation involves the actual installation or putting into place a new/improved system that has been designed for the workability of this new system. The research work will be meaningless if after design and the system is not implemented. Thus, in ensuring smooth implementation of this research work to develop a computerized drug procurement and distribution tracking system for the project (UNTH), there is an effort to document all the necessary steps taken to complete the design, and also provision of a proper documentation that would assist in implementation of the new software.

Documentation and implementation are principal stages of software development. Documentation is a well-defined description of what a program will accomplish with hope of making future amendments easier. Implementation is a process involved in changing an old system to a new

system. These are important systems in the software development that must not be undermined.

```
┌────────────────────────────────────────────────┬────┐
│ Login                                          │ X  │
├────────────────────────────────────────────────┴────┤
│ PLEASE ENTER YOUR USERNAME/PASSWORD                  │
│                                                      │
│                  ┌──────────────────────────┐        │
│ USER NAME        │ ADMIN                    │        │
│                  └──────────────────────────┘        │
│ PASSWORD         ┌──────────────────────────┐        │
│                  │                          │        │
│                  └──────────────────────────┘        │
│                                                      │
│           ┌───────────┐    ┌───────────────┐         │
│           │    OK     │    │    Cancel     │         │
│           └───────────┘    └───────────────┘         │
│                                                      │
└──────────────────────────────────────────────────────┘
```

LOGIN MENU: This is where you type in your username and password so that you can be able to access your system.

```
┌─────────────────────────────────────────────┐
│ NEW DRUG───────────────────────    ┌───────┐ │
│                                    │ EXIT  │ │
│                                    └───────┘ │
│ DRUG NAME                                    │
│ ┌──────────────────────────────────────────┐│
│ │                                          ││
│ └──────────────────────────────────────────┘│
│                                              │
│ DATE OF PURCHASE                             │
│ ┌─────────────────┐                          │
│ │                 │                          │
│ └─────────────────┘                          │
│                                              │
│ MANUFACTURED DATE                            │
│ ┌─────────────────┐                          │
│ │                 │                          │
│ └─────────────────┘                          │
│                                              │
│ EXPIRING DATE                                │
│ ┌─────────────────┐                          │
│ │                 │                          │
│ └─────────────────┘                          │
│                                              │
│ QUANTITY                                     │
│ ┌──────────────────────────────────────────┐│
│ │                                          ││
│ └──────────────────────────────────────────┘│
│                                              │
│ MANUFACTURER                                 │
│ ┌────────────────────────────────┐           │
│ │                                │           │
│ └────────────────────────────────┘           │
│                                              │
│ COST                                         │
│ ┌──────────────────────────────────────────┐│
│ │                                          ││
│ └──────────────────────────────────────────┘│
│                                              │
│                                              │
│   ┌───────────────┐      ┌───────────────┐   │
│   │   Add New     │      │     Save      │   │
│   └───────────────┘      └───────────────┘   │
└─────────────────────────────────────────────┘
```

NEW DRUG INVENTORY

New drug inventory is where you take all information about a new drug that has
been bought. All necessary inventories are taken in this form.

```
┌─────────────────────────────────────────────────┐
│  DRUG PROCUMENT ─────────────────┐  ┌──────────┐ │
│                                     │  EXIT     │ │
│  DRUG NAME:  ┌──────────────────┐  └──────────┘ │
│              └──────────────────┘               │
│                                                  │
│  QUANTITY: ┌──────────────┐                      │
│            └──────────────┘                      │
│                                                  │
│   DELIVERY: ┌──────────────┐                     │
│             └──────────────┘                     │
│                                                  │
│  EXPIRING DATE                                   │
│  ┌────────────────────────────────┐              │
│  └────────────────────────────────┘              │
│                                                  │
│  QUALITY                                         │
│  ┌────────────────────────────────┐              │
│  └────────────────────────────────┘              │
│                                                  │
│  SUPPLIER                                        │
│  ┌────────────────────────────────┐              │
│  └────────────────────────────────┘              │
│                                                  │
│  PURCHASE ORDER                                  │
│  ┌────────────────────────────────┐              │
│  └────────────────────────────────┘              │
│                                                  │
│  DATE OF PRODUCTION                              │
│  ┌────────────────────────────────┐              │
│  └────────────────────────────────┘              │
│                                                  │
│  RECIEPT VOUCHER  ┌──────────────────┐           │
│                   └──────────────────┘           │
│                                                  │
│     ┌──────────────┐    ┌──────────────┐         │
│     │   Add New    │    │    Save      │         │
│     └──────────────┘    └──────────────┘         │
└─────────────────────────────────────────────────┘
```

