

**COMPUTERIZATION OF INVENTORY CONTROL OF A
PHARMACY (A CASE STUDY OF ZAGBAYI PHARMACY,
MINNA, NIGER STATE)**

BY

TSADO, FLORENCE WOYE

PGD/MCS/2001/1099

**A PROJECT SUBMITTED TO THE DEPARTMENT OF
MATHEMATICS/COMPUTER SCIENCE, SCHOOL OF SCIENCE
AND SCIENCE EDUCATION, FEDERAL UNIVERSITY OF
TECHNOLOGY MINNA, NIGER STATE.**

NOVEMBER 2003

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**A PROJECT SUBMITTED TO THE DEPARTMENT OF
MATHEMATICS/COMPUTER SCIENCE IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF
POST GRADUATE DIPLOMA IN COMPUTER SCIENCE OF THE
FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, NIGER
STATE.**

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APPROVAL PAGE

This project has been read and approved as meeting the requirement for the award of Post Graduate Diploma in Computer Science of the Department of Mathematics and Computer Science, Federal University of Technology (F.U.T.), Minna.

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DATE

EXTERNAL EXAMINER

DATE

DEDICATION

This project is dedicated to my Lord Jesus Christ without whom I can do nothing. It is also dedicated to My late Father, Mr. I. Z. Tsado and My Dear Mother, Mrs. A. A. Tsado.

ACKNOWLEDGEMENT

My profound gratitude goes to the ALMIGHTY GOD for sparing my life, and whose love, favor and grace saw me through this Programme.

It would have been very difficult if not impossible to complete a work of this nature successfully without assistance from some special people. In the delight of this, I acknowledge with profound gratitude my supervisor Dr. N. I. Akinwande who took time to guide and read through my work and corrected me where necessary despite his tight schedule.

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I offer my sincere gratitude to Mall Isah Audu, who is my course coordinator. My thanks also go to all other lectures, Dr. Yomi Aiyesimi, who is the project coordinator, Prince R. O. Badmus, Mr. Hakimi Danladi.

Finally, I wish to express my sincere gratitude to my mother MRS. ABIGAIL.A.TSADO without whom it would have been impossible for me to be what I am today. I LOVE YOU. Not forgetting my wonderful brother MR. SOLOMON TSADO And FAMILY, also my lovely sisters LOLO, SAGI, NNASHA, YAKUBU, LEAH, YEBO and my nice YETU who never ceased to encourage and support me morally and spiritually.

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ABSTRACT

The invaluable relevance of Inventory control is that, it is openly or impliedly the "spinal Cord" of any organization or any Business enterprise. No matter the "setup" inventory control calls for appropriate programming to ensure a virile productive system. This computerized "Inventory system" is carried out, using an oriented database called Microsoft Visual FoxPro. In this project, we treat a number of "Pharmaceutical products in a store. Our particular attention is focused on avoidance of wastages and to elevate the organization concerned to the full advantage of effective management of resources and a proper accountability.

CHAPTER ONE

1.0. INTRODUCTION

In order for all types of organization to succeed they need to process data and use information effectively. This has become important and true in today's rapidly changing environment. In conducting their day-to-day operations, organizations use inventories for their functions, such as planning, control and decision-making. Inventory, therefore is unquestionably a critical factor in the operation of all organization.

Inventory control is a problem found in many organizations. Computer programs could be written to record items of each type of stock removed from stores, record quantities of new purchased items from the suppliers, check the level of stock to see if the quantities have fallen below a critical level (and if so generate an order to the supplier) and many other associated tasks. The files holding records of items in the computer could be updated by running the programs for update on hourly, daily or even weekly basis.

With the advent of computer, it has become imperative that computers are use in almost all divisions of science and technology. The usage includes; pure computational work, control production process, run traffic, handle statistical work, do Economic planning, gather and process information, handle control of inventory system and solve logic and other problems. The microcomputer also known as personal computer (PC) deals with mathematical variables in the form of numbers.

Microcomputers are versatile, accurate and can solve practically any mathematical problem. Knowing that microcomputers are

versatile in its operations, then in this thesis we shall look at how the microcomputer can help us solve our inventory control problems.

1.1. WHAT IS AN INVENTORY

An inventory is defined or can be defined as an itemized list of property. Inventories perform a number of vital functions in the smooth operation of any organization. In the absence of inventories, organizations would not achieve smooth operation of their organization.

1.2. AIMS AND OBJECTIVES OF INVENTORY CONTROL

The aim of inventory control is to obtain optimal inventory size. This is the point at which the combination of losses resulting from lost sales is held to combined minimum.

Direct mathematical techniques, such as calculus are employed for smaller inventory problems computer simulations are more effective for large problems of inventory.

Majority of businesses/firms include among their assets, stock and work in progress. Measuring the quantity and value of this asset is difficult owing to variations in method, time consuming and much potential error.

1.2.1. Objectives of Computerizing Inventory Control

The objectives of computerizing Inventory control in an organization can be highlighted as follows: -

- a) To minimize the problems of inadequate raw materials and supplies.
- b) To reduce losses from large quantities of stock.

- c) Presenting the management with up-to-date Inventory position at all times and when needed.
- d) To help the company in Maximizing its profit without tying down capital on unwanted inventories.
- e) Finally the major objective of this study is to critically examine the control of inventory in the pharmacy using Zagbayi Pharmacy as a case study. To also identify the problems and limitations of inventory control in pharmacy and to design a more rational, logical, systematic and scientific approach that is amendable to the use of the computer.

1.3. BRIEF HISTORY OF ZAGBAYI PHARMACY

Zagbayi Pharmaceutical Company started in 1991 with the name Zachas, as at that time it was a joint venture. Zachas was situated at Tunga, Minna. Then in the year 1995, it became a one-man business and was moved from Tunga to Hospital Road, Minna, with the name Zagbayi Pharmacy Ltd.

The organization or business deals only with pharmaceutical and physiological products. Since the inception of Zagbayi Pharmaceutical Company, their transaction has been both on wholesales and retailing. The Wholesales aspect of it deals with selling in large quantities, while the retail involves selling in smaller quantities and also deals with the aspect of counseling.

The company sources of purchases are re-ordering process, instant purchases from company agents or representatives (representatives that sell drugs) and also from neighbouring stores. The company method of sales involve issuing of invoices and receipts after and before sales. Bin cards (Stock cards) were used for stock

taking, until the year 1996, when computers were introduced the company.

The company presently has four branches, with the Head office at Minna, one branch at Abuja, Kaduna and one other branch at Minna.

1.4. WHAT IS A COMPUTER

The development of the role of the computer stores management has lead to increased attention being paid to store codes. Computer operations are greatly assisted by the use of a logical coding system. Because of the logical way in which computer operates, they are able to identify the item in question quickly, once given its code number.

Other advantages of stores coding in relation to computer systems are that it assists the process of direct "Input capture" and aids the process of computer programming and operations. In the business world, it is well known that there are only three factors of production, Land, Labour and Capital the forth one is men who coordinate, all other three to make production. In this case any good organization needs a fast and accurate system of processing its data and man being what he is (cannot be faster than his shadow) needs a machine that can assist him to coordinate these factors for effective production process – The computer.

Therefore, a computer can be defined as an electronic device, which accepts and processes data by following a set of instructions (program) to produce an accurate and efficient result (information).

1.5. CATEGORIES OF COMPUTERS

Computers are categorized according to purpose, types and capacity.

There are three types of computers namely

(i) Analog Computers:

Analogue computer operates by measuring and comparing the physical charges of a quantity for example, pressure, temperature, voltage, speed etc. a speedometer is an example of an analogue device. Here, drive shaft rotation are measured and converted to pointer that indicates the speed of the car. The analogue computer accepts data directly for measuring instruments without need for intermediate concession from/to some symbol or code and to its high speed of data collection, it is used in industries e.g. paper mills, oil refinery, military formation e.t.c. It does not contain memory since it measures or compares data/value.

(ii) Digital Computers:

Digital computers are basically electronic calculating and data processing machines that work with instructions and data, which are coded in sample binary digit from hence the characterization "digital". They are used for data processing because they handle alphanumeric characters with precision and speed.

(iii) Hybrid Computers:

These are computers, which may be conceived as combination of digital and analogue computers i.e. combines the capabilities

of analogue and digital processing of collected data is desirable. Hybrid computers are known to have found much application in control and feed back process.

1.6. SCOPE OF THE STUDY

In an organization, inventory control is one that its functions encompass all the aims of the stores operation. The basic concept of inventory control is quite simple; that is to supply the right material in the right quantity, of the right quality at the right time and place for processing. Having said that, the element of cost in relation to inventory control also plays a vital role, for cost of items, determine the maximizing and minimizing the cost.

Inventory as a term covers so much area, such as Personal inventory, Business inventory, School Inventory e.t.c. But the major focus of this study is on the computerization of inventory control that are within a business, particularly a Pharmacy (Zagbayi Pharmacy). This study is limited by time and financial constraints.

CHAPTER TWO

2.0. LITERATURE REVIEW

2.1. PHARMACY

A department of the medical Art, which consist in the collecting, preparing, preserving and dispensing of medicines.

2.2. INVENTORY AND ITS CLASSIFICATIONS

2.2.1. Definitions of Inventory

Inventory in business are items of property held in stock by a form, including finished goods held for sales, goods in the process of production, raw materials and goods that will be consumed in the process of producing goods to be sold. Inventory appears on a company's balance sheet as an asset. The change in inventory over a given period of time is known as inventory investment.

A perpetual inventory is a running book record based on a detailed account of all incoming and outgoing items. A book inventory is the total cost of the goods on hand as shown by a perpetual or physical inventory. The money value of the inventory also appears on the income statement in determining the cost of the goods sold. The cost of goods sold is determined by adding the inventory on hand at the beginning of the period and the cost of purchasing and producing goods during the period and subtracting the inventory on hand at the end of the period. For financial statements inventories are usually priced.

Inventory is the stock of any item or resources used in the organization. An inventory system is the set of policies and controls that monitors level of inventory and determines what levels should be

maintained, when stock should be replenished and how large orders should be. In its complete scope, inventory include inputs such as financial, energy, equipment and raw materials; outputs such as parts, components and finished goods and interim stages of the process, such as partially finished goods or work – in progress. The choice of which items to include in inventory depends on the organization. A manufacturing operation can have an inventory of personnel, machines and working capital as well as raw materials and finished goods. An airline can have an inventory of seats, a modern drug store or pharmacy can have an inventory of medicines and engineering firm an inventory of engineering talent e.t.c.

2.2.2. Inventory Classification

The inventory control problem is a difficult one if for no other reason but that the typical firm may find it necessary to carry inventories of thousands of different raw materials, supplies, parts sub – assemblies and assemblies. An attempt to maintain close control over the stock of each of these items may prove to be uneconomical from the standpoint of the demand such rigid control would generate for time and personnel. For this reason, it is usually advisable that management establishes classifications, which enable it to decide upon the degree to which the individual items that are stocked should be controlled.

Various criteria exist on the basis of which classification system can be developed. The most common of these is the Annual Dollar Rate of use of the items. This will be obtained by multiplying each item's unit purchase or production by the number of units purchase or produced per year. Such analysis may reveal that during the past year,

\$700,000 worth of a given raw materials was used. As opposed to this, the cost of another raw material during the same period may have been only \$350,000. Obviously, the inventories of the first item should be controlled to a greater degree than those of the second. This type of classification proves to be helpful because as a rule, the organization or council will find that a relatively small percent of the items account for a large percent of the total rate of use.

Another basis for classifying inventories is the "dollar investment" in the respective items, for instance, at the time an analysis is being taken, it may be found that inventory on product represents a capital investment of \$220,000 and that the inventory of some other product represents an investment of only \$2,600. It is likely that a higher degree of control is called for in the case of the first item than in the case of the second item. In any project or event, this method of classification will also reveal that very often, tight control need to be exercised over a small percent of the total items being stocked.

Criteria of a non-quantitative nature may also be established for use in conjunction with those we have just considered. Tight control would probably be applied to those items whose supply is endangered by a threatened strike to those items whose prices are characterized by and with frequent price fluctuations to those items that are subject to sudden obsolescence to those items that are critical in the sense that a shortage would bring production activities to a stand still and so on. But regardless of the criteria selected, they serve only to simplify the inventory control problem and not to eliminate it.

2.3. PURPOSE OF INVENTORY

The purpose of inventory analysis in an organization and stock keeping services is to specify (i) When items should be ordered and (ii) How large the order should be.

In goods production, a stock of inventory is kept to satisfy the following needs: -

- (a) To maintain independence of operations: - A supply of materials at a work center allows that centre flexibility in operations for instance, since there are costs for making each new production set up, this independence allows management to consider economic production lot size. Work centres on an assembly line usually are not independent because raw materials are products to work on and are fed at line speed. There may be none or only a few extra products to work on in the event; the worker performs either faster or slower than line speed or if the workstation up streams slows down output. The unit completed at a workstation passes to the next person.
- (b) To meet variation in product demand: - If the demand for a product is known precisely, it may be possible (though not necessarily economical) to produce the product to exactly meet the demand. In the usual case however, demand is not completely known and a safety or buffer stock must therefore be maintained to absurd variation.
- (c) To allow flexibility in production scheduling: - A stock of inventory relieves the pressure on the production system to get the goods out. They allow longer lead times, which permit not only production planning for smoother flow but also lower – cost of

operation through more economical lot size production. High set up cost, for instance, favour the production of a large number of units once the setup has been made.

