DESIGN AND IMPLEMENTATION OF COMPUTERIZED DRUG INFORMATION MANAGEMENT SYSTEM

(A Case Study of Vamak Pharmacy, Auchi)

BY

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BEING A PROJECT WORK SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY.
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CERTIFICATION

We, the undersigned, certify that this project work was carried out by **NGBEKEN UCHE EMMANUEL** with **MAT NO. ICT/2252060222** in the department of Computer Science, School of Information and Communication Technology.

We also certify that the work is adequate in scope and quality in partial fulfillment of the requirements for the award of Higher National Diploma (HND) in Computer Science.

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DEDICATION

This project work is dedicated to **ALMIGHTY GOD,** for giving me the strength to complete it and to my lovely parents, **Mr. and Mrs. Ngbeken**.

ACKNOWLEDGEMENTS

First and foremost, I wish to express my profound gratitude to **ALMIGHTY GOD,** who is the sustainer of life and giver of wisdom for his infinite mercy and protection on me from creation to this moment and for the successful completion of this project.

I want to acknowledge my able project supervisor **Mr. Akhetuamen S.O** for his advice and thorough supervision during the course of this project. May God bless you sir.

My special thanks goes to my head of department **Mr. Akhetuamen S.O** and other lecturers and staffs in the department of Computer Science.

I also want to thank my parents **Mr.** and **Mrs. Ngbeken** for their prayers and love. My siblings, you are appreciated.

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ABSTRACT

In this study are presented the results regarding the analysis of a novel type of remote control based on the data transmission facilities offered by the GSM network infrastructure and the processing power achieved by new generation of microcontrollers. The system is intended to be used in the development of complex distributed control applications that are specific to various automated industrial processes, including the manufacturing of printed circuit boards and electronic modules. The proposed control system was analysed using a prototype board equipped with Atmega 328 microcontroller. For implementation of data communication between the remote modules that compose the distributed control system a Quectel M10 quad-band GSM/GPRS radio modem could be used. The quality of the proposed design was evaluated through extended performances analysis focused on the delay time, maximum transfer rate, failure tolerance and reliability. The system allows versatile configuration of command's structure and can operate with an extended set of commands for the remote modules. Also, compared with other implementation solutions the proposed design can be used almost in any location due to the large availability of the GSM infrastructure.

Keywords: GSM, System, Broadband, GPRS, Data

CHAPTER ONE

INTRODUCTION

1.1 Background of the 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 (Dzierba et al., 2020).

Drug procurement and distribution tracking system provides a computer based information management system in a Pharmacy store 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. 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 (Moons et al., 2019).

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 (Chand et al., 2022).

Pharmaceutical unit 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, 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 the Problem

Drug procurement, tracking, distribution and information management in this regard are routine processes carried out in various hospitals and stores across Nigeria. It is a common place to observe that these routine processes are still preformed manually or are minimally computerized. 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.

1.3 Objectives of the Study

The aim of this project is to develop a system that will track drug procurement and distribution. The objectives of this study includes designing a system that will:

I. Order for drugs without mistake of procuring more than required.

II. Take good stock of drugs.

III. Prevent dispensary of expired drugs.

IV. 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

1.5 Scope of the Study

This research work will cover only Vamack Pharmaceutical Stores. 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 Limitations of the Study

Some of the constraints of this project include the following

i. Time constraints

ii. Epileptic power supply

iii. Inability to access relevant materials

iv. Financial constraints

1.7 Definition of Terms

i. **Database**: A collection of logically related data to meet the information need of organization.

ii. **DBMS**: Database Management Software that enable the user to define, maintain Control the database.

iii. **Application Program:** A computer program that interacts with the database.

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

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

CHAPTER TWO

LITERATURE REVIEW

The positive impact of computing in the area of health care services has brought significant help to the society. According to Silverman (2020), 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 (2021) 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.

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 provide physicians with specific details including the use of dosage, potential reactions to drug and details of drug cost. In a large hospital or pharmacy store, 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.

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. 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. Varied prices of drugs purchased by health, non-health sectors and noncompliance 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 (2019).

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.

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, 2019).

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:

a. **Prescription entry for patient;** the prescription entry responds as fast as you can type.
b. **Reporting;** the software provides an easy to use embedded report writer allowing quick and easy customization of forms and reports.
c. **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.

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).

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.

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

SYSTEMS ANALYSIS AND DESIGN

3.1 System Analysis

System investigation and analysis deal with considering the full study of the existing system by investigating the system to expose the strength and weakness of the existing system. It also allows the problem of existing system to be identified and eliminated from the proposed system and enables the good method to be incorporated if possible SWOT (strength, weakness, opportunity, and threat) analysis is used as a tool in this chapter.

3.2 Methods of data collection

For achieving the objectives of this study and to conduct the investigation, data has been collected from both primary and secondary sources:

Primary Data: Data collection methods for primary data include: Structured and semi-structured questionnaires, mailed questionnaires, structured and semi-structured interviews (personal and telephone interviews), observation and focus discussions. Questionnaires are the most commonly used methods when respondents can be reached and are willing to co-operate. These methods can reach a large number of subjects who are able to read and write independently. The study used primary data, which was captured through a prearranged questionnaire. For this study Primary data was collected from selected members of the staff through oral interview on daily operations.

Secondary Data: Secondary data was collected through Books, Journals. Research papers, Websites, Articles and Newspapers.

3.2.1 Data Analysis Technique

The analytical tool used in the analysis is simple percentage. Percentage analysis is the method used to represent raw streams of data .as a percentage (a part in 100-percent) for better understanding of collected data.

3.3 Analysis of the Existing System

The existing system of drug procurement is highly manual, time consuming and stressful. Because the system is manual, it involves a lot of paper work which in itself is cumbersome and prone to loss or damage. Another thing to note is the margin for error which is high because it is based solely on human abilities. Drug procurement is much more difficult with the current system, as it also

encourages a lot of time wastage that is not to the benefit of those in dire need of these facilities.

Drawbacks of Existing System

- More man power.
- Consumes large volume of paper work.
- Needs manual calculations.
- Inconsistency in data entry, room for errors, miscopying information.
- Large ongoing staff training cost.
- System is dependent on good individuals.
- Time consuming and costly to produce reports.
- Lack of security.

