DESIGN AND IMPLEMENTATION OF AN INVENTORY AND MANAGEMENT SYSTEM

BY

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BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE, SCHOOL OF INFORMATION COMMUNICATION TECHNOLOGY, AUCHI POLYTECHNIC, AUCHI.

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CERTIFICATION

We the undersigned, hereby certify that this project was carried out by **Oyeleye Kemi** with matriculation number **ICT/2252070235** and **Paul Victory Deborah** with the matriculation number **ICT/2252070488** of the department of computer science, Information and Communication Technology, Auchi, Polytechnic Auchi, Edo State.

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.

…… ……

MR AKHUEWU D.E **DATE**

Project Supervisor

…… ……

MR. AKHETUAMEN O.S **DATE**

Head of Department (HOD)

DEDICATION

This project work is dedicated to Almighty God who gives knowledge, wisdom, understanding, strength, good health and grace to undergo the training throughout the period of my studies.

ACKNOWLEDGEMENT

We would like to deeply thank the Almighty God for His grace and wisdom that has taken us this far, to our lovely parents **Mr and Mrs Oyeleye, and Mr and Mrs Paul** thanks for the support, encouragement and prayers, my Supervisor, **Mr Divine Emoata** For his endless and tireless support, encouragement, and supervision from day one of developing this concept, to the last day of submitting this project work.

I want to thank the Department of Computer Science department for giving me the opportunity to embark on this project and all my lecturers whose roles as lecturers gave me an enduring foundation and helped transform me into a visionary and focused person.

To my course mate Paul Victory Deborah for her assistance, in term of advice, suggestions and support. Their advice and suggestions have also contributed much on the preparation and completion of my work.

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ABSTRACT

This research work is concise and generally summarizes the activities duly carried out in the design and implementation of an automated inventory control system in Blessed store. The visual basic.net programming language was used. The system is designed to efficiently handle the movement and tracking of goods through the replacement of human workers by technology. The manual method or intervention is labour intensive, costly, and error prone and cannot ensure the inventory remains up-to-date due to oversight and internal shrinkage. With the proposed new system, inventory can be updated in real time without product movement, scanning, or human involvement. The automated system allows inventory status to be determined and shipping and receiving documents to be generated automatically triggering automatic orders for products that are low in inventory. The study outlines the main concepts of the analysis and design methodology of the proposed system, compares it to the existing and goes further to explain the design and implementation of the system using Microsoft Access for the database. The fact finding techniques employed is interview, observation, online and library research.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

Inventory management is the process of efficiently overseeing the constant flow of units into and out of an existing stock of goods. This process usually involves controlling the transfer of units in order to prevent the inventory form becoming too high or dwindling levels that could put the operation of the company into jeopardy (Dimitrios, 2008). Inventory management is primarily about specifying the shape and percentage of stocked goods. Inventory management is required at different locations within a facility or within multiple locations of a supply network to protect the regular and planned course of production against the random disturbance of running out materials or goods. The scope of inventory management also concerns the fine lines between replenishment lead time, caring costs of inventory visibility, future inventory price forecasting, physical inventory, available physical space for inventory, quality management, replenishment, returns and defective goods and demand forecasting.

An inventory control system contains a list of orders to be filled and then prompts works to pick the necessary items and provides them with packaging and shipping information. Inventory management may be used to automate a sales order fulfillment process and also manage in and outward material of hardware. Automation is the replacement of

humanworkers by technology. For optimal sales and inventory management process, rebust functionality is needed for managing logistics facilities. Warehouse management function is for inventory control cover internal warehouse movements and storage and its support helps in the recording and tracking of materials on basis of both quantity and value. This application takes care of all supply orders reducing cost for warehousing, transportation while improving customer service. It significantly improves inventory turns optimizes flow of goods and shortens routes within warehouse and distribution centers. It also improves cash flow, visibility and decision making providing efficient execution of tasks using this fast and reliable computerized method. The design and development of an automated inventory costing can management system for the Mrs. BLESSED drink store still no doubting bring immeasurable relief from the problems associated with the manual system.

1.2 STATEMENT OF PROBLEM

The current inventory system at Mrs. BLESSED drink store is completely manual which result is inaccurate and inefficient in recording keeping of availability or otherwise of goods in the store. The process of updating the inventory requires the sales personnel to monitor stock level of each item. Anytime a stock level reaches a point that is too high or low, an action is instituted which include to write down stock status or to generate a purchase order. There are a lot of problems associated with using this manual method which include time wasting, difficulty in calculating the total amount of items sold, too much paper work and

difficulty in updating every time a change is made, hence the need for automating the inventory system.

1.3 AIM AND OBJECTIVES OF STUDY

The aim of this study is to design and implement an inventory management system that will improve current operational processes in Mrs.BLESSED Drink Store to its full capacity by developing efficient computer software that can handle inventory in a computerized manner.

The objectives of this study are to:

i. Provide system that keeps constant updates about total number of stock available in the store and constantly each and every item in the stock that is going down low to out of stock, the system alert as soon as is due.

ii. Provide software that save time and reduces energy consumption by making complicated processing and inventory sales report easy and without delay

iii. Help track sales, hence staffs are constrained to sell at a fixed price and remit recommended price

iv. Be able to discover several goods in stock that are about to expire in stock. The software gives the flexibility to know every single item in the store, its quantity and their expiry dates at just a click to the software.

v. Provide easy way to print out weekly/monthly summary reports, showing how much have been used for different stock items from a computerized stock system.

1.4 SCOPE OF THE PROJECT

The program is designed to take care of a typical automated system, which deals with inventory management of Mrs. BLESSED Drink Store and other retail stores/supermarkets alike having similar problem of inventory management.

1.5 SIGNIFICANCE OF STUDY

In view of the rapid development of computer technology in almost all the fields of operation and its use in relation to information management, it has become important to look into the development of an inventory management system to meet up with demands of the customers in real time. Therefore, the inventory management system will help customers and management to:

i. To study the functions of inventory management system
ii. To explore the challenges being faced by the manual system
iii. To implement the supply products data on the computerized inventory management system to ensure its functionality.

1.6 LIMITATIONS

Limitations are matters and occurrences that arise in a study which are out of the researcher's control. They limit the extent to which a study can go, and sometimes affect the end result and conclusions that can be drawn. The few limitations in this software are as follows;

i. Due to time and financial constraints, the software that is developed covers only the aspect of inventory management and control.

ii. This application is designed with visual basic 6.0 therefore, only the administrator and restricted personnel can have access to the software.

1.7 DEFINITION OF TERMS

i. **Automation:** This is the use of technology or computers to control and process data reducing the need for human intervention.

ii. **Database:** This refers to a large store of relate data on a computer that a user can access and modify.

iii. **Password:** This is a secret code that must be entered into a computer to enable access to its applications. It is made up of numbers, letters, special characters or a combination of any of the above categories

iv. **Inventory Management System:** A list of orders to be filled, and prompts workers to pick the necessary items and provides them with packaging and shipping information.

v. **Computerization:** This is the conversion of a manually operated system to a controlled, organized and automated system.

vi. **System:** A set of computer components functioning together

vii. **Technology:** The study of techniques of mobilizing resources such as information for accomplishing objectives that benefit man and his environment.

viii. **Software:** A computer program or set of instructions that direct a computer to perform processing functions.

ix. **Information System:** A collection of procedures, people, instructions, and equipment to produce information in a useful form.

CHAPTER TWO

LITERATURE REVIEW

2.1 OVERVIEW OF INVENTORY MANAGEMENT SYSTEM

Graman and Magazine (2006), argued that today, the cost of holding inventory, extensive product proliferation and the risk of obsolescence, especially in rapidly changing markets, make the expense of holding large inventories of finished goods excessive and that high demand items naturally have safety stock assigned to them, but in many organization there are so many very-low-demand items that keeping any stock of these items is unreasonably expensive, so they argue that companies must now provide good service while maintaining minimal inventories. Therefore, inventory management approaches are essential aspects of any organization. Wallin et al. (2006), has argued that that a typical manufacturing firm spends on average, 56 cents out of every dollar of revenue to cover the direct cost of purchased goods, and Monczka et al. (2002), and Handfield (2002), have argued that this percentage figure is higher for the typical wholesaler or retailer. Therefore, organizations from manufacturing to wholesale to retail require effective inventory management.