- (d) To take advantage of economic purchase order size: - Clearly, there are costs to place an order, labour, phone calls, typing and postage e.t.c. Therefore the larger the size of each order, the fewer the numbers of orders that need to be written. Also the non-linearity of shipping costs favour larger order; that is the larger the shipment the lower the per unit cost.
- (e) To provide a safe guard for variation in raw material delivery times: - When material is ordered from a vendor, delays can occur for a variety of reasons. There is a normal variation in shipping time, which occasionally will be large; there might be a shortage of materials at the vendor's plant, causing him to back log our order; the order might be lost or they could be incorrect or defective material shipped by the vendor. A safety stock is determined depending on the severity of the consequences.

2.4. INVENTORY COSTS

In making any decision that will affect inventory size, the following costs must be considered: -

- Carrying cost (CC): - This is a broad category that include the costs for shortage facilities, handling, insurance, pilferage, breakage obsolescence, depreciation, taxes and the opportunity cost of capital. Obviously, high carrying costs tend to favour low inventory levels and frequent replenishment.

- Production charge costs (PCC): - To make each different product involves obtaining the necessary materials arranging specific equipment setup; filling out the required papers appropriately changing time and materials and moving out the previous stock of material. In addition, other costs may be involved in hiring training or lay off of workers and in idle time or overtime.

If there were no costs or loss of time in changing from the production of one product to another, many small lots of products would be produced. This would reduce inventory levels with a resulting saving in cost. However change over costs usually exist and one of the challenges today is to try to reduce these setup costs to permit smaller lot sizes.

- Order costs (OC): - These costs refer to the managerial and clerical costs to prepare the purchase or production order.
- Shortage cost (SC): - When the stock of an item is depleted, an order for that item must either wait until the stock is replenished or be cancelled. There is a trade off between carrying stock to satisfy demand and the costs resulting from stock out. This balance is sometimes difficult to obtain, since it may not be possible to estimate frequently, the assumed shortage cost is little more than a guess, although it is usually possible to specify a range of such costs. This determination obtained by using mathematical models is traditionally viewed as the essence of inventory theory.

2.5. INVENTORY SYSTEM

An inventory system provides the organizational structure and the operating policies for maintaining and controlling goods to be

stocked. The system is responsible for ordering and receipt of goods, timing the order placement and keeping track of what has been ordered, how much and from whom.

Further, the system must provide follow-up to enable the answering of such question as; Has the vendor received the order? Has it been shipped? Are the dates correct? Are the procedures established for reordering or returning undesirable merchandise?

There are two types of inventory systems, these are based on;

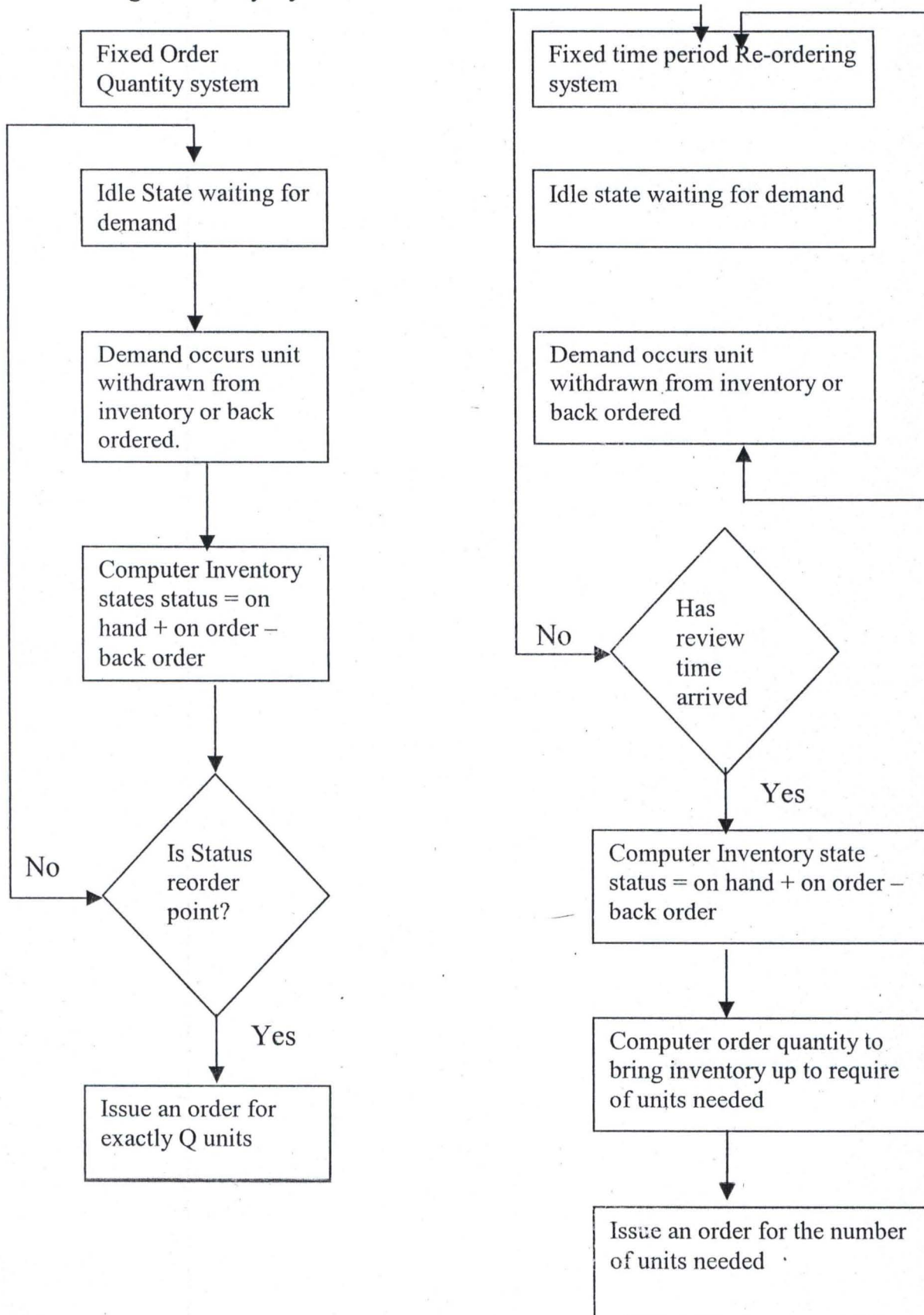
- (i) Fixed order quantity models (also called the economic order quantity (EOQ) and
- (ii) Fixed time period model (also referred to variously as the periodic review system and the fixed – order interval system).

The basic distinction between fixed – order – quantity inventory system and fixed time inventory system is that the former is “event triggered” while the latter is “time triggered”. That is a fixed – order quantity inventory system initiates an order when the “event” of reaching a specified reorder level occurs. This event may take place at any time, depending upon the demand for the items considered. In contrast, the fixed time period inventory system is limited to placing orders at the end of predetermined time period. Hence, the passage of time alone “triggered” the system.

This difference can be illustrated in the figure below:

Inventory System	Order Quantity	When order is placed
Fixed – order Quantity (Event – Triggered)	Q – Constant (the same amount ordered each time)	R – when quantity on hand reaches their order level.
Fixed –Time period (time Triggered)	Q – variable (varies each time order is placed)	T – When the review period arrived

Comparison of Fixed – order Quantity and Fixed Time Period Re-ordering Inventory System is shown below.



From the above figure, the fixed order quantity system focuses on order quantities and reorder point. While in the fixed – time period system, a decision to place an order is made after the stock has been counted or “reviewed” whether an order actually placed depends upon the inventory status at that time.

2.6. INVENTORY BASIC MODEL TYPES

The inventory model that will be covered are the Basic Saw Tooth Model, Price – Break Model, Single period model, Fixed order Quantity model with usage and special Purpose models.

2.6.1. A Basic Saw Tooth Model: - The simplest models in this category occur when all aspects of the situation are known with certainty. If the annual demand for a product is 10,000 units for instance, it is precisely 10,000 not 10,000 plus or minus 10 percent. The same is true for set up costs and carrying costs. Although the assumption of complete certainty is rarely valid, it provides a good starting point for our coverage of inventory models.

- Fixed Order Quantity Model: - Fixed order Quantity Models attempt to an order which will be placed to determine the specific point, R at which an order will be placed and the size of that order Q. the order point R is always a specified number of units actually in an inventory.
- Simple Fixed Order Quantity Model: - The ensuring derivation of this model for the optimal order quantity are based on the following characteristics; when demand for the product is constant and Uniform through out the period; lead time is also constant;

price per unit of product is constant and all demands for the product will be satisfied.

- The "Saw Tooth effect" relating Q and R show that when Inventory drops to point R, a reorder is placed. This order is received at the end of time period L, which does not vary in this model. The illustration is shown below

A Basic Saw tooth model

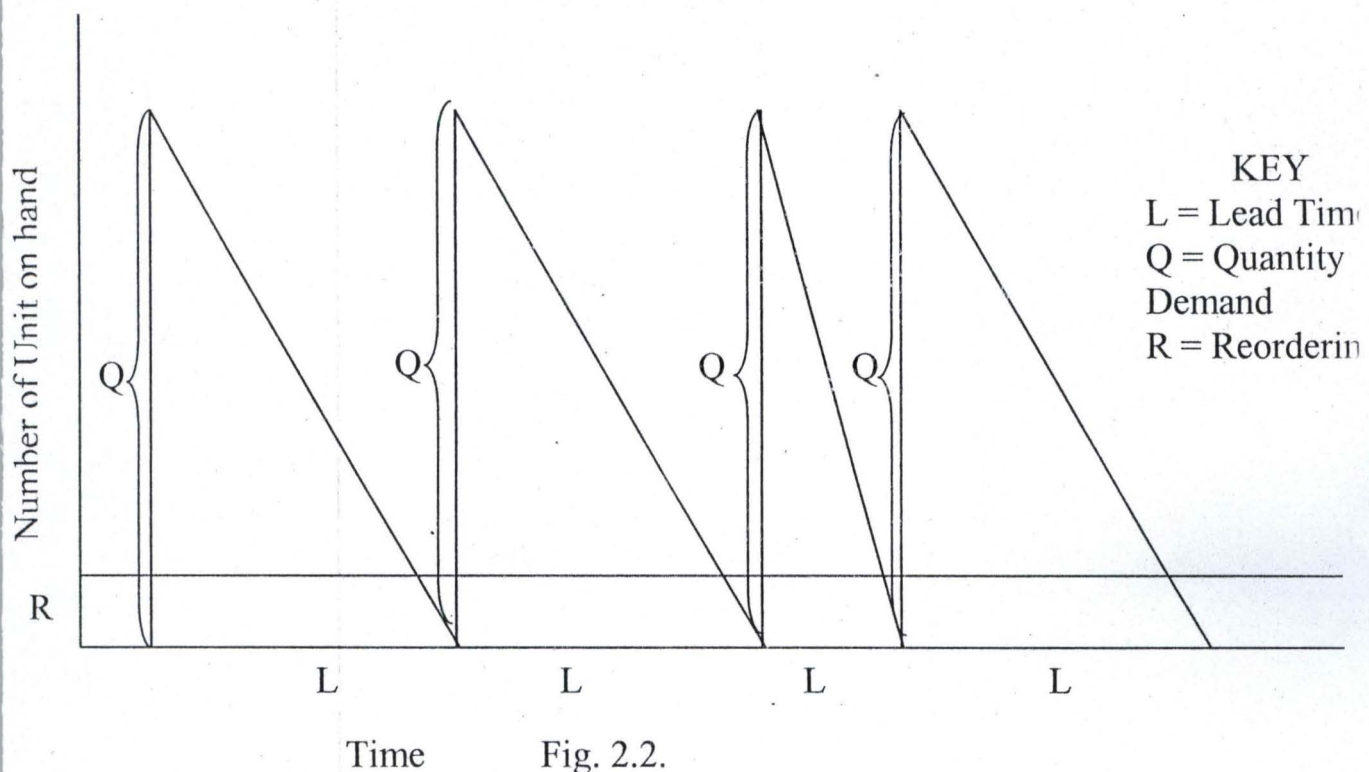


Fig. 2.2.

2.6.2. A Simple Fixed Order Quantity Model with Usage: -

In many situations, infact, production of an inventory item and usage of that item take place simultaneously. This is particularly five where one post, for instance, a production system acts as a supplier to another part, for instance, Aluminum extrusions are being made to full an order for aluminum windows, the extrusion order is completed. This situation resembles the model with usage. The production with

usage of inventory model is only slightly different from the proceeding model.

