COMPUTERISATION OF INVENTORY CONTROL SYSTEM.

(A Case Study of West African Portland Cement Company)

[WAPCO SHAGAMU]

By

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PGD/MCS/97/250

A PROJECT SUBMITTED TO THE DEPARTMENT OF MATHEMATICS/COMPUTER SCIENCE F .U . T . MINN, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF POST-GRADUATE DIPLOMA IN COMPUTER SCIENCE.

DECEMBER 1999

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ABSTRACT

This project ascertain the usefulness and the importance of a computerised inventory control system. Although WAPCO operates a partial method of computerised system, the proposed new system will enhance an improvement in terms of reliability, effectiveness, privacy and security.

A Dbase IV, a database management system (DBMS) for Micro-computer system that make use of menu driven rather than through programming is used for database interaction. The system design is to provide management with accurate and timely information, proper accountability and efficiency.

ACKNOWLEDGMENT

I sincerely thank my project supervisor, Prince R.O.BADAMOSI, for his understanding, guidance and tolerance during this project work. Am also indebted to Prof. R.K.ADEBOYE for his moral and academic advice. The entire staff, academic and non-academic members of the DEPARTMENT OF MATHEMATICS/COMPUTER SCIENCE FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.

My sincere thanks also goes to the OFFICERS and MEN of the NIGERIAN ARMY ENGINEER and SCHOOL for giving me the opportunity to come for my second degree.

To my beloved wife, MRS. ESTHER O. AZAGBA, my lovely children, MISS OGHENEFEGOR I. AZAGBA, MR. KESENA G. AZABGA, and MISS IRUOGHENE T. AZAGBA in loving appreciation of the many lonely Days and Nights they endured without complain in order to see me achieve my aim. To my late Father Chief JOHN OKPOFU AZAGBA and my lovely mother MRS. CELINA NAKOME AZAGBA, for indicating in me the benefits of education and their moral upbringing that helped me scale through many obstacles.

To my in-laws, Chief FREEBORN O. ETEKU and Chief (MRS) MARGARET ETEKU for their support and encouragement that led to my success. A very Big thank you to Prince PETER ONYEMAECHI AZABGA my elder brother.

At this juncture, I must not forget my friends and relations who in one way or the other contributed immensely both in kind and in cash toward my success, most especially to be mentioned includes, Chief Joseph OMORDI OSHILONYA of Michelin PLC PortHarcourt, MR. JOHN ANDA of "THE PRESIDENCY [NRMAFC] "Abuja. and MR. AND MRS. Samuel Aliyu of F. U. T. MINNA for their financial and moral support. MR. CHRISTIAN MADUAKOLAM, MRS. IKUBELA ADIM. May the Almighty God in HIS infinite mercy, reward and bless them according to their heart desires in Jesus Name Amen.

TO GOD BE THE GLORY AMEN.

DEDICATION

This project work is dedicated to the living memory of my late father Chief John Okpofu Azagba

CHAPTER ONE

INTRODUCTION:-

In every organisation, inventory control is of a paramount importance to the functions of production control. The problem of inventory arises whenever there is something to be stored to meet a future demand. An inventory, therefore, is any resources (Men, Material, money and machine) that has value because it can satisfy future needs.

The management of inventories, fall under two closely related functions viz:

(a) PLANNING FOR INVENTORIES and

(b) CONTROL OF INVENTORIES.

The Planning aspect is concerned with such decisions as what to store or produce, where and Best source for the procurement of goods, what are the most economical arrangements for transportation, storage, inspection, etc.

The control aspect which is the base and the area of consideration in this project is concerned with decisions such as when to order or produce, how much to order or produce and what type of inventory (Max. profit) cost.

The heart of any inventory control system is an appropriate model that expresses relationship between a criterion variable such as total cost or profit and a set of decision variable such as order quantity (Q). We shall restrict our attention to

models that have "Total inventory cost" (T) as the criterion variable and either the order quantity (Q) or the level of safety stock (SS) as decision variable. An inventory model which is a mathematical model, provide the means for designing an optional inventory policy in terms of when and how much to order or produce.

MECHANISED DEVICES ORIGIN:-

The origin of the computing machines and their technological development is as a result of a long chain of events, innovative thoughts, and their demonstrated effort, which is tracable to some primitive calculating devices such as ABACUS used in performing numerical and dividing operation in 1617 by John Nappia. In 1642 a 19 year old Frenchman called Blaise Pascal invented a calculating machine capable of performing only addition and subtraction operation. ANALYTICAL ENGINE which was the forerunner of the modern digital computer was developed by Charles Babbage an English mathematician in 1833. At about 20yrs after the death of C. Babbage, punched cards were used for data processing especially in textiles loom to control patterns. In 1887, Herman Hollerith and employee of the U.S. Bureau of census, used punched card coding and a tabulating equipment to process the 1890 census.

The first large scale, general purpose electronic digital computer called ENIAC (ie. Electronic Numerical Integrator and computer) used to compute the firing and ballistic tables for Army Artillery gun was put into operation in 1946 at the (U.S.A) university of Pennsylvania by John Mauchly and J. Prosper Eckert after which John Von Neumann devised what he called the stored program concept, by which a read instruction from computer stored program can switch to a new program. The first

stored program computer were completed in 1949 and J.V. Neumann has the credit as the forefather of stored program computers.

The first business data processing system UNIVAC 1 was delievered to the United State Bureau of census in 1951. This was developed by Eckert and Mauchly and contain 500 vacuum tubes and is capable of reading, computing and writing information simultaneously. It also was followed by the operation of automatic programming language that could help other people to us the machine.

The second generation of computer (1959 – 1963) saw the introduction of transistors in to the computer to replace the vacuum tubes. These makes the computer look smaller with more memory capacity and consumes less energy. They become faster in speed, with wider range of data applications.

Between (1964 – 70) saw the introduction of the third generation of computers which is characterised by the use of integrated circuit (I.C.) technology. These machines become more reliable, compatible, very small, consume less power and leads to the development of mini computers and the emergence of the software industry.

In the 70s, saw the emergence of mini computers followed by micro-computer which were generally small with highly specialised facilities that support specific business activities such as financial planning, auditing, management planning, stock controls and other related business activities.

PROBLEM DEFINITION:

The project "HOW COMPUTERISATION OF INVENTORY CONTROL SYSTEM COULD BE MADE POSSIBLE FOR WEST AFRICAN PORTLAND CEMENT COMPANY PLC."

PROBLEM IDENTIFICATION:-

THE OLD SYSTEM (PARALLEL RUNNING) IS NOT EFFICIENT ENOUGH.

AIM / OBJECTIVES OF THE STUDY:

The aim of this project is to solve the existing problem usually encountered during the cause of transaction operation (inflow/outflow of information) within the organisation. Its objective also includes:

(i) To establish the most desirable distribution of services, and equipment through the company.

(ii) To minimise operational cost and maximise profit for the organisation.

(iii) To enable the most efficient handling of large data and provide management with timely information on stocks.

(iv) To eliminate duplicacy, conflicting and unnecessary service in the organisation.

(v) To provide responsive service to meet with customers need.

(vi) To define the orderly method of handling transaction activities using sound organisational procedures.

(vii) To increase the speed with which reliable data are accessed and available in the system.

(viii) To facilitate data interaction between and within the various levels of management.

METHODOLOGY:

The fact finding techniques employed for this project were observation, interviewing and record searching.

OBSERVATION:

This type of technique is carried out by personally watching most of the operations for a given period of time to see for oneself exactly what is happening. It also gives a first hand information about how activities such as goods/documents and processes are being carried out, whether or not specified steps were actually followed.

INTERVIEW:-

This type of techniques is most common, prove most satisfactory, a way of collecting information from individual/groups. The respondants here should be the current user of the existing system and the would be potential users of the proposed new system when approved.

RECORD SEARCHING:-

This technique gives an introductory knowledge and later acts as basis for comparing actual operation with what the records indicate should be happening.

SCOPE:-

The development of this project is to assist management achieve the said aims and objectives contain mainly on stores for such decision as what to order or produce, when to do so and how, the type of inventory cost to be taken to achieve profitability.

LIMITATION:

Although this software tends to alleviate the general inventory problem experienced in the organisation, the constraint encountered during this project write up includes

The acquisition of materials from the management for the purpose of analysis and simplicity which the management were not willing to release completely for security reasons.

Time also was not in favour of the period allocated for the completion of this project.

Finance which could have been a very good source of help to the completion of this project, becomes a major constraint due to the non availability of enough fund to carry out more research work during the short period of this work.

The human factors also was a constraint toward this project due to stress and strain.

ADVANTAGES OF COMPUTERISATION;-

The benefits derived in computerising the store division of an organisation includes;

(1) accurate and timely information to the management.

(2) Removal of labour redundancy

(3) Increase speeds and reliability

(4) Maximise profits as it saves time

(5) Encourage staff training to become computer literate

(6) No lost of information

DEFINITION OF TERMS

INVENTORY: Is the process of keeping records of things in the stores at every point in time.

INVENTORY POLICY;- This is the organisation stock holding policy represented as a series of rules and regulation governing the inventory control.

CEMENT;- This is a gray powdered material (lime and clay) used for uniting other materials or articles. When wetted, it is generally plastic at the time of application but hardens up when in place.

KILN:- This is the furnace use for drying ore, driving off carbon dioxide from lime stone during the process of making cement.

BINE CARDS:- Serve as a first hand information note during any inventory transaction.

LEAD TIME;- This is the time laps between the time of ordering and the actual arrival time of the order.

DEMAND;- This is the actual amount of items required per period (not necessarily the amount sold) because some demand may go unfulfilled due to shortages.

FIXED ORDER QUANTITY SYSTEM;- Is a system in which the quantity is the same at each time an order is made but the interval between the placing of order may not necessarily be the same (varies).

STORAGE PENALTY COST;- Is the cost incurred when an item requested for is not available in stock.

HANDLING COST;- This comprises of the cost of labour to move stock equipment such as forklift, cranes, trucks for the purpose of moving one stock from one point to the other.

PURCHASE;- Purchases are made only after a purchasing application form has been obtained, filled and dully approved by an authorised officer.

GOODS RECEIVED NOTES;- When the purchased goods arrive the company for delivery, a form called Goods Received Note that contains the various stock itmes received is filled by an authorised person of the store division under the condition notifying the supplier that the goods are accepted to the store subject to an inspection by an authorised officer from the department to which such supplied items are needed.

INSPECTION FORM;- The officer concerned with the inspection of the new items does so by stating clearly in the form the quality, quantity of goods accepted, rejected and general remarks.

ISSUE VOUCHER;- This issue voucher which is in quadruplicate copies and of different colour, contains details about the persons to whom issues are made to, the gate pass number, and the date where necessary. The various colours contain in this voucher also indicate which department that must own a copy of the voucher.

CODING;- This process, makes stock control easy and fast due to the reduced possibilities of duplications, high costs of replacing what is supplied and not what is required by the supplier and long varying descriptions of items. During coding, no group or sub-group is allowed to have more than 999 items coding in its category.

STOCK REDUCTION AND STANDARDISATION;- This helps to reduce the number of items in stock, facilitates what items to buy or not to and the ease of getting supplier(s).

STOCK LEVEL;- The stock levels main objective is to ensure that items are available at all time in order to maintain the continuity of production.

The three levels of stock level operations are viz:-

(i) Maximum stock level.

(ii) Re-order level

(iii) Minimum stock level

MAXIMUM STOCK LEVEL:- Is the level at which no stock material is expected to go Beyond. The determining factors being the financial terms and the possibility of items deterioration, the changes in technology and can be calculated as follows:-

MAX. LEVEL = ROL – (MRP X MC) + ROQ

Where ROL = Re-order level

MRP = Minimum Re-order period

MC = Minimum Consumption of material in the period

ROQ = Re-order quantity.

RE-ORDER LEVEL: At this level the ordering of new stock items are made before it gets to or beyond the minimum stock level point. The determining factors being

(a) Rate of usage

(b) Lead time

The Re-order level is calculated as:

ROL = MRP x MC

Where ROL = Re-order level

MRP = Maximum Re-order period

MC = Maximum consumption of material during the period.

MINIMUM STOCK LEVEL:- This level states the lowest level in which stocked items should NOT be allowed to fall below, and as such, emphasis should be laid on this aspect so as to avoid discontinuity of production. It is calculated as

ROL – (NRP x NC)

Where ROL = Re-order level

NRP = Normal Re-order period

NC = Normal consumption of material for the period.

ECONOMIC ORDER QUANTITY (EOQ):- It is a very good and important thing to known the right and economic quantities of stock items needed to be purchased by the company at the right time. This is so because a large order may result in high storage cost, lighting and heating cost, more capital being tied up in inventory, high taxes with higher cost of insurance. While this is so, with large orders, there is also the likelihood of damage, deterioration of goods and obsolescence.

Smaller orders also brings about increased handling cost, less discounts and the likelihood of stock out of hand.

This can be calculated as follows:

$$EOQ = \sqrt{\frac{2D \quad Cd}{P \quad ct}}$$

Where D = The total demand

Cd = Cost of ordering

P = Unit Price

Ct = Cost of storage

The EOQ is used in mainly where the price of items are stable for an appreciable time.

RETURNED ITEMS:- Stock items may be returned to the store due to the following reasons:

- Wrongly issued items
- Avoidance of wastage due to planned production

- Return of excess raw material from process control

These items returned are accepted and registered into the store credit voucher (SCV) which indicate the department/unit returning such items, quantities and condition of the returned items.

UNSERVICEABLE/DISUSED ITEMS:- These are those items whether new or old are said to be of no use any more to the company and as such when returned to the store, the store control unit simply opens a return to store register for such items.

No care or entry are made for them.

FEASIBILITY REPORT:- The present parallel system being run in the company, serves as a very good source of information for the actualisation of a direct computerised system. The basic functions of the store division include purchasing (receiving), issuing and stock taking. The problem so far identified with the existing system (Parallel) are:-

(i) The repetition involved in tiring and uninteresting.

(ii) Administrative delay

(iii) Expensive to maintain

(iv) It is not as effective as should be

(v) Access to information is time consuming

(vi) Human errors due to large volume of data to handle

(vii) Misplacement and lost of vital documents.

CHAPTER TWO

WAPCO IN PERSPECTIVE:-

West African Portland Cement Company Plc was founded and established in 1960 at Ewekoro and by 1977 the Shagamu work was established in the present town of Shagamu in Ogun State of Nigeria. It was charged with the sole responsibilities of producing and operating an integrated cement plant and allied product. Presently, Engr. J. O. Makoju who is the present Chairman of Cement Manufacturing Association (CEMA) in Nigeria is the Chief Executive Officer of WAPCO Plc.

