COMPUTERIZATION SCHEME FOR STORES MANAGEMENT AND FUNCTIONS A CASE STUDY OF NATIONAL INSTITUTE FOR PHARMACEUTICAL RESEARCH AND DEVELOPMENT IDU – ABUJA.

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DEDICATION

I DEDICATE THIS PROJECT to the glory of God the Father, the Son and the Holy Spirit my Everything.

To my Father and Mother **TITUS** and **SUZAINAH** of blessed memory respectively who gave birth to me.

To my Wife **GRACE MAJIYEBO AKALE** and my Children **LAMI JOY, GIMBA LAWRENCE, HASSANA FLORENCE** and **SOKOGA EMMANUEL** who understand, care so much and always pray for me. They are God's special gift to my life. I am indeed grateful to God for all of them.

CERTIFICATION

This project has been approved by the undersigned, as meeting the requirement of the Department of Mathematics/Computer Science Federal University of Technology Minna.

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ACKNOWLEDGEMENT

No one can achieve anything meaningful without the knowledge of the **Almighty God the Creator** of the Universe and all that is therein. In the light of this, I register my sincerest gratitude to **God Almighty my Everything** who owns life and knowledge to have bestowed on me this great opportunity to undertake this privilege work.

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Finally, to myself I say well done there is still room to fill up.

ABSTRACT

The project aimed at looking into the viability of computerization of stores management and functions with a view of minimizing loss and willful manipulations of records. This work carried out enquires about the problems and suggest useful solutions to minimize them.

Enquires made available many lapses in the administration of stores, in the following areas, updating of stock record, mutilation and loss of stock documents, closure of issuance for the purpose of periodic stock count, duplication of work, schedule among personnel, pilferaging outright stealing and interference with store administration ethics etc. In view of this, the project work investigated the existing problems critically. The writer adequately proposed and designed a suitable computer system with numerous merits over the manual method, i.e computer system can handle large volume of data effectively on disk files. The benefits to be derived from computerization of store management in N.I.P.R.D can therefore not be overemphasized.

The system allows, speedy operation, accurate and reliable information, quick retrieval of information, highly productive and improved services, minimized record manipulation and maximum efficiency among others.

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CHAPTER ONE

1.0 INTRODUCTION

The advent of computer system brought about large production of volume of data into meaningful information. Computers have proved a useful technology in this aspect. The use of adding and calculating machines to perform arithmetic operations were important advancement into the history of data processing. The mechanical and manual methods have been in existence until mid 1940s when the first brand of electronic digital machines was introduced.

In recent past, many organizations have been using manual method in keeping their records. This has made compilation of store records cumbersome and rather two complex and hectic. Stores management comprises two major activities namely (i) store inventory and (ii) stock control. Computer Scheme is the actual automation of these activities by the use of computer system.

Computer as an electronic data processing machine has the ability and capability of string, retrieving and manipulating large data at a fantastic speed. It has indeed become a wonder tool or machine in operation and management of modern organisations today.

Introduction of computer in National Institute for Pharmaceutical Research and Development Idu – Abuja inventory and stock control as a means of effective control, will speed up routine jobs and minimize to a great deal the possibility and chances of errors, manipulation of store records, pilferaging and discrepancies by mischievous operators. Stock control can be defined as a means by which items are kept under required temperature and made available to users as when required with due respect to economy.

1.1 HISTORICAL BACK GROUND OF NIPRD

The need for the advancement of indigenous pharmaceutical research and development (R&D) so as to enhance development and commercialization of pharmaceutical raw materials drugs and biological products has been recognized. Therefore in 1987, the Federal Government approved the establishment of the National Institute for pharmaceutical Research and Development Idu – Abuja as a Parastatal under the Ministry of Science and Technology based on the recommendation of the Pharmaceutical Society of Nigeria (PSN).

The institute became functional in 1989. the institute is governed by a Board of Governors with representatives from the Pharmaceutical Society of Nigeria, Traditional Medicine Practitioners, Pharmaceutical Group of Manufacturers Association of Nigeria (PG-MAN) Federal Ministry of Science and Technology (FMST) while the Chief Executive serves as member and the secretary to the Board.

The primary objectives of the institute are developing drugs, biological products and pharmaceutical raw materials primarily from indigenous resources. The institute is established to perform the following functions:-

(a) Undertake research and development work into drugs, biological products including vaccines and pharmaceutical raw materials from indigenous natural resources and by synthesis using appropriate science and Technology Methodologies.