2.6.4. Price – Break Model

Generally, the selling price or cost of an item varies with the order size. This is a dilate or step change rather than per unit change. The total for each feasible economic order Quantity and price break quantity is tabulated and the Q that leads to the minimum cost is the optimal order size.

If holding cost is based on percentage of unit price, it may not be necessary to compute economic order quantities at each price. Procedurally the largest order quantity (lowest unit price) is solved first; if the resulting Q is valid, that is the solution. If not, the next largest order quantity (second lowest price) is derived. If that is feasible, the cost of this Q is compared to the cost of using the order quantity at the price break above and the lowest cost determine the optional Q.

2.6.5. Special Purpose Model

The fixed order quantity and the fixed time periods models presented thus far are ordered in their assumption but had two characteristics in common.

- The cost of units remained constant for any order size and
- The reordering process was continuous; that is the items were stocked with the expectation that the need would convince.

This section presents two new models; the first illustrates the effect on order quantity when unit price changes with the order size; the second

is a single is a single period model (sometimes called static model) in which ordering and stocking require a cost trade off each time. This type of model is amendable to solution by marginal analysis.

In conclusion, the general formulas in constructing any Inventory model are; the first step is to develop a functional relationship between the variables of interest and the measure of effectiveness. In this section or case, since we are concerned with cost, the following would pertain.

Total annual cost = Annual Purchase Cost + Annual Ordering Cost +
Annual ordering cost + Annual holding cost or

$$TC = DC + \frac{DS}{Q} + \frac{QH}{2}$$

Where

TC = Total Annual Cost

D = Demand (Annual)

C = Cost per Unit

Q = Quantity to be ordered (the optimum amount is termed the economic order quantity – EOQ or Oopt).

S = Setup cost or cost of placing an order

R = Reorder Point

L = Lead Time

H = Annual holding and storage cost per unit of average inventory often holding cost is taken as a percent of the item, such as;

H = I (Where I is the percent carrying cost).

2.7. Types of stock

Stock of uncompleted and unconsumed items can be categorized as:

- Finished goods held for consumption
- Goods purchased for use
- Work in progress
- Raw materials and components purchased for in-incorporation into products for their use.
- Consumable stores, lubricant, cleaning materials, fuel, spare parts etc.

All these categories are usually by stock analysis shown on the balance sheet proper or in a note attached to the balance sheet.

2.8. STOCK TAKING, KEEPING AND VALUATION METHOD

2.8.1. Stock Taking

In an organization, stocking is not always easy to determine, entries are easily made. Hence the following are the procedure for good stock – taking.

- Proper planning for the stock taking operation.
- Partition of the stock into manageable area for central reason.
- Proper rules and decision of instruction to staff.
- Clear instructions should be given in time of counting, weighing, measuring and checking of items.
- Two or more persons to be involved in counting cash item.
- Counted items should be properly marked.
- There should be a restriction of movement during stock taking.
- Proper care should be taken over the issue of blank sheets and the return of used and unused stock balance sheet.

2.8.2. Stock Keeping (Store Keeping)

This is an important and patinent aspect of material management. The store keeper is responsible for the maintenance of the store and also for goods receiving role. The duties of store keeper depends on the organization concern. In some organization the store keeper is virtually a material controller, keeping detail records and raising all purchase requisition.

2.8.3. Stock Valuation Method

The main aim of stock valuation is to give the importance for the cost of materials of the valuation method selected by the management.

Since, the amount assumed by the organization to start or end stock have a direct effect on the cost materials sold or used and to also affect the profit measured. It is difficult to decide what value to assign to the stock over a period of time.

It is impossible to say whether the items remaining at the end of the period are part of the original starting stock or part of what has been purchased during the period. A cost flow regulations must be made to determine whether the items remaining in stock at the end of a period are deemed to come from the batch recently purchased or from a batch purchased at the beginning of the period.

And if batches are purchased at different price, then the cost flow rules and regulations will have its effect on the profit disclosed.

Therefore, the formula used to evaluate stock cost of goods used/cost of material used can be expressed below: -

Cost of goods/material used = $SS + P - ES$

Where

SS = Starting stock

P = Purchases or New materials purchased.

ES = Ending Stock

Hence it is always easy to take a stock at the end of the costing period by counting the items in the stores, value the materials and computing the amount of the last stock.

2.9. DEFINITION OF TERMS

- Back log: A reserve of unfilled orders for goods or an accumulation of uncompleted work.
- Bandwagon: A strong popular appeal to shift one's request or support to the winning side.
- Depreciation: To diminish in value, be little or become less in value.
- Insurance: The practice by which an individual secures financial compensation for a specified loss or damage result resulting from risk of any sort, by an agreement with a company or organization to which he pays regular premiums.
- Lot size: One of a number of a number of portions into which a quantity of material may be divided for allotment.
- Lull: A temporary drop in activity e.g. in business.
- Merchandised: Goods bought and sold in commerce to promote the sale of goods.
- Opportunity: cost; a value that resources used in the best possible or another specific way.

- Pilferage: To steal in small quantities or to commit petty thefts.
- Replenishment: To get a new supply of goods or materials.
- Safety stock: A safety stock is determined, depending on the severity of the consequences.
- Skepticism: An attitude of doubt.
- Staple: A commodity for which the demand is constant and which is regularly kept in stock e.g. raw materials.
- Stock broker: Some one who deals in stocks and shares stocks brokerage
- Stockiest: Someone who keeps a supply of specified goods for sale.
- Tax: A charge on a person's income or property.
- Tradeoff: In decision making, selecting the choice from analysis of advantages and disadvantages of two or more alternatives.

CHAPTER THREE

3.0. SYSTEM ANALYSIS AND DESIGN

3.1. INTRODUCTION – SYSTEM THEORY

A system is an organized collection of interrelated elements that work amicably for a defined common purpose.

System theory emphasizes the following important concepts:-

Inputs: - Inputs are those elements that come into the system from without.

Processes: - Processes are the transformation of inputs into other forms.

Outputs: - Outputs are the results that come from processing inputs.

Feedback: - Feedback is the communication from the system's output back into the system.

Environment: - Environment is the surrounding world or conditions that are outside the system that influence the development of the system.

Boundary: Boundary is the delimitation that separates the system from the environment.

3.1.1. Introduction of System Analysis and Design

System Analysis and design is a problem solving activity that involves a critical examination of a system, Identification of system functions and devising improvements.

The process of system analysis and design can be carried out in five stages: -

1. System Investigation: - This involves identifying the information needs of a system and the feasibility of meeting these needs.

2. System Analysis: - This process involves the detailed examination of the current information flow and the drawing up of specifications of a new system.
3. System Design: - This involves the process of devising an alternative information system.
4. System Development and Implementation: This is the stage where the design information system is transferred from paper to physical reality. This process includes development, testing and training of the end users of the system.
5. System maintenance: - This is the monitoring and evaluation of the new information system and the adoption of modifications where necessary.

3.1.2. Zagbayi Pharmaceutical Company system and subsystems.

Zagbayi pharmacy which is located along Hospital Road and headed by the managing director who is the pharmacist in charge of the company and also charged with the responsibility of presiding over the highest management decision making of that branch.

The Managing Director works hand in hand with fifteen (15) other staffs among which are two (2) Accountants, one for the morning section and the other one for the evening section.

Ten (10) Staff work within the hours of 7.30am to 3.30pm, while five (5) staff work within the hours of 3.30pm to 10.00pm, when the company closes for the day.

3.2. SYSTEM INVESTIGATION

System investigation involves a thorough scrutiny and the identification of the problems and information needs of a system.

3.2.1. A description of the existing system

The inventory control of Zagbayi pharmacy was examined in detail, however a brief description will suffice at the junction.

The methods of purchasing used by the pharmacy are re-ordering process; instant purchases from agents or company representatives and their method of sales involve Issuing of invoices and receipts. Every record of the above were done on bin cards or stock cards, until in 1996 when the use of computers were introduced for entries of records.

3.3. PROBLEM DEFINITION AND IDENTIFICATION OF INVENTORY FORMS USED.

On investigation, it was discovered that Zagbayi pharmacy uses Dbase IV for the computation of the inventory records. Which has not totally solved the problem of manual recording because of the disadvantage of the program. And also the staff were not properly trained for the use of this program.

It was also discovered that the Dbase IV used by Zagbayi Pharmacy for the computation of inventory does not fully give the pharmacy an effective computerization of its inventory, this is due to the following setbacks: -

1. Dbase IV does not allow the development of applications with a Graphic user interface, which is not the current trend. Being a command user interface, it not user friendly.
2. Dbase IV does not have a built in data dictionary, a table that has definition for tables, does not also have persistent relationship between tables.
3. Dbase IV is normally cumbersome and the logic of software development using Dbase IV are not easily understood by users.
4. Data or records are only assessed by the use of commands. Which are outdated

3.4. SYSTEM ANALYSIS

Prior to this stage only some preliminary information about the operation of the system has been gathered, enough to establish the overall requirements and determine the feasibility of the project.

3.4.1. Data Gathering

The first step in the analysis of the system under study is the gathering of data, the stage of data gathering helps in the definition of existing system; two tools were employed in the process.

i. Interview

In attempt to determine the inventory of Zagbai Pharmacy, the Pharmacist who is the Managing Director was interviewed, after which some staff were also interviewed.

The low level of computer literacy on the part of the staff was a major hindrance in the process of data gathering. However, detailed question were designed to extract necessary data and

information and where necessary the interviewer had to educate the interviewee on the overall objective and advantages of the project, computerization and on what computers are capable of doing and not doing

ii. Written Documents

During the interview, documents relating to the operation of the system were requested for and studied but attempts to collect sample copies proved abortive.

3.5. SYSTEM DESIGN

The outcome of this stage in a system development process is the ultimate in documentation of the new system, the systems specification. This contains full detail of all clerical and computer procedures involved.

The design stage may lead to a number of possible alternative designs for example, different combinations of manual and computerized elements were first of all considered. On selection of an alternative, the purpose of design stage is to work from the requirement specification to produce a system specification.

In this project work due to the problems discovered in the old system, a structured method will be used, which allows:

1. Providing a number of well defined and complementary ways in which to represent information about important aspects of the system;
2. Providing a recommended series of tasks to be carried out so that the methods fit together as whole.

This lead to development of the project in modules, which were to be designed independently and later put together into the whole system.

The system was designed to have four (4) main modules namely: Data Entry, Enquiry, Reports and System Administration.

3.5.1. Data Entry:

This is the record update module, which allows system users to add new records, modify existing record and deleting an existing record.

3.5.2. Enquiry:

This module enable the users to search for specific information from the database for instance, the balance of stock of a particular item at a given point in time.

3.5.3. Reports:

This module is responsible for routine reports that the system is expected to use, which can always be printed as hardcopy or previewed on the screen as soft copy

3.5.4. System Administration:

This module monitors how the system is used, who uses the system, backing up data to back up files to guard against accidental loss of data and restoring data from the backup files.

3.6. ECONOMIC BATCH QUANTITY (EBQ)

The balance in between too small and too large producing or procurement (affordable) quantity is known as economic batch quantity.

Derivation of Economic Batch quantity (EBQ).

Let

D = Demand per annual

Q = Batch Quantity

H = Stock holding per unit cost (expressed as a fraction or in percentage (%))

P = Price per item

C = Cost per delivery

Then

The average stock is = $Q/2$

Stock holding cost/unit = HP

Total stock holding price = $HPQ/2$

No. of deliveries = D/Q

Total cost of deliveries = CD/Q

But we pay cost per each delivery

Hence, total variable cost (T) = $HPQ/2 + CD/Q$

To optimize (minimize or maximize)

We differentiate with respect to Q, at critical point: -

$$\begin{aligned}\frac{dT}{dQ} &= \frac{HPQ^{1-1}}{2} - CDQ^{-1-1} \\ &= \frac{HP}{2} - CDQ^{-2} \\ &= \frac{HP}{2} - \frac{CD}{Q^2} = 0 \\ \frac{HP}{2} &= \frac{CD}{Q^2} \\ Q^2 HP &= 2CD \\ Q^2 &= \frac{2CD}{HP} \\ Q &= \sqrt{\frac{2CD}{HP}}\end{aligned}$$

That is, relationship which exist between producer, purchaser and stock holding.

Example 1

Let the supply monthly be 600, cost of each article is ₦60, stock holding price is 50% and delivery charges is ₦600, then find the EBQ

Solution

$$\text{From } Q = \sqrt{2CD/HP}$$

$$D = 600 \times 12 = 7200$$

$$P = \text{₦}60.00$$

$$C = \text{₦}600.00$$

$$H = 50/100 = 0.5$$

$$Q = \sqrt{\frac{2 \times 600 \times 7200}{0.5 \times 60}}$$

$$Q = \sqrt{288,000}$$

$$= 536.656$$

$$\text{i.e. } Q = 537 \text{ units}$$

CHAPTER FOUR

4.0. SYSTEM DEVELOPMENT AND IMPLEMENTATION

4.1. SOFTWARE DEVELOPMENT

4.1.1. Choice of software packages

Due to the problems discovered (listed in chapter 3.2 above) in the present computerization of the Inventory control of Zagbayi Pharmacy, the following are recommended.