Since the inception of operation, WAPCO has lived up to expectation as a result of her performance in the field of quality production. It is the best and most popular cement manufacturer nationwide, this is so because statistic shows that out of every 100 bags of cement randomly sampled, 56 bags comes from WAPCO. Its production capacity is 60 tones per hour (1 tone = 1000kg therefore,,, 60 tone = 60,000kg and 1 bag = 50kg which implies the production capacity of 1,200 bags of cement per hour of production.

ORGANISATIONAL SET UP:

Improving the performance of management is one of the supreme task of the Board of Directors (BOD) and the chief executive of every organisation. A sound organisation structure plus a common understanding of the major functions and responsibilities of each of the level of management, and how their respective relationship are integrated, provides the framework necessary for the development and maintenance of a smooth running organisation.

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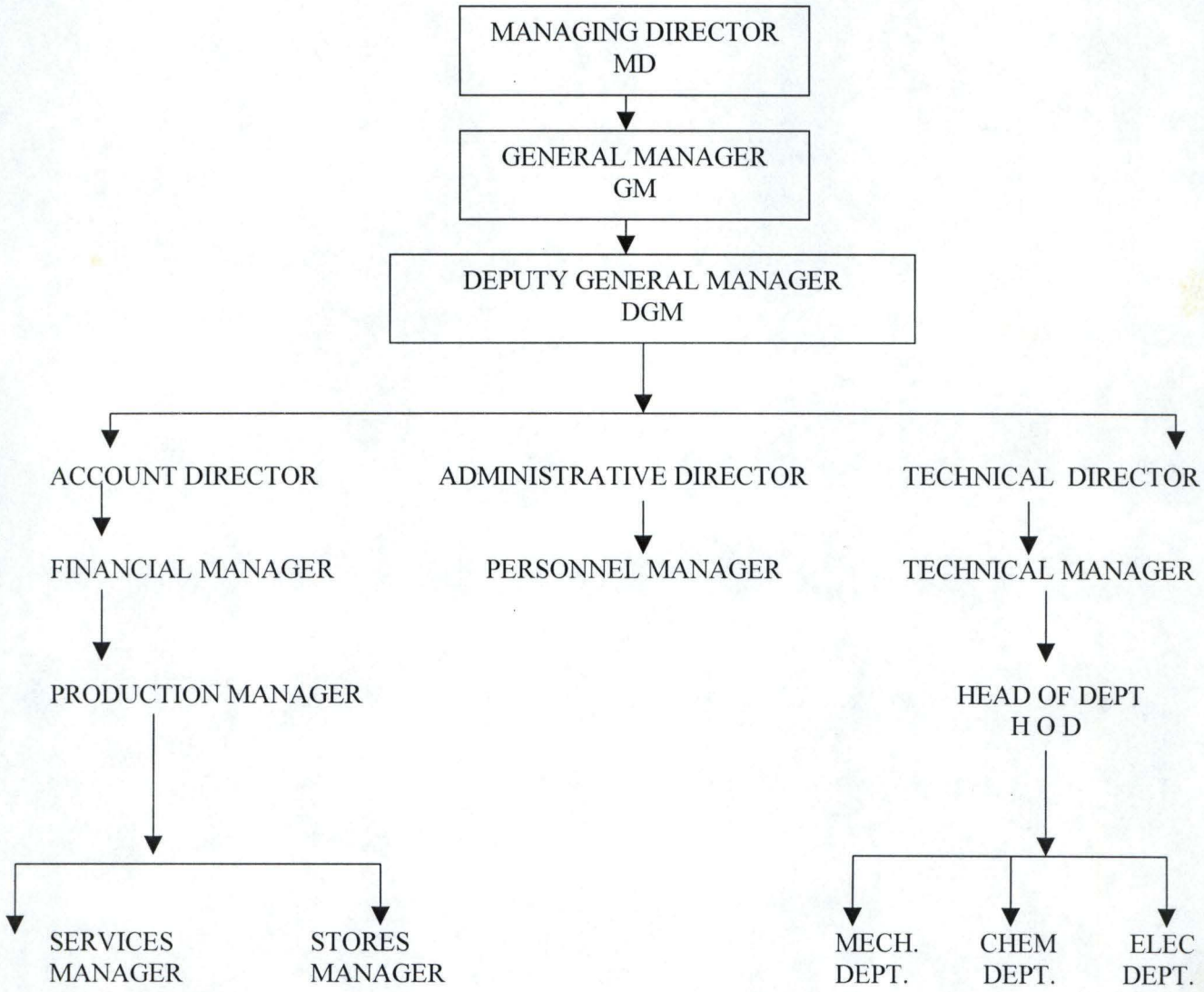
The Board of Directors is accountable to the policyholders for the welfare and progress of the Company. The board, upon the recommendation of the MD/CEO, approves the overall objectives, policies, annual budget, and other basic controls governing the administration of the Company and delegates to the MD final responsibility for the attainment of the desired result.

ORGANISATIONAL CHART (ORGANOGRAM)



THE MANAGING DIRECTOR (MD)

The MD delegates to designated line officers responsibilities and authorities for the attainment of specific results and effecting remedial action whenever necessary. He also designates authority to staff officer accountability for planning, developing, and recommending patterns of action and recommending any action required to assure the accomplishment of result delegated to the MD by the Board. Invariably, he coordinates the various activities or operations going on in the company.

GENERAL MANAGER (GM)

The GM having known the responsibilities and scope of authority as delegated, must understand the over all purpose and objective of the company as a whole and the relationship of functions performed in major units as this will enable him sense principal problems and causes involved in the organisation in which he is an executive. By so doing he oversees the day to day running activities of the company and make sure all policies formulated by the Board of Director are executed in the organisation as he is also member of the BOD. His success or failure are reported directly to the managing director to whom he is responsible.

THE DEPUTY GENERAL MANAGER (DGM)

The DGMs function is mainly to deputize for the GM in situations where the GM is unavoidably absent. He performs all such duties as suppose to have been performed by the General manager and report directly to the MD on his arrival.

ADMINISTRATIVE DIRECTOR

The Director Admin is directly in charge of the welfare of the entire member of the organisation both employee and employer. He is concerned with their health, wages and salaries, training and education, records, public relations, maintenance and legal matters.

PERSONNEL MANAGER

Work directly under the eagle eye of the Admin director as he receive instructions from him, pass them on to the section concern, make sure the instructions are effectively and efficiently carried out, then report back to the admin director.

ACCOUNT DIRECTOR

This is the companies chief accountant responsible for the bookkeeping function and the payment of all invoices, together with providing information in keeping with the companies Acts, in the form of trading, profit and loss accounts and balance sheets and many other financial information that is required. Due to his important function in the company, he has to work closely with the managing director and delegates powers to the financial manager.

FINANCIAL MANAGER

Like the personnel manager to the admin director, he is the working tool of the Account director as he make sure all financial activities are carried out efficiently accurate as he has to report back to the Account Director.

PRODUCTION MANAGER

The production manager most of the time, assume independence in carrying out his duties which is mainly the making sure the end result of the companies need is met. For the fact that the wealth of the company is generated by the skillfulness of the production manager, he should then work closely with the financial manager and depend when necessary on the service and store managers for a complete turnover.

SERVICE MANAGER

Takes care of such thing as the central planning, temporary work design, work study, cost and budgetary control, plant, payment and claims. These enable him to supplement the effort of the production manager when necessary.

STORE MANAGER

Is the one directly responsible for the procurement of items needed in the company, inspect them weather they are acceptable or not, them the internal or external distribution of such items or finished goods inform of sales or allocation to staffs.

TECHNICAL DIRECTOR

He direct the performance of specific operations.. He also understand responsibilities and scope of authority as delegated, determines what operations are necessary to attain end results assigned, and recommend policies pertinent to their successful achievement.

TECHNICAL MANAGER

Plans and distributes the work load of the unit on the basis of the most effective operation, assume responsibility for the acts of subordinates as he keeps the technical director aware of operating experience and trends that are pertinent to their administrative functions as he delegate and assigned responsibilities to the Head of Department.

HEAD OF DEPARTMENTS (HOD)

These are officers directly responsible to the technical manager as they implement the duties slated to them from above to the junior workers of their various departments. They understands the manager objective and policies,, abide by and support decision of the manager, know each workers record and ability.

MECHANCIAL DEPARTMENT

Takes care of all the mechanical aspect of the job of the company such as major or minor repairs of faults in machine or engine parts, fabrication work and maintenance.

CHEMISTRY DEPARTMENT

Takes charge of the analytical experimental laboratory test of the raw materials and the chemical combination of the end product. They also take care of the quality control of the end product.

ELECTRICAL DEPARTMENT

Is in charge of all electrical work of the factory which include the major or minor repairs of the electrical parts or component of machinery of the organisation.

TYPES OF INVENTORY COST

Irrespective of the nature of demand lead time, and unit demanded during the lead time , four categories of inventory cost are associated with keeping inventories of an item

(i) Purchase cost of the inventory item

(ii) Ordering or set-up cost

(iii) Holding cost

(iv) Stock out cost.

Therefore, for any inventory situation, the total inventory cost per year can be determined from the following cost equation.

Example:

Total inventory cost = Purchase cost of inventory Item + ordering cost + holding Cost + stock out cost.

(i) **Purchase cost of the inventory items**:

The purchase cost of an inventory item can be of two types.

(a) When the purchase price is fixed and hence the cost per unit, (c) is constant regardless of the quantity purchased. While (b) is when quantity discounts are available and hence the cost per unit is a variable (ie. Determined by the size of the purchase).

(ii) **Ordering (or set-up) cost:-**

This is the cost where a company may decide to meet its inventory demand either by purchasing for outside supplies or by settling up its own production facilities (ie buy or make). In either case, there are some well-defined cost called procurement costs, that must be incurred by the company.

When the company purchase from outside, the procurement cost are referred to as ORDERING COST, and they include all the cost incurred in sending inquiries, writing purchase orders, receiving and inspecting goods, paying the bills, and performing related paper work to keeping, the supplies floating. It also includes personnel salaries, expense on telephone, form and supplies: In the order hand if the company engage in supplies its own requirement, eg batch production of different items, the procurement is referred to as SET-UP COST which is the cost needed to set up a production process to produce a batch of the needed good.

(iii) **Holding (or Carrying) Cost:**

This consist of all cost relating to carrying inventories in stock. Examples includes cost of money tied up in the inventory, storage cost, depreciation, insurance, taxes, deterioration and obsolesces. This can also be expressed in two ways viz.

(a) When the holding cost (H) can be expressed as a fixed percentage of average Naira inventory value. For example if the accounting record of a film shows the value of H to be 20 percent, it means that if the average Naira inventory of the firm is N20,000, the holding cost is 20% multiply by the average Naira inventory i.e. 0.20 (20,000) = N4,000 per year.

(b) When the holding cost is (h) can be expressed as the cost of holding an inventory item for a period of time T such as one year. Example, the cost of holding one unit of an inventory item for one year can be N5 or N10, depending on the purchase price, cost of capital and so on. Many formula has been formulated but the most oldest and widely use among others is

$$Q = \sqrt{\frac{2RS}{I}}$$

Where Q	=	Economic lot size
R	=	Annual use of the items in units per year
S	=	Setup cost each time a new lot is started.
I	=	Carrying cost per unit per year.

(iv) **Stockout Cost:-**

These are cost incurred when a customers demand cannot be met or fulfilled because the inventory is completely depleted. If the customer decides or is willing to wait, then the stockout cost becomes the cost of expediting the order and processing it under "RUSH" condition. But where the customer is not willing to wait and there is nothing like back-ordering, in such case the stockout cost consist of loss of goodwill and loss of profit from that sales.

Several system of inventory are available and one of the most popular one is the periodic order system, in which cards indicate the pertinent information concerning usage rate, items on order, items reserved for specific usage, and balance on hand.

STOCK TAKING

Stock taking in WAPCO is generated the same way as above with any other department. A computerized stock control system is an improvement on the very tedious and repetitive not so reliable parallel computerized method being used at the company presently. A project to computerize inventory control system in an organisation, involves a carefully planned procedure. Plans for specification writing, system analysis, system design and development, implementation and re-organisation for the new automation. The raw materials supplied to the company and other items are firstly coded and entered into supply/purchase file (in a DBMs).

As soon as these items are entered into supply/purchase file. the inventory file is automatically opened and the items which are entered into the supply file are copied into it. The inventory file keeps the records of stock balances. The item that are issued out from stores to the production department or other departments are entered into the issue file and automatically use to up date the inventory file (master file) which also goes with the sales file. In all cases, the system will locate the identical item codes in the inventory file and subtracts the issued and sales items form it as it automatically update the balance.

NATURE OF INVENTORY:

This can be defined as the quality of goods, commodities or other economic resources that are stored at any given point in time in respond to demand for further use.

It can also be the raw material needed for operation partly finished or partly processed raw material or finished products including maintenance.

The optimum size or nature of inventory, depends on the need of the production department. Some parts, materials and completed products are to be kept on hand in order to absorb discontinuity in production and to handle uncertainty and so, so stock must be held in other to have something to work on. Even finished products may be held to provide better service for the customer.

A manufacturing firm must keep adequate physical inventories of raw materials, work-in—process and finished goods in order to meet customers demands at various stages of the production process and distribution. Inventory/stock control answers such questions as.

(i) When to order or produce a raw material and

(ii) How much to order or produce

(iii) When to order or produce? Is best answered in two forms.

Firstly, these form relates to some level of inventory which necessitates the ordering activities, example, if the inventory level of an item drops to 50%, then there is an issue for procurement order of such items while.

Secondly is the form of when to order relates directly to the dimension of time. Example, a firm can design an inventory policy to state that in every two mouths, there must be a procurement order of the item.

(iv) How much to order or produce? Is best answered when the quantity needed to be ordered or produced at one time is known.

INVENTORY CONTROL SYSTEM

This takes care of the procurement, movement and the management of stock that can satisfy feature needs within the organisation. It can be of different size and types depending on the nature of the organisation and the technological application. The application of computerised system control for inventory information is aimed at keeping proper records on every item supplied, purchased, issued to various departments and those sold out of the company thereby promoting efficiency. The system use is fast file processing method such as sort file records in the appropriate order before producing any selected output. This ascertains stock balances after any transaction has taken place, warns when the stock reaches a predetermined level called the RE-ORDER point but allows transaction until items balance becomes zero level, at which all level of transaction is no longer possible. Thereafter, the receipt and issues on any inventory item can then be adjusted, which immediately update the stock master file (inventory file) thereby keeping it up-to-date. This system have both screen output and printer for Hard copy output form of report.