(b) Conduct appropriate investigations and consequent applications vis-à-vis the evaluation, preservation, purification standardization, safety and rational utilization of traditional medicine.

(c) Develop methodologies for quality assessment of biological products, orthodox and herbal medicines including their raw materials.

(d) Serve as reference centre for research work on the biopharmceutics pharmacoxinetics, storage and stability of imported and locally manufactured drugs and biological products.

(e) Conduct research and development work into pharmaceutical, biotechnology nutrition, cosmetics and environmental science for improved quality of life and the conservation of medicinal and aromatic plants.

(f) Establish and operate a quality Assurance Laboratory for pharmaceutical materials and products.

(g) Promote and sponsor staff development through training courses, workshops, and fellowship within and outside Nigeria.

(h) Promote and sponsor the local development and production of drugs, vaccines, pharmaceutical raw materials, cosmetics, food supplements, pharmaceutical machinery, devices and accessories.

(i) Promote the pilot production unit of the institute in to a limited liability business venture.

(j) Transfer pharmaceutical products and machinery technologies to private sector industries, and render consultancy and extension services to such and other organisation.

(k) Establish and maintain relevant laboratories, clinics, medicinal plant gardens and other institutions in strategic ecological zones of Nigeria as may be necessary for the performance of the functions:- (i) Compile and publish relevant data resulting from the performance to the functions of the institute.

(l) Sponsor such national and international conferences, workshops symposia, etc as it may consider appropriate.

(m) Patent and register new products and processes with appropriate national bodies, international organisations and selected countries.

(n) Enter into commercial and other appropriate agreements with relevant national and multi-national corporations

regarding the marketing and utilization of the institutes products and services.

(o) Liase with higher institutions, Government Organisations, multi–national bodies and other relevant establishments within and outside Nigeria in the pursuance of the mandates of the institute and finally to establish and collate and synthesis relevant research information for drug manufacturing industries and research centers.

1.2 STATEMENT OF PROBLEMS

The importance of an effective warehousing cannot be overemphasized, as stock processing continue to increase each day. Under a close examination, it was discovered that the present manual method of inventory has some lapses which require very meaningful urgent management attention at this period of material acquisition.

Has management observed the failures and inadequacies in the use of manual methods for documentation of stock movement? Again, has the managers been able to see that loss and mutilations of stock could lead to inaccuracy in stocks and records? Managers of organisations should understand that stock are cash in kind which required to be handled by good hand. Bad handwriting coupled with

willful alteration of figures account for over fifty percent (50%) of errors committed in store sometimes. Moreover for the purpose of adequate accountability of stock when conducting periodic stock count, issuance of all store items from the warehouse should be closed until after the exercise. This is because it normally create friction and as well paralyze the activities of other department and sections, notwithstanding that time is wasted during the period.

This is a point management should ponder over because time is money in business. Furthermore, has there been any positive step to regulate the receipt and issuance of stock with due regard to economy so as to avoid deliberate attempt to provide security, obsolescence and stock out? Lastly, has the information need of the management regarding control and inventory model been met with maximum efficiency under the present manual methods? These and many professional questions need to be asked as regard management of our warehouse.

1.3 OBJECTIVE OF STUDY

Office automation embraces the concept of using computers to support clerical an administrative aspect of an organisation. As a result of numerous problem associated with the manual system, the writer of this project intend to undertake a research in these areas in the interest of streamlining the inventory and record keeping activities by introducing the use of computer scheme. Computers are expert tool in inventory and material control process since each item can be treated in accordance with a set of rules. Hence the vast amount of work involved can be discharged quickly, accurately and timely.

This will ensure the following enhancement, that stock are constantly updated on real-time basis for quick management decisions. That standard warehouse maintain the maximum an minimum standard required by stock levels. This will invariably reduce the danger of accessive stockholding, pilfraging, redundancy, obsolescency of stock. Reduction in the use of papers for documentation of stock item. Computerization of store data and files.

To aid management exert effective supervision and control on the procedures for purchasing and controlling of stocks should not be every man business.

1.4 SIGNIFICANCE AND SCOPE OF STUDY

It will be most unfortunate for an organisation of reputable international research standard such as National Institute for Pharmaceutical research and Development to neglect automation of its warehouse with its present predicaments and shortcomings of the operators on the management information needs.

Thus the writer concludes that a system that is tailored towards the efficient running of the institutes warehouse would be of tremendous advantage. It will be worthy to appraise the immediate introduction of the integrated advancement of material management and its findings are applied to the inventory control, the problems that have always compounded the inefficiency of the store officers will be greatly reduced or minimized.