1. Microsoft Windows 98 (operating system)
2. Microsoft Visual FoxPro. 6.0, Microsoft Visual FoxPro is the software with which the application software for this project is developed.
3. Microsoft Word 2000 – A word-processing package for preparation of documents such as internal memos, business letters, reports (not produced by the main application program) and other similar documents.
4. Microsoft Excel 2000 – This is a spreadsheet package that is specifically chosen to aid the pharmacy in the preparations of annual budgets and also by the accounting department of the pharmacy for financial analysis and reports.

4.2. PROGRAM AND PROGRAMMING DETAILS

Why Microsoft Visual Fox Pro? Using Microsoft Fox pro 6.0., which is database programming software, which possess graphic user interface, develops the application software for this project.

The reasons for choosing Microsoft Visual FoxPro 6.0 for building this application include the following: -

1. Microsoft Visual FoxPro is database application development software and the system requirement report of this project specifies the need for a well-established database for the pharmacy. Microsoft Visual FoxPro is of the most enhanced database software suitable for the computerization of inventory control of the pharmacy.
2. The logic of software developed using Microsoft Visual FoxPro are easily understood by users because it ensures that program codes are written in modular structure with each form, report, menu on screen having individual modules.
3. Microsoft Visual FoxPro enables the development of applications with a graphic user interface, which is friendlier and enhances the ability of the user to understand the application better than any application using a command user interface.
4. Microsoft Visual FoxPro has a built in data dictionary based on a data container, a table that has definitions for tables, persistent relationship between tables and connections to remote data sources such as Microsoft SQL server and views both for local and remote data.
5. The Microsoft Visual FoxPro has a general field in the table structure of it's database that can be used to call in files from other applications such as Microsoft Word, Microsoft Excel and graphics such as pictures, graphs and charts.

The above reasons make Microsoft Visual FoxPro an obvious choice for the development of the application for this project.

As noted in the last chapter the bedrock of software design is data analysis. In Microsoft Visual FoxPro data consists of databases, tables, indexes, queries, views and their relationships.

A database is simply a container for the data objects.

A table in Microsoft Visual FoxPro like in most other Xbase relational software consists of rows of records where each column of the data or information is a field.

Tables in Microsoft Visual FoxPro may be bound to a database or may be free tables (not bound to any database). In this application all the tables are attached to databases because of the advantages that tables attached to databases have over free tables, these advantages include;

- Provision made for long field names
- Validation rules for fields and records, which guide the user to input only data that are valid, such that invalid data are rejected by the application.
- Stored default values
- Triggers that call stored code when data is added, deleted or modified.
- Persistent relationships between tables
- Referential integrity rules.

The Visual FoxPro software has a project manager, which is the central interface for workshop with the application; it is a tool with which data and objects in a project can be organized.

4.2.1. CREATING DATABASE AND TABLES

The terms “database” and “table” are not synonyms as in some languages. In Visual FoxPro a table stores data in records and fields while a database is a set of tables related to each other through common fields.

(1) Data type

Visual FoxPro has the following data type:

- Character: This data type is suitable for data that are alphanumeric text such as letters, numbers, spaces, symbols and punctuations. Character field are usually used to store information such as addresses and numbers that are not used for mathematical calculations.
- Numeric: This Data Type is used to indicate magnitude – having values that contain digits and may include a sign and or a decimal point. Numeric values may be integers or fractions.
- Float: same as Numeric
- Currency: Currency data type is used for money units.
- Date: The date data type is used for chronological data consisting of day, month and year.
- Date time: Date time is used for chronological consisting of month, year, days, hours, minutes and seconds.
- Double: The double data type is used instead of numeric for when data requires greater precision and accuracy.
- Integer: The integer field type is used for non-decimal numerical values.

- Memo: The memo field type is used to store blocks of data, the size of which depends on the data stored in them. The data for memo field are stored in a separate file with an FTP extension. The field can be as large as the available disk space.
- General: - This is used to store Object Linked Embedded (OLE) objects. It can be used to reference, a picture, word processing document or spreadsheet created by another application. The size of the field is limited to the available disk space.

(2) The Table Designer

Name	Type	Width	Decimal	Index	NULL
date	Date	8			
sno	Character	10			
product_id	Character	10		↑	
product_names	Character	25		↑	
supplier_id	Character	10		↑	
unitstore	Numeric	10	0		

Display
Format:
Input mask:
Caption:

Field validation
Rule:
Message:
Default value:

Map field type to classes
Display library:
Display class:

Field comment:

Fig. 4.0. Table Designer Showing the Fields Tab

The table designer in Visual FoxPro is a Visual tool for creating and maintaining the structures of tables. In creating tables more detailed decision about data types, caption, default values for field, triggers as well as table indexes.

Tables can be designed and created programmatically or interactively with the table designer through the project manager or the file menu.

Select and click on the New button on the project manager to activate the table designer. A new table window opens, here one chooses the

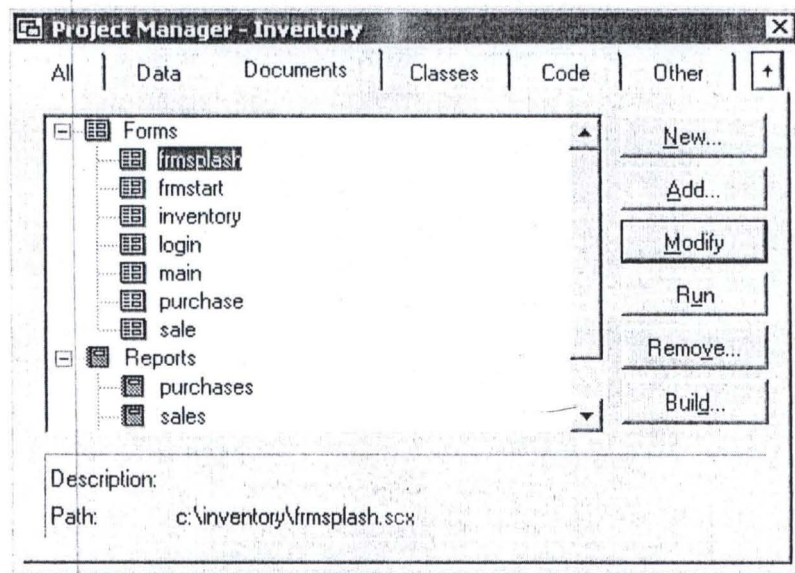


Fig. 4.1: Project Manager

New table option, on doing this and a CREATE window opens for one to insert the name of the table and save it. After saving, the table designer automatically appears on the screen.

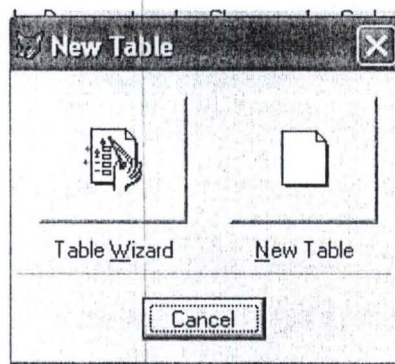


Fig. 4.2. New Table Window

The designer has three tabs: - the field indexes and Table tabs, when one clicks on the field tab, a window appears where the programmer can fill in the name of field under the name column heading and the data type under the Type column heading, the width of the field is also to be specified under the field column heading – here one has to specify the maximum number of character spaces the application should make provision for in respect to that field. Under the decimal column heading, one indicates the number of character spaces to be made available for decimals.

Name	Type	Width	Decimal	Index	NULL
date	Date	8			
sno	Character	10			
product_id	Character	10		↑	
product_names	Character	25		↑	
supplier_id	Character	10		↑	
unitstore	Numeric	10	0		

Display:
 Format:
 Input mask:
 Caption:

Field validation:
 Rule: ...
 Message: ...
 Default value: ...

Map field type to classes:
 Display library: ...
 Display class:

Field comment:

Fig 3: Table Designer

In the table designer provision is made for index, if a field is to be indexed, it will be indicated whether the index is in ascending or descending order. Provision is also made for one to indicate whether the field will accept null values or not. (A null value is a value that is

not equivalent to zero or a blank and yet has no explicitly assigned value).

Field captions can be entered into a table in the designer through the caption text box. These are alternative table names, which visual fox pro uses to place field names in forms created using the form wizard, grid controls, browse and edit windows.

The field captions are used formatting short labels in substitute to long ones, it may also be used to make field names more descriptive and for data labels. Like field names captions can contain up to 128 characters.

Default values for fields can be entered into the table designer in the default value textbox. This defines a value that Visual FoxPro automatically enters into a field whenever a new record is added to a table, the default value can be edited if the value is not appropriate.

Validation rules are used to enforce business rules for data entry, there are field level as well as record level validation rules, which are conditions that describe what constitute an acceptable value in the field or record. The field level validation rule can be entered on the table designer, by a click on the fields tab and entering the validation expression in the rule textbox, the error message to be displayed if the rule is violated, is entered in the message textbox.

To make the record level validation rule click on the Table tab in the table designer and enter the validation rule expression in the Record validation Rule textbox, the error message can also be entered in the message textbox.

Notes describing the purpose of a field can be made in the field comments edit box in the Table designer.

(3) Index key Fields

Index key fields are of immense importance in Visual FoxPro and will be employed extensively in the application for this project.

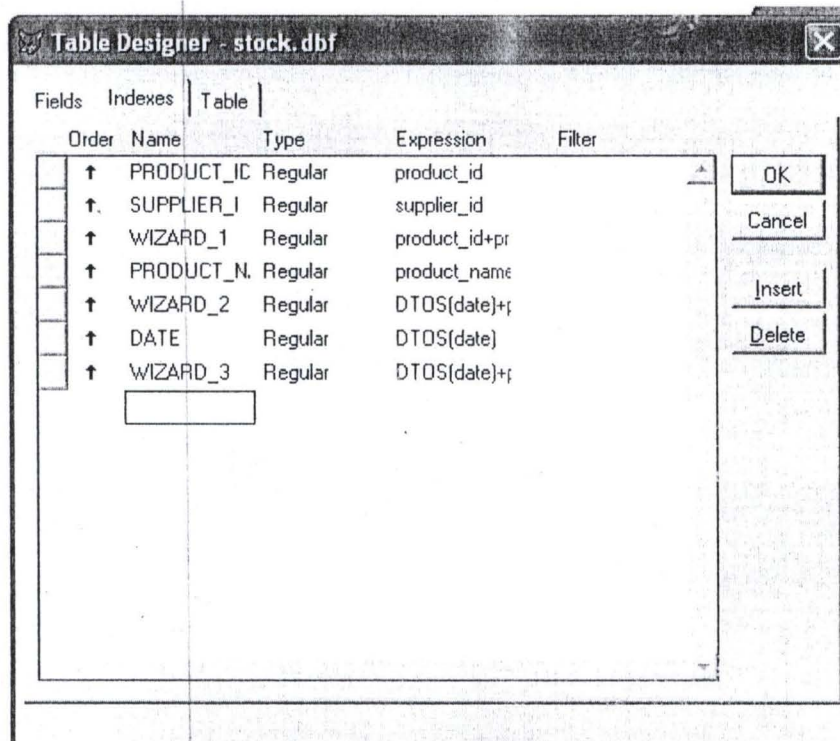


Fig 4.3. Table Designer, showing the Indexes Tab

Indexes are used

- To execute or first search for individual records.
- To support relationships between tables
- To process records in a sequence other than the order they are physically stored in to the table.

Visual FoxPro supports four types of indexes

1. Primary index
2. Candidate index
3. Unique index
4. Regular index

PRIMARY INDEX: - In the database, there is a stipulation that every record in a table must be uniquely identified. Duplicate values are not permitted on such specified fields. The column or field whose values uniquely identifies a row or record; on a table is known as the primary index or primary key.

CANDIATE INDEX: - A candidate index is an index apart from the primary index that uniquely identifies a record; this qualifies to become a primary key.

UNIQUE INDEX: - This is an index that selects and orders records based on the first occurrence of a value in the field specified. This means that unlike primary and candidate indexes, a unique index allows the entry of duplicate values to the table but hides all but one of each set of duplicate records.

REGULAR INDEX: - A regular in an index that is not primary, candidates or unique that meet certain criteria, order as group records as well as to create reports and other output media.

In the table designer, Indexes can be built by selecting the indexes tab, there is an order button to sort the index in ascending or descending order, the name textbox is used to enter the name of the index and the type textbox is used to enter the index type in the expression box. A filter box is provided for filter expressions with which records that satisfy certain conditions can be available for access and display.

4.2.2. Creating Table Structures And Relationships

In understanding exactly what information one want to store and the way a relationship is form in a database management system such as Visual FoxPro and the way visual stores date, the different entities identified in the system analysis and design stages will now be organized into separate tables. This adds flexibility to the database. Thus we have the following tables.