FUNCTIONS OF INVENTORY CONTROL

Looking at what inventory control is all about, the basic function whether the raw materials, work-in-process or finished product is that of decoupling the operations involved and converting inputs into outputs to meet demand. This permits the independent operation of the purchasing stage, manufacturing and distribution process from the others. It also create room for both time and spatial separation between production and consumption of products in the operation system. Also inventory can be used for other purpose from decoupling functions such as the service of promotional investment when inventories are displayed. Raw materials and finished product inventories are frequently accumulated to hedge against price rise, inflation and strikes. It also serve to smooth irregularities in supply.

In essence, inventories act to decouple organisational activities, thereby achieving activities act to reduce procurement cost, provide good customer service and production flow smooth running relation by avoiding costly stock shortages. Inventories ordered in larger quantities tides up capitals that would have been otherwise idle and such cost as insurance , spillage and taxes must be incurred as a result of maintaining inventory.

THE ROLE OF ELECTRONIC DATA PROCESSING

Inventory management in a very large company such as WAPCO Plc is a tedious task as it usually involved operations that are repetitive of clerical nature but simple enough to handle through computerisation which is the application of mechanised data processing, once quantitative decision rules are developed. Computer can be used for reviewing the inventory status of each item, performing calculations quickly and accurately and taking action (such as providing a re-order notice) only when action is required. It also serve as a good tool in monitoring the current activity to determine when decision rules should be defined.

For instance, the re-computing of reorder points when there is change in sales trends or adjusting buffer stock when there is change in the pattern of sales variation. (it can also be used for forcasting future need. It can be use to generate reports, summerising the activities and current status of the inventory. In setting up a computer base inventory control system, three set of decisions are necessary viz; The total size of inventory which the business is currently able to support. The rules to be used in dertermining order quantities and the level of customer service required for each item.

The three major component of computerised inventory control are viz:

1 **INVENTORY COUNTING**

When inventories are processed by computers, it is easier to ensure their reliability and continuous stock taking made easy. This aim could be achieved by any of this following.

(a) The stock is counted and the details of the physical balance are inputted. The computer does the computing using the method of

(i) The computer calculating any difference between the physical and book inventory. In some cases the difference of a specific amount is reported.

(ii) by counting the stock and comparing with most recent print out of the balances in the file after adjusting for outstanding issue and receipt the adjustment could be achieved manually or by computer. The difference are processed by the input of an adjustment and a manual record is also kept for items to be counted.

2 **INVENTORY RECORDING**

This is the method which involves the recording of inventories according to their types into master files and these quantities are automatically adjusted after every transaction.

3 **INVENTORY VALUES**

After computerisation, the computer is programmed to give periodic report on information relevant to the value of inventory. Depending on the system, this may include information as to access stock, obsolete stock and slow moving stock.

SYSTEM OF INVENTORY CONTROL AND MANAGEMENT

An inventory control system is a frame work for integrating the necessary information and data for the purpose of minimizing total inventory system, considering the followings.

(i) **FIXED ORDER QUANTITY**:- This is so when a re order is placed for the fixed quantity whenever the inventory on hand drops to a particular level referred to as the reorder point. For more effective usage of this system, it is necessary to determine the economic order quantity that will minimize the total variable cost of holding inventory and determine the order point of inventory.

(ii) **CYCLICAL ORDERING SYSTEM** This is the replenishment of fixed period system as a time base system involve in schedules of periods review of the stock level of all item. The time between reorders remains the same, While the quantity re-ordered is allowed to fluctuate. The replenishment level usually is directed at keeping inventory at the minimum level.

(iii) **OPTIONAL REPLENISHMENT SYSTEM** This is in effect replenishment system which is modified to place a lower limit on the size of the variable ie reorder quantity. This method combine the features of the order quantity system and the variable order quantity of the basic replenishment system. This system also look at the cost effect in determining lead-time, but place a lower limit on the size of an order and, in effect give recognition to the fact that there is cost association with policing an order.

CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN

COMPUTER

Computer as a machine is an electrical/mechanical device capable of accepting input, process it and outputting the result.

COMPUTER SYSTEM

Is the complete assembling of the different component that provide a working environment for the acceptance of data, processing it and producing the output. If comprises of both the software and the hardware of which the result of the process can be viewed either on the screen or as hard copy.

COMPUTERISATION

This is the process of converting the objective of the management as far as data are concerned into solution that can be amended or modify with ease through the use of computer processing. This is made possible through the management of the computer Soft/Hardware.

SYSTEM ANALYSIS

This involves the collecting and analysing of facts with regards to the existing operational procedure, so as to be able to review the appreciation of the current system.

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THE NEW SYSTEM DESIGN CRITERIA

CAPACITY: The proposed system is suppose to handle a large amount of data using Dbase IV.

SIMPLICITY: The proposed system though design to handle complex operations, must be simple to use .

FLEXIBILITY: The proposed system is expected to operate in a dynamic rather than in a static condition.

EFFICIENCY: The new system must be designed in such a way that the desired report of its output is of a very high efficiency.

USER FRIENDLY: In this case, the system should be menu driven, which simply gives the user (operator) a choice of different transactions for implementation.

SECURITY: The security of the system takes into consideration the availability of the system facilities to the authorised users only.

PLANS FOR SPECIFICATION

This involves the feasibility study and system analysis of the step-by-step transactions and pointing out of the problems area and bringing the suggesting solution to the problems.

SYSTEM DEVELOPMENT

This is the designing of the new system based on the finding of the analyst and the recommendations made during the analysis. It also involves the testing and implementing of the new system to ensure its functionality.

FEASIBILITY STUDY

The feasibility study conducted was to analyse the current parallel method transactions and stock control in West African Portland Cement Plc in order to determine whether the propose new system should be developed or not.

The feasibility study aspect of the project so considered are as follows:-

(a) Operational feasibility: This is concerned with the workability of the proposed information system when developed and installed.

(b) Technical feasibility: This test, seek to clarifies if the proposed project can be done with current equipment existing software technology and available personnel.

(c) Economic feasibility: Test for the financial feasibility to ascertain the cost of implementing the proposed project and the benefits derived in implementing it.

ANALYSIS OF CURRENT SYSTEM

Generally, the inventory control department is trusted with the duty of maintaining stock and non-stock items of the company. It also look into the moving stock items of the company.

STOCK RECEIVED

This is related to all the information about goods received or supplied.

LOGICAL MODEL OF THE MANUAL SYSTEM

The logical model of the system explains the general operations of the stores division. It starts from the purchase/supply of items to the stores and subsequence issuing of the items to the various department requesting them. When items are purchased or supplied, the management check and inspect the supplied items to see if they meet the standard and are then accepted. If acceptable, Goods Received Note is issued to the supplier(s) and the item are registered into the supply file. This is followed by coding and then storing. Demands from each department are sent to the stores where the items are checked and allocated together for the departments and issue voucher entered. This is recorded daily as stock taken. At the end of the day's activities, all issues are entered into the day's ledger and then the stock system is taken. Stock taking involves the balancing and updating inventory of items which were received and issued out.

PROCEDURES

These are steps taken to unify the whole process, and link everything together to produce the desire output.

OPENING BALANCE

This is the record showing the stock at hand prior to the transaction activities for each item.

CASH SALES

Is the record showing only the total sales made per item.

RECEIPT

Is the record that contains the quantity of goods received.

TOTAL

Is the total amount of items in stock in each case of the item

CLOSING BALANCE

This column ascertain only the good or stock that are remaining after every deduction concerning transaction been made. This can be represented as Closing Balance (C/B) = Total – (cash sale + transfers)

ELEMENTS OF DESIGN

The computerization of **WAPCO** Plc inventory control system is tend to reduce, if not eliminate all inventory problem associated with the previous method. The output produce could either be in hard copies or kept in the storage medium by the organisation for record purposes and decision making. The hard copy can also be issued to the customer for personal use or for further transaction.

INPUT

This is the process of obtaining or capturing the original data and placing it into the data processing system. In the proposed new system, the user will work with a screen based data entry form. Since it is menu driven, the computer will ask questions for the user to respond to.

This is then influenced by the needs of output taking into consideration the types of input media needed, data collection method used, and volume of input documents needed.

OUTPUT

It is necessary to consider what is required from the system before deciding how to set about producing it. Since the output needed will be required mostly in the printed form (or hard copies) both within and without the organisation, a printer must be needed.

FILES

This element is very much linked to input and output. Input is processed against the files to produce the necessary output. Consideration have been given to the following viz:-

(a) **FILE ORGANISATION AND ACCESS**: Due to the large records and data involved, the file will be organised and accessed randomly using database management system.

(b) **SECURITY OF THE FILES:** Considering the importance of the various files of the proposed systems a user's password could be needed to avoid unnecessary infiltrating into such files and to protect the secret of the organisation.

(c) **RECORD LAYOUT**: Provision are made for the database structure so that similar records can be distinguished and accessed easily.

RECOMMENDED COMPUTER SYSTEM

Bearing in mind the approaching computer millenium bug, One is first of all to recommend a personal computer or any work–station that is in compliance with the Y2K (year 2000). This recommendation must be of greater performance to be able to run sophisticated software at faster speeds and quicker access to the corporate, mainframe with an on-line remote and on-line information database.

The operator of the new system has to learn only a relatively simple sequence of keyboard operations since the processing operations are menu driven and as such well trained staff are necessary. To ensure improvement and innovation into the system, a competent operator is very essential.

WORKSTATION REQUIREMEMT

PROCESSOR	PENTIUM/INTEL
MEMORY EXPANSION	STANDARD
EXPANSION SLOTS	TWO 16 OR 32 BITS SLOTS
MASS STORAGE OPTIONS	5.¼OR 3½ DISKKETTE
CONTROLLED MONOCHROME	GRAPHIC OR ENHANCED
HARD DISK OUTPUT DEVICE	IBM PRINTER; EPSON FX1050
OPERATING SOFTWARE	DBASE IV PLUS
	WINDOW NT
	WINDOW 95 V7
	DOS 6.0

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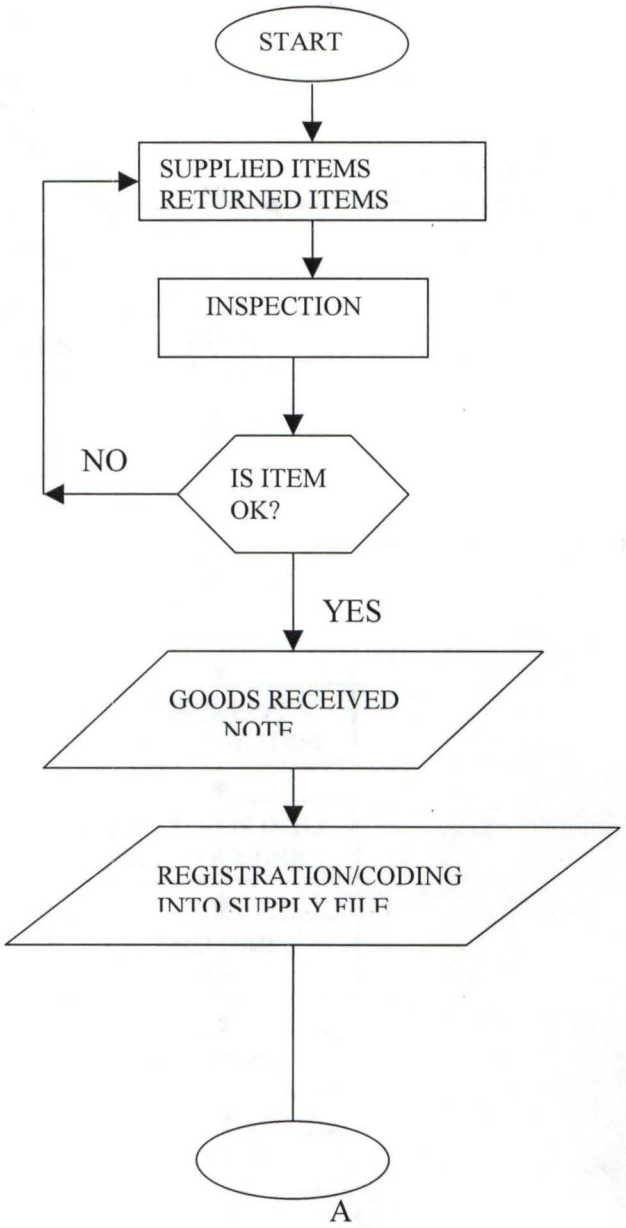
COST AND BENEFITS ANALYSIS

DEVELOPMENT COST	=N=
System analysis and design	60,000
Software development/implementation	22,000
Equipment purchase 3 PCs	400,000
Printers 3 laser jet 5L	150,000
UPS (3500VHS)	16,000
Stabilizer	6,000
Personnel Training	60,000
Miscellaneous	25,000
Total	**737,000**

OPERATING COST

	=N=
Parts Supplies for One Year	110,000
Installation	30,000
Equipment Maintenance	60,000
Programme Maintain	10,000
Labour Cost (Six Operator)	24,000
Fire Extinguisher	15,000
Miscellaneous	25,000
Total	**274,000**

PROCEDURE FLOW CHART



CHAPTER FOUR

SOFTWARE DEVELOPMENT

The mechanism that is develop to facilitate the successful organisation and accessing of data known as a Database system is a term that has come to mean both the organisation of data and the software that is needed in order to manager those data

So one can define Database as a sheared mechanism and centrally controlled collection of data used in an organisation. It is also the collection of any useful information organised in a systematic and consistent manner. A Database can also be regarded as an organised databank where data are stored.

To avoid the delay caused by individual database in an organisation, the integrated database of different types are logically linked by a relationship of a complex software system known as a Database management system.

CHOICE OF LANGUAGE

The choice of language of this new system is such that will tend to be a complete database system which is a collection of data usually files. The files arrangement should be in such a way that it is independent of any particular application and data redundancy should be totally eliminated. Access to the files is provided by a database management system (DBMS)which is a complex software system which uses logical relationship to link integrated data of different

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types. In view of this, the overall objective of developing a database technology is to treat data as an organisational resources and as an integrated whole.

ADVANTAGES OF DATABASE SYSTEM

MAINTENABILITY:

It is easier to maintain on database than maintaining many similar files.

DATA SECURITY

Database software can protect the access of data from unauthorised users thereby imposing centralised control system over its operational data.

ACCESSING THE NEEDED DATABASE

It is easy to access the existing database so that records could be accessed, deleted, modified etc.

Information retrieval from a pool of data collection is easier and quicker than other software.

It allows the transfer of one file to another through sorting, indexing e.t.c.

Report generation of the processed information can be generated according to once desire or need from a database.

FEATURE OF DATABASE

DATA REDUNDANCY: This occurs in a file processing system when data cannot be arranged to suit all the application programs accessing these data. Thus, the same data appearing in more than one file hence leading to wastage of storage space and duplication of effort during data entry.