DRUG PROCUREMENT: This activities of involves buying; it also involves the activities of identifying the agency needs.

4.4 TESTING

Testing is the process of executing a system program or application with the intent of finding software bugs. The accuracy of the program was tested with some varying data. It gives assurance that the new system will achieve its objectives and purpose.

4.4.1 Unit Testing

The Test Data	Expected Tested Result	Actual Test Result
Login Form	Expected to see the login form immediately the software is run	When the software is run, a form now appears where you supply your username and password
Main Menu Form	Contain 6 buttons, 3 are expected to drop down a menu and the remaining 3 are not expected to. 1st button: FILE drops down NEW PASSWORD, NEW PATIENT, PATIENT MEDICATION AND EXIT 2nd button: INVENTORY	After login, 6 buttons appear. 3 drop down menus while the remaining 3

	drops down **NEW** DRUG,BALANCE OF DRUG,EXPIRED DRUG,UPDATE DRUG and DELETE DRUG 3rd button: PROCUREMENT 4th button: DISTRIBUTION 5th button: VIEW drops down INVENTORY, DRUG DISTRIBUTION and PATIENT 6th button: ABOUT	don't.
New password	Expected to enable user change his password	Allows the user to create a new password
New patient	Expected to enable user register a new patient	Allows the user to register a new patient

Patient medication	Expected to enable user register patient medication	Allows the user to register a patient medication
New drug	Expected to enable the user register a new drug	Allows the user to register a new drug
Balance of drug, Expired drug, Inventory, drug distribution and patient.	Expected to enable the user view balance of drug, expired drug, inventory, drug distribution and patient.	Allows the user to view balance of drug, expired drug, inventory, drug distribution and patient.
Update drug	Expected to enable the user update drug.	Allows the user to update drug.
Delete drug.	Expected to allow user delete unwanted drug.	Allows the user to delete drug.

	It is expected to see some information	Some system information is here.
About		

4.4.2 System Testing

After test running was varied data, which is after running the program, the output was shown on the monitor. The output can also be printed on paper. These show that the new system was perfect and effective.

CHAPTER FIVE

SUMMARY, RECOMMENDATION AND CONCLUSION

5.1   SUMMARY:

These systems underpin all the activities of drug procurement and distribution tracking system, by providing good health care and safety. It also provides fast access to drug information and the current status of drug can be obtained from the database files unlike the manual system.

This can be applied by using computer to determine the effectiveness of drug stock control; it helps in making quick decision by members of the organization.

Further enhancement should be made on drug procurement, and distribution tracking system of hospitals such as medical records, billing and general hospital.

5.2 LIMITATION

1. This work is design strictly for the use in UNTH. If any other hospital is to use it, it has to be modified.

2. The hospital (UNTH) has to train their staff on the use of computer system.

3. Some modification can be made in order to improve more on the design.

5.3   RECOMMENDATION

This work is recommended to improve in the way drug should be search. It should have a drop down menu that have lists of drugs in order to make work easy and also in the expiring date, it should have a sign to show that a drug have expired.