Due to constraints imposed by time resources and the problem of collecting relevant materials, this study will be focused on the main store of National Institute for Pharmaceutical Research and Development Idu – Abuja with special emphasis on updating inventory records on real time data processing. However, the findings of this research project could be applicable to other warehouse or main store of federal ministries and similar parastatals which is

financed by government to serve as a means of enhancing fast information retrieval.

1.5 LIMITATIONS

One of the limitations in a study of this nature is the difficulty in gathering information. The uncompromising attitudes of civil servants towards interview and in releasing documents or what is called official secrets that are vital to this project work posed a great problem. But thank God Almighty the writer was privileged to handle the store before. This placed him in adequate position to fish out some of the relevant documents and information required. Moreover, there were not enough facilities for keeping in programs and debugging. Finally, financial constraints also pose some problem.

1.6 DEFINITION OF TERMS

WAREHOUSE:

A room in which stocks are kept

STOCK RECORD:

This is a register or document that contains all record of receipted and issued items with their physical balance.

STOCK LIST:

List of items available at a given time

STOCK CODE:

Is the logical basis of easy identification of individual items.

STOCK TAKING:

Is a periodic and occasional physical counting of items in relation to quantity issued to detect any abnormal practice or reveal physical goods at hand.

MINIMUM STOCK LEVEL:

Is the amount expressed in unit below which stock should not be allowed to fall before re-punishment is made.

MAXIMUM STOCK LEVELS:

Is the amount expressed in unit or which stock must not be allowed to exceed.

COMPUTER SYSTEM:

Is an integrated electronic machine, which accepts data from an input device perform logical operations in accordance with a predestined set of rules.

COMPUTERIZATION

Is the designing and implementation of a computer base data processing system that enhances the efficiency and fast retrieval of

records.

DATA:

Are either qualitative or quantitative information collected by the writer which can be fed into the system to produce results.

MANUAL SYSTEM:

Specifically refers to non-computer operated group of activities.

DATABASE:

Is a collection of data file integrated and organized into a single file system which is so arranged to minimize duplication of data and reduces cost.

DATABASE MANAGEMENT:

Is the software used for the management and retrieval of data stored in a Dbase environment.

COMPUTER NETWORK:

A number of computer system linked together so that each has the capability of communicating with each other.

HARDWARE:

Is the physical components of the computer system.

SOFTWARE:

A set of program, which is coded in such a way as to function and control the hardware.

MATHEMATICAL METHOD:

A representation of the factors and inferences of an entity or situation e.g. model of the economic condition when certain factors are added.

THEORETICAL FRAME WORK:

Literary basis, which support or lend credence to the topic under investigation.

PERIPHERAL EQUIPMENT:

All components that are external to the computer system but are made to function along with it.

ENTERNETT:

The software for installing a network.

PROGRAM LIBRAY:

The source of programme that is coded by the writer.

FILE:

A collection of related records.

HYPOTHETICAL DATA:

Data that are literally used by the writer in testing the operations of one system.

CHAPTER TWO

2.0 LITERATURE REVIEW

The team inventory is often considered in the contest of manufacturing and distribution or departmental stores, other types of organisation carry inventory. Banks for example must maintain customers demand. Non-business organisations such like hospitals must carry inventory of drugs, surgical supplies and all kinds of house keeping materials relevant to them. Schools have inventory or instructional materials while government agencies have inventory of office supplies which are technically referred to as maintenance repairs and operation (MRO) and in the military cycles we talk of inventory of arms and Ammunition.

Recently, the government sounded that all federal ministers, permanent secretary's and parastatals management in the country must go integrated electronically. Government also directed the government key players to be computer literate.

The chapter is therefore an attempt to bring together related ideas, past writings of scholars and authorities since the idea of Computers into every face of organization's activities.

In a study conducted by Menon M.S (1993), he stated that materials management embodies both stock inventory and control systems. This is associated with planning, scheduling, purchasing, storing and distribution. Menon was of the opinion that with the increased population explosion especially sub-Saharan regions had increased or is increasing in astronomical rate, demand for maximum

efficiency speedy operation or production processes must go computer system to ensure proper coordination and accurate operations. He went further to stress that stock management involves two aspect of data processing:-

(a) Keeping of updated records of inventories, receipted materials, their issues and balances could be obtained with high degree of accuracy.