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DATA INDEPENDENCE: Any changes or modifications to the data are accommodated by changes to the database management system without any changes to the application.

DATA INTEGRATION: Information from several files can be coordinated, accessed and operated upon as though it is single file. This allows users to link compatible data across the organisation.

DATA INTEGRITY MAINTAINED: This means that one update is usually sufficient to achieve a new record status for all applications which uses it without necessarily standards for all database users.

DATA SECURITY: Data will be protected from unauthorised persons or users.

SOFTWARE DEVELOPMENT AND TESTING

Here, emphasis should be on the data structure for the database management files, a simple chart of modular programms, the program etc.

DATA STRUCTURE

Here both the input data and output information are kept in files. To create any file in a database management system, there should be need for data structure.

Data structure in database has to do with the arrangement of data into fields such as field name, filed type (e.g. numeric, character, logic, memo or data etc.) field width and decimal.

As already stated, the input files are supply. DBF, issue .DBF while the output files is invent .DBF. Below are the structure for the database file

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	DECIMAL SUPPLY .DBF
1.	Item Code	Numeric	8	3
2.	Item Name	Character	50	
3.	Item Number	Numeric	8	3

IMPLEMENTATION

This comprises of all those activities that take place in order to change from the existing system to the new one. In this case the existing system is the PARALEL computerisation that needed an improvement while the new system is an improved DIRECT inventory computerisation of WAPCO Plc.

Adequate implementation is essential to improve a reliable system that will meet the organisation requirements, and before this could be done, staff training must be carried out successfully to enable them adapt to the new system.

CHANGE-OVER PROCEDURE

File conversion is an essential activity that should not be underestimated in any organisation. This involve the conversion of the old file data system into the form required by the new system. It is usually very expensive stage in the project. For the purpose of this project we will consider the procedure, concerned viz.

PARALLEL RUNNING:- This is the processing of current data by both the old and new system to cross-check the results.

Its main attraction is that the old system is kept alive and operational until the new system has been proved for at least one system cycle, using full data in the real operational environment of place, people, equipment and time. It allows the result of the new system to be compared with the old system before acceptance by the user, thereby promoting users confidence.

DISADVANTAGES

(i) Extra cost

(ii) Difficulties and sometime the impracticability

(iii) Double operation (old and new) for a system

(iv) Cost of time

DIRECT CHANGEOVER (Proposed System)

This is the complete replacement of the old system with the new system in one move. This is done when everybody in the organisation is confident in the new system. When a direct changeover is planned, system tests and training should be comprehensive, and the changeover itself planned in detail. This method is potentially the least expensive but the most risky. Due to unforseen circumstance, the old system may still be held in abeyance to avoid total close down of the organisation.

SYSTEM DESIGN AND DEVELOPMENT

The analysis of the inventory control system in West Africa Portland cement shows clearly that the inventory control needs a computerised system. The items in the organisation are classified into category with each item being coded.

INPUT OF DATA

In the data input process the user works with a screen consisting of user image form. This form has blanks in which data can be entered at any point on the form.

DATABASE

The system is a complete database system. A database is a collection of data usually files, arranges in such a way that it is independent of any particular program or application. The arrangement allows access to files and eliminate data redundancy. A database management system (DBMS) is an organised collection of inter-related data and the set of programs to access that is efficient and convenient for retrieving information from stored database.

DATABASE FIELD DESCRIPTION

In this database management system, there are three database files in use viz

- supply Database File Supply.Dbf
- Issue Database file Issue.Dbf
- Inventory Database file Invent .Dbf

The item code serves as the identification (ID) key.

SUPPLY DATABASE FILE: This is the file where the items supplied newly to the stores are first recorded coded and inventory automatically updated by adding the new items to the old stock in the file.

ISSUE DATABASE FILE: This keep the records of items issued out of store to various units or departments. As issues are made, the inventory is automatically updated by reducing the items issued from the total quantity of items in the inventory file.

INVENTORY DATABASE FILE: Keeps all records of the stock balance, supply records as well as issue records in stores.

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DATABASE STRUCTURE

SUPPLY .DBF

ITEM NO.	ITEM DESCRIPTION	FIELD NAME	FIELD TYPE	ITEM WIDTH	DECIMAL
1.	Item Code No.	Code	Numeric	4	0
2.	Item Description	DESCP	Character	35	
3.	Item Category	CAT	Character	13	0
4.	Qty Received	QREC	Numeric	9	2
5.	Qty Indented	Qindent	Numeric	9	2
6.	Qty Indented	Qstock	Numeric	9	2
7.	Unit Qty.	Qunit	Numeric	9	2
8.	Date Received	RDATE	Date	9	
9.	Indenting Unit	ID-Unit	Character	22	
10.	Extract	Extract	Logic	1	
11.	Qty Supplied	Qsupply	Numeric	9	2
12.	Sub-Code	Sub-Code	Numeric	7	
13.	Vocab-Number	VOC-Num	Numeric	7	0

DATA STRUCTURE

ISSUE .DBF

FIELD NO.	FIELD DESCRIPTION	FIELD NAME	FIELD TYPE	FIELD WIDTH	DEC.
1.	Item Code	Code	Numeric	4	0
2.	Sub-Code	Sub-Code	Numeric	3	0
3.	Item Description	DESCP	Character	34	
4.	Item Category	CAT	Character	14	
5.	Quantity Issued	Numeric	Numeric	9	2
6.	Issued Date	IDATE	Date	9	
7.	Qty Received	QREC	Numeric	9	2
8.	Date Received	RDATE	Date	9	
9.	Unit Qty	QUNIT	Numeric	9	2
10.	Voucher Number	Vch-Num	Numeric	9	0
11.	Voucher Number	Voc-Numeric	Numeric	9	
12.	Extract	Extract	Logic	1	
13.	Qty Indented	QIndent	Numeric	9	2
14.	Indenting Unit	ID-unit	Character	22	
15.	Qty in Stock	Qstock	Numeric	9	2

DATABASE STRUCTURE

INVENTORY .DBF

FIELD NO.	FIELD DESCRIPTION	FIELD NAME	FIELD TYPE	FIELD WIDTH	DEC
1.	Item Code	Code	Numeric	5	0
2.	Sub-Code	Sub-code	Numeric	5	0
3.	Item Description	DESCP	Character	32	
4.	Item Category	CAT	Character	13	
5.	Qty Issued	Qissued	Numeric	6	2
6.	Date	RDATE	Date	9	2
7.	Qty Received	QREC	Numeric	9	2
8.	Date Received	DREC	Date	9	
9.	Total Stock	Tstock	Numeric	9	
10.	Location	Locate	Character	18	2
11.	Date	RDATE	Date	9	
12.	Qty in Stock	Qstock	Numeric	9	
13.	Stock Balance	STBAL	Numeric	9	0
14.	Indenting Unit	ID-unit	Character	18	
15.	Date	MRDATE	Date	9	
16.	Cost of	Item Cost	Numeric	9	

NB: STBAL = Q = QSTOCK + QREC where

QSTOCK = STBAL – QISSUED

CRT LAYOUT FORM AND SCREEN INPUT

1. Item Code Number:
2. Item Description:
3. Item Category:
4. Quantity in Stock:
5. Quantity Received:
6. Date Received:
7. Quantity Issued:
8. Date Issued:
9. Extract
10. Indenting
11. Quantity Indented
12. Balance

OUTPUT DESCRIPTION

The computer print charts and information display system layout streets are used as the output design aids for the computerised system. The screen output is slightly different from the print chart output to limited screen space.

ALGORITHMS FOR THE PROPOSED PROGRAM

Begin: Display Data Entry Menu

Select Option

Case Option = "$"

Execute Stock Menu

End Case: Case Option = 'I"

Execute Issue Menu

End Case: Case Option "S"

Execute Supply Menu

End Case: Case Option = "R"

Execute Report Menu

End Case

End Select

End:

Display Stock Menu

Select Option

Case Option

Case Option = "A"

Execute Add Stock

End Case: Case Option "D"

Execute Delete Stock

End Case: Case Option = "V"

Execute View Stock

End Case

End Select

End:

Display Issue Menu

Select Option

Case Option = "A"

Execute Add Issue

End Case: Case Option = "M"

Execute Modify Issue

End case: Case Option = "D"

Execute Delete Issue

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End Case: Case Option = "V"

Execute View Issue

End Case

End Select

End:

Display Supply Menu

Select Option

Case Option ="A"

End Case: Case Option = "M"

Execute Modify Supply

End Case: Case Option = "V"

Execute View Supply

End Case

End Select

End:

Display Report Menu

Select Option

Case Option = "R"

Execute Supply Report

If Option = "P"

Execute Printer Report

Else

Execute Screen Report

End if

End Case

End:

Case Option = 'I"

Execute Issue Report

If Option = "P"

Execute Printer Report

Else

Execute Screen Report

End if

End Case

End:

Case Option = '$"

Execute Stock/Inventory Report

if option = "P"

Execute Printer Report

Else

Execute Screen Report

End if

End Case

End:

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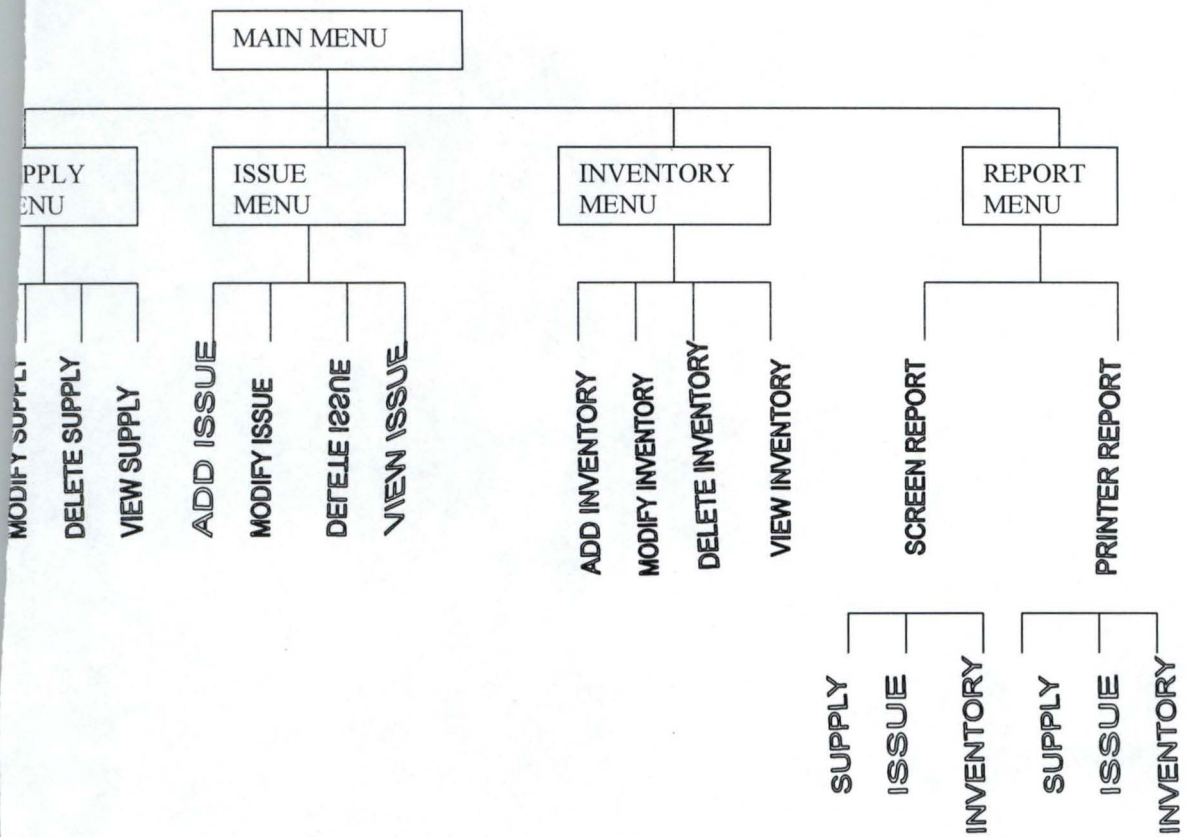
MODIFY PROGRAM STRUCTURE OF THE PROPOSED SYSTEM



DATA ENTRY MENU

SUPPLY MENU .. .. $

ISSUE MENU I

INVENTORY MENU .. .. S

REPORT MENU .. .. R

EXIT .. .. E

PLS ENTER A CHOICE I, R, $, S, OR E

SUPPLY MENU

ADD SUPPLY .. .. A

MODIFY SUPPLY .. .. M

DELETE SUPPLY .. .. D

VIEW SUPPLY v

EXIT SUPPLY .. .. E

PLEASE ENTER A CHOICE: A D V M OR E

ISSUE MENU

ADD SUPPLY .. .. A

MODIFY SUPPLY .. .. M

DELETE SUPPLY .. .. D

VIEW SUPPLY v

EXIT SUPPLY .. .. E

PLEASE ENTER A CHOICE: A D M V OR E

INVENTORY MENU

ADD INVENTORY .. .. A

MODIFY INVENTORY. .. .. M

DELETE INVEENTORY .. .. D

VIEW INVENTORY.. v

EXIT INVENTORY .. .. E

PLEASE A CHOICE: A M D V OR E

Finance also play a very important role in the limitation of this project. This is so due to non availability of enough fund to carry out the research work during the short period given for the completion of the project works.

Among other human factors such as stress and release all the needed material for this project for security reasons.

RECOMMENDATION

Under the circumstances it was tested the project has been found to work according to the specification. However, for implementation in WAPCO PLC, a X86 IMB with 66 MHZ speed and a hard disk of storage capacity 640MB RAM is recommended due to the large volume of work expected to be in store.

The is also a need for the stores to own a printer. EPSON 1050 + Printer and enhanced keyboard are recommended. The inventory reports should be generated on daily basis so as to know the daily balance of the stock items.

Any subsequence work on this project should focus mainly on the PLANNING FOR INVENTORY AND MAINTENANCE.

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R. O. Badamosi
K. Raimi

PROGRAMMING DATABASE

PROJECT TOPIC:..... COMPUTERISATION OF INVENTORY CONTROL SYSTEM FOR WAPCO PCL

PROGRAM ID..... INVENTORY REC.