To avoid all these limitations and make the working more accurate the system need to be computerized.

3.4 Analysis of the Proposed System ·

The main objective of this project is to present a system which can effectively replace the existing system by providing quick and prompt responses to queries as it pertains to drug procurement, distribution and any other services requested. This software is built up to meet the needs of hotels with regards to automating its management.

This is based on new techniques and on new idea. This is totally different and beneficial for others (new users/ non-computer literate) to easily use and

understand. This software provides fresher processing of any query and makes information up to date.

3.4.1 Advantages of Proposed System

The system is very simple in design and to implement. The system requires very few system resources and the system will work with almost all configurations. It has got the following features and advantages;

• Minimize manual data entry.

• Minimum time needed for the various processing.

• Greater efficiency.

• User friendliness and interactive

3.5 Input and Output Designs

The proposed system is built with the user put into consideration. The flow of data is in such a way that the system is very easy to use and the system requirements are met.

3.5.1 Input Design

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps that are necessary to put transaction data into a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into

the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The data supplied to the system includes

- User Login
- Client Registration

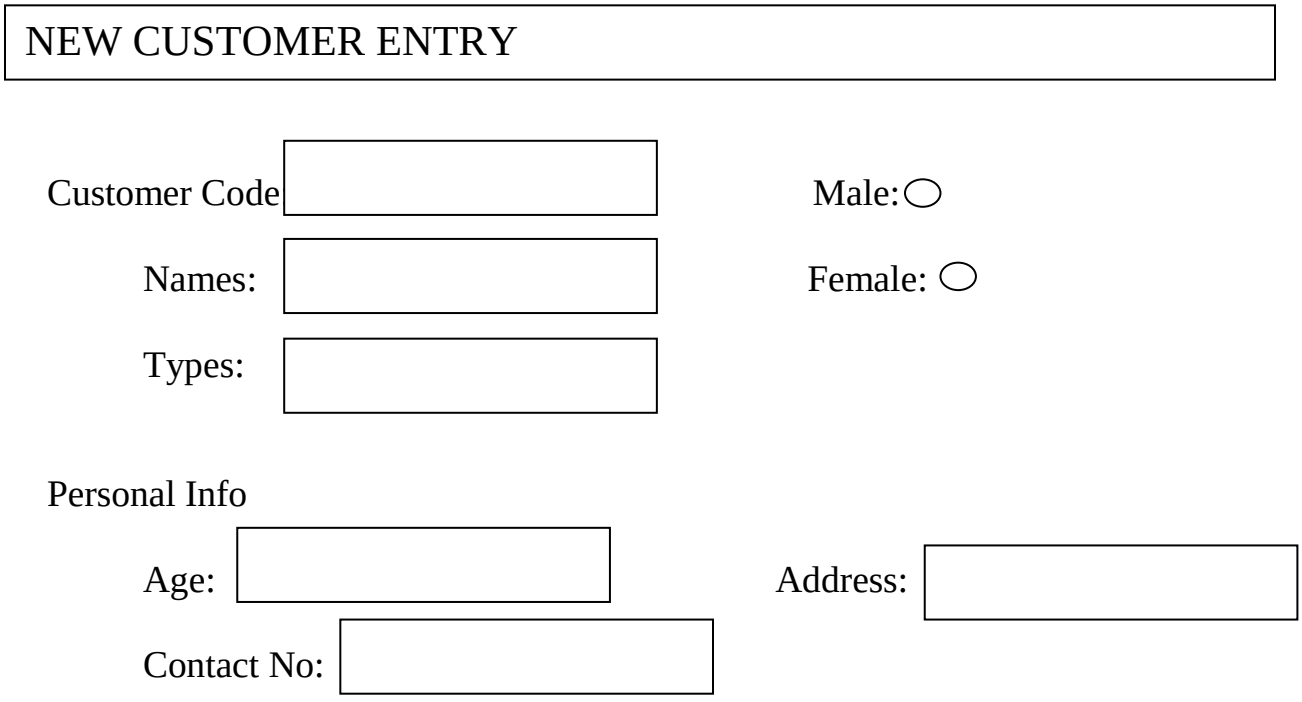

Figure 3.1 Client's Registration Form

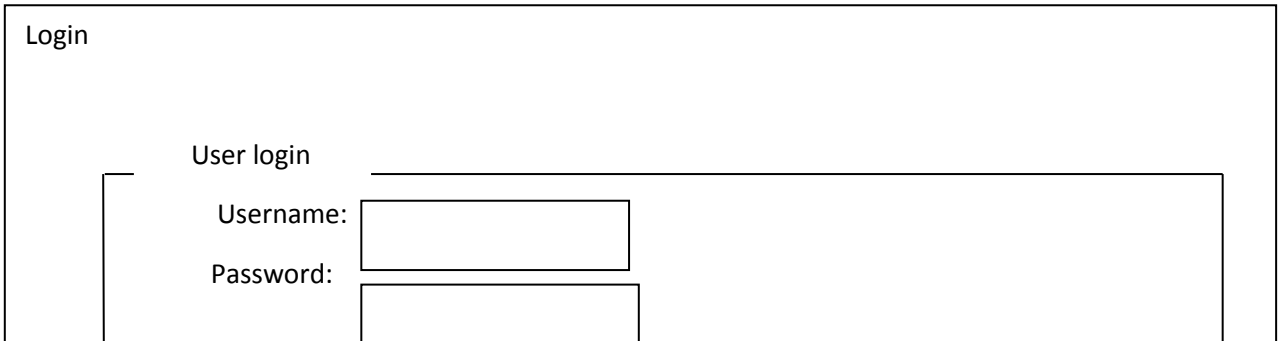

Figure 3.2 The Login Form

3.5. 2 Output Design

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the user and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

Designing computer output should proceed in an organized, well thought out manner: the right output must be developed while ensuring that each output element is designed so that people will find the system easy to use and efficient.

When analysing design computer output, they should identify the specific output that is needed to meet the requirements.