(b) That data relating to receipts and issues are entered into the computer and the electronic does the necessary calculations or manipulations and generate the required lists of items for which orders are to be placed or purchasing order is required.

Burton J. A (1981), noted that in a manual system, people talked to each other while at work and can therefore cause a set back in the process of their activities e.g. Bin Card updating. But he contended that the manual methods have now become too slow to meet the speed of information need of the management. Burton therefore went further to suggest that computers are better management tool which have great flexibility and characterized by their speedy operation and accuracy in the processing of inventory.

The trend in the advancement of computer system has greatly hastened the effect on all automation processes in other to make office work more efficient, cheaper and better flexibility than before. Most organisations today are producing at peak capacity due to increasing demand. In this regard, Morrison A. (1982), highlighted the merit of automation of "Paperwork" which he said is the automation of the physical process of activities in the warehouse tailored to achieved high degree of standard with the use of on-line computer systems.

2.1 THE MANAGEMENT FOCUS

In stressing the need for effective store management, Ebikeme T. (1988), was concerned with problems of discrepancies that exist always between the physical inventory and stock records. He maintained that "effective stock control was indeed necessary to guide management in decision making" However, he did not suggest the means by which it could be achieved. However, one area of business decision in which quantitative methods have played highly successful role is achieving cost savings, is the area of inventory control. This was noted in a study conducted by Lapin L. L *1981), "a

primary reason for this success story". Lapin highlighted, "was that inventories represented such a vast segment of total economic activities of any business concern". Lapin went further to point out two phenomena, which have contributed to improvement in controlling inventories. One was the application of mathematical models and optimization techniques to achieve efficiencies while the second one was the development of the digital computers which has improved information processing and retrieval capabilities.

Lapin stated further that "reports are prepared periodically, using the inventory activity report program. The required data element are retrieved from each record in the inventory master file and are arranged so that the printed report satisfies the management information needs" Lapin further said that with the use of these systems, managers in complex organisations now have immediate access to all kinds of information relevant to inventories, and information that was once impossible to obtain quickly.

Donnelly J. H. Jr, et al, (1987) examine the effect of applying computer to achieve inventory control at Norton Company, a USA base construction firm. Some of the well noted impressive results were that:-

i. The plants were not shut down to take inventory

ii. Inventory level increased by 57%

iii. Record keeping accuracy increased from 64% to 99%

iv. On – time delivery of stocked items to customers increased from 40% to 99%

In the light of this, it is evident to note that the closing of this information gap has drastically reduced the need to keep track of manually controlled inventories.

2.2 STOCK VALUATION AND CONTROL

Most firms consider inventory a major source of cost. Managers therefore seek measures for controlling inventory cost. One of the widely used approaches is the economic order quantity model (EOQ). Donnelly, J. H, Jr, et al, (1987).

The "EOQ model" Donnelly reinstated enables managers to determine a number of key inventory decisions, for instance by deciding how many units of items to order and how often to order them. The idea of which is to balance the cost of having too much or too little inventory. This is calculated by the following formula:-

$$EOQ = \sqrt{2 (D * J / V * E}$$

Where 2 is a constant

D = Units of Item Purchased

J = Ordering Cost

E = Insurance and Tax

V = Value of the Item

2.3 FACTORS INFLUENCING INVENTORY CONTROL

There are some major factors that have important bearing on inventories commonly known as carrying cost, Meno, K.S, (1993)

a. Interest on the capital locked up: Meno insist this could amount to as much as 16 to 20 percent of the cost materials depending upon the source of fund. Also firm or establishments that do not borrow capital but lock up its own funds in materials would not deny that there is a capital cost associated with their possession.

b. Rental for space occupied by the stores and taxes payable.

c. Insurance premium payable on goods

d. Obsolescence: some of the materials or components might become obsolete because the product made from these might have discontinued or their design also changed.

e. Shrinkage: Some materials shrink or reduce in size when they are kept for too long could lead to loses.

f. Evaporation:- Certain materials for example, chemical substances reduce in volume because of evaporation. Yet another factor that was identified by menon, K.S, which influence inventory cost is the stock-out when a required material is not in stock, and there are of course cost on them.

He further maintained that such consequences on stock-out could be serious such as, stoppage of production, which could lead to idle time of machine and labour, loss of production, profit and loss of good will from customers.