Inventory management systems have been of concern for many years to business firms worldwide. Inventory control systems play crucial role in enhancing effectiveness and efficiency in handling inventory of business firms. Companies have been continualy in search for sources of sustainable competitive advantages in their operations. Therefore, there is

need for business enterprises to enhance effective inventory management practices in order to improve their competitiveness (Rajeev, 2008). In 1980s inventories of raw materials, work-in-progress components and finished goods were kept as a buffer against the possibility of running out of needed items (Salawati, Tinggi, & Kadri, 2012). However, large buffer inventories consume valuable resources and generate hidden cost (Salawati, Tinggi, & Kadri, 2012). Too much inventory consumes physical space, creates a financial burden, and increases the possibility of damage, spolage and loss (Nyavwanga & Ojera, 2012) on the other hand, too little inventory often disrupts business operations (Dimitrios, 2008).

Lyson (1996) posits that inventory management enhances profitability by reducing costs associated with storage and handling of a mterials. According to Buffa and Salin (1987) there are several reasons for keeping inventory. Too much stock could result in funds being tied down, increase in holding cost, deterioration of materials can lead to interruption of products for sales; poor customer relations and underutilized machines and equipment.

2.2 HISTORY OF INVENTORY MANAGEMENT SYSTEM

People have been buying and selling things for centuries, so naturally, that means that inventory management has always existed in some form, at least, obviously, there were no computer 300 years ago, and certainly no bar code readers, but people have always tried to simplify the trading process, adopting new technologies along the way.

The Early Days

By early days, we don't mean the Middle Ages or even before that. No, we're talking more about the period before the Industrial Revolution, when merchants had to write down purchases and keep an eye on how many items were sold that day, and how many of them were left. And since they certainly didn't have a sales forecasting app, merchants had to forecast future needs themselves, which was not always accurate, and could easily slow down the business and cause troubles.

The Industrial Revolution

One of the events that had the most profound impact on people throughout history is certainly the Industrial Revolution, which increased the efficiency and mass production. The businesses grew, and so did their needs for better inventory management.

In the early 1930s, a team at Harvard University designed what would become the first modern check-out system. This system used punch cards, which were inserted into a computer that read them, and eventually passed the information to the storeroom. Although it might seem simple now, this automated process was able to manage inventory as well, which was a huge thing at the time. However, the system was too expensive to use.

Moving Towards Modern

A forerunner of the modern bar-coding system was created in the late 1940s and early 1950, and it utilized ultraviolet light-sensitive ink and

a reader. In the late 1960s, the Universal Product Code (UPC) was created, which improved inventory management systems. As the computer technology improved, so did the systems, and in the mid and late 1990s, modern inventory management systems began to be used.

One of the amazing technologies used in today's inventory management is the use of Radio-frequency identification, with microchips that transmit product information that contains everything that's relevant to a business owner and their employees. Together with a mobile inventory app, managing your inventory in the 21st century has never been easier.

CHAPTER THREE

SYSTEM ANAYLYSIS AND DESIGN

3.1 PREAMBLE

It is a process of collecting and interpreting facts, identifying the problems, and decomposition of a system into its components. System analysis is conducted for the purpose of studying a system or its parts in order to identify its objectives. It is a problem solving technique that improves the system and ensures that all the components of the system work efficiently to accomplish their purpose. Analysis specifies what the system should do. It is a process of planning a new business system or replacing an existing system by defining its components or modules to satisfy the specific requirements. Before planning, you need to understand the old system thoroughly and determine how computers can best be used in order to operate efficiently. System Analysis and Design (SAD) mainly focuses on; Systems, Processes and Technology. (Tutorialspoint, 2018).

3.2 METHODS OF DATA COLLECTION

Although there are various methods of data collection, the researcher choose the two main sources of data collection in carrying out their study. They are:

i. **Primary Source**

The primary source refers to the sources of collecting original data in which the researcher made use of empirical approach such as personal interview

ii. **Secondary Source**

The secondary sources of data for this kind of project cannot be over emphasized. The secondary data were obtained by the researcher from magazines, journals, newspapers and library source.

3.2.1 ORAL INTERVIEW

The interview method of data collection can be defined as a systematic way of collecting data or information from a respondent through asking questions directly from a respondent through asking questions directly from the respondent and also collecting information with the aim of facilitating understanding. The oral interview was done between the researcher and the management of Blessed store. Reliable facts were gathered based on questions posed to the manger by the researcher which help the researcher in starting the work and also helped in the area of solution presentation of the new design.

3.3 RESEARCH METHODOLOGY

The purpose of the research methodology is to provide a view of the methods that was applied into this research. In addition, it defines the system development life cycle (SDLC) for developing the system. The methodology used for this work is the lean methodology.

Lean methodology promotes maximizing customer value, while minimizing waste. It aims to create more value for the customer by using fewer resources. Lean is an improvement and problem solving methodology that strives to reduce or eliminate activities that don't add value to

customer. Stemmed from the Japanese manufacturing industry, its values suppose that as waste is eliminated, quality improves while the production time and cost are reduced. It identifies three types of waste; muda, mura and muri, also known as the 3Ms.

3.4 ANALYSIS OF THE EXISTING SYSTEM

The existing system is one that has been manually operated over the years. It is a system in which all the methods of controlling inventory are of manual approach. Critical analysis of this system reveals that it is prone to errors. Careful analysis also shows that due to the complexities of the manual system, records of inventory kept are inaccurate and manually operated in such a way that requires the clerk to register sales on a book, thereby making a staff handle two or three jobs at a time. An example is a staff trying to register sales and at the same time rushing back to face a queue of impatient customers waiting to be attended to. This makes the place so crowded with customers with just one person attending to them. Sometimes, due to unavailability of staff, customers who have other things to do, end up missing their various appointments. As a result of this, the attendant finds it very difficult to have an accurate record as pressure is being mounted on her. Blessed store operates manually and has not adopted an Automation mode of operation. This generates inadequate records or exercise improper management of the store and in extreme cases, the store may lose its customers. The existing system at Blessed store lacks the efficiency and flexibility in handling of

data relating to inventory control of its items. Below are some of the problems outlined:

i. Old method of operations
ii. Repetition of routines
iii. Difficulty in updating when new stocks are added
iv. Wrong calculation

3.5 PROPOSED SYSTEM

The proposed system is an application developed to manage information and inventory control of customers, supplier and staff. The system should cover the following functions in order to support the inventory control process for achieving the objectives:

i. Reduce paper work and redundancy thereby improving productivity and lowering cost of online activities
ii. Aid the staff in effective update, calculation and search available products
iii. Ease the daily routine of the management and staff.

3.6 PROCESSES IN AUTOMATION OF THE INVENTORY CONTROL SYSTEM

These steps below show the process employed by the developer in Automation of The Inventory Control System.

1. **Getting a clear understanding of the problem:** - I made all enquiry method within my reach to enquire and know the process used in the manual process. I concentrated on the problems that

are encountered in the process involved by the manual process. Again, the various inputs and outputs were the basic requirement were also considered and all other conditions involved.

2. **Problem Analysis:** - The problem associated with the manual system were critically observed and analyzed in detail with a hope of providing a possible solution to them.
3. **Program Design:** - After analyzing the entire program should be written as given. The program inputs and outputs are also tested. The flow of the logic of the program is also drawn.
4. **Segmenting the program:** - The whole program is written in segments so as to allow each part to be tested and debugged easily.
5. **Desk Checking:** - Checking of program to ensure that all syntax and logic error are detected and corrected.
6. **Running of the program:** - The program is successfully run without and error, written and identification absolutely connection. It is documented in case of future use reference.

3.7 ADVANTAGE OF THE NEW SYSTEM

1. Speed and Efficiency

A computerized inventory management system makes everything from inputting information to taking inventory easier. Doing a hand count of inventory can take days, but with a computerized inventory management system, the same process can be done in a matter of hours.

2. Document Generation

Once the computerized inventory management system is in place, managers and workers can use it to automatically generate all kinds of documents, from purchase orders and checks to invoices and account statements. Managers can also use the system to automatically order products when they run low.

3. Timely Data

With a manual system, the data is only as accurate and up to date as the last hand count. With a computerized inventory management system, the management team can pull a report and instantly see how many units are on the floor, how many have sold and which products are selling the fastest.