5.4   BEME   (BILL   OF   ENGINEERING   MEARSUREMENT   AND
**   EVALUTION).**

ITEM	ITEM PRICE(₦)
COMPACT DISK	500
MODEM	5500
TRANSPORT	5000
VB 10 TUTORIALS	20,000
PHONE CALLS	2,000
COMPUTER SYSTEM	90,000
PRINTING	2,000
BINDING	500
TOTAL	130,000

5.5   CONCLUSION

The benefit of using drug procurement and distribution tracking system cannot be over emphasized. This is because the system will increase the speed and accuracy of procurement, distribution and tracking of drug in pharmacy department of any hospital especially that of UNTH. It will also eliminate the case of misplacing files of patient and reduce the pilling up of papers in the office.

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APPENDIX A

"Program Source Codes"

NEW REGISTRATION

```
Private Sub Command1_Click()

With Form1.Data1

.DatabaseName = App.Path & "\gdb.mdb"

.RecordSource = "SELECT * FROM inventory"

.Refresh

 Do Until .Recordset.EOF


      If Form1.Txtname.Text = .Recordset.Fields("drug_name") Then

      GoTo 20

        Exit Do

      End If


    .Recordset.MoveNext


  Loop

  End With
```

```
    GoTo 3

20 With Form1.Data1

.DatabaseName = App.Path & "\gdb.mdb"

.RecordSource = "SELECT * FROM inventory"

.Refresh


.Recordset.Edit


.Recordset.Fields("drug_name") = Txtname.Text

Dim t As Integer


t = Val(Txtdate.Text) - Val(Text1.Text)

If Val(t) < 0 Then

MsgBox "Sorry You have less quantity for supply"

GoTo 3


Else

.Recordset.Fields("quantity") = t

Dim s As Integer
```

```
s = Val(Label8.Caption) - Val(Text1.Text)

.Recordset.Fields("balance") = s

.Recordset.Fields("source_unit") = Txtadd.Text

.Recordset.Fields("date_issued") = Txtphone.Text

.Recordset.Fields("time_issued") = Txtemail.Text

 .Recordset.Update

 End If

End With


MsgBox ("UPDATE SUCCESSFUL")

Unload Me

3 End Sub


Private Sub Command2_Click()

MsgBox ("DO WISH TO QUIT?")

Unload Me

End Sub


Private Sub Command3_Click()
```

```
  Txtname.Text = ""

Txtdate.Text = ""

    Text1.Text = ""

  Txtadd.Text = ""

    Txtphone.Text = ""

    Txtemail.Text = ""



End Sub



Private Sub Form_Load()

On Error Resume Next



With Form1.Data1

    .DatabaseName = App.Path & "\gdb.mdb"

    .RecordSource = "select * from inventory"

    .Refresh

    .Recordset.MoveFirst

  Do Until .Recordset.EOF
```

```vb
        If Form14.Text1.Text = .Recordset.Fields("drug_name") Then

        Txtname.Text = .Recordset.Fields("drug_name")

        Txtdate.Text = .Recordset.Fields("quantity")

        Label8.Caption = .Recordset.Fields("balance")


    Exit Do

            End If



            .Recordset.MoveNext



    Loop

    End With

End Sub
```

DRUG PROCUREMENT

```vb
Private Sub Command1_Click()


With Form1.Data1

.DatabaseName = App.Path & "\gdb.mdb"
```

```
.RecordSource = "SELECT * FROM procure"

.Refresh

.Recordset.AddNew


.Recordset.Fields("drug_name") = Text1.Text

.Recordset.Fields("quantity") = Text2.Text

    .Recordset.Fields("price") = Text3.Text

  .Recordset.Fields("delivery") = Text4.Text

    .Recordset.Fields("description") = Text5.Text

    .Recordset.Fields("source") = Text6.Text

    .Recordset.Fields("supply") = Text7.Text

.Recordset.Fields("purchase") = Text8.Text

.Recordset.Fields("quality") = Text9.Text

    .Recordset.Fields("production") = Text10.Text

  .Recordset.Fields("expire") = Text11.Text

    .Recordset.Fields("voucher") = Text12.Text


 .Recordset.Update

End With
```