(a) Table 4.0: Products Table

Field Name	Date type	Field width	Description
Product-id	Character	4	Product identification number
Product- name	Character	50	Product Name
Qty- supplied	Numeric	12	Quantity supplied
Amount- paid	Numeric	12,2	Amount
Supplier-id	Character	4	Supplier of the product identifica
Rate	Numeric	10	Rate of payment
Date-supplied	Date	8	Date the product supplied
Officer	Character	30	Who received the product.

(b)Table 4.1: Suppliers Table

Field Name	Field type	Field width	Description
Supplier-id	Character	4	Suppliers identifying Nu
Supplier-Surname	Character	30	Suppliers Surname
Supplier- other name	Character	30	Suppliers other name
Title	Character	15	Suppliers title
Address	Memo	4	Address of the supplier
Photograph	General	4	Photograph of the suppli
Telephone	Character	30	
Fax	Character	30	
Company-id	Character	4	Company identification n

(c) Table 4.2: Category Table

Field Name	Date type	Width	Description
Category-id	Character	4	Identification number of the category
Category- name	Character	30	Category e.g. Stationery, Mechanical electrical Building & Materials

(d) Table 4.3. Employee Table

Field Name	Data type	Width	Description
Employee – id	Character	6	Employee Identification No.
Surname	Character	20	Employee Surname
Other name	Character	20	Employee other name
Title	Character	10	
Sex	Date	10	
Date of birth	Date	8	Date of birth
Date–appointment	Memo	8	Date of appointment
Address	Character	4	Address
Phone – extension	General	5	Phone extension number
Photograph	Memo	10	Passport or any photograph
Remark	Memo	4	
Access level	Character	20	
Password	Character	10	

(E) Table 4.5. Requisition Table

Field Name	Data type	Width	Description
Rf. No.	Character	4	
Dept. code	Character	4	Department code
Division code	Character	4	Division code
Product name	Character	30	Name of the product
Qty – required	Numbers	12	Quantity required
Qty – issued	Numbers	12	Quantity issued by the officer in charge
Date issued	Date	8	Date issue

Relationships of the tables were established by joining the related primary keys of the tables for instance, the product table is related to suppliers table through the primary key (supplier – id). It is a one to much relationship because one supplier can supply many products. Similarly, the requisition table was related to product table through the product – id.

4.3. IMPLEMENTING SECURITY

Database security involves restricting access to data. Unauthorized users should not have access to any data while other users should not have full access to certain data for example the data entry personnel cannot change employee information.

To implement security, two fields were added to the employee table, access level and password. To gain access to information in the database a user must complete a login form and supply the appropriate password. When the user login, the system can determine the access level of that user from the value in the access level field.

4.3.1. Maintaining Data Integrity

Protecting data integrity involves making sure that authorized users don't add, change or delete data that would make parts of the database invalid or inaccurate. For instance a supplier's name cannot be deleted when he/she has supply a product.

Data integrity management at the database level applies whether a user is changing values through forms in the application or directly in a browse window.

4.3.2. Defining Table Relationships

In view of the fact that visual FoxPro stores related data in separate tables, it is referred to as a relational database management system.

There are three types of relationships between tables: -

- One – to – many relationship
- Many – to – many relationship
- One to one relationship

One – To – Many Relationship

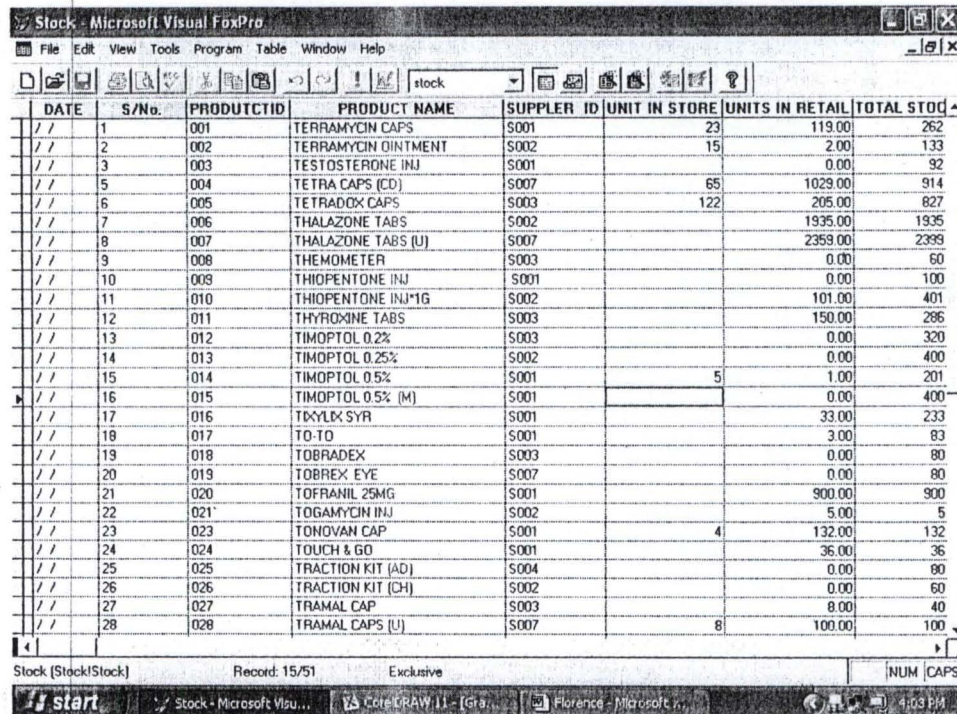
The one to many relationship is the relation in which a record in the primary table can be linked to many record in a related table, this is the common type of relationship in this project.

Many – To – Many Relationship

The many to many relationship is a relationship between tables where each record in each of the tables has many matching records in the related table. In a many to many relation the change in the database design is always a prerequisite. A junction table is usually created to normalize the design. The products and the suppliers' tables for example have many to many relationship because we have many suppliers and many products.

One-To-One

Two tables have a one-to-one relationship if each record in one table has a match if each record in one table has a match in the other. This project has no one to one relationship amongst tables. Tables store data in row and column format, the row represents a record while the

A screenshot of the Microsoft Visual FoxPro application window showing a table named 'Stock'. The table has 8 columns: DATE, S/No., PRODUCTID, PRODUCT NAME, SUPPLIER ID, UNIT IN STORE, UNITS IN RETAIL, and TOTAL STOCK. The data is displayed in a grid format with 28 rows. The status bar at the bottom indicates 'Record: 15/51' and 'Exclusive' mode.

DATE	S/No.	PRODUCTID	PRODUCT NAME	SUPPLIER ID	UNIT IN STORE	UNITS IN RETAIL	TOTAL STOCK
11/11	1	001	TERRAMYCIN CAPS	S001	23	119.00	262
11/11	2	002	TERRAMYCIN OINTMENT	S002	15	2.00	133
11/11	3	003	TESTOSTERONE INJ	S001		0.00	92
11/11	5	004	TETRA CAPS (CD)	S007	65	1029.00	914
11/11	6	005	TETRADOX CAPS	S003	122	205.00	827
11/11	7	006	THALAZONE TABS	S002		1935.00	1935
11/11	8	007	THALAZONE TABS (U)	S007		2359.00	2359
11/11	9	008	THEMOMETER	S003		0.00	60
11/11	10	009	THIOPENTONE INJ	S001		0.00	100
11/11	11	010	THIOPENTONE INJ*1G	S002		101.00	401
11/11	12	011	THYROXINE TABS	S003		150.00	286
11/11	13	012	TIMOPTOL 0.2%	S003		0.00	320
11/11	14	013	TIMOPTOL 0.25%	S002		0.00	400
11/11	15	014	TIMOPTOL 0.5%	S001	5	1.00	201
11/11	16	015	TIMOPTOL 0.5% (M)	S001		0.00	400
11/11	17	016	TOLYX SYR	S001		33.00	233
11/11	18	017	TO-TO	S001		3.00	83
11/11	19	018	TOBRADEX	S003		0.00	80
11/11	20	019	TOBREX EYE	S007		0.00	80
11/11	21	020	TOFRANIL 25MG	S001		900.00	900
11/11	22	021	TOGAMYCIN INJ	S002		5.00	5
11/11	23	023	TONOVAN CAP	S001	4	132.00	132
11/11	24	024	TOUCH & GO	S001		36.00	36
11/11	25	025	TRACTION KIT (AD)	S004		0.00	80
11/11	26	026	TRACTION KIT (CH)	S002		0.00	60
11/11	27	027	TRAMAL CAP	S003		8.00	40
11/11	28	028	TRAMAL CAPS (U)	S007	8	100.00	100

column represents a field.

4.3.3. Referential Integrity

Referential Integrity was implemented at the database level using the referential Integrity Builder for all parent tables in the database, when a key value is changed, that change is also made in the child tables. Users cannot delete records in other parent tables if there are related records in a child table.

4.3.4. Creation of Interfaces

Four types of forms were designed for the application.

- Information displaying forms
- Access form
- Data entry forms
- Menu's submenu's and options displaying forms

(1) Information displaying Forms

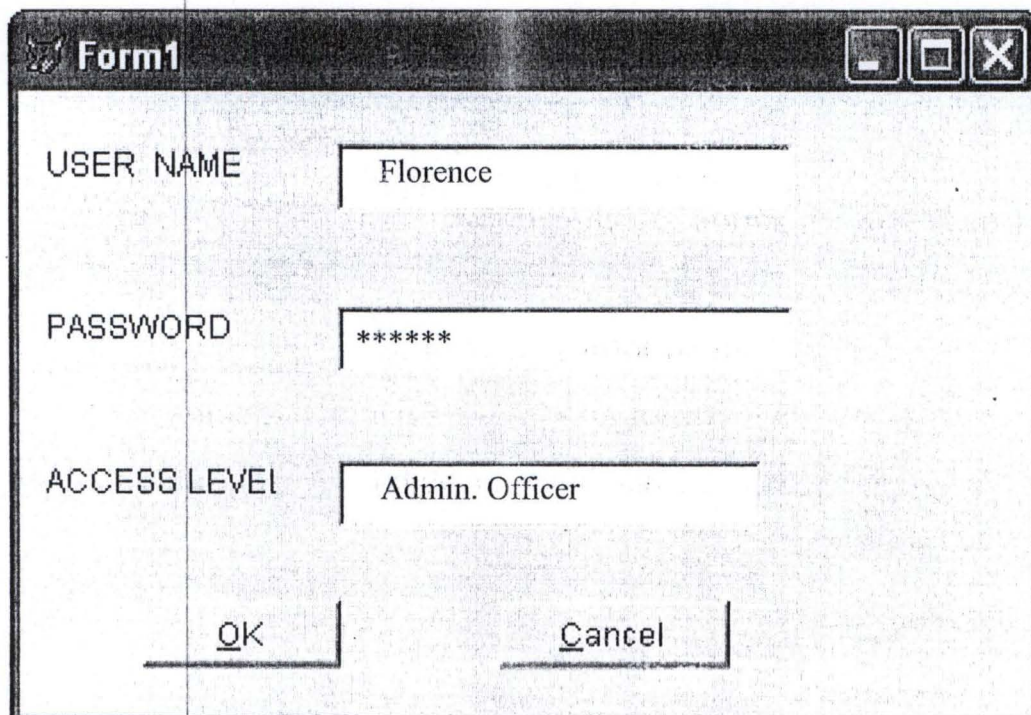
These forms were designed to display information.

- The welcome screen plays the sign on forms where the name of the application, version and developers' name.
- The bye – bye screen which display the sign – off form when the application is shafting down.

(2) Access Form

This is the form, displayed immediately after the welcome screen.

This is the login form were the user types his her name access level and password. The form is as shown below: -



The image shows a screenshot of a Windows-style application window titled "Form1". The window contains a login form with three input fields and two buttons. The first field is labeled "USER NAME" and contains the text "Florence". The second field is labeled "PASSWORD" and contains seven asterisks "*****". The third field is labeled "ACCESS LEVEL" and contains the text "Admin. Officer". At the bottom of the form are two buttons: "OK" and "Cancel". The window has a standard Windows title bar with minimize, maximize, and close buttons.

USER NAME	Florence
PASSWORD	*****
ACCESS LEVEL	Admin. Officer
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

The Name and the access level are displayed as typed but the password is displayed in asterisks for security reason. If the user is graded access on checking OK, the form is released and the name menu displayed or else the application shut down.

(3) Menu, submenu and option Displaying Form

These are forms designed for displaying menu, sub menu items and options. Main menu form contains options for data entry, reports, inquiry, system administration and quit submenus. The data entry sub menu contains option for adding, deleting and modifying records, inquiry sub-menu contain, options for inquiring by supplier, product, product category. Report submenu gives the options for various reports by the system while system administration submenu have option for user maintenance back up of files, restore file from backup and audit trail.

4.3.5. Data Entry Forms

These are data bounded forms designed from the created tables. They contained controls representing fields of these tables. They provide the following functionalities.