3.8 STRUCTURE CHART

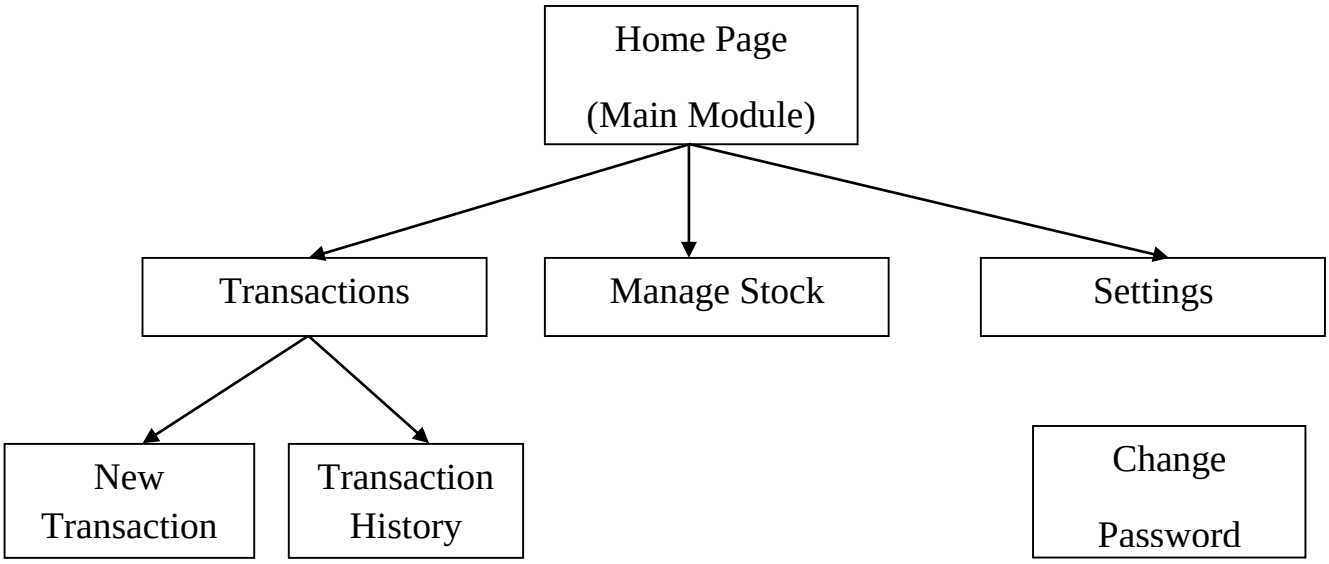

Figure 3.8: Structured flowchart of the system design

3.9 USING CASE DIAGRAM

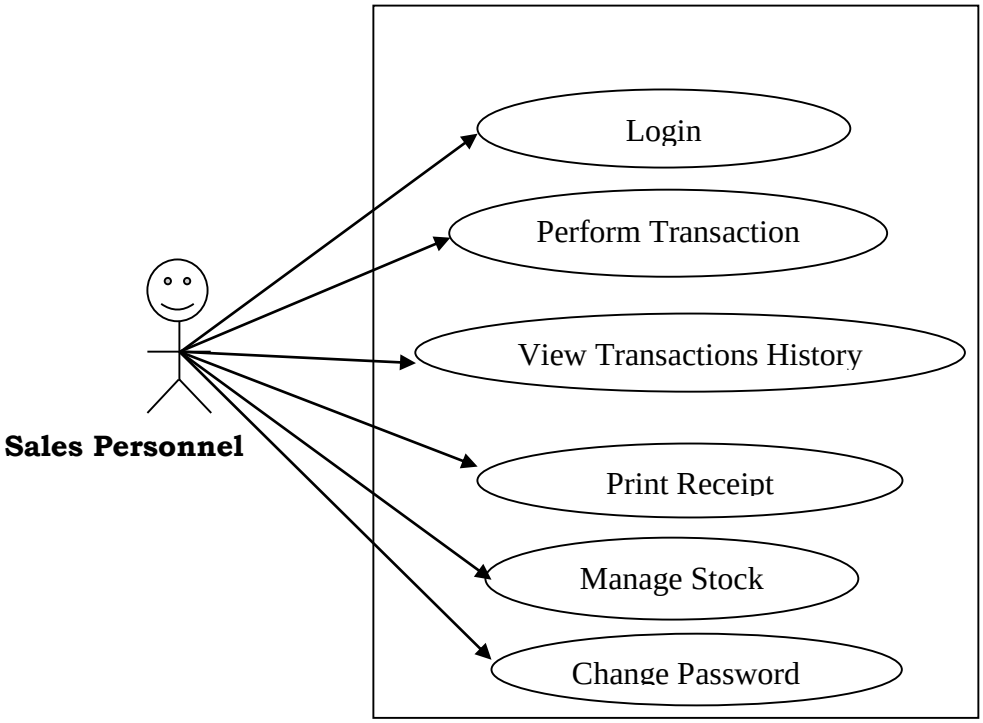

Figure 3.9: Diagram of the system design

1. Login: a password or code used when logging into a computer, database or system.
2. Perform Transaction: this is the opening of a new request or order by a customer.
3. View Transactions History: it shows the details about and payments made by a customer.
4. Point Receipt: this is the issuing of a printed document to a customer about a payment being made.
5. Manage Stock: This is the administrative role of assessing the inventory of a business and making sure it is sufficient to meet consumer demand.

6. Change Password: This is the menu used by the database administrator to change the user's password. He alone has the right to change it.

3.10. DATA BASE DESIGN

i. Files used in this project are made up of different data types. Some of the files are designed and linked with database. There are several advantages of storing data in database and MS Access database was used in this project design.

ii. All data is stored at one location when a database is used, all tables are stored in a single file thus, and we need not deal with separate buttons using the single database file. Though all data is stored in a single file, distinctions exist because tables are used since each table is stored as a separate entity in the file.

iii. It is possible to define relationship between tables and these are also stored in the database.

iv. It is possible to define validation at fields as well as table level and this ensures accuracy of data being stored.

v. Query, report, sorting etc. are also used.

3.11 DESIGN PROCESS

The design process takes place at two levels that are,

i. Logic design which is that part of the design process when you write the detailed specification of the new system.

ii. Physical design, namely the activities involved when you turn the logical design into reality. The feature that would consider in the

logical design of "MRS, BLESSED INVENTORY CONTROL SYSTEM" is;

a. Data input to the system
b. Output to be produced by the system
c. process it under goes before output is produce
d. The database structure or layout

3.11.1 INPUT SPECIFICATION

The data inputs into MRS. BLESSED Inventory Control System are from the database i.e. sales and inventory. The input specification is shown below;

MANAGE STOCK ITEM

Table 3. 1 structure of the Manage Stock table

DESCRIPTION	FIELD NAMES	DATA TYPES	FIELD LENGHT
Serial number	S/N	Number	4
Item name	StockName	Text	20
Item Category	Category	Text	2
Cost price	CostPrice	Number	9
Selling price	SellingPrice	Number	9
Minimum Balance	MinimumStockBal	Number	4

TRANSACTION HISTORY

Table 3. 2 structure of the Transaction History table

DESCRIPTION	FIELD NAMES	DATA TYPES	FIELD LENGHT
Serial number	ID	Number	4
Item category	Category	Text	20
Selling price	Price	Number	2
Quantity	Qty	Number	35
Total amount	TotalAmount	Number	12
Purchase date	PurchaseDate	Number	9

CHANGE PASSWORD

Table 3. 3 structure of the Login Table

DESCRIPTION	FIELD NAMES	DATA TYPES	FIELD LENGHT
Serial number	S/N	Number	4
Username	Username	Text	15
Old Password	Password	Text	15
New Password	Password	Text	15
Confirm Password	Password	Text	15

3.12 OUTPUT SPECIFICATION

Specification here means arrangement of headings and details on the output document. Whatever the medium used in both, paper document and transaction output. The purpose is for the clarity of the output to the user.

The product sales report shows the total product sold, their unit prices and the amounts. The entire inventory report shows the types of product in stock without any need of counting the product of items in the shelf one after the other in order to know the type and quantity of products in stock. It also deals with the aspect of the unit's prices and cost prices of goods or items in stock.