USERNAME	FULLNAME	ACTIVITY LOG	LOGIN TIME	LOGOUT TIME
MANAGER	GREG	LOGIN SUCCESSFUL	6/14/2018 07:00AM	6/14/2018 12:58PM
MANAGER	GREG	CLIENT REGISTERED	12/25/2017 07:00AM	12/25/2017 07:00PM
MANAGER	GREG	PRINTED SUMMARY SHEET	11/14/2017 07:00AM	11/15/2017 05:00AM

Table 3.1 Activity Log

3.6.1 Program Flowchart

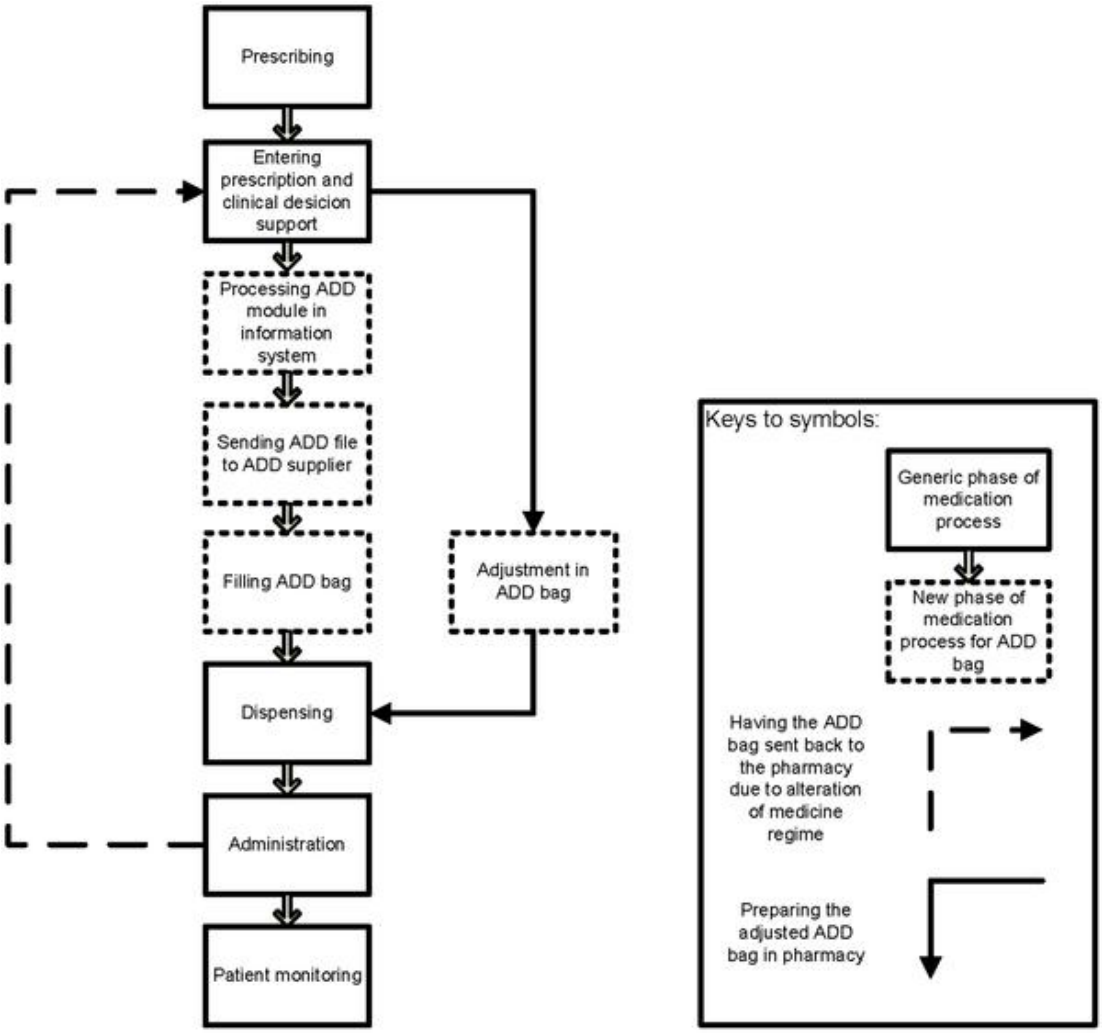

Figure 3.3 Program Flowchart

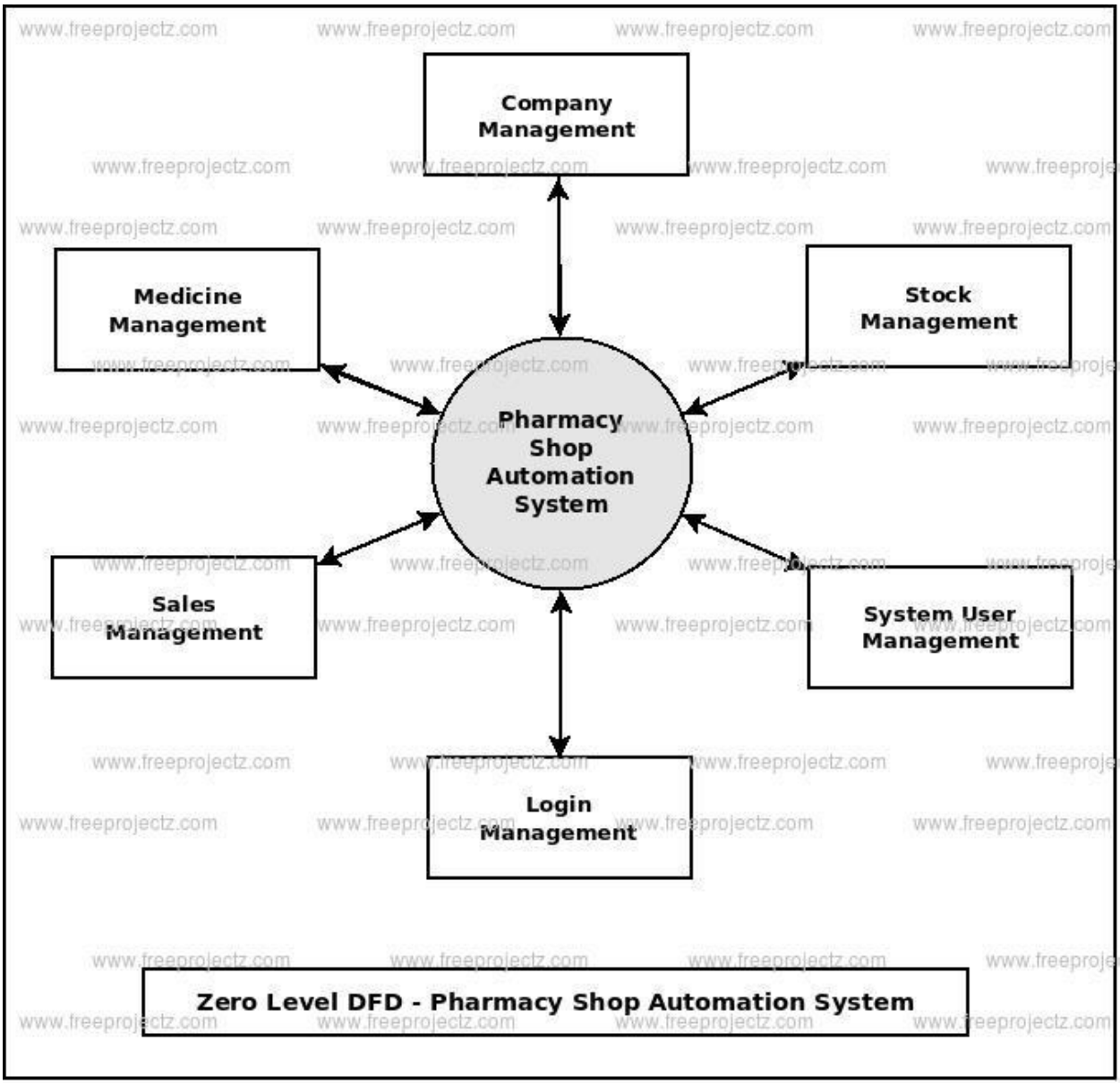

Figure 3.4 Data Flow Diagram

3.6 Database Design

The data in the system has to be stored and retrieved from the database. Designing the database is part of the system design. Data elements and data structures to be stored have been identified at the analysis phase. They are structured and put together to design the data storage and retrieval system. A database is a collection of interrelated data stored with minimum redundancy to serve many users quickly and efficiently. The general objective of the Hotel Management Information System is to make record access quick, easy, inexpensive and flexible to the user. Relationships are established between the data items, and unnecessary data items are removed. Normalization is done to get an internal consistency of data and to have minimum redundancy and maximum stability. This ensures minimizing data storage required, minimizing chances of data inconsistencies and optimizing for updates, The MS Access database has been chosen for developing the relevant databases. The following are the tables that are involved in the proposed system:

FIELD	DATATYPE	WIDTH	CONTRAINT/COMMENT
CustomerID	Int		Primary Key
Name	Char	100	
Address	Nvarchar	Max	

Type Of Drug	Int		
Sign	Char	50	

Table 3.2 Customer details

FIELD	DATATYPE	WIDTH	CONSTARINT/COMMENT
UniversalID	Numeric	18	Primary Key
SourceID	Int		
Description	Char	100	

Table 3.3 Obtain ID

FIELD	DATATYPE	WIDTH	CONSTARINT/COMMENT
UserID	Varchar	50	Primary Key
UserName	Varchar	50	
Password	Varchar	50	

Table 3.4 Passwords

FIELD	DATATYPE	WIDTH	CONSTARINT/COMMENT
StatusID	Int		Primary Key
Status	Nvarchar	50	
dateAdded	Datetime		
AddedByFK	Int		
DateModified	Datetime		
LastUserFK	Int		

Table 3.5 Cashier Account

FIELD	DATATYPE	WIDTH	CONSTARINT/COMMENT
UserID	Text		Primary Key
Password	Varchar	50	
FFullName	Text		
MaritalStatus	Text		
ID_Number	Varchar	50	
Gender	Char	1	
Address	Text		

Telephone	Bigint		
RegistrationDate	Date		