- Table Navigation: - Moving through the records in the table, from first records, next record, going.
- Previous record and last record.
- Management of user access to data
- Interface co-ordination

Examples of these forms are employee form, products form etc.

4.4. CREATION OF REPORTS AND QUERIES

4.4.1. Designing Queries

Queries are ways of retrieving data from tables using some selection criteria. The selection process may involve more than one table with at least a related field satisfying one more filtering conditions. The output of the query can be a form, a report form or a browse window. They are quick way of obtaining results.

- Enquiry on a product
- Enquiry on a supplier
- Enquiry on an employee
- Enquiry on category of a product.

4.4.2. Reports

Reports are formal output of an application, a report may be based on a table, two or more tables. Reports of the system were designed from tables and views, which are result of selected statement (SQL). For instance, the report of all items or all supplier, were generated from the product and suppliers table respectively, while reports of a specific item or a group of supplier satisfying a given criteria were created from views composed using the value supplied by the user.

4.5. BUILDING THE PROJECTS

After all the components of the application were designed the main program controlling the project was built into executive file with EXE extension which make it possible to be install many computers and any user computer need not to own a copy of Visual FoxPro.

4.6. SYSTEM TEST

Having established the hardware and software for the new computerized system, it is of immense importance to carry out a thorough and systematic system test. This test will involve the hardware components, the software and procedures used applied in the new system. Obviously some of the work patterns of the staff will change and there must be some change of status. The test is necessary to discover how the staff adapts to these changes and for the removal of bottleneck if any.

4.7. CONVERSION

Conversion is the process of changing over from an old information system to a new one.

There are four types of conversions commonly used; Direct Conversion, Parallel Conversion, Pilot Conversion and Phased Conversion.

Direct Conversion: this is the process of changing from the old information system to the new one in one fold expensive move. This mode of conversion though least is highly risky and is not recommended for this project

Parallel Conversion: This process operates the old and the new information side by side until the new system is certified to be reliable. This system of conversion is less risky but more expensive than the direct conversion.

Pilot Conversion: This pilot conversion process applies the new information system to only a part of the organization, until it is proven before being applied to other parts of the organisation

Phased Conversion: The phased conversion method is the process of introducing the new system piece by piece, with the new system gradually replacing the old.

The phased conversion is less risky than the direct conversion and enables the analyst to learn from mistakes, it also entails fewer disruptions in the operations.

The last option – phased conversion will be adopted for this project due to these advantages.

4.8. TRAINING

There is the need of an intensive training before and during take – off of the new system. The training will include the data – entry operators, computer operators.

4.9. ESTABLISHING SAFETY STOCK BY SERVICES

After the stage of system test, we need to establish safety stock to provide some land of protection against stock outs in organization. The general literature on this subject of safety stocks contain two approaches relating to the demand for inventory that is to be protected.

- i) The probability that demand will exceed some specific amount.
For example, an objective may beset, like the safety stock level

so that there will only be a small percent chance that will demand certain units of products within limit scheduled.

- ii) This deals with the expected number of units that will be out of stock. For example, an objective is set on an inventory level, so that we will be able know the percentage of demand to make at a certain time.

4.9.1. Service Level

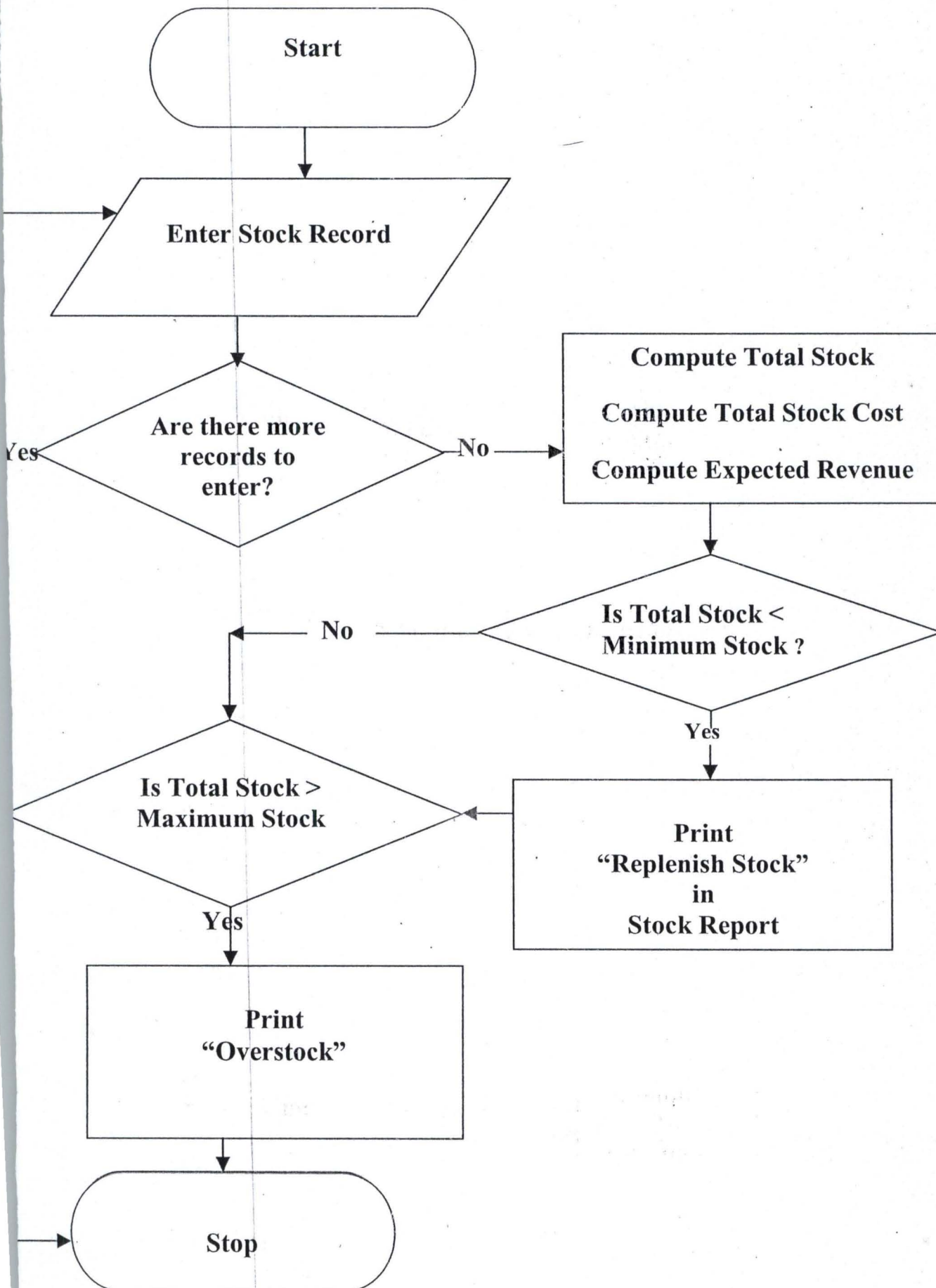
Safety stock can be defined as that stock that is carried in addition to the expected demand to provide some level of protection against stock out. In determining the amount of safety stock that should be carried, a term frequently used is "service level".

4.10. MAINTENANCE

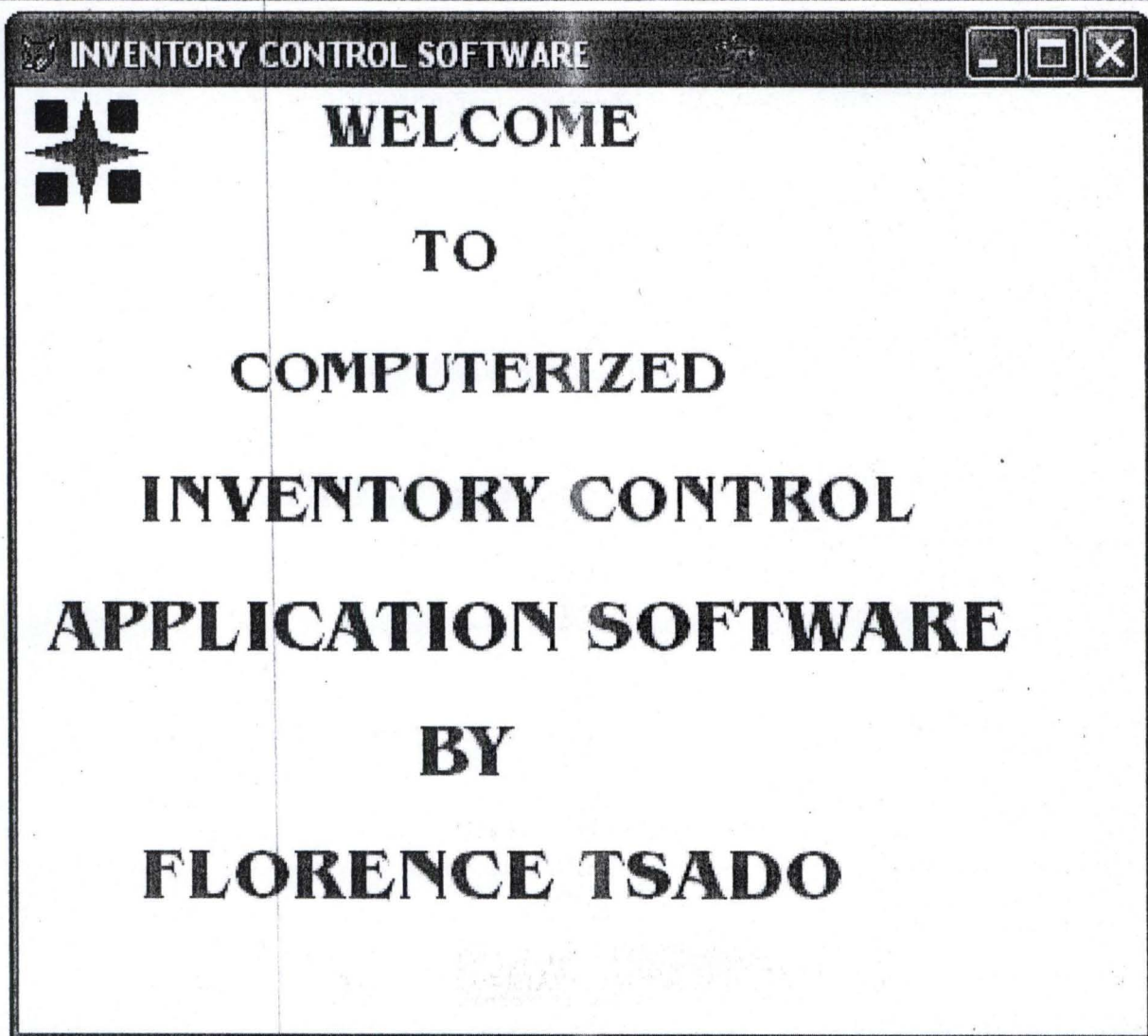
No matter how carefully a new information system implementation is handled, it only not run along by it self. A maintenance exercise is usually established to monitor and evaluate the new system modification.

Systems reviews need to be conducted consistently and periodically beginning immediately after the take off of the new information system. The Systems Analyst or Computer Administrator as the case may be, need to check on the reliability, efficiency training program, targets and goals of the new information system at every point in time to ensure that the huge investment incurred in establishing the new system is justified.