3.13 PROGRAMMING LANGUAGE USED

Visual basic.net programming language was used due to its ability to effectively and efficiently carry out record management. In addition, to efficiently carry out the computerized operation and to code various instructions and to debugged it. A structural approach to programming was also called or adopted. Each segment separately tested and the whole

segment of modules integrated to form a single program, which is the computerized inventory system. These have the advantages of identifying and debugged error easily.

When the programmer needs a specific user interface feature such as a button, he selects the appropriate ready to use component provided by the visual programming environment these component can be moved, resized and renamed as required. No need to write code to create and display commonly required control. It provides all features that are required to develop graphical user interface as ready to use components.

CHAPTER FOUR

IMPLEMENTATION AND DOCUMENTATION

4.1 SYSEM IMPLEMENTATION

System implementation is the process of defining how the information how the information system should be build (i.e. physical system design) ensuring that the information system is operational and used, also ensuring that the information system meets quality standard (i.e. quality assurance).

4.2 MINIMUM SOFTWARE REQUIREMENTS

Software is the term used to describe all the various types of programs or command, which enable the computer system hardware to functions or operate effectively. Software are prepared by manufacturers of a computer system, which are used by the computer users to perform different task, such as that of inventory control, word processing, accounting, planning, etc the accurate software suggested for the new system are as follows;

i. MS windows XP or Newer
ii. Visual studio (visual basic classic 6.0 or add-in installer)
iii. Microsoft Access (database)

4.2.1 MINIMUM HARDWARE REQUIREMENTS

The hardware is the term used to describe all physical component of a computer or communicating system including both mechanical and electronic parts of the computer. The hardware required to run this

automated inventory control system is a microcomputer with the following features.

i. Processor of at least 2 GHZ clock speed
ii. GB RAM
iii. Printer for printing reports

The listed configurations are the minimum requirements, but if the configurations are of higher versions, the processing derived will definitely be better and the program will run faster.

4.3 USUAGE PROCEDURE

In order to use the application, some procedures are required which include:

i. Launch the application
ii. Perform the CRUD (Create, Retrieve, Update and Delete) operation

Launch the Application: This involves accessing the application via installing the add-in file. The first form to be displayed is the login form which is a container holding the administrator login form as shown in fig 4.1

Perform the CRUD (Create, Retrieve, Update and Delete) Operations: These operations are performed by the administrator of the system, where customer details, supplier details, availavle products in stock and report generation (see fig. 4.2)

This is the first form that appears when the software is run.

Fig 4.1 login form

4.4 IMPLEMENTATION

The new system is designed to be put into efficient use. Here, I will look into the various technical aspects that influenced the successful implementation of this system and determine the effective operation of the system. System implementation follows the approval of the system proposals and its objectives, thus it is to arrive at a satisfactory, implemented, completed, and function evaluated automated system.

Fig. 4.1 Welcome Form

This is the first form that appears when the software is run.

Fig 4.2 login form

This is the first form that requires the user to provide the information (i.e. username & password) needed in order to the access the features of the software.

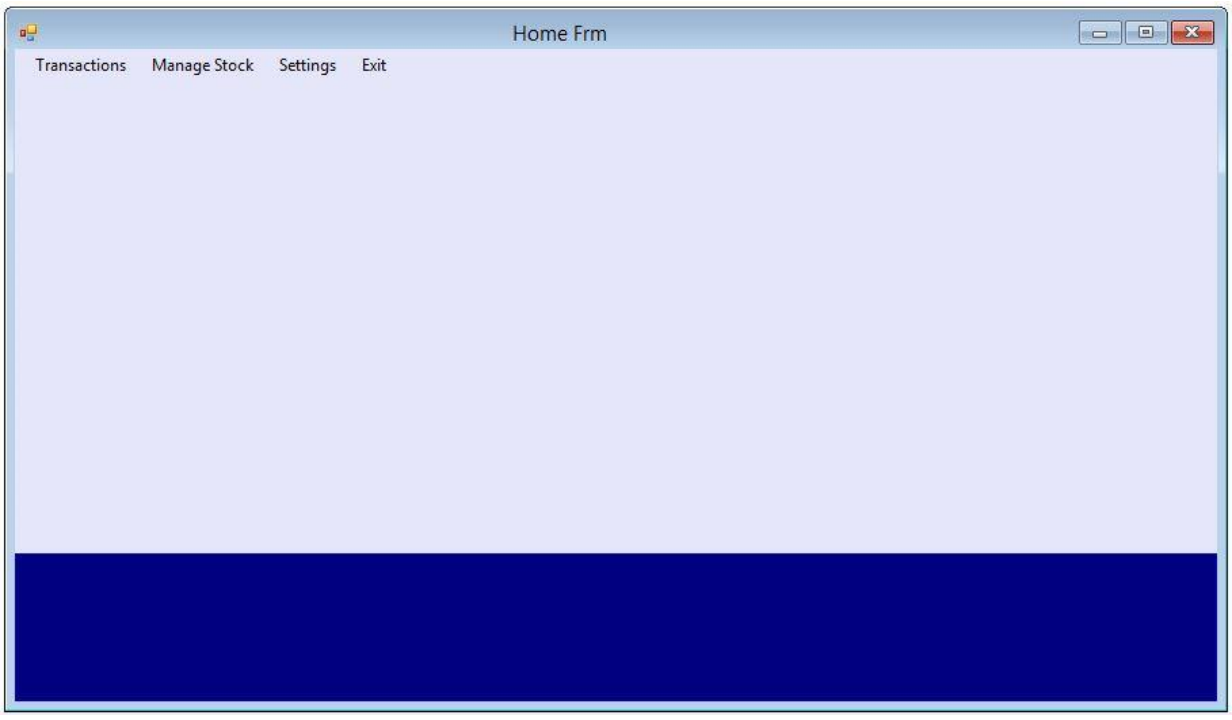

Fig. 4.3 Home form

This is form seen after username and password have been supplied or inputted. Now the features of the software can be accessed.

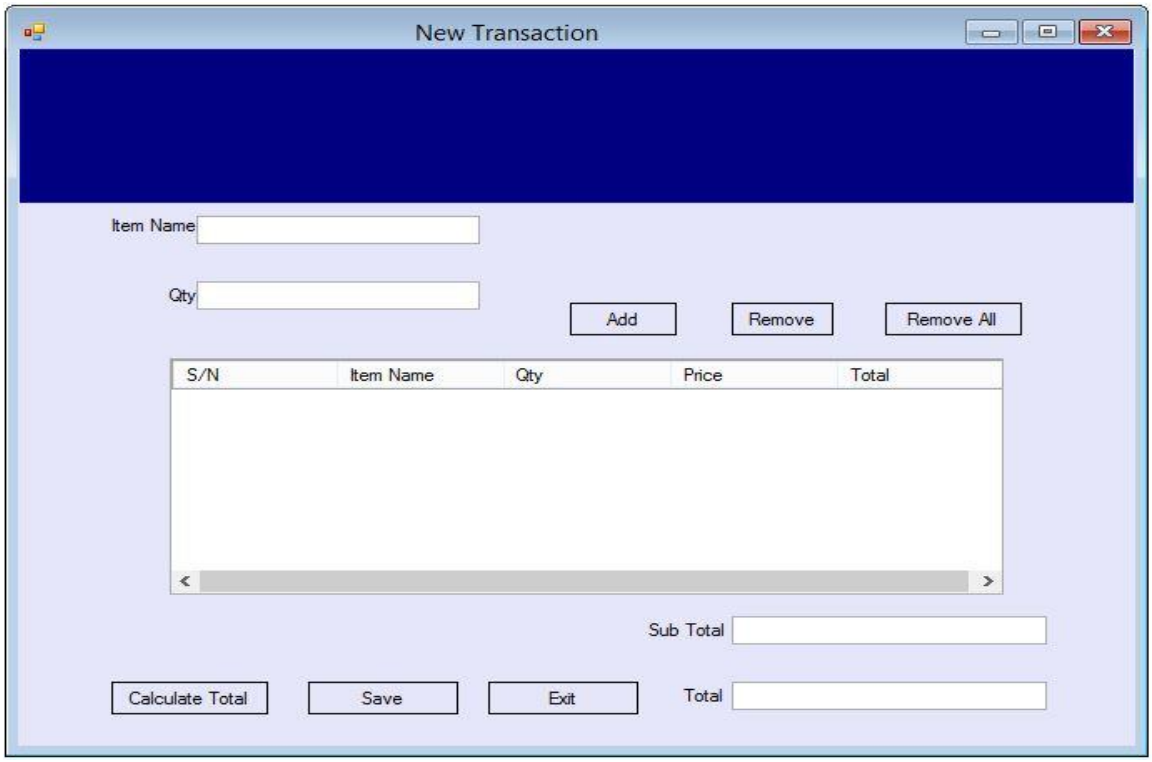

Fig. 4.4 Transaction form

Transaction form is used for selling of items and issuing receipt to the customer whenever a items are purchased 4.3.5 RECIEPT FORM