DESIGNED DATE..... 1998

DESIGNED BY..... AZAGBA GODMAN ODIRI

SUPERVISED BY..... PRINCE R. O. BADAMOSI

```
SET ECHO OFF
SET STAT OFF
SET BELL OFF
SET TALK OFF
SET HELP OFF
SET PROC TO INVENTORY PRG
CLEAR
SET COLOR TO W/R
@ 2, 3 TO  24, 75 DOUB
@ 3,  4 CLEA TO 23, 74
@ 3, 11 SAY "WEST AFRICAN PORTLAND CEMENT PLC"
@ 5, 20 SAY "COMPUTERISATION OF INVENTOR CONTROL SYSTEM"
@ 7, 4 TO 7, 74
@ 9, 32 SAY "FOR"
```

```
@  12, 22 SAY "WAPCO PLC"
@  14, 4 TO 14, 74
@  18, 16 SAY "DESIGNED BY AZAGBA GODMAN ODIRI
@  20, 24 SAY "DESIGNED DATE (1998)"
   SET COLOUR TO N/W
   SET  INTEN OFF
    SET  CONSOL OFF
@  22, 24  SAY "PRESS ANY KEY TO CONTINUE ...."
    WAIT"
    CLEAR
    SET COLOUR TO RG
@  3, 24 SAY "WEST AFRICAN PORTLAND CEMENT PLC"
@  4, 28 SAY "INVENTORY CONTROL SYSTEM"
@  6, 24 SAY "THIS SYSTEM TAKES THE INVENTORY"
@  11, 36 SAY "OF"
@  15, 23 SAY "STOCK ITEMS IN WAPCO STORE DIVISION"
 @  17, 20 SAY "AGBA SOFTWARE SYSTEM DEVELOPMENT"
 @  18, 38 SAY         "1998"
 @  21, 25 SAY "PRESS ANY KEY TO CONTINUE ...."
    WAIT.
    CLEAR
     Do While  .T.
     STORE SPACE (1) TO OPT
     CLEAR
```

```
    SET COLOUR TO W/B+
@ 1, 4 CLEA  TO 4, 70
@ 1,4 TO 4,70 DOUB
@ 2, 8 SAY " WEST AFRICAN PORTLAND CEMENT STORE DIVISION"
@ 3,18 SAY  "COMPUTERISATION OF INVENTORY CONTROL SYSTEM"
STORE SPACE (1) TO OPT
SET COLOR TO B+/W
@ 5,5 CLEAR TO 23, 74
@ 5,4 TO 23, 75
@ 22, 15 TO 24, 56
@ 7, 20 SAY "DATA ENTRY FORM"
@ 10, 16 SAY "DATA ENTRY MENU .....[D]"
@ 12, 16 SAY "INVENTORY MENU ..... [S]"
@ 14, 16 SAY "ISSUE MENU ..... [I]"
@ 16, 16 SAY "REPORT MENU ..... [R]"
@ 18, 16 SAY  "SUPPLY MENU ..... [S]"
@ 20, 16 SAY "EXIT .....[E]"
@ 23, 16 SAY "PLEASE ENTER A CHOICE (D,S, I, R, $  OR E)      [  ]"
@ 23, 54 GET PICT "!"
   READ
   DO CASE
   CASE OPT = "D"
   DO ENTRY
   CASE OPT = "S"
```

```
DO INVENTORY
CASE OPT = "I"
DO ISSUE
CASE OPT  = "S"
DO SUPPLY
CASE OPT = "R"
DO REPORT
CASE OPT = "E"
 CLEAR ALL
 CLOSE  ALL
 CLOSE PROC
  EXIT
  OTHERWISE
@  23, 10 SAY "WRONG OPTION CODE" + OPT + " ENTERED"
    WAIT
    END CASE
    END DO
    SET ECHO ON
    SET STAT ON
    SET BELL ON
     RETURN
     ∘∘∘∘∘∘∘∘∘∘∘∘∘∞∘∘∘∘
    PROCEDURE SUPPLY
    ∘∘∘∘∘∘∘∘∘∘∘∘∘∞∘∘∘∘
```


61

```
   DO WHILE  . T .
   CLEAR
   SET COLO TO WG/RB
@  1,4 CLEAR TO 4, 70
@  1, 4 TO 4, 70 DOUB
 @  3, 20 SAY "SUPPLY MENU"
 @  5,8 SAY "SUPPLY ENTR FORM"
   STORE SPACE (1) TO OPT 1
   SET COLO TO R+/N
 @  5,4 CLEAR TO 23, 74
 @  5, 4 TO 23, 75
 @  22, 17 TO 24, 58
 @  10, 20 SAY "ADD SUPPLY  ..... [A]"
 @  12, 20 SAY "MODIFY SUPPLY  ..... [M]"
 @  14, 20 SAY "DELET SUPPLY ..... [D]"
 @  16, 20 SAY "VIEW SUPPLY ..... [V]"
 @  18, 20 SAY "EXIT ..... [E]"
@  23, 18 SAY "PLEASE ENTER A CHOICE (A,M,D, V, OR E)[ ]"
@  23, 56 GET OPT 1 PICT "@!"
   READ
   DO CASE
   CASE OPT 1 = "A"
   DO ADSUPPLY
   CASE OPT1 = "M"
```


62

```
DO MDSUPPLY
CASE OPT1 = "D"
DO DTSUPPLY
CASE OPT1 = "V"
DO  VWSUPPLY
CASE OPT1 = "E"
CLEAR ALL
EXIT
OTHERWISE
@ 23, 10 SAY "WRONG OPTION CODE" + OPT + " ENTERED"
WAIT
ENDCASE
ENDDO
SET COLO TO
RETURN
o o o o o o o o o o o o o o o
ADD  SUPPLY
o o o o o o o o o o o o o o o
*** PROGRAM TO ADD SUPPLY ***
DO WHILE . T .
CLEAR
SET DATE BRITISH
CLOSE DATA
USE SUPPLY
```


63

```
   CLEAR
   M Code = 0
   STORE SPACE (12) TO MCAT
   MDESCP = SPASE (18)
   STORE 0. 00 TO MQ STOCK, MQREC
   STORE 0.00 TO MCOST, MSELPRICE
   MRDATE = CTOD (" / / ")
   DO WHILE . T.
   CLEAR
@  10, 10 SAY "ENTER ITEM CODE NUMBER OR XX  TO
    EXIT ....."
@  10, 70 GET MCODE PICT "9999"
   READ
   IF MCODE = 00
   CLEAR
   RETURN
   END IF
   CLEAR
@  3,10 SAY "WEST AFRICAN PORTLAND CEMENT PLC"
@  4,4 TO 4, 75 DOUB
@  6, 14 SAY "SUPPLY ENTRY IN PROGRESS"
@  7, 14 to 7, 40
 SET COLO TO RG/B
 @  3, 65 SAY "DATE ( )"
```

```
@  10, 6 SAY "ITEM CODE NUMBER:"
@  12, 6 SAY "ITEM CATEGORY:"
@  14, 6 SAY "ITEM DESCRIPTION:"
@  16, 6 SAY "QUANTITY IN STOCK:"
@  18, 6 SAY "QUANTITY RECEIVED:"
@  20, 6 SAY "COST PER UNIT:"
@  22, 6 SAY "DATE RECEIVED:"
@  10, 24 GET MCODE PICT "9999"
@  12, 24 GET MCAT   PICT "@!"
@  14, 24 GET M DESCP PICT "@!"
@  16, 24 GET MQSTOCK PICT "999998"
@  18, 24 GET MQREC PICT"999999.99"
@  20, 24 GET MCOST PICT "999999.99"
@  22 24 GET MRDATE PICT "99/99/9999
    READ
  STORE SPACE (1) TO RP
@   23, 35 SAY "CONFIRM DATA? (Y/N)"
@   23, 56 GET RP PICT  "!"
    READ
  IF UPPER (RP) = "N"
    EXIT
  END IF
  IF UPPER (RP) = "Y"
  APPEND PLANK
```


65

```
REPLACE CODE WITH M CODE
REPLACE CAT WITH MCAT
REPLACE DESCP WITH MDESCP
REPLACE QSTOCK WITH MQSTOCK
REPLACE QREC WITH MQREC
REPLACE COST WITH MCOST
REPLACE RDATE WITH MRDATE
CLEAR

USE INVENTORY
LOCATE FOR CODE = MCODE
IF . NOT. E OF ( )
MSTBAL = MQSTOCK + MQREC
REPLACE CODE WITH MCODE
REPLACE CAT WITH MCAT
REPLACE DESCP WITH MQESCP
REPLACE QSTOCK WITH MQSTOC
REPLACE QREC WITH MQREC
REPLACE COST WITH MCOST
REPLACE STBAL WITH MSTBAL
END IF
END IF
EXIT
ENDDO
```

```
ENDDO
RETURN
o o o o o o o o o o o o o o o
MODIFY SUPPLY
o o o o o o o o o o o o o o o
***MODIFICATION OF SUPPLY***
USE SUPPLY
DO WHILE . T.
CLEAR
MCODE = 0
SET COLO TO R/N
@ 11, 8 TO 13, 75
@  12, 10 SAY "ENTER THE ITEM CODE TO MODIFY" GET  MCODE PICT
"9999"
READ
IF MCODE = 00
CLEAR
RETURN
ENDIF
GO TOP
LOCATE FOR CODE = MCODE
IF.NOT. FOUND ( )
CLEAR
SET COLO TO RG/B
```

```
@ 10, 20 SAY "INVALID NUMBER TRY ANOTHER PLEASE..."
@ 13, 20 SAY "  "
   WAIT
   CLEAR
   LOOP
   ENDIF
   ***CHECK TO SEE IF RECORD EXIST ***
   IF FOUND ( )
   STORE CAT TO MCAT
   STORE DESCP TO MDESCP
   STORE QSTOCK TO MQSTOCK
   STORE QREC TO MQREC
   STORE COST TO MCOST
   STORE RDATE TO MRDATE
   ENDIF
   CLEAR
   SET COLO TO GR+/B, W/R, GB+
@ 1,1 TO 23, 75 DOUB
@ 3, 17 SAY "WEST AFRICAN PORTLAND CEMENT PLC"
@ 5, 23 SAY "INVENTORY CONTROL SYSTEM"
@ 7, 23 SAY "SUPPLY MODIFICATION"
@ 10, 16 SAY "CODE NUMBER:"
@ 12, 6 SAY "ITEM CATEGORY:"
@ 14, 6 SAY "DESCRIPTION:"
```

```
@ 16, 6 SAY "QUANTITY IN STOCT:"
@ 18, 6 SAY "QUANTITY RECEIVED:"
@ 20, 6 SAY "COST PER ITEM:"
@ 22, 6 SAY "DATE OF SUPPLY:"
@ 10, 35 GET MCODE
@ 12, 35 GET MCAT PICT "!"
@  14, 35  GET MDESCP PICT "@!"
@  16, 35 GET "MQSTOCK PICT "999999999"
@  18, 35 GET "MQREC PICT "999999999"
@  20, 35 GET "MCOST PICT "999999.999"
@  22, 35 GET "MRDATE PICT "99/99/9999"
   READ
   REPLACE CODE WITH MCODE
   REPLACE CAT WITH MCAT
   REPLACE DESCP WITH MDESCP
   REPLACE QSTOCK WITH MQSTOCK
   REPLACE QREC WITH MQREC
   REPLACE RDATE WITH MRDATE
   APPEND BLANK
   CLEAR
   CHOICE = SPACE (1)
@ 20, 0 CLEAR TO 21, 76
@ 15, 16 SAY "DO YOU WANT TO MODIFY MORE RECORDS? (N/Y)"
   DO WHILE .T .
```

```
@ 15, 58 GET CHOICE PICT '!'
  READ
@ IF . NOT . UPPER (CHOICE) $ "YN"
  CHOICE = SPACE (1)
  LOOP
  ENDIF
  EXIT
  ENDDO
  CLEAR
  IF UPPER (CHOICE) = "N"
  CLEAR
  EXIT
  ENDIF
  IF UPPER (CHOICE) = "Y"
  CLEAR
  LOOP
  ENDIF
  CLOSE ALL DATABASE
  ENDDO
  RETURN
  o o o o o o o o o o o o o o o
  DELETE  SUPPLY
  o o o o o o o o o o o o o o o
  ***DELETING RECORD FROM SUPPLY . DBF
```

```
PUBLIC MCODE
USE SUPPLY
DO WHILE . T.
MCODE = 0
SET COLO TO GB
CLEAR
@ 11,8 TO 14, 74 DOUB
@ 13, 11 SAY "ENTER CODO NUMBER OF ITEM TO DELETE OR 00 TO
  QUIT..."
@  13, 66 GET MCODE PICT "9999"
    READ

*** VERIFYING FOR THE CORRECT CODE ***
IF MCODE = 00
CLEAR
EXIT
ENDIF
+ + +FIND CODE NUMBER IN SUPPLY .DBF+ + +
LOCATE FOR CODE = MCODE
+ + IF SUCH RECORD + +
CLEAR
IF EOF ( )
CLEAR
@  9,13, TO 11, 70
```

```
@ 10,20 SAY "THERE IS NO SUCH RECORD IN FILE...."
@ 15, 20 SAY "   "
WAIT
END IF
*** IF RECORD EXIST THEN STORE IT
IF. NOT. E o F ( )
+ + REPLACEMENT + +
STORE CAT TO MCAT
STORE DESCP TO MDESCP
STORE QSTOCK TO MQSTOCK
STORE QREC TO MQREC
STORE COST TO MCOST
STORE RDATE TO MRDATE
SET COLO TO GR+/B, W/R, GB+
@ 1,1 TO 23, 75  DOUB
@ 3, 17 SAY "WEST AFRICAN PORTLAND CEMENT PLC"
@ 5, 23 SAY "INVENTORY CONTROL SYSTEM"
@ 7, 23 SAY "SUPPLY DELETION"
@ 9, 16 SAY "CODE NUMBER"
@ 11, 6 SAY "ITEM CATEGORY"
@ 13, 6 SAY "DESCRIPTION:"
@ 15, 6 SAY "QUANTITY IN STOCK:"
@ 17, 6 SAY "QUANTITY RECEIVED:"
@ 19, 6 SAY "COST PER ITEM:"
```

```
@ 21, 6 SAY "DATE OF SUPPLY:"
@ 9, 35 GET MCODE
@ 11, 35 GET MCAT PICT "!"
@ 13, 35 GET MDESCP PICT "@!"
@ 15, 35 GET MQSTOCK PICT "999999999"
@ 17, 35 GET MQREC PICT "999999999"
@ 19, 35 GET MCOST PICT "999999.99"
@ 21, 35 GET MRDATE PICT "99/99/9999
  CLEAR
  CHOICE = SPACE (1)
@ 23, 35 SAY "AREYOU SURE TO DELETE ? (Y/N.) ..." GET CHOICE
   READ
   IF UPPER (CHOICE) = "N"
   CLEAR
   EXIT
   END IF
   IF UPPER (CHOICE) = "Y"
    CLEAR
   SET COLOR TO RG+
   @ 6, 30 SAY "SUPPLY DELETION"
   SET COLO TO G+
  DELET
   PACK
   SET COLO TO R
```

```
  @ 9, 22 TO 11, 54 DOUB
@ 10, 23 SAY "THE RECORD HAS BEEN DELETED !"
@ 10, 52 SAY "  "
 WAIT
 CLEAR
 EXIT
 END IF
 END IF
 END DO
 RETURN
o o o o o o o o o o o o o o o
 VIEW SUPPLY
 o o o o o o o o o o o o o o o
 ** PROGRAM TO LIST SUPPLIED ITEMS**
USE SUPPLY
CLEAR
 C=O
 S=SPACE (2)
 HEAD 1="CODE "+" CATEGORY "+" DESCRIPTION
 "+" QUANT - IN - STOCK
 "+" QUANT - RECEIVED "+" UINT - COST
 "+"  SU - DATE"
 ? HEAD 1
 @ 2, 1 SAY "  "
```

```
    GO TOP
    W = 2
    DO WHILE . NOT. EOF ( )
    **? WTRIM (CODE), S, CAT, S, TRIM (DESCRIP), S,
    Q - STOCK, S, Q - REC, S, COST, S DATE
 @ W, 2 SAY "CODE"
 @ W, 7 SAY "CAT"
 @ W, 16 SAY "DESCP"
 @ w, 28 SAY "QSTOCK"
 @ W 45 SAY "Q REC"
 @ W, 74 SAY "RDATE"
    W = W+1
    SKIP
    F=F+1
IF F = 5
IF. NOT. E O F ( )
 @ 23, 23 SAY "PRESS ANY KEY TO CONTINUE ...."
 @ 2, 60 CLEAR TO 20, 60
W = 2
I = 0
DO WHILE I = 0
I = INKEY ( )
END DO
END IF
```

```
@  2, 1 CLEAR TO 23, 78
@  2, 1  SAY "  "
F = 0
LOOP
END IF
END DO
 @  23, 1 CLEAR TO 23, 79
 @  23, 18 SAY "PRESS ANY KEY TO CONTINUE THE PREVIOUS MENU"
I  =  0
DO  WHILE  I  =  0
I  =  IN KEY ( )
END DO
RETURN


o o o o o o o o o o o o o o o
PROCEDURE ISSUE
o o o o o o o o o o o o o o o
CLEAR
DO WHILE . T.
CLEAR
SET COLO TO R+/N
@  1, 4 CLEAR TO 4, 75
@  1, 4 TO 4, 75 DOUB
@  3, 22 SAY  "ISSUE MENU"
```

```
STORE SPACE (1) TO OPT2

SET COLO TO R / W

@ 5, 5 CLEAR TO 23, 70

@ 5, 4 TO 23, 72

@ 22, 17 TO 24, 58

@ 10, 20 SAY "ADD ISSUE ". .. .....[ A ] "

@ 12, 20 SAY "MODIFY ISSUE ..... [ M ] "

@ 14, 20 SAY "DELETE ISSUE ..... [ D ] "

@ 16, 20 SAY "VIEW ISSUE ..... [ V ] "

@ 18, 20 SAY "EXIT .....[ E ] "

@ 23, 18 SAY " PLEASE ENTER A CHOICE ( A, M, D, V, OR E )  [  ] "

@ 23, 56 GET OPT2 PICT "@! "

READ

DO CASE

CASE OPT2 = "A"

DO A ISSUE

CASE OPT2 = "M"

DO MO ISSUE

CASE OPT2 = "D"

DO DEL ISSUE

CASE OPT2 = "V"

DO V ISSUE

CASE OPT2 = "E"

CLEAR ALL
```