MsgBox ("RECORD SUCCESSFUL")

End Sub

Private Sub Command2_Click()

Text1.Text = ""

Text2.Text = ""

Text3.Text = ""

Text4.Text = ""

Text5.Text = ""

Text6.Text = ""

Text7.Text = ""

Text8.Text = ""

Text9.Text = ""

Text10.Text = ""

Text11.Text = ""

Text12.Text = ""

End Sub

Private Sub Label17_Click()

cd.ShowPrinter

End Sub

INVENTORY

Private Declare Function OSWinHelp% Lib "user32" Alias "WinHelpA" (ByVal hwnd&, ByVal HelpFile$, ByVal wCommand%, dwData As Any)

Private Sub Coand3_Click()

 Txtname.Text = ""

 Text1.Text = ""

   Txtadd.Text = ""

 Txtphone.Text = ""

 Text2.Text = ""

End Sub

```
Private Sub Command1_Click()

With frmMain.Dat1

    .DatabaseName = App.Path & "\GDB.mdb"

    .RecordSource = "select * from inventory"

    .Refresh


  Do Until .Recordset.EOF


    If   frmMain.Txtname.Text   =   .Recordset.Fields("drug_name")   And
frmMain.DTPicker1.Value = .Recordset.Fields("date_purchase") Then

    MsgBox ("The Name  already exist")

    GoTo 20

      Exit Do

    End If


    .Recordset.MoveNext


  Loop

End With
```

```
If Txtphone.Text = "" Then

MsgBox "Please fill in the form properly,Fields are empty"

GoTo 20

Else

With frmMain.Dat1

.DatabaseName = App.Path & "\GDB.mdb"

.RecordSource = "SELECT * FROM inventory"

.Refresh

.Recordset.AddNew


.Recordset.Fields("drug_name") = Txtname.Text

.Recordset.Fields("date_purchase") = DTPicker1.Value

.Recordset.Fields("manufacturer_date") = DTPicker3.Value

    .Recordset.Fields("expiry_date") = DTPicker2.Value

    If DTPicker2.Value = DTPicker1.Value Then

    MsgBox "Drug expiring today"

    GoTo 20

    Else
```

```
.Recordset.Fields("manufacturer") = Txtphone.Text

.Recordset.Fields("quantity") = Txtadd.Text

Dim t As Integer

t = Val(Txtadd.Text) + Val(Text1.Text)

.Recordset.Fields("balance") = t


.Recordset.Fields("cost") = Text2.Text

.Recordset.Update


    End If

End With

    End If

MsgBox "DRUG SAVED"

20 End Sub


Private Sub Command10_Click()


Frame2.Visible = False

End Sub
```

```
Private Sub Command12_Click()

Frame1.Visible = True

Frame2.Visible = False

Frame3.Visible = False

Frame4.Visible = False

Frame5.Visible = False

Frame6.Visible = False

End Sub


Private Sub Command2_Click()

Frame3.Visible = True

Frame1.Visible = False

Frame2.Visible = False

End Sub


Private Sub Command3_Click()

If search.Text = "" Then

MsgBox ("NO  NAME ENTER")
```

```
GoTo 3

End If

With Form1.Data1

    .DatabaseName = App.Path & "\gdb.mdb"

    .RecordSource = "select * from inventory"

    .Refresh

     .Recordset.MoveFirst

  Do Until .Recordset.EOF

   If frmMain.search.Text = .Recordset.Fields("drug_name") Then

Form7.Show

 search.Text = ""

 Exit Do

 Else



End If

 .Recordset.MoveNext

Loop search.Text = ""

     Exit Sub
```