FLOW CHART FOR INVENTORY CONTROL PROGRAM



PROGRAM OUTPUT



WELCOME SCREEN




INPUT FORMS

STOCK			
INVENTORY CONTROL FORM			
DATE:	05/05/2002	S.No.:	48
PRODUCTID:	048	PRODUCT NAME:	URINE BAG
SUPPLIER ID:	S012	UNIT IN STORE:	190
UNITS IN RETAIL:	21.00	UNIT COST:	\$17.00
UNIT PRICE:	\$21.00	REORDER LEVEL:	15
MAXIMUM STOCK:	1,000	MINIMUM STOCK:	10
SALE:			
<div>Top Prev Next Bottom Find Print Save Revert Delete Exit</div>			

STOCK DATA ENTRY FORM

STOCK	
PURCHASES	
DATE:	11
PRODUCTID:	001
PRODUCT NAME:	TERRAMYCIN CAPS
UNITS PURCHASED:	60
<div>Top Prev Next Bottom Find Print Add Edit Delete Exit</div>	

PURCHASES DATA ENTRY FORM

SALE RECORDS FORM		  							
SALE RECORDS FORM									
DATE:	<input type="text" value="11/10/2002"/>								
PRODUTCTID:	<input type="text" value="001"/>								
PRODUCT NAME:	<input type="text" value="TERRAMYCIN CAPS"/>								
SALE:	<input type="text" value="60"/>								
<hr/>									
Top	Prev	Next	Bottom	Find	Print	Add	Edit	Delete	Exit

SALE DATA ENTRY FORM

ZAGBAYI PHARMACY

INVENTORY CONTROL REPORT

PRODUCT NAME	TOTAL STOCK	REMARKS
	0	REPLENISH STOCK
	0	
TERRAMYCIN OINTMENT	133	
TESTOSTERONE INJ	92	REPLENISH STOCK
TETMOSOL	88	
TETMOSOL SOAP	4	
TETRA CAPS (CD)	914	
TETRADOX CAPS	827	
THALAZONE TABS	1,935	
THALAZONE TABS (U)	2,399	
THERMOMETER	60	REPLENISH STOCK
THIOPENTONE INJ	100	
THIOPENTONE INJ*1G	401	
THYROXINE TABS	286	
TIMOPTOL 0.2%	320	
TIMOPTOL 0.25%	400	
TIMOPTOL 0.5%	201	
TIMOPTOL 0.5% (M)	400	
TIXYLIX SYR	233	
TO-TO	83	
TOBRADEX	80	
TOBREX EYE	80	
TOFRANIL 25MG	900	
TOGAMYCIN INJ	5	REPLENISH STOCK
TONOVAN CAP	132	
TOUCH & GO	36	
TRACTION KIT (AD)	80	
TRACTION KIT (CH)	60	

ZAGBAYI PHARMACY

INVENTORY CONTROL REPORT

PRODUCT NAME	TOTAL STOCK	REMARKS
TRAMAL CAP	40	
TRAMAL CAPS (U)	100	
TRAMAL INJ	20	
TRANCOPAL TABS	100	
TRANSVASIN CREAM	18	
TRIANGULAR BANG	100	
TRICEFIN INJ	100	
TROSYD CREAM	12	
TROSYD POWDER	1	REPLENISH STOCK
TRYPTIZOLE 25MG	1,701	
TUSSIREX P SYR	61	
TYZINE N/ DROPS	0	REPLENISH STOCK
UIFECARD RETARD	1,677	
ULTRA REGULAR *10	1	REPLENISH STOCK
ULTRA SUPER*8	40	
UNASYN CAP	3	REPLENISH STOCK
UNASYN INJ	1	REPLENISH STOCK
UNASYN SYR	60	
UNGRAFIIN INJ	60	
UNISOM CAPSULES	40	
UNISOM TABS (CD)	40	
URO TARIVID TABS	0	REPLENISH STOCK
URINE BAG	21	

ZAGBAYI PHARMACY

PURCHASES REPORT

PRODUCT NAME	UNITS PURCHASED	UNIT COST	COST OF PURCHASE
THALAZONE TABS	0	1835.0000	0.00
THALAZONE TABS (U)	10	4440.0000	44,400.00
THERMOMETER	15	35.0000	525.00
THIOPENTONE INJ	25	90.0000	2,250.00
THIOPENTONE INJ*1G	75	100.0000	7,500.00
THYROXINE TABS	34	145.6000	4,950.40
TIMOPTOL 0.2%	80	220.0000	17,600.00
TIMOPTOL 0.25%	100	300.0000	30,000.00
TIMOPTOL 0.5%	50	400.0000	20,000.00
TIMOPTOL 0.5% (M)	100	400.0000	40,000.00
TIXYLIX SYR	50	65.0000	3,250.00
TO-TO	20	45.0000	900.00
TOBRADEX	20	581.0000	11,620.00
TOBREX EYE	20	388.0000	7,760.00
TOFRANIL 25MG	0	854.0000	0.00
TOGAMYCIN INJ	0	440.0000	0.00
TONOVAN CAP	0	31.6700	0.00
TOUCH & GO	0	116.6600	0.00
TRACTION KIT (AD)	20	250.0000	5,000.00
TRACTION KIT (CH)	15	140.0000	2,100.00
TRAMAL CAP	8	24.0000	192.00

CHAPTER FIVE

5.0. GENERAL EVALUATION

From the investigation, analysis and findings in this project, it is evident that the importance of inventory control in our organizations cannot be overemphasized.

From the study carried out, it was observed that an organization constructing a database will put into consideration only the data it impact to use for obvious economic reasons. The computer is being increasingly used as the center of a communication network. Many organizations are replacing the traditional data processing with computerized information system.

There should be integrated system, which extends the database to include all information flow in a business automates many "decisions" as possible to produce comprehensive management information system.

5.1. CONCLUSION

The objective of this project has been to reverse the trend at which the inventory control process is slow and inefficient and to proffer an alternative that is fast, structured and efficient. It is of great importance to every firm to concern itself with inventories because inventories perform a lot of vital function for the smooth and effective running of the organization.

They serve to offset errors contained in the forecast of the demand for the company's product. With inventories materials and purchased goods could be scheduled to be delivered at the specific times at which they are needed. Also, goods could be scheduled to be received

at the specific times at which they were required to meet the customer's demand.

Inventories permit more economical utilization of manpower, when the nature of the business is such that fluctuations in demand exist. The computerization of the inventory control of the pharmacy with the new program will reduce to the barest minimum the consumption of time in preparation of inventory.

5.2. RECOMMENDATION

I hereby recommend the following: -

1. That for the new system to work efficiently, the implementation strategies enunciated above need to be religiously adhered to.
2. That staff should be properly trained and if possible, there is the need for the pharmacist in charge of the Pharmacy to employ the services of at least one systems analyst and one programmer.
3. Finally, Computer databases should be interconnected in a network to enhance exchange of data and information.

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APPENDIX I

(1) THE MAIN PROGRAM

SET DEVICE TO SCREEN
SET SYSMENU OFF
CLOSE ALL
CLEAR
SET SAFETY OFF
SET BELL OFF
SET CENTURY ON
SET STATUS OFF
*SET CURSOR ON
*SET CONFIRM ON
SET ESCAPE ON
*SET HELP ON
SET DATE TO BRITISH
SET HOURS TO 12

CLEAR
SET PATH TO C:\INVENTORY
set dire to C:\INVENTORY
set defa to C:\INVENTORY
OPEN DATABASE STOCK
SET DATABASE TO STOCK
_SCREEN.Backcolor = RGB(255,192,255)
_SCREEN.Caption = "INVENTORY CONTROL "

_SCREEN.PICTURE = ""
_SCREEN.ICON = ""

SET PATH TO C:\INVENTORY
sele 0
use STOCK again exclusive
sele 1
use REQUISITION again exclusive
sele 2
use SUPPLIER again

DO FORM LOGIN
READ EVENTS
DO SYSENVIRONMENT
RETURN

(2) THE SYSTEM ENVIRONMENT PROGRAM

```
SET TALK ON
SET NOTIFY ON
SET CLOCK OFF
SET COMPATIBLE OFF
SET PALETTE ON
SET BELL ON
SET BELL TO ", 1
SET SAFETY ON
SET ESCAPE ON
SET LOGERRORS ON
SET KEYCOMP TO WINDOWS
SET CARRY OFF
SET CONFIRM OFF
SET BROWSEIMECONTROL OFF
SET STRICTDATE TO 1
&& TabOrdering = 0
&& ResWidth = 640
&& ResHeight = 480
&& GridHorz = 12
&& GridVert = 12
&& ScaleUnits = 0
&& FormSetLib =
&& FormSetClass =
&& FormsLib =
&& FormsClass =
SET EXACT OFF
SET NEAR OFF
SET ANSI OFF
SET LOCK OFF
SET EXCLUSIVE ON
*SET MULTILOCKS OFF
SET HEADINGS ON
SET DELETED OFF
SET OPTIMIZE ON
SET UNIQUE OFF
SET CPDIALOG ON
SET REFRESH TO 0,5
SET ODOMETER TO 100
SET BLOCKSIZE TO 64
SET REPROCESS TO 0
SET COLLATE TO ""
&& SCCProvider =
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VF98\SCCTEXT.PRG" TO
_SCCTEXT
&& ProjectHookLib =
&& ProjectHookClass =
&& CrsBuffering = 1
&& CrsMethodUsed = 1
&& CrsWhereClause = 3
&& CrsFetchSize = 100
&& CrsMaxRows = -1
&& CrsNumBatch = 1
&& CrsUseMemoSize = 255
```

```

&& SQLDispLogin = 1
&& SQLTransactions = 1
&& SQLConnectTimeOut = 15
&& SQLIdleTimeOut = 0
&& SQLQueryTimeOut = 0
&& SQLWaitTime = 100
&& TMPFILES = c:\windows\temp
SET PATH TO
&& HelpTo = c:\program files\microsoft visual studio\msdn98\98vs\1033\msdnvs98.col
SET HELP ON
SET HELP TO "c:\program files\microsoft visual studio\msdn98\98vs\1033\msdnvs98.col"
&& ResourceTo = c:\program files\microsoft visual studio\vfp98\foxuser.dbf
SET RESOURCE ON
SET RESOURCE TO "c:\program files\microsoft visual studio\vfp98\foxuser.dbf"
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\WIZARD.APP" TO _WIZARD
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\BUILDER.APP" TO
_BUILDER
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\CONVERT.APP" TO
_CONVERTER
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\SPELLCHK.APP" TO
_SPELLCHK
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\GENMENU.FXP" TO
_GENMENU
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\BROWSER.APP" TO
_BROWSER
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\GALLERY.APP" TO
_GALLERY
STORE "" TO _INCLUDE
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\BEAUTIFY.APP" TO
_BEAUTIFY
STORE "" TO _GETEXPR
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\GENHTML.PRG" TO
_GENHTML
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\RUNACTD.PRG" TO
_RUNACTIVEDOC
STORE "" TO _STARTUP
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL
STUDIO\MSDN98\98VS\1033\SAMPLES\VFP98\" TO _SAMPLES
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\COVERAGE.APP" TO
_COVERAGE
SET SYSFORMATS OFF
SET SECONDS ON
SET CENTURY OFF
&& CurrSymbol = $
SET CURRENCY LEFT
SET CURRENCY TO "$"
SET HOURS TO 12
SET DATE TO AMERICAN
SET DECIMALS TO 2
SET FDOW TO 1
SET FWEEK TO 1
SET MARK TO ""
SET SEPARATOR TO ","
SET POINT TO "."
&& DebugEnvironment = 0
SET TRBETWEEN OFF

```



```

STORE 0.00 TO _THROTTLE
&& DebugOutputFileName =
&& TraceFontName = Courier New
&& TraceFontSize = 10
&& TraceFontStyle = 0
&& WatchFontName = MS Sans Serif
&& WatchFontSize = 8
&& WatchFontStyle = 0
&& LocalsFontName = MS Sans Serif
&& LocalsFontSize = 8
&& LocalsFontStyle = 0
&& OutputFontName = MS Sans Serif
&& OutputFontSize = 8
&& OutputFontStyle = 0
&& CallstackFontName = MS Sans Serif
&& CallstackFontSize = 8
&& CallstackFontStyle = 0
&& TraceNormalColor = RGB(0,0,0,255,255,255), Auto, Auto
&& TraceExecutingColor = RGB(255,255,0,0,0,0), NoAuto, Auto
&& TraceCallstackColor = RGB(0,0,0,192,192,192), Auto, Auto
&& TraceBreakpointColor = RGB(255,0,0,0,0,0), NoAuto, Auto
&& TraceSelectedColor = RGB(255,255,255,0,0,0), Auto, Auto
&& WatchNormalColor = RGB(0,0,0,255,255,255), Auto, Auto
&& WatchSelectedColor = RGB(255,255,255,0,0,0), Auto, Auto
&& WatchChangedColor = RGB(255,0,0,255,255,255), NoAuto, Auto
&& LocalsNormalColor = RGB(0,0,0,255,255,255), Auto, Auto
&& LocalsSelectedColor = RGB(255,255,255,0,0,0), Auto, Auto
&& OutputNormalColor = RGB(0,0,0,255,255,255), Auto, Auto
&& OutputSelectedColor = RGB(255,255,255,0,0,0), Auto, Auto
&& CallstackNormalColor = RGB(0,0,0,255,255,255), Auto, Auto
&& CallstackSelectedColor = RGB(255,255,255,0,0,0), Auto, Auto
SET TALK ON
SET NOTIFY ON
SET CLOCK OFF
SET COMPATIBLE OFF
SET PALETTE ON
SET BELL ON
SET BELL TO ", 1
SET SAFETY ON
SET ESCAPE ON
SET LOGERRORS ON
SET KEYCOMP TO WINDOWS
SET CARRY OFF
SET CONFIRM OFF
SET BROWSEIMECONTROL OFF
SET STRICTDATE TO 1
&& TabOrdering = 0
&& ResWidth = 640
&& ResHeight = 480
&& GridHorz = 12
&& GridVert = 12
&& ScaleUnits = 0
&& FormSetLib =
&& FormSetClass =
&& FormsLib =
&& FormsClass =