78

```
EXIT
OTHERWISE
@ 23, 10 SAY "WRONG OPTION CODE "+OPT+" ENTERED
WAIT
END CASE
END DO
SET COLOUR TO
RETURN


o o o o o o o o o o o o o o o
ADD ISSUE
o o o o o o o o o o o o o o o
*** PROGRAMME TO ADD ISSUE ***
DO WHILE .T.
CLEAR
SET DATE BRITISH
CLOSE DATE
USE ISSUE
CLEAR
 MCODE = 0
MSUB CODE = 0
STORE SPACE (12) TO MCAT
MDESCP = SPACE (18)
STORE 0.00 TO MQSTOCK, MQISSUED, QISSUED
```

```
MIRDATE = CTOD ( " / / " )
DO WHILE .T.
CLEAR
@ 10, 10 SAY "ENTER ITEM CODE NUMBER OR 00 TO
EXIT ... "
@ 10, 65 GET MCODE PICT "9999"
READ
IF MCODE = 00
CLEAR
RETURN
END IF
CLEAR
@ 3, 10 SAY "WEST AFRICAN PORTLAND CEMENT PLC "
@ 4, 4 TO 4, 75 DOUB
@ 6, 10 SAY "ISSUES ENTRY "
@ 7, 10 SAY "REPLC ( "=", 46) "
SET COLO TO RG+/B
@ 3, 60 SAY "DATE ( )"
@ 10, 6 SAY " ITEM CODE NUMBER :"
@ 12, 6 SAY " ITEM CATEGORY :"
@ 14, 6 SAY " ITEM DESCRIPTION :"
@ 16, 6 SAY " QUANTITY IN STOCK :"
@ 18, 6 SAY " QUANTITY ISSUED :"
@ 20, 6 SAY " SUB CODE :"
```


80

```
@ 22, 6 SAY " DATE ISSUED :"
@ 10, 24 GET MCODE PICT "9999"
@ 12, 24 GET MCAT " ! "
@ 14, 24 GET MDESCP PICT "@ !"
@ 16, 24 GET MQSTOCK PICT "999999"
@ 18, 24 GET MQISSUED PICT "999999"
@ 20, 24 GET MSUB CODE PICT "999"
@ 22, 24 GET MIRDATE PICT "99/99/9999"
READ
STORE SPACE (1) TO RP
@ 23, 35 SAY "CONFIRM DATE ? (Y/N)"
@ 23, 56 GET RP PICT " ! "
READ
IF UPPER (RP) = "N"
EXIT
END IF
IF UPPER (RP) = "Y"
APPEND BLANK
REPLACE CODE WITH MCODE
REPLACE CAT WITH MCAT
REPLACE DESCP WITH MDESCP
REPLACE QSTOCK WITH MQSTOCK
REPLACE QISSUED WITH MQISSUED
REPLACE SUB CODE WITH MSUB CODE
```

```
REPLACE IRDATE WITH MIRDATE

CLEAR

USE INVENTORY

LOCATE FOR MCODE  =  CODE

LOCATE FOR MSUB CODE  =  SUB CODE

IF  . NOT. EOF  (  )

MSTBAL  =  MQSTOCK  -  MQISSUED

REPLACE CODE WITH MCODE

REPLACE SUBCODE WITH MSUB CODE

REPLACE CAT WITH MCAT

REPLACE DESCP WITH MDESCP

REPLACE QSTOCK WITH MQSTOCK

REPLACE QISSUED WITH MQISSUED

REPLACE IRDATE WITH MIRDATE

REPLACE STBAL WITH MSTBAL

MCODE  =  4

MSUB  CODE  =  3

END  IF

END  IF

EXIT

END DO

END DO

RETURN
```


82

```
o o o o o o o o o o o o o o o

MODIFY  ISSUE

o o o o o o o o o o o o o o o

** PROGRAMM TO MODIFY ISSUE **

USE SUPPLY

DO WHILE  .T.

CLEAR

MCODE  =  0

MSUB CODE  =  0

SET COLO TO R +

@  11, 8  TO  13, 75

@  12, 10 SAY  "ENTER THE ITEM CODE TO MODIFY OR  0  TO EXIT ... "

@  12, 64 GET MCODE PICT  "9999"

READ

IF  MCODE  =  0

CLEAR

DO  A  ISSUE

WAIT

END IF

GO TOP

LOCATE FOR CODE  =  MCODE

LOCATE FOR SUB CODE  = MSUB CODE

IF . NOT .  FOUND  (  )

CLEAR
```

```
SET COLO TO B
@ 10, 20 SAY "INVALID NUMBER ,TRY ANOTHER PLEASE ... "
@ 13, 20 SAY "    "
WAIT
CLEAR
END IF

***CHECK IF THE RECORD EXIT
IF FOUND ( )
STORE CODE TO MCODE
STORE SUB CODE TO MSUB CODE
STORE CAT TO MCAT
STORE QSTOCK TO MQSTOCK
STORE QREC TO MQREC
STORE EXTRACT TO MEXTRACT
STORE RDATE TO MRDATE
END IF
CLEAR
MCODE = CODE
MSUB CODE = SUB CODE
MCAT = CAT
MDESCP = DESCP
MQSTOCK = QSTOCK
MQREC = QREC
```

```
MEXTRACT  =  EXTRACT

MRDATE  =  RDATE

SET COLO TO GR+/B, W/R, GR+

@  1, 1 TO 23, 75 DOUB

@  2,17 SAY  "WEST AFRICAN PORTLAND CEMENT PLC"

@  4, 22 SAY  "INVENTORY CONTROL SYSTEM"

@  6, 20 SAY  "RECORD MODIFICATION"

@  10, 6 SAY  "CODE NUMBER:"

@  12, 6 SAY  "ITEM CATEGORY:"

@  14, 6 SAY  "DESCRIPTION:"

@  16, 6 SAY  "QUANTITY IN STOCK:"

@  18, 6 SAY  "QUANTITY ISSUED:"

@  20, 6 SAY  "SUB CODE !"

@  22, 6 SAY  "DATE OF ISSUE:"

@  9, 35 SAY  "EXTRACT:"

@  10, 35 GET MCODE PICT "9999"

@  12, 35 GET MCAT PICT  " ! "

@  14, 35 GET MDESCP PICT  "@ !"

@  16, 35 GET MQSTOCK PICT  "999999"

@  18, 35 GET MQREC PICT  "999999"

@  20, 35 GET MSUB CODE PICT  "999"

@  22, 35 GET MRDATE PICT  "99/99/9999"

@  9, 60 GET EXTRACT PICT  "@ !"

READ
```

```
REPLACE CODE WITH MCODE

REPLACE SUB CODE WITH MSUB CODE

REPLACE CAT WITH MCAT

REPLACE DESCP WITH MDESCP

REPLACE QSTOCK WITH MQSTOCK

REPLACE QREC WITH MQREC

REPLACE EXTRACT WITH MEXTRACT

REPLACE RDATE WITH MRDATE

APPEND BLANK

CLEAR

CHOICE  =  SPACE  ( 1 )

@  20, 0 CLEAR TO 21, 76

@   15, 1 SAY "   "

WAIT  "DO YOU WANT TO MODIFY MORE RECORDS? (N/Y)" TO CHOICE

IF . NOT . UPPER ( CHOICE ) $ "Y/N"

CLEAR

@  14, 10 SAY  " PLEASE ENTER  Y OR N "

@  15, 14 SAY  "    "

WAIT

END IF

IF UPPER ( CHOICE)  =  "N"

CLEAR

EXIT

END IF
```


86

```
IF UPPER (CHOICE ) = "Y"

CLEAR

LOOP

END IF

CLOSE ALL DATA BASE

END DO

RETURN

ooooooooooooo

DELETE ISSUE

ooooooooooooooo

*** PROGRAM TO DELETE ISSUE  FROM SUPPLY . DBF

PUBLIC MCODE, MSUB CODE

USE SUPPLY

DO  WHILE . T .
```


87

```
CODE = MCODE
SUB CODE = MSUB CODE
MCODE = 0
MSUB CODE = 0
SET COLO TO GB
CLEAR
@ 11,8 TO 14, 74 DOUB
 @ 13, 11 SAY "ENTER CODO NUMBER OF ITEM TO DELETE OR TO QUIT
..."
@ 13, 70 GET MCODE PICT "9999"
READ
***CHECK TO VERIFY THE CORRECT CODE
IF MCODE = 0
CLEAR
EXIT
END IF
***FIND CODE NUMBER IN SUPPLY .DBF
LOCATE FOR CODE = MCODE
LOCATE FOR SUB CODE = MSUB CODE
*** IF SUCH RECORD EXISTS ****
IF EOF ( )
CLEAR
@  9, 13 TO 11, 75
@  10, 20 SAY "THERE IS NO SUCH RECORD IN THE FILE...."
```

```
@  15, 20 SAY "   "
WAIT
LOOP
END IF
*** IF FOUND BEFOR END OF FILE STORE IT
 IF . NOT . EOF (  )
** REPLACEMENT**
DO WHILE .T.
@18, O CLEAR
@18, 1 SAY " "
WAIT "ARE YOU SURE YOU WANT TO DELETE? (Yy/Nn)...." TO CHOICE
DO CASE
CASE UPPER (CHOICE) = "N"
CLEAR
EXIT
CASE UPPER (CHOICE) = "Y"
CLEAR
SET COLO TO RGT
@6,22 SAY "DELETING RECORDS"
SET COLO TO R
DELETE
PACK
SET COLO TO G
@9, 14 TO 11, 45 DOUB
```

```
@10, 16 SAY "THE RECORD HAS BEEN DELETED"
@11, 16 SAY "  "
WAIT
CLEAR
EXIT
OTHERWISE
? CHOICE (7)
LOOP
END CASE
END DO
LOOP
CLOSE ALL
END DO
RETURN


o o o o o o o o o o o o o o o
VIEW ISSUE
o o o o o o o o o o o o o o o

**PROGRAM TO VIEW ISSUE
USE SUPPLY
CLEAR
F = O
HEAD1 = "CODE "+"SUB CODE "+"CAT "+" DESCP
"+" QSTOCK "+" QREC "+":COST "+"RDATE"
```


90

```
?HEAD1
@2, I SAY " "
GO TOP
DO WHILE .NOT. EOF ( )
?CODE, SUB CODE, CAT, TRIM (DESCP), QSTOCK, QREC, COST, RDATE
SKIP
F= F + I
IF F = 5 .AND. .NOT. EOF ( )
@  23, 23 SAY "PRESS AND KEY FOR REST ..."
I = O
DO WHILE . I . = O
I = INKEY ( )
END DO
@2, 1 CLEAR TO 23, 79
@2,1 SAY " "
F = O
LOOP
END IF
END DO
@23, I CLEAR TO 23, 80
@23, 18 SAY "PRESS ANY KEY TO RETURN TO THE PREVIOUS MENU"
I = O
DO WHILE . I . = O
I = INKEY ( )
```