Roles	Text		
Email	Varchar	50	
AccountNo	Bigint		
Department	Varchar	50	
Salary	Decimal	(18, 0)	

Table 3.6 User Account

CHAPTER FOUR

SYSTEM DEVELOPMENT AND IMPLEMENTATION

4. 1 Software Requirements

For the effective implementation of the new system, the following software has to be installed on the computer system.

• PHP

• Windows 7 Operating System or later

• MYSQL

4.2 Hardware Requirements

For running the project, the following minimum hardware is required.

• Pentium VI and above

• 80 Gigabyte of Hard Drive

• 2 GB Ram and above

4.3 Choice of Programming Language

PHP was used to develop the new system. This is because of its ease of use and flexibility which provides the programmer with hints and a good

graphical user interface. PHP also allows for object-oriented programming. There are various tools in the program environment that makes coding and navigation easy. These and many more makes PHP the ideal programming language.

4.4 System Documentation

The system was designed to be user friendly. It can be operated by anyone regardless of their literacy level.

4.4.1 User Documentation

The user needs to register before he/she can have access to the program. After the registration, the user can login to the platform via the login account he/she has used to register. Other registration details can be filled up after the user must have login to the site.

4.5 Education and User Training

1. User's Training: The users should be taught how to enter data into the system to retrieve the output and know mode of operation. The training session needs to cover how and what a simple error message on the screen means and how it can be handled successfully coupled with the maintenance of the system.
2. System Conversion: This is the process of switching from one system to the other (i.e manual to automation). Prior to conversion, users and computer operation

personnel might bear been trained in their duties on the application software of the news system made available for use.

4.6 Execution of Testing

Testing phase is a very important for a successful system. In this phase before implementing the new system into operation, for eliminating bugs a test run of the system is done. After completing codes for the whole programs of the system, a test plan should be developed and run one given set of test data.