APPENDIX B

APPENDIX 1 LOAD MENU

APPENDIX 2 LOGIN PAGE
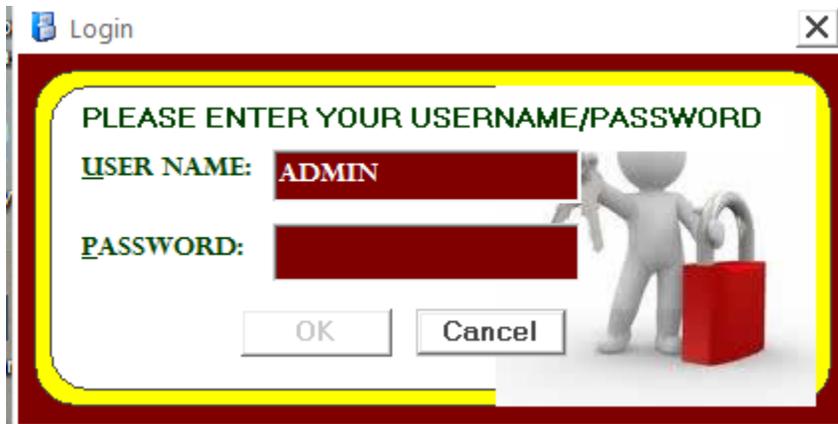
APPENDIX 3 MAIN MENU
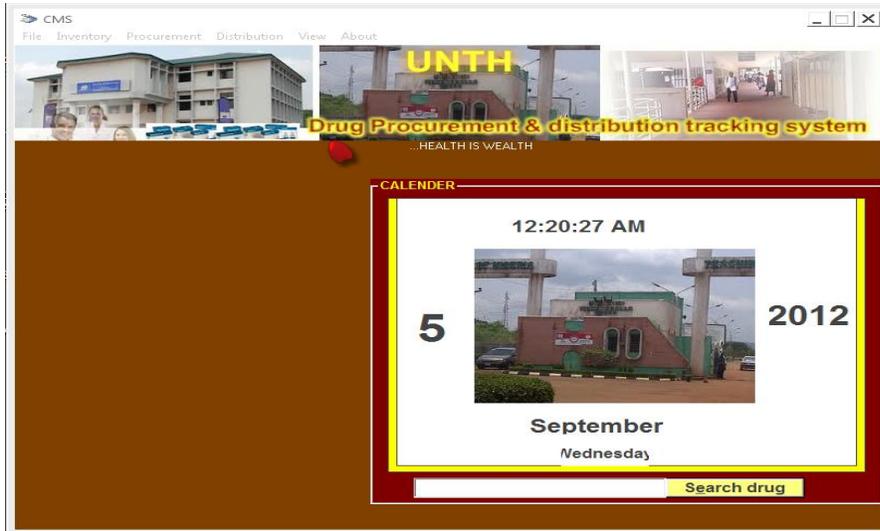
APPENDIX 4 NEW PATIENT

APPENDIX 5 PATIENT MEDICATION

APPENDIX 6 NEW DRUG

APPENDIX 7 VIEW EXPIRING DATE

APPENDIX 8 UPDATES DRUG

APPENDIX 9 DRUG DISTRIBUTION

DRUG DISTRIBUTION

DRUG DISTRIBUTION

DRUG NAME
PANDOL

QUANTITY IN STOCK
500 PACK

QUANTITY ISSUED

SOURCE UNIT

DATE ISSUED

TIME ISSUED

ADD NEW SAVE Cancel

APPENDIX 10 DRUG PROCUREMENT

DRUG PROCUREMENT

DRUG NAME:

QUANTITY:

PRICE:

DELIVERY:

DRUG DESCRIPTION:

DRUG SOURCE:

SUPPLIER

PURCHASE ORDER

QUALITY

DATE OF PRODUCTION

EXPIRING DATE

RECIEPT VOCHER

SAVE ADD NEW