91

```
END DO

RFETURN


o o o o o o o o o o o o o oo o o o o o o o o

PROCEDURE INVENTOR PRG

o o o o o o o o o o o o o o oo o o o oo o o o


DO WHILE .T.

CLEAR

SET COLO TO R/N+

@1,4 CLEAR TO 4, 70

@1, 4 TO 4, 75 DOUB

@3, 24 SAY "INVENTORY MENU"

STORE SPACE (1) TO OPT3

SET COLO TO WG/RB

@5,5 CLEAR TO 23, 74

@5,4 TO 23, 75

@22, 17 TO 24, 58

@10, 22 SAY " AND STOCK - - - - - - - - - - - - - - - - - (A)"

@12, 22 SAY "MODIFY STOCK - - - - - - - - - - - - - - - (M)"

@14, 22 SAY "DELETE STOCK - - - - - - - - - - - - - - - (D)"

@16, 22 SAY "VIEW STOCK - - - - - - - - - - - - - - - - - (V)"

@18, 22 SAY "EXIT - -- - - - - - - - - - - - - - - - - - - - (E)"

@23, 18 SAY "PLEASE ENTER A CHOICE (A, m, D, V, OR E) ( )"

@23, 56 GET OPT3 PICT "@!"
```


92

```
READ
DO CASE
CASE OPT3 = "A"
DO AINVENT
CASE OPT3 = "M"
DO MOINVENT
CASE OPT3 = "D"
DO DEINVENT
CASE OPT3 = "V"
DO VINVENT
CASE OPT3 = "E"
CLEAR ALL
EXIT
OTHERWISE
@23, 1 0  SAY "WRONG OPTION CODE "+OPT+" ENTERED"
WAIT
END CASE
END DO
SET COLO TO
RETURN
```

ADD INVENTORY

```
***PROGRAM TO ADD INVENTORY

CLEAR

SET DATE BRITISH

CLOSE DATE

USE INVENT

CLEAR

RDATE = MRDATE

MSUB CODE = O

M DODE = O

STORE SPACE (12 TO MCAT

MDESCP = SPACE (18)

STORE O.O TO MQSTOCK, MQREC

STORE O.OO TO MCOST, MSELPRIC

MRDATE = CTOD (" / / ")

DO WHILE .T.

CLEAR

@10, 10 SAY "ENTER ITEM CODE NUMBER OR XX TO

 EXIT ..."

@10, 65 GET MCODE PICT "9999"

READ

IF MCODE  = 00

EXIT

END IF

CLEAR
```


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```
@3, 20 SAY "WEST AFRICAN PORTLAND CEMENT PLC"
@4, 4 TO 24, 75 DOUB
@6, 26 SAY "INVENTORY ADDITION"
@7, 26 SAY REPLIC (" = ", 20)
SET COLO RO RG+/B
@3, 60 SAY "DATE ( ) "
@10, 6 SAY "ITEM CODE NUMBER:'
@12, 6 SAY "ITEM CATEGORY:"
@14, 6 SAY "ITEM DESCIPTION:"
@18, 6 SAY "QUANTITY RECEIVED:"
@20, 6 SAY " COST PER UNIT:'
@22, 6 SAY "DATE RECEIVED:"
@12, 28 SAY "SUB CODE:"
DO WHILE .T.
@10, 24 GET MCODE PICT "99999"
@12, 24 GET MCAT PICT "!"
@14, 24 GET MDESCP PICT "@!"
@16, 24 GET MQSTOCK PICT "999999"
@18, 24 GET MQREC PICT "999999"
@20, 24 GET MCOST PICT "999999.99"
@22, 24 GET MRDATE PICT "99/99/9999"
@12, 48 GET MSUB CODE PICT "999"
READ
STORE SPACE (1) TO RP
```

```
@  23, 35 SAY " CONFIRM DATA ?  (Y/N) "
@  23, 56 GET RP APICT  "!"
READ
IF UPPER (RP)  =  "N"
LOOP
END IF
EXIT
END DO
APPEND BLANK
REPLACE CODE WITH MCODE
REPLACE CAT WITH MCAT
REPLACE DESCP WITH MDESCP
REPLACE QSTOCK WITH MQSTOCK
REPLACE QREC WITH MQREC
REPLACE RDATE WITH MRDATE
EXIT
ENDDO
EXIT
RETURN
```

MODIFY INVENTORY

***PROGRAM TO MODIFY INVENTORY

96

```
USE INVENT
DO WHILE .T.
CLEAR
MSUB CODE = O
SET COLO TO RB+
@11, 8 TO 13, 75 DOUB
@12, 10 SAY "ENTER THE ITEM CODE TO MODIFY OR OO TO EXIT ..."
@12, 64 GET MCODE PICT "9999"
READ
IF MCODE = O O
CLEAR
WAIT
RETURN
END IF
GO TOP
LOCATE FOR CODE = MCODE
IF .NOT. FOUND ( )
CLEAR
SET COLO TO B+
@10, 20 SAY "INVALID NUMBER, TRY ANOTHER PLEASE!!!
@13, 20 SAY "  "
WAIT
CLEAR
LOOP
```

```
END IF
****CHECK TO SEE IF THE RECORD EXISTS
IF FOUND ( )
STORE CODE TOP MCODE
STORE CAT TO MCAT
STORE DESCP TO MDESCP
STORE QSTOCK TO MQSTOCK
STORE QREC TO MQREC
STORE COST TO MCOST
STORE RDATE TO MRDATE
END IF
CLEAR
CODE = MCODE
SUB CODE = MSUB CODE
MCAT = CAT
MDESCP = DESCP
MQREC = QREC
MCOST = COST
MRDATE = RDATE
CLEAR
SET COLO TO GR+/B, W/R, GB+
@2, 17 SAY "WEST AFRICAN PORTLAND CEMENT PLC"
@4, 19 SAY "INVENTORY CONTROL SYSTEM"
@6, 17 SAY "INVENTORY MODIFICATION"
```

```
@10, 6 SAY "CODE NUMBER"
@12, 6 SAY "ITEM CATEGORY"
@14, 6 SAY "DESCRIPTION"
@16, 6 SAY "QUANTITY IN STOCK"
@18, 6 SAY "QUANTITY RECEIVED"
@20, 6 SAY "COST PER ITEM"
@22, 6 SAY "DATE OF SUPPLY"
@9, 35 SAY "SUB CODE"
@10, 35 GET MCODE PICT "0000"
@12, 35 GET MCAT PICT "!"
@14, 35 GET MDESCP PICT "@!"
@16, 35 GET MQSTOCK PICT "999999"
@18, 35 GET MQREC PICT "999999'
@20, 35 GET MCOST PICT "99/99/9999"
@9, 60 GET MSUB CODE PICT '999"
READ
REPLACE CODE WITH MCODE
REPLACE CAT WITH MCAT
REPLACE DESCP WITH MDESCP
REPLACE QSTOCK WITH MQSTOCK
REPLACE QREC WITH MQREC
REPLACE COST WITH MCOST
REPLACE RDATE WITH MRDATE
REPLACE SUB CODE WITH MSUB CODE
```

```
APPEND BLANK

CLEAR

CHOICE = SPACE (1)

@ 20, O CLEAR TO 21, 80

@ 15, I SAY  "    "

WAIT "DO YOU WANT TO MODIFY MORE RECORDS?

(Y/N)" TO CHOICE

@ 14, 10 ;SAY  "PLEASE ENTER YOUR CHOICE YORN"

IF. NOT. UPPER (CHOICE) $ "YN"

END IF

IF UPPER (CHOICE) = "N"

CLEAR

EXIT

ENDIF

IF UPPER (CHOICE) = "Y"

CLEAR

LOOP

ENDIF

CLOSE ALL DATABASE

ENDDO

RETURN
```

o o o o o o o o o o o o o oo o o

```
DELETE INVENTORY
```

```
**PROGRAMME TO DELETE A RECORD FROM SUPPLY DBF
PUBLICE M CODE
USE INVENT
DO WHILE .T.
CODE = M CODE
M CODE = O
SET COLO TO G +
CLEAR
@ 11, 8 TO 13, 75 DOUB
@ 12, 11, SAY "ENTER CODE NUMBER OF ITEM TO
 DELETE OR OO TO QUIT...."
@ 12, 70 GET ;M CODE PICT "9999"
READ
*** CHECK TO VERIFY THE CORRECT CODE
IF M CODE = OO
CLEAR
EXIT
ENDIF
*** FIND CODE NUMBER IN SUPPLY. DBF
LOCATE FOR CODE = M CODE
*** IF SUCH RECORD EXISTS **
IF EOF (  )
```

```
CLEAR
@ 9, 13 TO 11, 75
@ 10, 20 SAY "THERE IS NO SUCH RECORD IN FILE....."
@15, 20 ;SAY     "          "
WAIT
LOOP
ENDIF
**IF RECORD IS FOUND BEFORE END OF FILE
THEN STORE IT
IF . NOT. EOF (  )
**START PERFORMING REPLACEMENT **
DO WHILE .T.
CHOICE = SPACE (1)
@ 18, O CLEAR TO 20, 78
@ 18, I SAY "ARE YOU SURE YOU WANT TO DELETE?
(Y/N)..." GET CHOKE
READ
IF UPPER (CHOICE) = "N"
CLEAR
EXIT
ENDIF
IF UPPER (CHOICE) = "Y"
CLEAR
SET CLOL TO RG +
```

```
@ 6, 22 SAY " INVENTORY DELETION"
SET COLO TO G
DELETE
PACK
SET COLO TO R +
@ 9, 14 TO 11, 45 DOUB
@10, 16 SAY "THE RECORD HAS BEEN DELETED"
@ 11, 16 SAY "
WAIT
CLEAR
EXIT
OTHERWISE
? CHR (7)
LOOP
END CASE
END DO
LOOP
CLOSE ALL
END DO
RETURN
```

° ° ° ° ° ° ° ° ° ° ° ° ° ° °°

VIEW INVENTORY

° ° ° ° ° ° ° ° ° ° ° ° ° ° °°

```
**PROGRAMME TO LIST INVENTORY ITEMS
USE INVENT
CLEAR
F = O
S = SPACE (2)
HEAD 1 = "CODE "+" CATEGORY "+" DESCRIPTION
"+" QUANTITY –N – STOCK
"+" QUANTITY – RECEIVED "+" SU-DATE"
? HEAD 1
@ 2, I SAY    "          "
GO TOP
W = 2
DO WHILE .NOT. EOF (  )
? CODE, S, CAT, TRIM (DESCP), S, QSTOCK, S,
COST, R DATE
@ W, 2, SAY CODE
@ W, 7 SAY CAT
@ W, 16 SAY DESCP
@ W, 28 SAY QSTOCK
@ W, 45 SAY Q REC
@ W, 58 SAY COST
@ W, 73 SAY R DATE
W = W + 1
SKIP
```

```
F = F + 1

IF F = 5

IF. NOT. EOF ( )

@ 23, 23 SAY "PRESS ANY KEY TO CONTINUE THE REST...."

@ 2, 60 CLEAR TO 20, 60

W = 2

I = 0

DO WHILE I = 0

I = INKEY ( )

ENDDO

ENDIF

@ 2, I CLEAR TO 23, 78

@ 2, I SAY  "   "

F = 0

LOOP

ENDIF

ENDDO

@ 23, I CLEAR TO 23, 80

@ 23, 18 SAY "PRESS ANY KEY TO RETURN TO THE PREVIOUS MENU"

I = 0

DO WHILE I = 0

I = INKEY ( )

END DO

RETURN
```

```
PROCEDURE REPORT GENERATION

CLEAR
DO WHILE .T.
CLEAR
SET COLO TO R + / N
@ 1, 4 CLEAR TO 4, 75
@ 1, 4 TO 4, 75 DOUB
@ 3,22 SAY "REPORT MENU"
STORE SPACE (1) TO OPT 4
SET COLO TO R/W
@ 5, 5 CLEAR TO 23, 70
@ 5, 4 TO 23, 75
@ 22, 17 TO 24, 60
@ 11, 20 SAY "ISSUE REPORT.....{I}"
@ 13, 20 SAY "SUPLY REPORT.....{S}"
@ 15, 20 SAY "INV ENTORY REPORT.....{S}
 @ 17, 20 SAY "EXIT.....{E}"
@ 23, 18 SAY "PLEASE ENTER A CHOICE (I, S, S, OR E)  {    }"
@ 23, 53 GET OPT 4 PICT "@!"
READ
DO CASE
```

```
CASE OPT 4 = "I"
DO PRINT
CASE OPT 4 = "S"
DO PRINT 2
CASE OPT 4 = "$"
DO PRINT 1
CASE OPT 4  = "E"
CLEAR ALL
EXIT
OTHERWISE
@ 23, 10 SAY  "WRONG OPTION "+OPT+" ENTERED"
WAIT
END CASE
END DO
SET COLOR TO
RETURN
* * * * * * * * * * * * * * *
REPORT ON ISSUE
* * * * * * * * * * * * * * *


SET TALK OFF
SET ECHO OFF
SET BELL OFF
SET DEVI TO PRIN
USE ISSUE
```

```
GO TOP
SET CONS OFF
N = 1
F = 1
STORE O TO TOT, TOT1, TOT2
DO WHILE .NOT. EOF (  )
IF F = 1
@ F, I SAY (MONTH (DATE  ( )  )
+ STR (DAY (DATE (  )  ), 3 ) +", " + STR (YEAR (DEATE (  ), 4,)
F = F + 2
@ F, 25 SAY "WEST AFRICAN PORTLAND CEMENT PLC"
F = F + I
@ F, 25 SAY "STORE ISSUE VOUCHER"
F = F + I
@ F, 1 SAY "ITEM NO."
@ F, 5 SAY "VOC NO."
@ F, 13 SAY "VOCAB NO."
@ F, 23 SAY "ITEM DESCP."
@ F, 33 SAY "QTY. ISSD"
@ F, 41 SAY "QTY. INDTED"
@ F, 52 SAY "BALANCE"
@ F, 62 SAY "INDENT UNIT"
@ F, 72 SAY "EXTRACT"
F = F + 1
END IF
```

```
@ F, 1 SAY STR (n, 3)
@ F, 5 SAY Vol NUM PICT "99999"
@ F, 13 SAY TRIM (DESCP)
@ F, 23 SAY Q ISSUED PICT "99999999.99"
@ F, 33 SAY Q INDENT PICT " 99999999.99"
@ F, 44 SAY Q STOCK PICT "99999999.99"
@ F, 57 SAY ID UNIT PICT "99999999.99
IF EXTRACT
@ F, 76 SAY "EXT."
END IF
TOT1 = TOT1 + Q STOCK
F = F + 1
N = N + 1
SKIP
IF EOF ( )
EXIT
END IF
IF F = 56
EJECT
F = 1
END IF
ENDDO
E = F + 2
@ F, 10 SAY "TOTAL BALANCED ="
```