4.6.1 Login Form

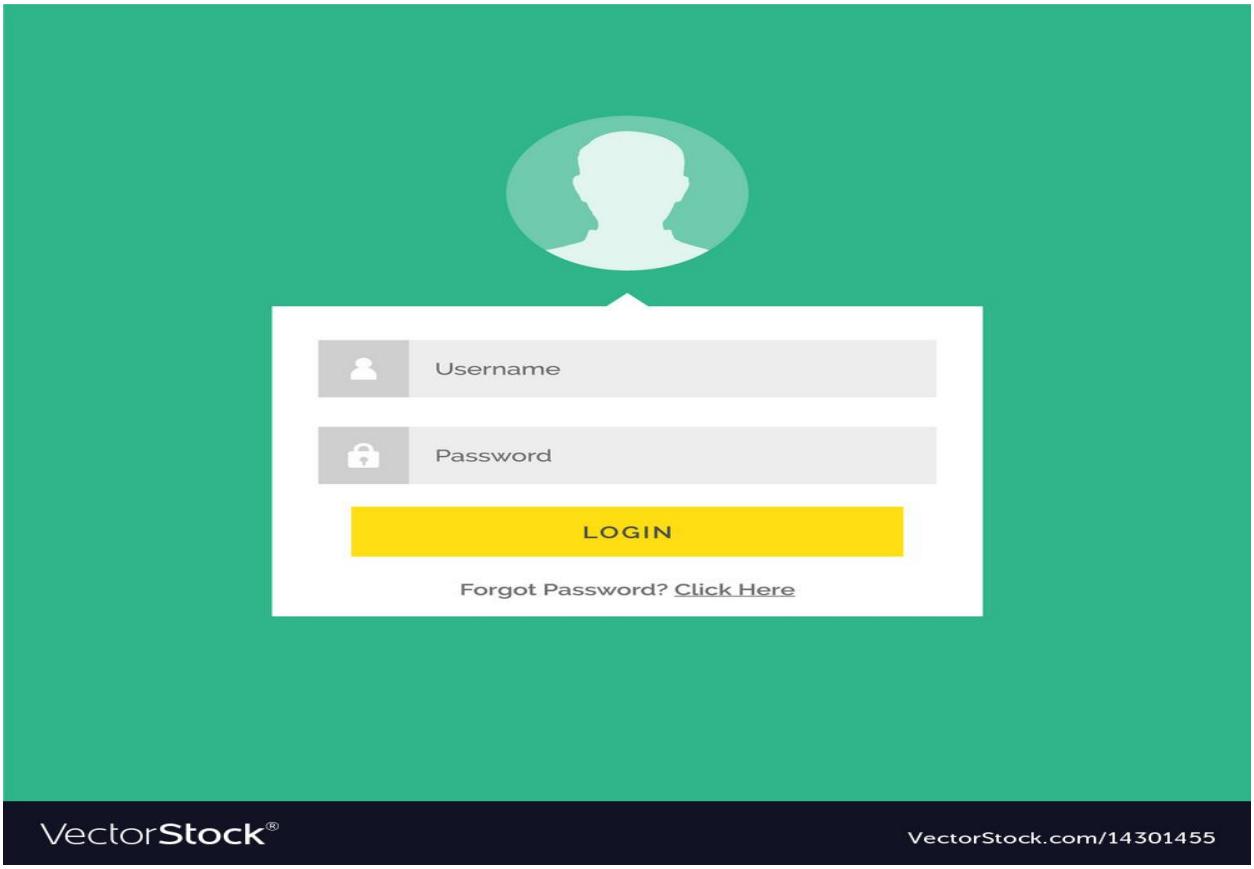

Figure 4.1 User Login

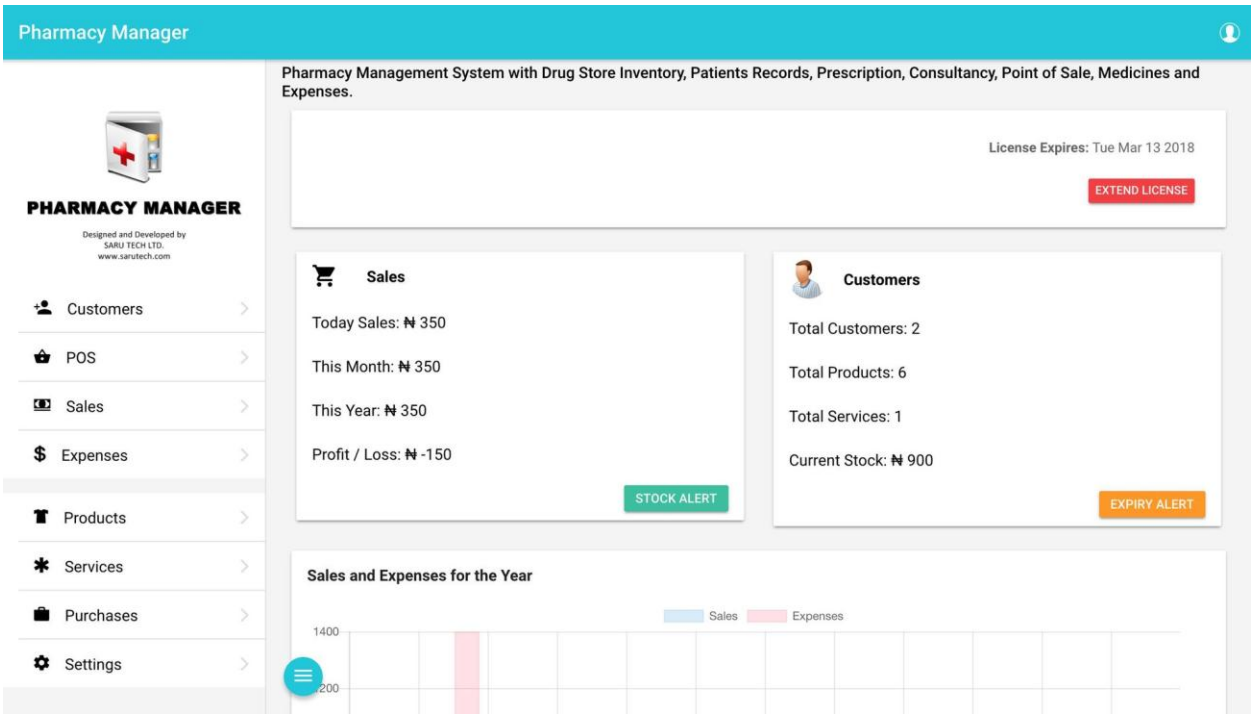

Figure 4.2 Homepage

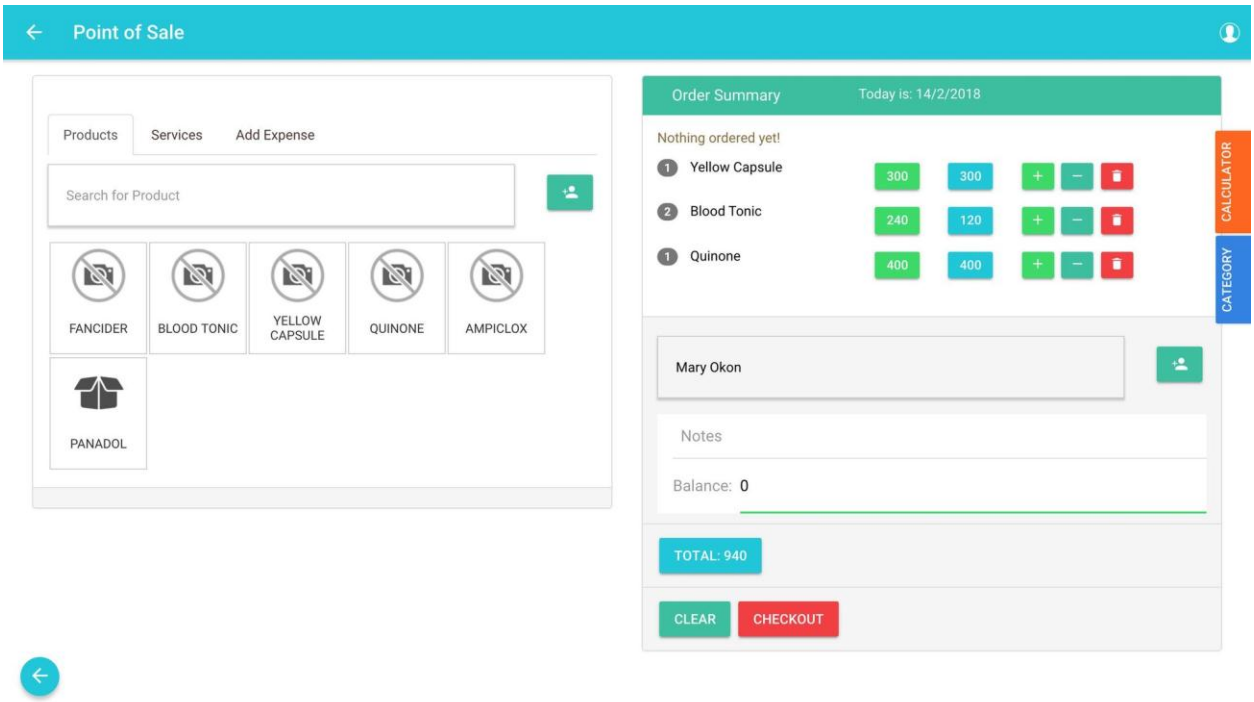

Figure 4.3 Sales Point Interface

Unit testing: It is a method by which individual units of source code, sets of one or more program modules collectively with associated control data, usage procedures, and operating procedures, are tested to determine whether they are fit for use. Intuitively, one can view a unit as the smallest testable part of an application. In procedural programming a unit can be an entire module but is more commonly an individual function. In object-oriented programming a unit is an entire interface but could be an individual method. Unit test is created by programmers or by white box testers during the development process.

Each test case is independent from the others: substitutes like method stubs, mock objects can be used to assist testing a module in isolation. Unit tests are typically written and run by software developers to ensure that code meets its design and behaves as intended. Its implementation can vary from being very manual to being formalized as part of build automation.

Integration testing: It is the phase in software testing in which individual software modules are combined and tested as a group. It occurs after unit testing and before validation testing. Integration testing takes as its input modules that have been unit tested, groups them in larger aggregates, applies tests defined in an integration test plan to those aggregates, and delivers as its output the integrated system ready for system testing .

Program test*:* After the programs have been coded, compiled and carried out to working conditions, they must be independently tested with the prepared test data. Any unwanted happening should be noted and debugged.

System Test*:* When the program test for each of the programs of the system is written and errors are removed then system test is complete. At this stage the test is done on actual data. The complete system is put into execution on the actual data. At every stage of the execution, the output of the system is studied. During theoutcome analysis, it may be found that the outputs are not matching the

estimated output of the system. In such situation, the bugs or errors in the particular programs are recognized and are fixed and further verified for the expected output.

When it is confirmed that the system is running error-free, the users are called with their own real data so that the system could be presented running as per their requirements.

4.7 System Maintenance

Maintenance involves the software industry captive, typing up system resources. It means restoring something to its original condition. Maintenance follows conversion to the extent that changes are necessary to maintain satisfactory operations relative to changes in the user's environment. Maintenance often includes minor enhancements or corrections to problems that surface in the system's operation. Maintenance is also done based on fixing the problems reported, changing the interface with the other software or hardware enhancing the software. Any system developed should be secured and protected against possible hazards. Security measures are provided to prevent unauthorized access to the database at various levels. An uninterrupted power supply should be so that the power failure or voltage fluctuations will not erase the data in the files. Password protections and simple procedures to prevent the unauthorized access are provided

to the users. The system allows the user to enter the system only through proper user name and password.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

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.

5.2 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 VAMACK Pharmaceutical Stores. It will also eliminate the case of misplacing files of patient and reduce the pilling up of papers in the office.

5.3 Recommendations

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. Further enhancement should be made on drug procurement, and

distribution tracking system of hospitals such as medical records, billing and general hospital.