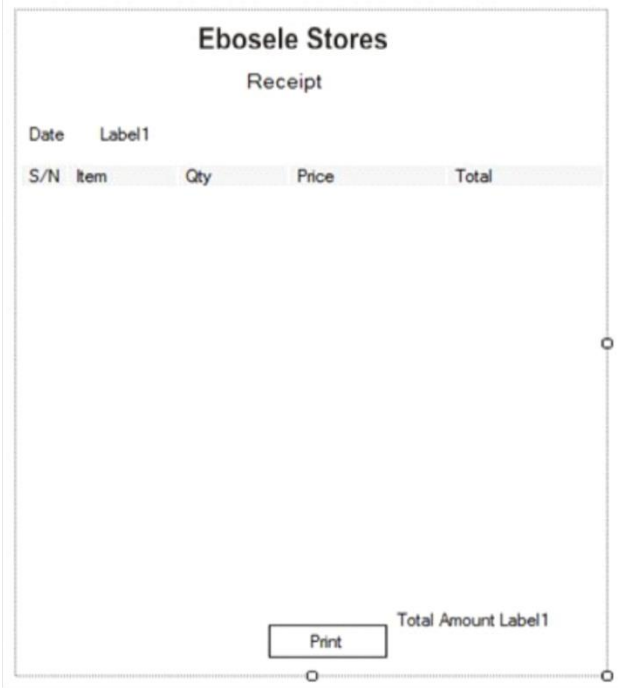

Fig.4.5 Receipt form

This form enables the receipt of the purchased to be printed receipt and issued to a customer.

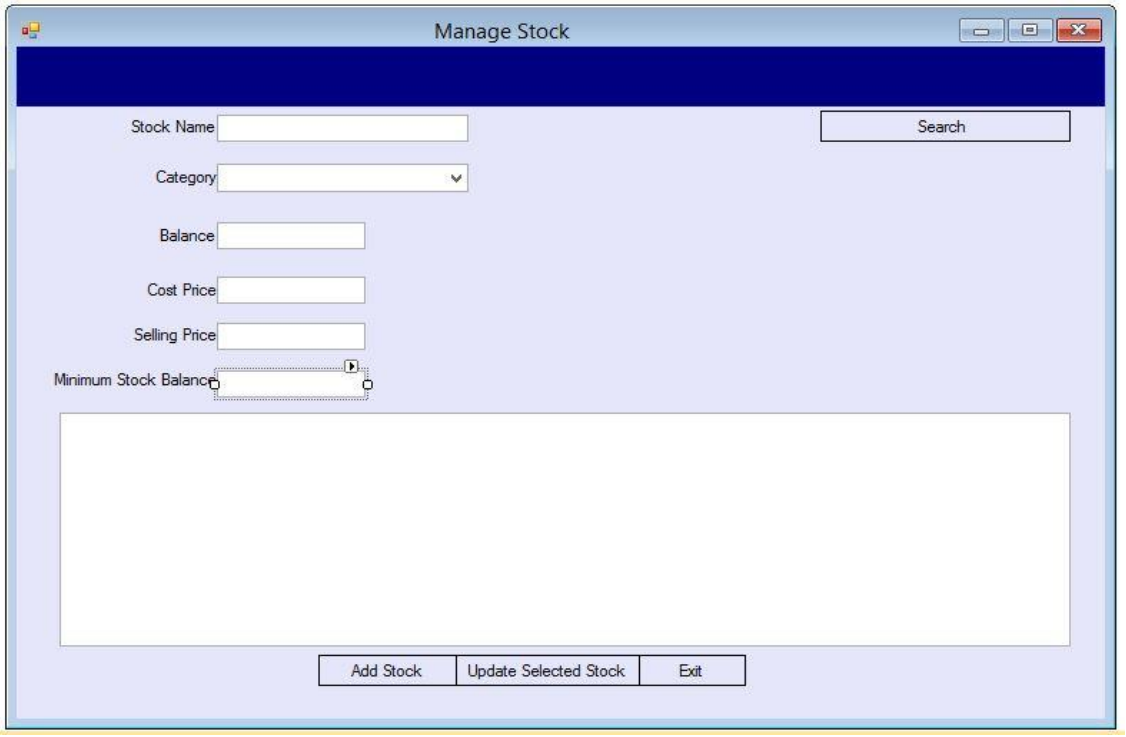

Fig. 4.6 Manage Stock form

This interface allows the user to add new stock and update selected stock balance.

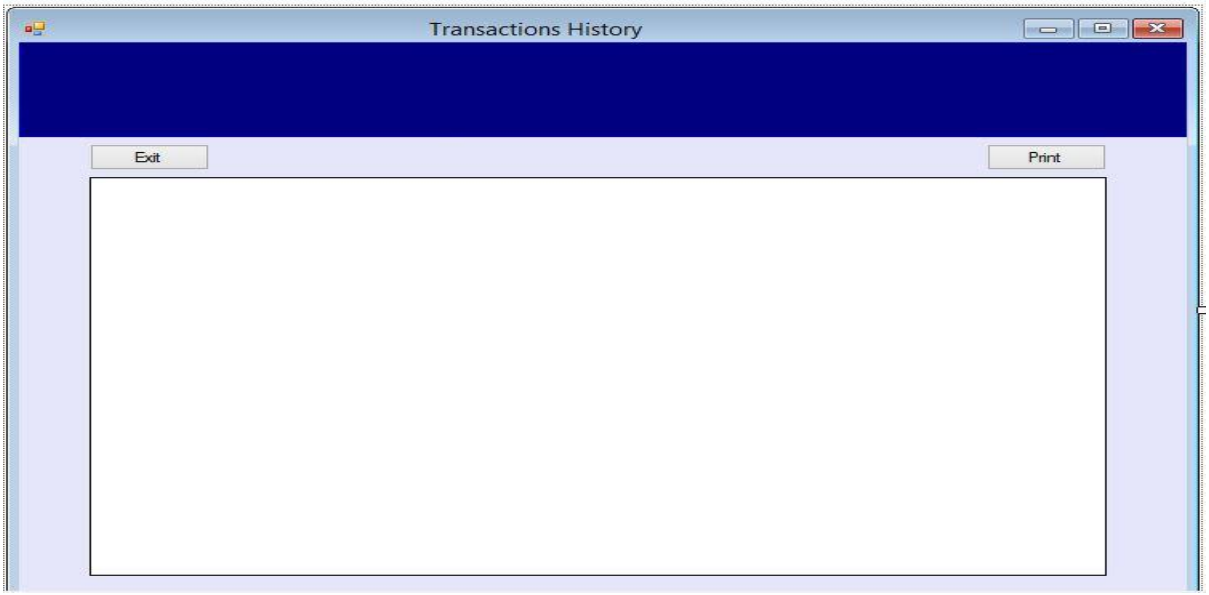

Fig. 4.7 Transaction History form

Transaction history is used to show the list of all sales for reference purpose.

This form is used in printing transaction record for reference purpose.

Change Password

Fig. 4.8 Change password form

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 SUMMARY

It can be observed that computer applications are very important in every field of human endeavour. With this new system, the difficulties encountered with the manual inventory control system of Femzi Store are overcome. The automated inventory control system reduces the workload of the staff, saves time and increases efficiency. The records of the company are safe and secure, distribution process is well managed, errors are minimized, and reports generated for management are accurate thereby increasing the profit margin. On a general note, this project covers necessary process involved in designing any inventory control in a retail shop. It is aimed at providing a means of helping staff of manage sales and inventory. The approach used involves the consultation of different individuals ranging from the owner and staff of Femzi Store. The method of implementation was with the use of visual studio 2010 (visual basic.net) as the programming language, SQL as the database engine. The basic user attention was given priority when designing the system. Therefore, this project if embraced would address the problems of sales and inventory management.