```
@ F, 26 SAY TOT1 PICT "9,999,999.99"
SET DEVI TO SCRE
WAIT "PRINTING JOB COMPLETED, PRESS ANY KEY."
SET TALK ON
SET BELL ON
SET ECHO ON
EJECT
RETURN



REPORT ON INVENTORY


**PROGRAMME PRINTS INVENTORY REPORT **
SET ECHO OFF
SET TALK OFF
SET BELL OFF
SET SCOR OFF
SED DEVI TO PRINT
USE INVENTORY
SET CONS OFF
N = 1
F = 1
```

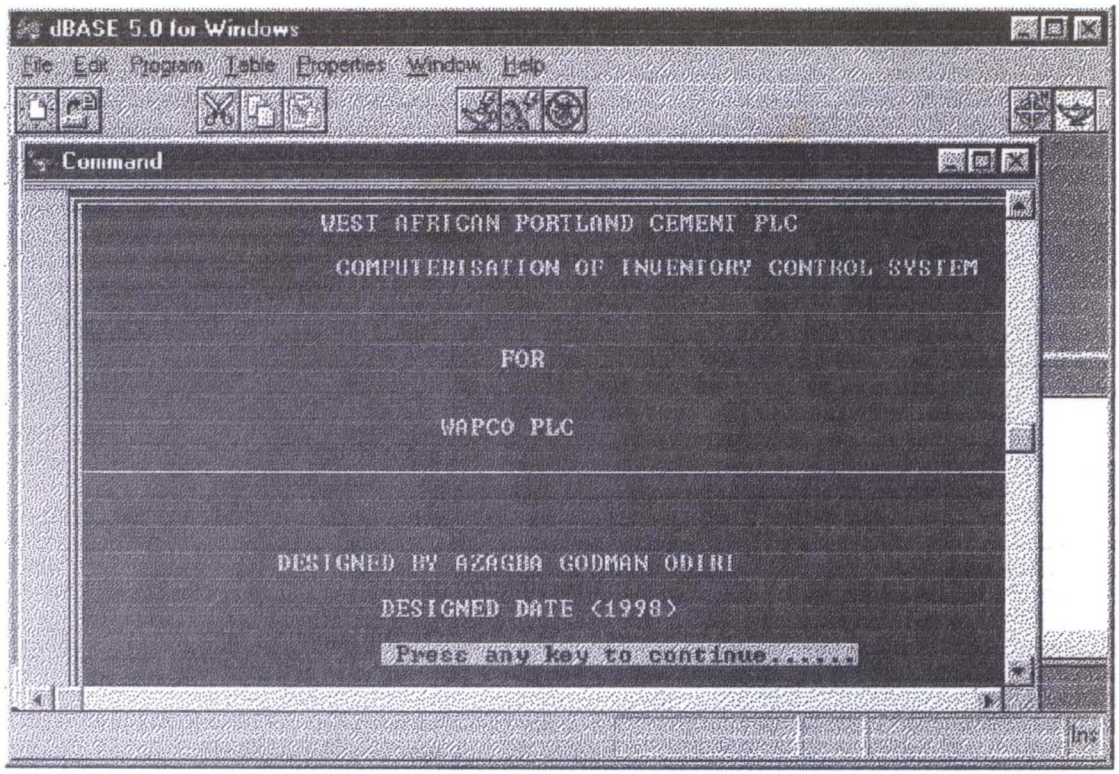
```
STORE O TO TOT, TOT1, TOT2, Q REC, Q ISSUED
DO WHILE. NOT. EOF ( )
IF F = 1
@ F, I SAY (MONTH (DATE ( ) ) + STR (DAY (DATE ( ) ),3) +
", " + STR (YEAR (DATE ( ) ), 4)
F = F + 2
@ F, 25 SAY "WEST AFRICAN PORTLAND CEMENT PLC"
F = F + 1
@ F, 25 SAY "INVENTROY REPORT"
F = F + 1
@ F, 1 SAY "ITEM NO. "
@ F, 5 SAY " CODE NO. "
@ F, 13 SAY "ITEM DESC."
@ F, 23 SAY "QTY. RECD"
@ F, 33 SAY "QTY. ISSD"
@ F, 41 SAY 'STOCK BAL."
@ F, 52 SAY "INDENT UNIT"
@ F, 62 SAY "EXTRACT"
F = F +1
END IF
@ F, 1 SAY STR (n, 3)
@ F, 5 SAY CODE PICT "9999"
@ F. 13 SAY TRIM (DESCP) PICT "@ ! "
@ F, 23 SAY QREC PICT "999999.99"
```

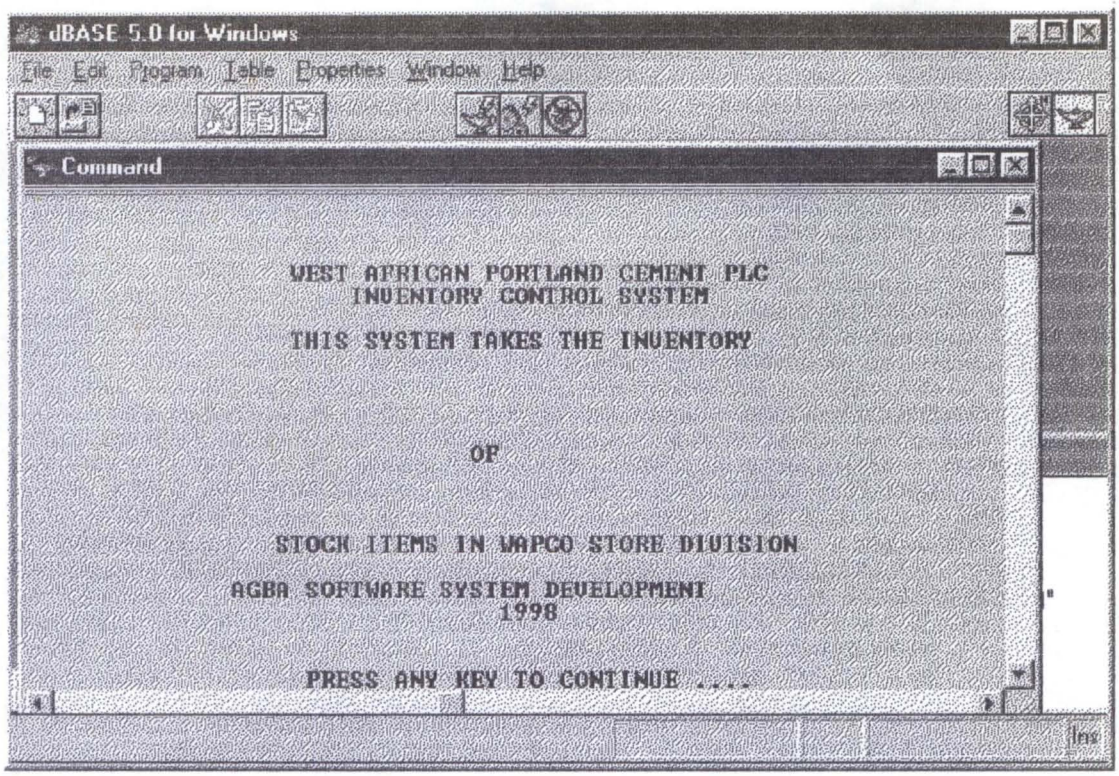
```
+ "," + STR (YEAR (DATE ( ) ), 4 )

F = F + 1

@ F, 25 SAY "WEST PORTLAND CEMENT PLC"

F = F + 1

@ F, 25 SAY "GOODS RECEIVED NOTES"

F = F + 1

@ F, 1 SAY " ITEM NO."

@ F, 5 SAY "VOCAB NO. "

@ F, 13 SAY "ITEM DESCP"

@ F, 23 SAY "QTY. INDENTED"

@ F, 33 SAY "QTY. SUPPLIED"

@ F, 41 SAY "BALANCE"

@ F, 52 SAY "INDENT UNIT"

@ F,62 SAY "EXTRACT"

F = F + 1

ENDIF

@ F, 1 SAY STR (n, 3)

@ F, 5 SAY VOC NUM PICT "99999"

@ F, 13 SAY TRIM (DESCP) PICT "@! "

@ F, 23 SAY Q INDENT PICT "99999999.99"

@ F, 33 SAY Q SUPPLY PICT "99999999.99"

@ F, 41 SAY Q STOCK PICK "99999999.99"

@ F, 52 SAY ID UNIT PICT "99999999.99"

IF EXTRACT
```

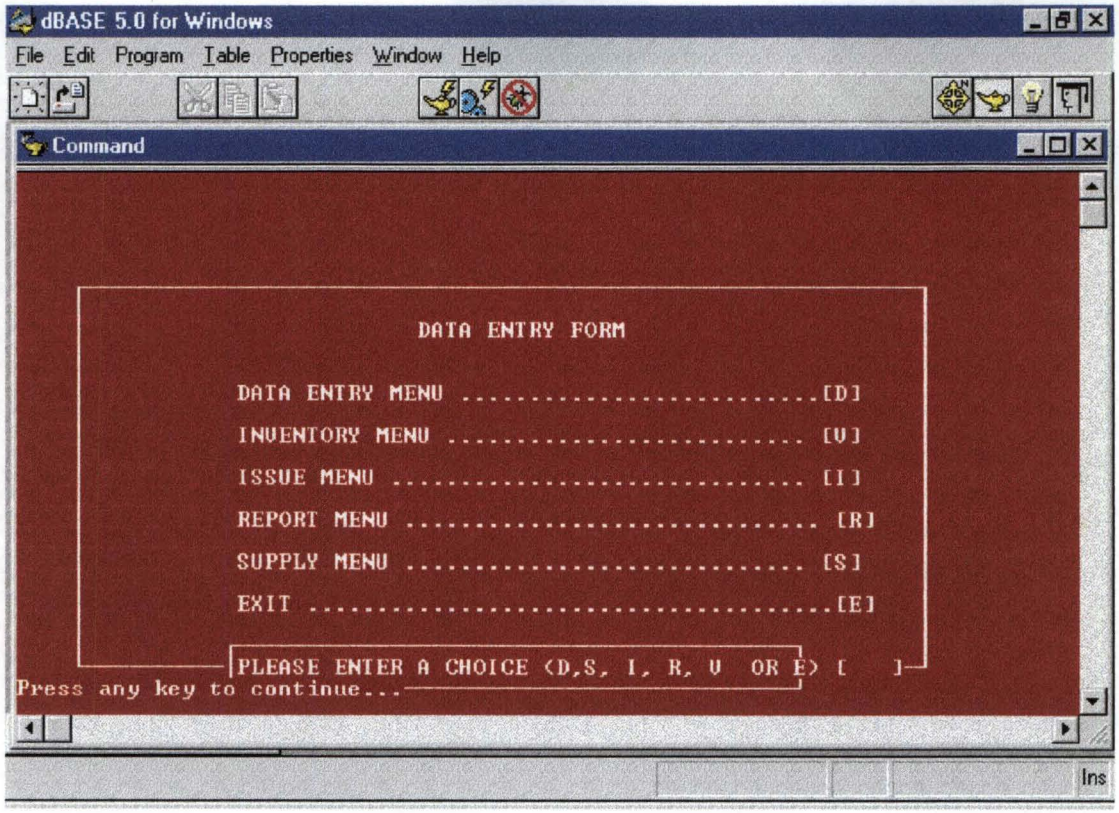
```
@ F, 76 SAY "EXT"
ENDIF
TOT = TOT + Q STOCK
F = F + 1
N = N + 1
SKIP
IF EOF ( )
EXIT
END IF
IF F = 56
EJECT
F = 1
END IF
END DO
F = F + 1
@ F, 10 SAY "TOTAL STOCK ="
@ F, 26 SAY TOT PICT "9,999,999.99"
SET DEVI TO SCOR
WAIT "PRINTING JOB COMPLETED, PRESS ANY KEY
SET ECHO ON
SET TALK ON
SET BELL ON
RETURN
```

```
@ F, 33 SAY Q ISSUED PIC "999999.99"
@ F, 41 SAY ST BAL PICT "999999.99"
@ F, 52 SAY ID UNIT PICT "@!"
IF EXTRACT
@ F, 66 SAY "EXT."
ENDIF
TOT = TOT + Q STOCK
TOT1 = TOT + Q REC
TOT2 = TOT1
F = F + 1
N = N + 1
SKIP
IF EOF ( )
EXIT
END IF
IF F = 56
EJECT
F = 1
ENDIF
ENDDO
F = F +2
@ F, 10 SAY "TOTAL QUANTITY OF ITEM IN STOCK ="
@ F, 46 SAY TOT PICT "9, 999,999.99"
SET DEVI TO SCRE
```

```
WAIT "PRINTING JOB COMPLETED, PRESS ANY KEY TO CONTINUE"

SET ECHO ON

SET TALK ON

SET BELL ON

SET SCOR ON

EJECT

RETURN


o o o o o o o o o o o o o o o oo o

 REPORT ON SUPPLY
o o o o o o o o o o o o o o o oo o

**THIS PROGRAMM GIVES REPORT ON SUPPLY

SET ECHO OFF

SET TALK OFF

SET BELL OFF

SET DEVI TO PRINT

USE SUPPLY

GO TOP

SET CONS OFF

F = 1

N = 1

STORE O TO TOT, TOT1, TOT2

DO WHILE. NOT. EOF ( )

IF F = 1

@ F, 1 SAY (MONTH (DATE ( ) ) + STR (DAY (DATE ( ) ) , 3)
```


dBASE 5.0 for Windows
File Edit Program Table Properties Window Help
Command
WEST AFRICAN PORTLAND CEMENT PLC
COMPUTERISATION OF INVENTORY CONTROL SYSTEM
FOR
WAPCO PLC
DESIGNED BY AZAGBA GODMAN ODIRI
DESIGNED DATE (1998)
Press any key to continue.....
Ins


dBASE 5.0 for Windows
File Edit Program Table Properties Window Help
Command
WEST AFRICAN PORTLAND CEMENT PLC
INVENTORY CONTROL SYSTEM
THIS SYSTEM TAKES THE INVENTORY
OF
STOCK ITEMS IN WAPCO STORE DIVISION
AGBA SOFTWARE SYSTEM DEVELOPMENT
1998
PRESS ANY KEY TO CONTINUE ....
Ins


dBASE 5.0 for Windows
File Edit Program Table Properties Window Help
Command
DATA ENTRY FORM
DATA ENTRY MENU .....[D]
INVENTORY MENU ..... [V]
ISSUE MENU ..... [I]
REPORT MENU ..... [R]
SUPPLY MENU ..... [S]
EXIT .....[E]
PLEASE ENTER A CHOICE (D,S, I, R, V OR E) [ ]
Press any key to continue...
Ins