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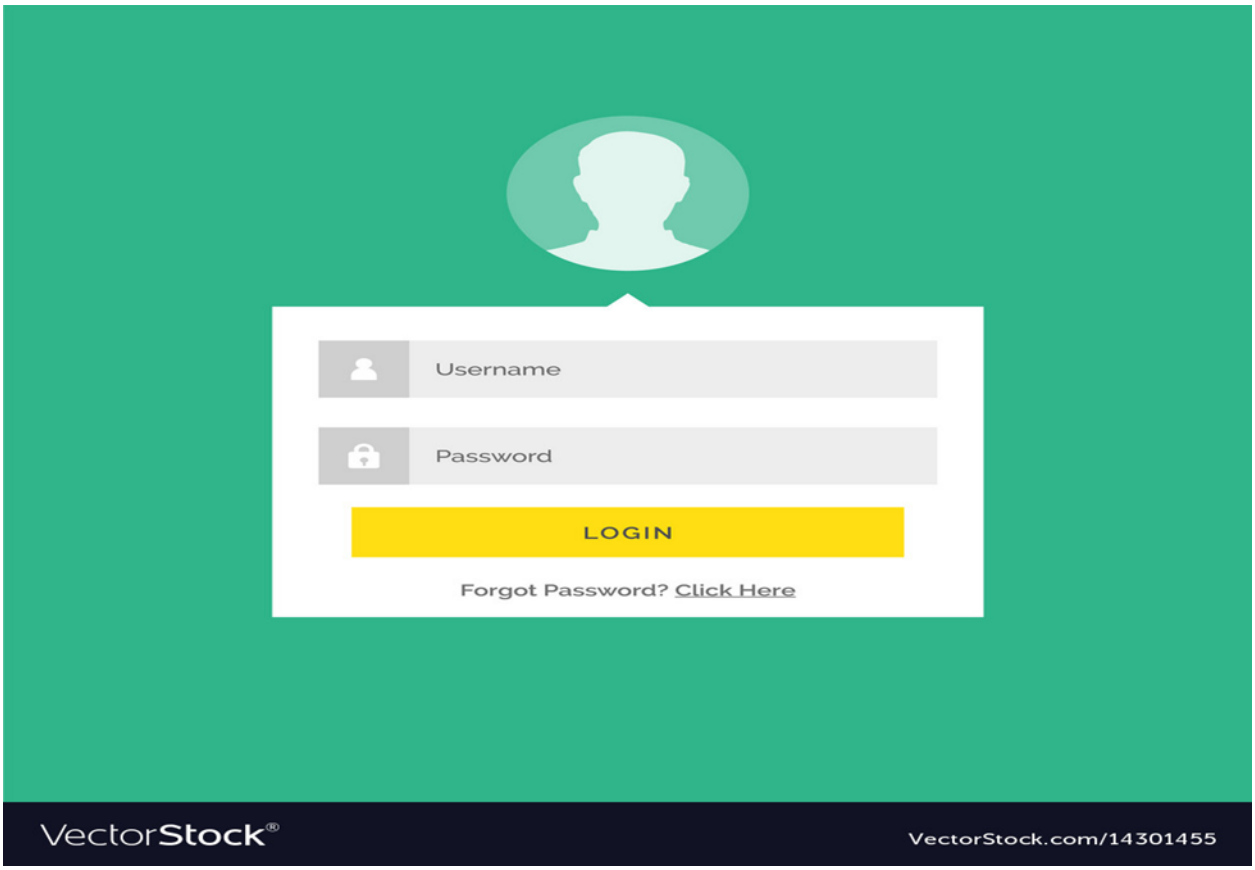
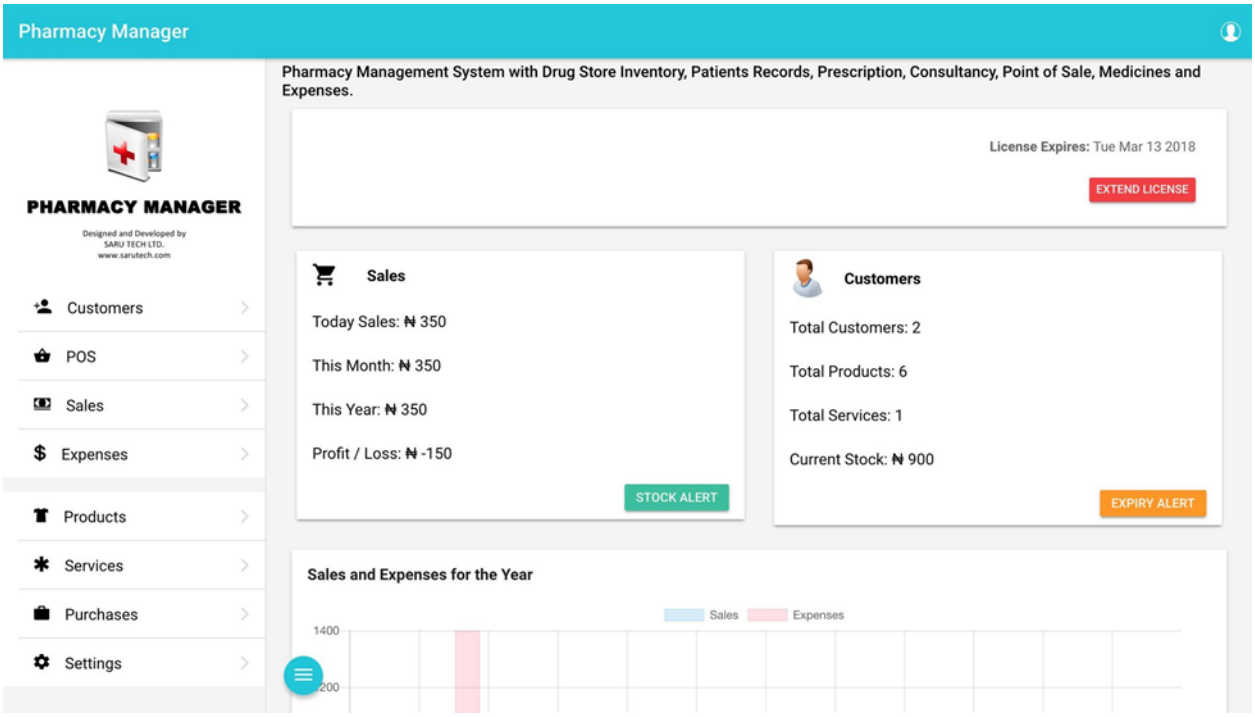
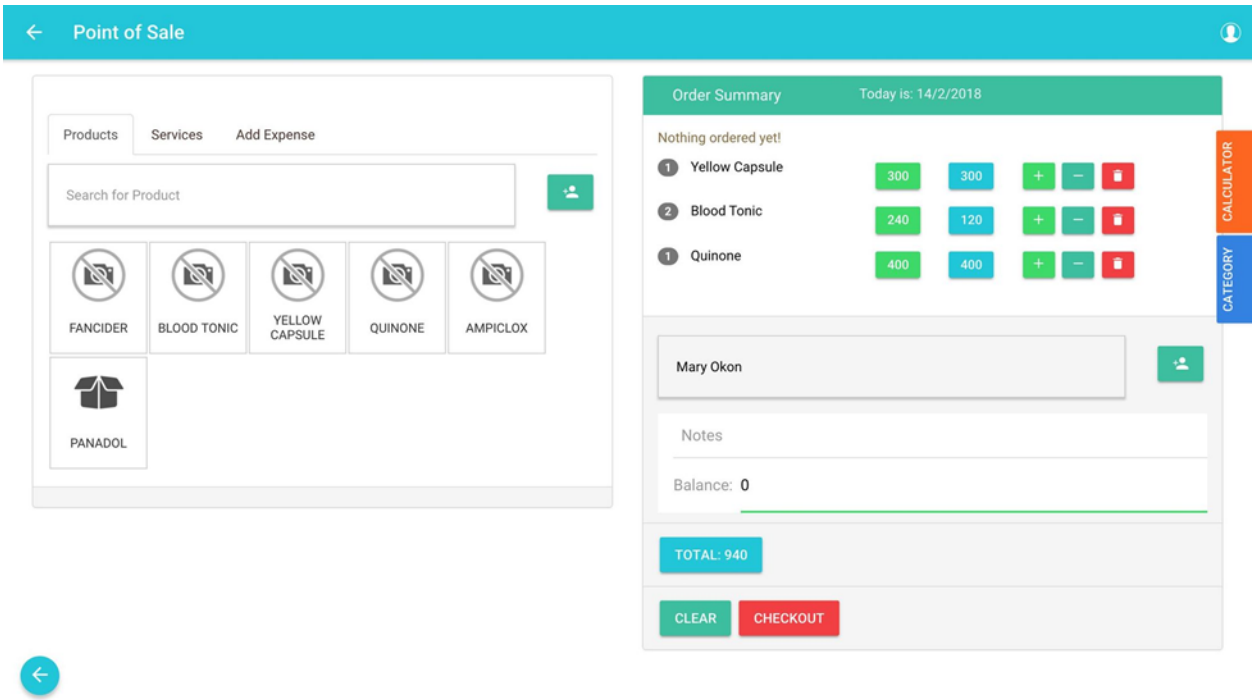
Appendix I