5.2 RECOMMENDATION

I recommend this automated inventory control system to the Femzi and any other store that still carry out their operation manually. This system will be useful since it is computerized and will promote effective,

efficient and improve service delivery. The use of this software developed for the control of inventory as it will make their work easier.

5.3 CONCLUSION

Anything worth doing is worth doing well. For a project of this kind, all that was discussed and done was to the best of ability and reach.

The benefits derived from this work cannot be over emphasized as tremendous amount of new knowledge was revealed and acquired in the course of study for this project work.

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APPENDIX
SOURCE CODE

MODULE 1:

```
Module Module1

    Public con As New OleDb.OleDbConnection("Provider=Microsoft.ACE.OLEDB.12.0; data source=" &Application.StartupPath& "/Dbase.accdb")

End Module
```

SPLASH SCREEN:

```
PublicClasssplashScreen

PrivateSub Timer1_Tick(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs) Handles Timer1.Tick
        ProgressBar1.Value = ProgressBar1.Value + 1
If ProgressBar1.Value = 90 Then
            ProgressBar1.Enabled = False
            Timer1.Enabled = False
Me.Hide()
loginFrm.Show()
EndIf
EndSub

PrivateSub ProgressBar1_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs) Handles ProgressBar1.Click
EndSub
EndClass
```

LOGIN FORM:

```
PublicClassloginFrm

PrivateSubloginBtn_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs) HandlesloginBtn.Click
con.Open()
DimcmdAsNewOleDb.OleDbCommand("SELECT * FROM LoginTable WHERE username='"&Me.usernameTxtbox.Text&"' AND password='"&Me.passwordTxtbox.Text&"'", con)
DimdrAsOleDb.OleDbDataReader :dr = cmd.ExecuteReader
```

```
Ifdr.Read = TrueThen
homeFrm.Show()
Me.Hide()
Else
MsgBox("Invalid username or password", MsgBoxStyle.Critical)
usernameTxtbox.Text = ""
passwordTxtbox.Text = ""
EndIf
con.Close()
EndSub

PrivateSubcancelBtn_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlescancelBtn.Click
End
EndSub

PrivateSubcancelBtn_MouseHover(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesloginBtn.MouseHover, cancelBtn.MouseHover
CType(sender, Button).BackColor = Color.Navy
EndSub

PrivateSubloginBtn_MouseLeave(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesloginBtn.MouseLeave, cancelBtn.MouseLeave
CType(sender, Button).BackColor = Color.Lavender
EndSub
EndClass
```

HOME FORM:

```
PublicClasshomeFrm

PrivateSubManageStockToolStripMenuItem_Click(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs)
manageStock.Show()
EndSub

PrivateSubNewTransactionToolStripMenuItem_Click(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesNewTransactionToolStripMenuItem.Click
transactionFrm.show()
EndSub
```

```
PrivateSubExitToolStripMenuItem_Click(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesExitToolStripMenuItem.Click
End
EndSub

PrivateSubChangePasswordToolStripMenuItem_Click(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesChangePasswordToolStripMenuItem.Click
loginSetFrm.Show()
EndSub

PrivateSubInventoryToolStripMenuItem_Click(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesInventoryToolStripMenuItem.Click
manageStock.Show()
EndSub

PrivateSubTransactionHistoryToolStripMenuItem_Click(ByVal sender AsSystem.Object,
ByVal e AsSystem.EventArgs) HandlesTransactionHistoryToolStripMenuItem.Click
transacHisFrm.Show()
EndSub

PrivateSub MenuStrip1_MouseHover(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) Handles MenuStrip1.MouseHover
CType(sender, MenuStrip).BackColor = Color.Navy
EndSub

PrivateSub MenuStrip1_MouseLeave(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) Handles MenuStrip1.MouseLeave
CType(sender, MenuStrip).BackColor = Color.Lavender
EndSub
EndClass
```

TRANSACTION FORM:

```
PublicClasshomeFrm

PrivateSubManageStockToolStripMenuItem_Click(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs)
manageStock.Show()
EndSub

PrivateSubNewTransactionToolStripMenuItem_Click(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesNewTransactionToolStripMenuItem.Click
```

```
transactionFrm.show()
EndSub

PrivateSubExitToolStripMenuItem_Click(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesExitToolStripMenuItem.Click
End
EndSub

PrivateSubChangePasswordToolStripMenuItem_Click(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesChangePasswordToolStripMenuItem.Click
loginSetFrm.Show()
EndSub

PrivateSubInventoryToolStripMenuItem_Click(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesInventoryToolStripMenuItem.Click
manageStock.Show()
EndSub

PrivateSubTransactionHistoryToolStripMenuItem_Click(ByVal sender AsSystem.Object,
ByVal e AsSystem.EventArgs) HandlesTransactionHistoryToolStripMenuItem.Click
transacHisFrm.Show()
EndSub

PrivateSub MenuStrip1_MouseHover(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) Handles MenuStrip1.MouseHover
CType(sender, MenuStrip).BackColor = Color.Navy
EndSub

PrivateSub MenuStrip1_MouseLeave(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) Handles MenuStrip1.MouseLeave
CType(sender, MenuStrip).BackColor = Color.Lavender
EndSub
EndClass
```

RECEIPT FORM:

```
PublicClassreceipt

PrivateSubreceipt_Load(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlesMyBase.Load
dateLbl.Text = Today
```

```
For i = 0 To transactionFrm.DataGridView1.RowCount - 2
With DataGridView1
                .Rows.Add()
                .Rows(i).Cells(0).Value = i + 1
                .Rows(i).Cells(1).Value =
transactionFrm.DataGridView1.Rows(i).Cells(1).Value
                .Rows(i).Cells(2).Value =
transactionFrm.DataGridView1.Rows(i).Cells(2).Value
                .Rows(i).Cells(3).Value =
transactionFrm.DataGridView1.Rows(i).Cells(3).Value
                .Rows(i).Cells(4).Value =
transactionFrm.DataGridView1.Rows(i).Cells(4).Value
EndWith
Next
totalLbl.Text = transactionFrm.totalTxtBox.Text
EndSub

PrivateSubprintBtn_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlesprintBtn.Click
printBtn.Visible = False
        PrintForm1.PrintAction = Printing.PrintAction.PrintToPreview
        PrintForm1.PrintAction = Printing.PrintAction.PrintToPrinter
PrintForm1.Print()
printBtn.Visible = True
Me.Close()
EndSub
EndClass
```