```



```

SET EXACT OFF
SET NEAR OFF
SET ANSI OFF
SET LOCK OFF
SET EXCLUSIVE ON
SET MULTLOCKS OFF
SET HEADINGS ON
SET DELETED OFF
SET OPTIMIZE ON
SET UNIQUE OFF
SET CPDIALOG ON
SET REFRESH TO 0,5
SET ODOMETER TO 100
SET BLOCKSIZE TO 64
SET REPROCESS TO 0
SET COLLATE TO ""
&& SCCProvider =
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\SCCTEXT.PRG" TO
_SCCTEXT
&& ProjectHookLib =
&& ProjectHookClass =
&& CrsBuffering = 1
&& CrsMethodUsed = 1
&& CrsWhereClause = 3
&& CrsFetchSize = 100
&& CrsMaxRows = -1
&& CrsNumBatch = 1
&& CrsUseMemoSize = 255
&& SQLDispLogin = 1
&& SQLTransactions = 1
&& SQLConnectTimeOut = 15
&& SQLIdleTimeOut = 0
&& SQLQueryTimeOut = 0
&& SQLWaitTime = 100
&& TMPFILES = c:\windows\temp
SET PATH TO
&& HelpTo = c:\program files\microsoft visual studio\msdn98\98vs\1033\msdnvs98.col
SET HELP ON
SET HELP TO "c:\program files\microsoft visual studio\msdn98\98vs\1033\msdnvs98.col"
&& ResourceTo = c:\program files\microsoft visual studio\vfp98\foxuser.dbf
SET RESOURCE ON
SET RESOURCE TO "c:\program files\microsoft visual studio\vfp98\foxuser.dbf"
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\WIZARD.APP" TO _WIZARD
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\BUILDER.APP" TO
_BUILDER
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\CONVERT.APP" TO
_CONVERTER
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\SPELLCHK.APP" TO
_SPELLCHK
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\GENMENU.FXP" TO
_GENMENU
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\BROWSER.APP" TO
_BROWSER
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\GALLERY.APP" TO
_GALLERY
STORE "" TO _INCLUDE

```



```

STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\BEAUTIFY.APP" TO
_BEAUTIFY
STORE "" TO _GETEXPR
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\GENHTML.PRG" TO
_GENHTML
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\RUNACTD.PRG" TO
_RUNACTIVEDOC
STORE "" TO _STARTUP
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL
STUDIO\MSDN98\98VS\1033\SAMPLES\VFP98\" TO _SAMPLES
STORE "C:\PROGRAM FILES\MICROSOFT VISUAL STUDIO\VFP98\COVERAGE.APP" TO
_COVERAGE

```

```

SET SECONDS ON
SET CENTURY OFF
&& CurrSymbol = $
SET CURRENCY LEFT
SET CURRENCY TO "$"
SET HOURS TO 12
SET DATE TO AMERICAN
SET DECIMALS TO 2
SET FDOW TO 1
SET FWEEK TO 1
SET MARK TO ""
SET SEPARATOR TO ","
SET POINT TO "."
&& DebugEnvironment = 0
SET TRBETWEEN OFF
STORE 0.00 TO _THROTTLE
&& DebugOutputFileName =
&& TraceFontName = Courier New
&& TraceFontSize = 10
&& TraceFontStyle = 0
&& WatchFontName = MS Sans Serif
&& WatchFontSize = 8
&& WatchFontStyle = 0
&& LocalsFontName = MS Sans Serif
&& LocalsFontSize = 8
&& LocalsFontStyle = 0
&& OutputFontName = MS Sans Serif
&& OutputFontSize = 8
&& OutputFontStyle = 0
&& CallstackFontName = MS Sans Serif
&& CallstackFontSize = 8
&& CallstackFontStyle = 0
&& TraceNormalColor = RGB(0,0,0,255,255,255), Auto, Auto
&& TraceExecutingColor = RGB(255,255,0,0,0,0), NoAuto, Auto
&& TraceCallstackColor = RGB(0,0,0,192,192,192), Auto, Auto
&& TraceBreakpointColor = RGB(255,0,0,0,0,0), NoAuto, Auto
&& TraceSelectedColor = RGB(255,255,255,0,0,0), Auto, Auto
&& WatchNormalColor = RGB(0,0,0,255,255,255), Auto, Auto
&& WatchSelectedColor = RGB(255,255,255,0,0,0), Auto, Auto
&& WatchChangedColor = RGB(255,0,0,255,255,255), NoAuto, Auto
&& LocalsNormalColor = RGB(0,0,0,255,255,255), Auto, Auto
&& LocalsSelectedColor = RGB(255,255,255,0,0,0), Auto, Auto
&& OutputNormalColor = RGB(0,0,0,255,255,255), Auto, Auto

```


&& OutputSelectedColor = RGB(255,255,255,0,0,0), Auto, Auto
&& CallstackNormalColor = RGB(0,0,0,255,255,255), Auto, Auto
&& CallstackSelectedColor = RGB(255,255,255,0,0,0), Auto, Auto

CLOSE ALL
_SCREEN.Backcolor = RGB(255,255,255)
_SCREEN.Caption = "Microsoft Visual FoxPro"

(3) THE PURCHASE PROGRAM

close all
set dire to C:\INVENTORY
set defau to C:\INVENTORY
open database STOCK

IF USED("STOCK")
USE STOCK
ELSE
SELECT 0
USE STOCK
ENDIF

REPLACE ALL TOTALSTOCK WITH Totalstock + Units_Purchased
REPLACE ALL Remarks WITH " " FOR Totalstock >= Min_Stock_Level
REPLACE ALL Purchasecost With Units_Purchased*Unit_Cost

(4) SALES PROGRAM

close all
set dire to C:\INVENTORY
set defau to C:\INVENTORY
open database STOCK

IF USED("STOCK")
USE STOCK
ELSE
SELECT 0
USE STOCK
ENDIF

IF Sale < Totalstock
REPLACE ALL Totalstock With Totalstock - Sale
REPLACE ALL Remarks With "Replenish Stock" For Totalstock < Min_Stock_Level
REPLACE ALL Remarks With "Over Stock" For Totalstock > Max_Stock_Level
REPLACE ALL Sales_Revenue With Sale*Unit_Price
ENDIF

(5) TOTAL (SUMMATION) PROGRAM

clear
close all
set dire to C:\INVENTORY
set defau to C:\INVENTORY
open database STOCK

IF USED("STOCK")
USE STOCK


```

ELSE
    SELECT 0
    USE STOCK
ENDIF

```

```

REPLACE ALL Totalstock With Unitsretail + Unitstore
REPLACE ALL Totalstockcost With Unit_Cost * Totalstock
REPLACE ALL Expected_Revenue With Unit_Price * Totalstock

```

(6) REPLENISH PROGRAM

```

close all
set dire to C:\INVENTORY
set defau to C:\INVENTORY
open database STOCK

```

```

IF USED("STOCK")
    USE STOCK
ELSE
    SELECT 0
    USE STOCK
ENDIF

```

```

REPLACE ALL Remarks With "Replenish Stock" For Totalstock < Min_Stock_Level
REPLACE ALL Remarks With "Over Stock" For Totalstock > Max_Stock_Level

```

```

* *****
*
* * 11/13/03      INVENTORY.MPR      02:52:24
*
* *****
*
* * Author's Name
*
* * Copyright (C) 2003 Company Name
*
* * Address
*
* * City,  Zip
*
* * Description:
*
* * This PROGRAM was automatically generated BY GENMENU.
*
* *****
*
* *****

```

* *
* *
* *

Menu Definition

* *****
*

SET SYSMENU TO
SET SYSMENU AUTOMATIC

DEFINE PAD _13e065ptr OF _MSYMENU PROMPT "Form" COLOR SCHEME 3 ;
KEY ALT+F, ""
DEFINE PAD _13e065pts OF _MSYMENU PROMPT "Report" COLOR SCHEME 3 ;
KEY ALT+R, ""
DEFINE PAD _13e065ptt OF _MSYMENU PROMPT "Quit" COLOR SCHEME 3 ;
KEY ALT+Q, ""
ON PAD _13e065ptr OF _MSYMENU ACTIVATE POPUP form
ON PAD _13e065pts OF _MSYMENU ACTIVATE POPUP report
ON SELECTION PAD _13e065ptt OF _MSYMENU ;
DO _13e065ptu ;
IN LOCFILE("\INVENTORY\INVENTORY" ,"MPX;MPR|FXP;PRG" ,"WHERE is
INVENTORY?")

DEFINE POPUP form MARGIN RELATIVE SHADOW COLOR SCHEME 4
DEFINE BAR 1 OF form PROMPT "Inventory"
DEFINE BAR 2 OF form PROMPT "Purchase"
DEFINE BAR 3 OF form PROMPT "Sale"
ON SELECTION BAR 1 OF form ;
DO _13e065pu1 ;
IN LOCFILE("\INVENTORY\INVENTORY" ,"MPX;MPR|FXP;PRG" ,"WHERE is
INVENTORY?")
ON SELECTION BAR 2 OF form ;
DO _13e065pu2 ;
IN LOCFILE("\INVENTORY\INVENTORY" ,"MPX;MPR|FXP;PRG" ,"WHERE is
INVENTORY?")
ON SELECTION BAR 3 OF form ;
DO _13e065pu3 ;


```
IN LOCFILE("INVENTORY\INVENTORY" ,"MPX;MPR|FXP;PRG" ,"WHERE is
INVENTORY?")
```

```
DEFINE POPUP report MARGIN RELATIVE SHADOW COLOR SCHEME 4
```

```
DEFINE BAR 1 OF report PROMPT "Inventory Control"
```

```
DEFINE BAR 2 OF report PROMPT "Purchases"
```

```
DEFINE BAR 3 OF report PROMPT "Sales"
```

```
ON SELECTION BAR 1 OF report ;
```

```
DO _13e065pu4 ;
```

```
IN LOCFILE("INVENTORY\INVENTORY" ,"MPX;MPR|FXP;PRG" ,"WHERE is
INVENTORY?")
```

```
ON SELECTION BAR 2 OF report ;
```

```
DO _13e065pu5 ;
```

```
IN LOCFILE("INVENTORY\INVENTORY" ,"MPX;MPR|FXP;PRG" ,"WHERE is
INVENTORY?")
```

```
ON SELECTION BAR 3 OF report ;
```

```
DO _13e065pu6 ;
```

```
IN LOCFILE("INVENTORY\INVENTORY" ,"MPX;MPR|FXP;PRG" ,"WHERE is
INVENTORY?")
```

```
* *****
```

```
* *
```

```
* *_13E065PTU ON SELECTION PAD
```

```
* *
```

```
* * Procedure Origin:
```

```
* *
```

```
* * From Menu: INVENTORY.MPR, Record: 13
```

```
* * Called By: ON SELECTION PAD
```

```
* * Prompt: Quit
```

```
* * Snippet: 1
```

```
* *
```

```
* *****
```

```
*
```

```
PROCEDURE _13e065ptu
```

```
ans = MESSAGEBOX("Are you sure you want to quit?", 4 + 32, "Please Confirm")
```

```
IF ans = 6
```

clear all
CLOSE ALL
CLEAR EVENTS

ENDIF
clear all
CLOSE ALL

```
* *****  
* *  
* * _13E065PU1 ON SELECTION BAR 1 OF POPUP form  
* *  
* * Procedure Origin:  
* *  
* * From Menu: INVENTORY.MPR,      Record:  5  
* * Called By: ON SELECTION BAR 1 OF POPUP form  
* * Prompt:   Inventory  
* * Snippet:  2  
* *  
* *****  
*
```

PROCEDURE _13e065pu1
Do form Inventory

```
* *****  
* *  
* * _13E065PU2 ON SELECTION BAR 2 OF POPUP form  
* *  
* * Procedure Origin:  
* *  
* * From Menu: INVENTORY.MPR,      Record:  6  
* * Called By: ON SELECTION BAR 2 OF POPUP form  
* * Prompt:   Purchase  
* * Snippet:  3
```



```

*
*
* *****
*

```

PROCEDURE _13e065pu2

Do form purchase

```

* *****
*
*
* _13E065PU3 ON SELECTION BAR 3 OF POPUP form
*
*
* * Procedure Origin:
*
*
* * From Menu: INVENTORY.MPR,      Record: 7
*
* * Called By: ON SELECTION BAR 3 OF POPUP form
*
* * Prompt:   Sale
*
* * Snippet:  4
*
*
* *****
*

```

PROCEDURE _13e065pu3

do form sale

```

* *****
*
*
* _13E065PU4 ON SELECTION BAR 1 OF POPUP report
*
*
* * Procedure Origin:
*
*
* * From Menu: INVENTORY.MPR,      Record: 10
*
* * Called By: ON SELECTION BAR 1 OF POPUP report
*
* * Prompt:   Inventory Control
*
* * Snippet:  5
*
*
* *****
*

```

PROCEDURE _13e065pu4

REPORT FORM STOCK PREVIEW

```
* *****
*
* * _13E065PU5 ON SELECTION BAR 2 OF POPUP report
*
* * Procedure Origin:
*
* * From Menu: INVENTORY.MPR,      Record: 11
* * Called By: ON SELECTION BAR 2 OF POPUP report
* * Prompt:  Purchases
* * Snippet:  6
*
* *****
*
```

PROCEDURE _13e065pu5

REPORT FORM PURCHASES PREVIEW

```
* *****
```