User Interface


Username
Password
LOGIN
Forgot Password? Click Here
VectorStock®
VectorStock.com/14301455


Pharmacy Manager
Pharmacy Management System with Drug Store Inventory, Patients Records, Prescription, Consultancy, Point of Sale, Medicines and Expenses.
PHARMACY MANAGER
Designed and Developed by SARU TECH LTD. www.sarutech.com
Customers
POS
Sales
Expenses
Products
Services
Purchases
Settings
License Expires: Tue Mar 13 2018
EXTEND LICENSE
Sales
Today Sales: ₦ 350
This Month: ₦ 350
This Year: ₦ 350
Profit / Loss: ₦ -150
STOCK ALERT
Customers
Total Customers: 2
Total Products: 6
Total Services: 1
Current Stock: ₦ 900
EXPIRY ALERT
Sales and Expenses for the Year
Sales
Expenses
1400
200


Point of Sale
Products
Services
Add Expense
Search for Product
FANCIDER
BLOOD TONIC
YELLOW CAPSULE
QUINONE
AMPICLOX
PANADOL
Order Summary
Today is: 14/2/2018
Nothing ordered yet!
1 Yellow Capsule
300
300
2 Blood Tonic
240
120
1 Quinone
400
400
CALCULATOR
CATEGORY
Mary Okon
Notes
Balance: 0
TOTAL: 940
CLEAR
CHECKOUT

Appendix II

Source Code

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <!-- Main CSS-->
    <link rel="stylesheet" type="text/css" href="css/main.css">
    <!-- Font-icon css-->
    <link rel="stylesheet" type="text/css"
href="https://maxcdn.bootstrapcdn.com/font-awesome/4.7.0/css/font-
awesome.min.css">
    <title>Apotik Gowok</title>
  </head>
  <body>
    <section class="material-half-bg">
      <div class="cover"></div>
    </section>
    <section class="login-content">
      <div class="logo">
        <h1 style="font-family: sans-serif;">Apotek Gowok</h1>
      </div>
      <div class="login-box">
        <form class="login-form" method="post" action="proses_login_user.php">
```

```
        <h3 class="login-head"><i class="fa fa-lg fa-fw fa-user"></i>LOGIN</h3>


        <div class="form-group">
          <label class="control-label">USERNAME</label>
          <input id="username" type="text" class="form-control" name="username" required="required">
        </div>
        <div class="form-group">
          <label class="control-label">PASSWORD</label>
          <input id="password" type="password" class="form-control" name="password" required="required">
        </div>


        <div class="form-group btn-container">
          <button class="btn btn-primary btn-block"><i class="fa fa-sign-in fa-lg fa-fw"></i>SIGN IN</button>
        </div>
        <p> Need an account? <a href="daftar_user.html"> sign up </p>
      </form>


    </section>
    <!-- Essential javascripts for application to work-->
    <script src="js/jquery-3.2.1.min.js"></script>
    <script src="js/popper.min.js"></script>
    <script src="js/bootstrap.min.js"></script>
    <script src="js/main.js"></script>
```

```
    <!-- The javascript plugin to display page loading on top-->
    <script src="js/plugins/pace.min.js"></script>
    <script type="text/javascript">
      // Login Page Flipbox control
      $('.login-content [data-toggle="flip"]').click(function() {
          $('.login-box').toggleClass('flipped');
          return false;
      });
    </script>
  </body>
</html>
```