TRANSACTION HISTORY FORM:

```
ImportsMicrosoft.Office.Interop.Excel

PublicClasstransacHisFrm

PrivateSubtransacHisFrm_Load(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesMyBase.Load
con.Open()
Dim da AsNewOleDb.OleDbDataAdapter("SELECT Item, Category, Price, Qty, TotalAmount,
PurchaseDate FROM TransactionHistory", con)
DimdtAsNewSystem.Data.DataTable
da.Fill(dt)
```

```
Me.DataGridView1.DataSource = dt
con.Close()
EndSub

PrivateSubprintBtn_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlesprintBtn.Click
WithMe.DataGridView1
If ((.Columns.Count = 0) OrElse (.Rows.Count = 0)) Then
Exit Sub
EndIf

DimdsetAsNewDataSet

dset.Tables.Add()

For g = 0 To .ColumnCount - 1
dset.Tables(0).Columns.Add(.Columns(g).HeaderText)
Next

DimdrAsDataRow

For g = 0 To .RowCount - 1
dr = dset.Tables(0).NewRow

For j = 0 To .Columns.Count - 1
dr(j) = .Rows(g).Cells(j).Value
Next
dset.Tables(0).Rows.Add(dr)
Next

Dim excel AsNewMicrosoft.Office.Interop.Excel.Application
DimwBookAsMicrosoft.Office.Interop.Excel.Workbook
DimwsheetAsMicrosoft.Office.Interop.Excel.Worksheet

wBook = excel.Workbooks.Add
wsheet = wBook.ActiveSheet

DimdtAsSystem.Data.DataTable = dset.Tables(0)
Dim dc AsSystem.Data.DataColumn
Dim dr1 AsSystem.Data.DataRow

DimcolindexAsInteger = 0
```

```
DimrowindexAsInteger = 0
ForEach dc Indt.Columns
colindex = colindex + 1
excel.Cells(1, colindex) = dc.ColumnName
Next

ForEach dr1 Indt.Rows
rowindex = rowindex + 1
colindex = 0

ForEach dc Indt.Columns
colindex = colindex + 1
excel.Cells(rowindex + 1, colindex) = dr1(dc.ColumnName)
Next
Next

wsheet.Columns.AutoFit()
Me.FolderBrowserDialog1.ShowDialog()

DimfnameAsString = Me.FolderBrowserDialog1.SelectedPath &"\Transaction"&DateString
DimblnFileOpenAsBoolean = False

Try
DimFTempAsSystem.IO.FileStream = System.IO.File.OpenWrite(fname)
FTemp.Close()
Catch ex AsException
blnFileOpen = False
EndTry

IfSystem.IO.File.Exists(fname) Then
System.IO.File.Delete(fname)
EndIf

MsgBox("Transaction Report Has been Exported Successfully!", MsgBoxStyle.Information,
"Confirmation!")

wBook.SaveAs(fname)
excel.Workbooks.Open(fname)
excel.Visible = True
EndWith
EndSub
```

```
PrivateSubbackBtn_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlesexitBtn.Click
Me.Close()
EndSub
EndClass
```

MANAGE STOCK FORM:

```
PublicClassmanageStock

PrivateSubsearchBtn_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlessearchBtn.Click
IfnameTxtbox.Text = ""Then
MsgBox("Please Enter a Valid Stock Name", MsgBoxStyle.Exclamation +
MsgBoxStyle.OkOnly)
Else
con.Open()

DimcmdAsNewOleDb.OleDbCommand("SELECT * FROM ManageStock WHERE StockName =
'"&nameTxtbox.Text&"'", con)
DimdrAsOleDb.OleDbDataReader :dr = cmd.ExecuteReader
Ifdr.Read = TrueThen
Me.categoryCmb.Text = dr("Category").ToString
Me.balTxtbox.Text = dr("StockBalance").ToString
Me.cpTxtbox.Text = dr("CostPrice").ToString
Me.spTxtbox.Text = dr("SellingPrice").ToString
Me.minbalTxtbox.Text = dr("MinimumStockBal")
EndIf

con.Close()
EndIf
EndSub

PrivateSubaddBtn_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlesaddBtn.Click
con.Open()
IfnameTxtbox.Text<>""AndcategoryCmb.Text<>""AndbalTxtbox.Text<>""AndcpTxtbox.Text<>""
AndspTxtbox.Text<>""AndminbalTxtbox.Text<>""Then
DimcmdAsNewOleDb.OleDbCommand("INSERT INTO ManageStock (StockName, Category,
StockBalance, CostPrice, SellingPrice, MinimumStockBal) VALUES
('"&nameTxtbox.Text&"','"&categoryCmb.Text&"','"&balTxtbox.Text&"','"&cpTxtbox.Text&"
','"&spTxtbox.Text&"','"&minbalTxtbox.Text&"')", con)
```

```
DimdrAsOleDb.OleDbDataReader :dr = cmd.ExecuteReader
MsgBox("Stock Added", MsgBoxStyle.Information + MsgBoxStyle.OkOnly)

Dim da AsNewOleDb.OleDbDataAdapter("SELECT * FROM ManageStock", con)
DimdtAsNewDataTable
da.Fill(dt)
Me.DataGridView1.DataSource = dt

nameTxtbox.Text = ""
categoryCmb.Text = ""
balTxtbox.Text = ""
cpTxtbox.Text = ""
spTxtbox.Text = ""
minbalTxtbox.Text = ""
Else
MsgBox("Please Fill Empty Fields", MsgBoxStyle.Exclamation + MsgBoxStyle.OkOnly)
EndIf
con.Close()
EndSub

PrivateSubupdateBtn_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlesupdateBtn.Click
con.Open()

DimcmdAsNewOleDb.OleDbCommand("SELECT * FROM ManageStock WHERE StockName =
'"&Me.nameTxtbox.Text&"'", con)
DimdrAsOleDb.OleDbDataReader :dr = cmd.ExecuteReader

Ifdr.Read = TrueThen
DimcmdUpdateAsNewOleDb.OleDbCommand("UPDATE ManageStock SET StockBalance =
'"&balTxtbox.Text&"',  CostPrice = '"&cpTxtbox.Text&"', SellingPrice =
'"&spTxtbox.Text&"' WHERE StockName = '"&nameTxtbox.Text&"'", con)
cmdUpdate.ExecuteNonQuery()
cmdUpdate.Dispose()
EndIf

Dim da AsNewOleDb.OleDbDataAdapter("SELECT * FROM ManageStock", con)
DimdtAsNewDataTable
da.Fill(dt)

Me.DataGridView1.DataSource = dt
MsgBox("Record Updated", MsgBoxStyle.Information + MsgBoxStyle.OkOnly)
```

```
con.Close()
EndSub

PrivateSubcloseBtn_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlesexitBtn.Click
Me.Close()
EndSub

PrivateSubmanageStock_Load(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlesMyBase.Load
con.Open()
Dim da AsNewOleDb.OleDbDataAdapter("SELECT * FROM ManageStock", con)
DimdtAsNewDataTable
da.Fill(dt)
Me.DataGridView1.DataSource = dt
con.Close()
EndSub

PrivateSubbackBtn_MouseHover(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesupdateBtn.MouseHover, exitBtn.MouseHover,
addBtn.MouseHover
CType(sender, Button).BackColor = Color.Navy
EndSub

PrivateSubbackBtn_MouseLeave(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlesupdateBtn.MouseLeave, exitBtn.MouseLeave,
addBtn.MouseLeave
CType(sender, Button).BackColor = Color.Lavender
EndSub

PrivateSubsearchBtn_MouseHover(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlessearchBtn.MouseHover
searchBtn.BackColor = Color.Navy
EndSub

PrivateSubsearchBtn_MouseLeave(ByVal sender AsSystem.Object, ByVal e
AsSystem.EventArgs) HandlessearchBtn.MouseLeave
searchBtn.BackColor = Color.Lavender
EndSub
EndClass
```

CHANGE PASSWORD FORM:

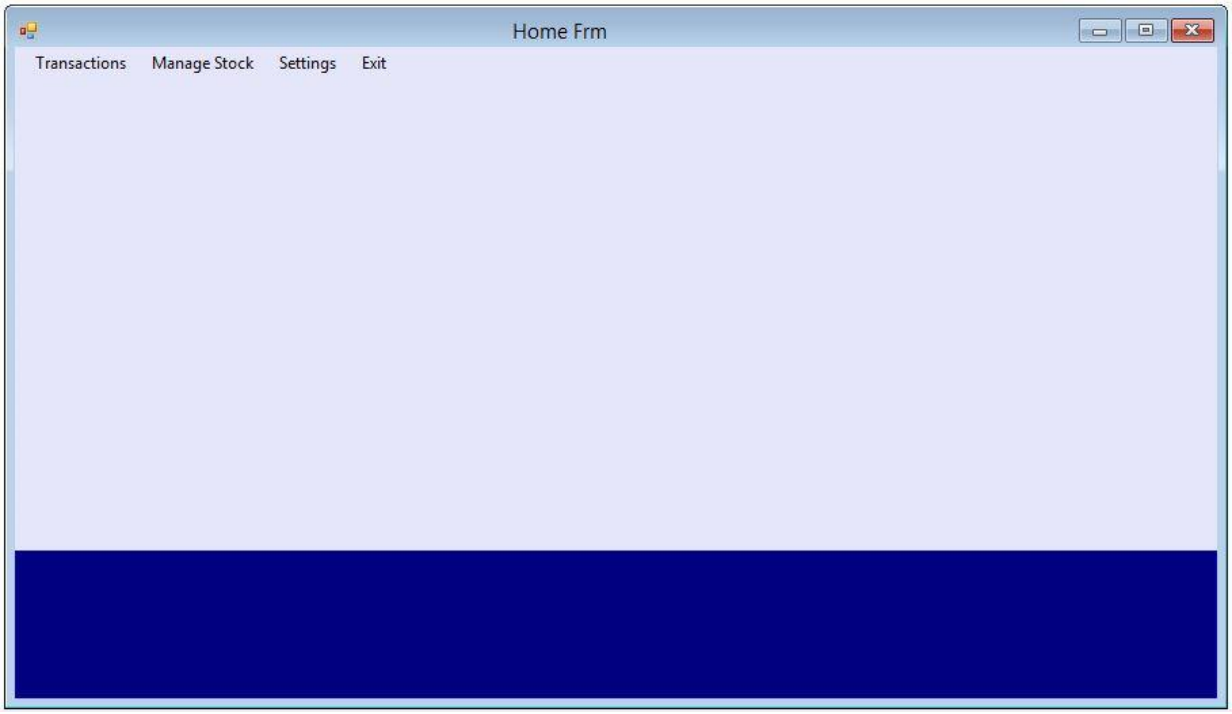
```
PublicClassloginSetFrm

PrivateSubokBtn_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlesokBtn.Click
con.Open()
DimcmdAsNewOleDb.OleDbCommand("SELECT * FROM LoginTable WHERE username =
'"&Me.unameTxtbox.Text&"' And password = '"&Me.opTxtbox.Text&"'", con)
DimdrAsOleDb.OleDbDataReader :dr = cmd.ExecuteReader
Ifdr.Read = TrueThen
DimcmdUpdateAsNewOleDb.OleDbCommand("UPDATE LoginTable SET [password]
='"&npTxtbox.Text&"' WHERE username ='"&Me.unameTxtbox.Text&"'", con)
cmdUpdate.ExecuteNonQuery()
cmdUpdate.Dispose()
MsgBox("Password Changed", MsgBoxStyle.Information + MsgBoxStyle.OkOnly)
Else
MsgBox("Invalid username or password", MsgBoxStyle.Critical)
EndIf
con.Close()
EndSub

PrivateSubcancelBtn_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlescancelBtn.Click
unameTxtbox.Text = ""
opTxtbox.Text = ""
npTxtbox.Text = ""
cnpTxtbox.Text = ""
EndSub
PrivateSubexitBtn_Click(ByVal sender AsSystem.Object, ByVal e AsSystem.EventArgs)
HandlesexitBtn.Click
Me.Close()
EndSub
EndClass
```

APPENDIX B

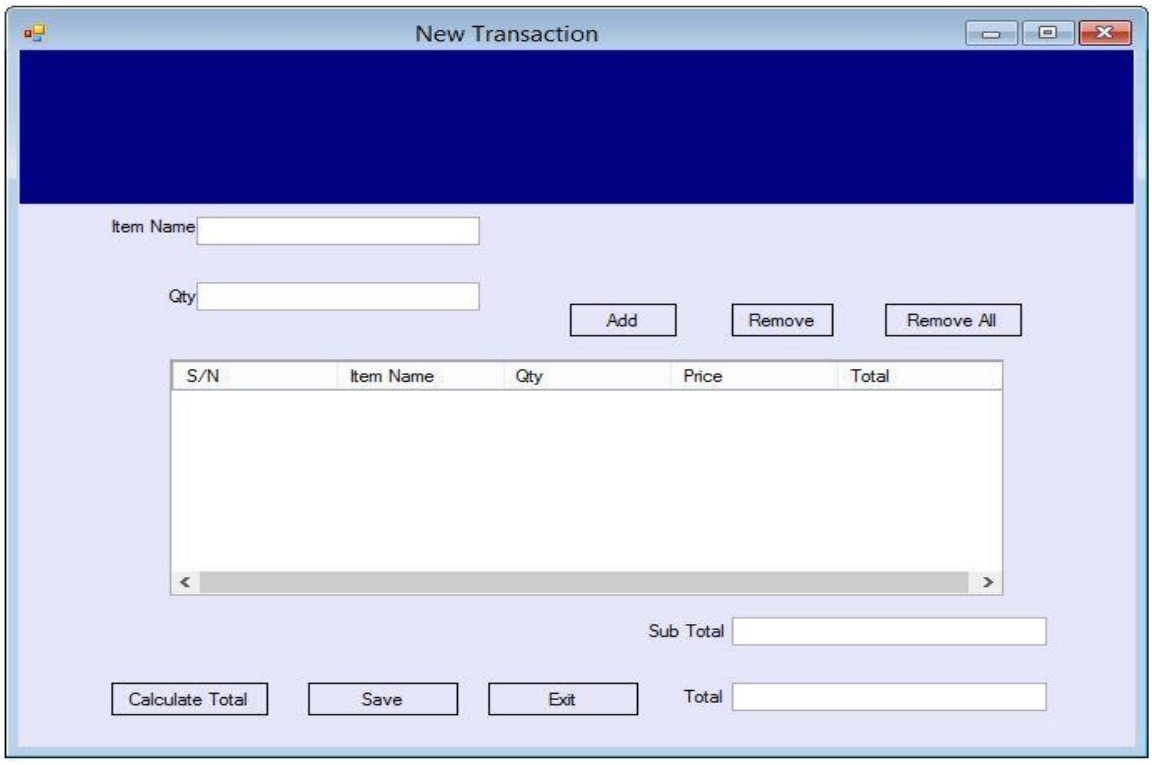
SCREENSHOTS

Welcome Form

login form

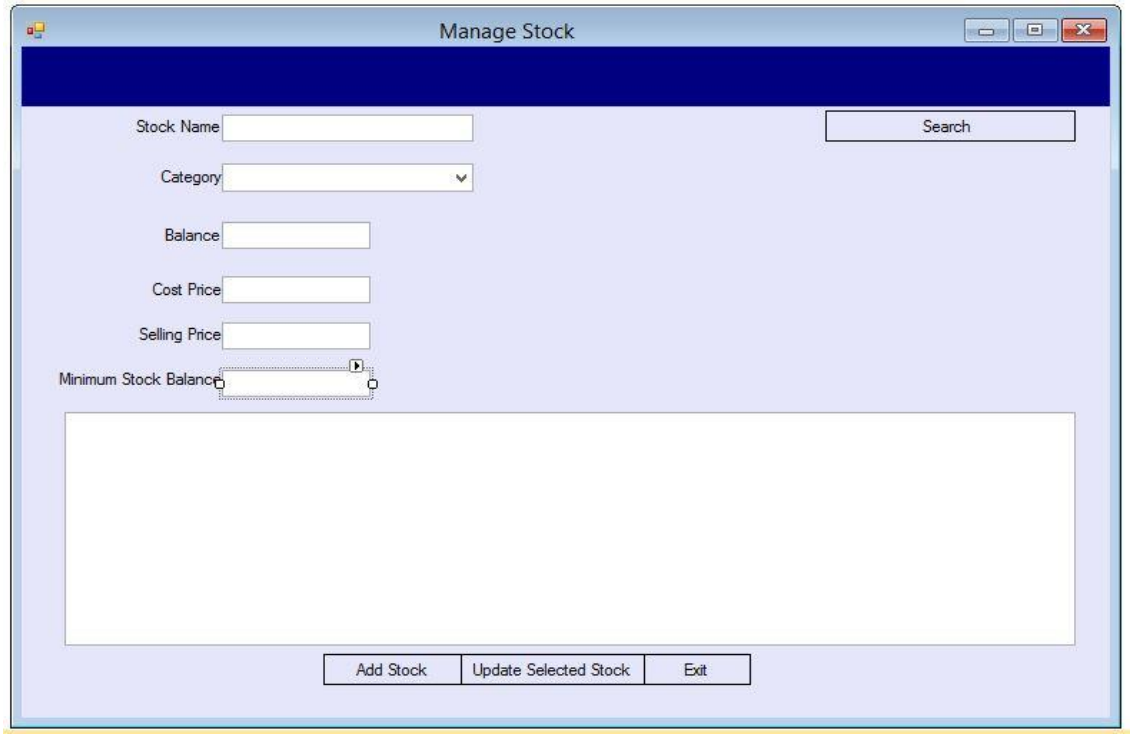


Home form



Transaction form

Receipt form



Manage Stock form

Transaction History form

Change password form