2.4 DETERMINING THE STOCK LEVEL

Maintaining a standard stock level in an establishment will go a long way to keep business running. Although the time to replenish

stock are chosen from the point of view of administrative convenience hence fixing stock level on each item serves the basic means of stock control by quantity. There are three main stock levels used by most organisations. These are:

1. **Maximum Stock level:** This method expresses the largest quantity of stock that is allowed to be kept in the store. With this method stock is never allowed to exceed this level. The aim of this level is to check excess investment on materials and guide against pilferaging and obsolescence of items. Another aim is to avoid tying up of working capital.
2. **Minimum Stock Level:** This is technically referred to as working stock. At this level urgent action could be forwarded for delivery before the stock goes below the level. Material management prescribed that careful issuing of stock at this level must be maintained. The idea is to see that the organisation is not paralyzed due to stock–out.
3. **Re-order Level:** This is another level between the maximum and the minimum levels. At this level actions should be taken to replenish stock so as to avoid stock falling below the minimum level. (see figure below).

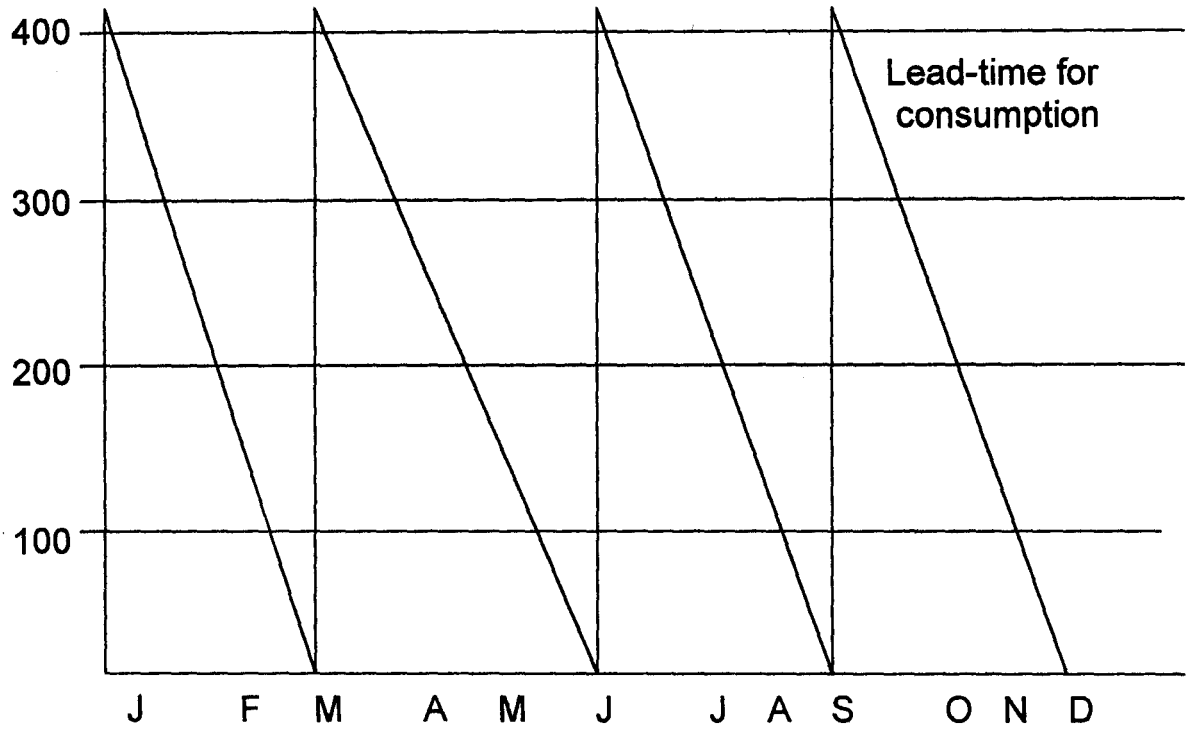


Figure 2 represent a smooth average rate of consumption of 100 units per month. Supplies are obtained once there is a quarter that is equivalent to three months. Consumption of 300 units. The minimum level is fixed at 100 units, the lead time in this case is 45 days. This means that when the stock reaches a level equal to 45 days consumption above the minimum level, the replenishment must be ordered. The level is at 250 units and is called the re-order level. The maximum level is set at 400 units while the recorder quantity is set at 300.

In view of the expert's opinion on the automation of store-keeping as a means of enhancing the efficiency of the store

personnel and the provision of greater accuracy, the writer deem it feasible and viable to introduce a computer oriented electronic scheme for the management of National Institute for Pharmaceutical Research and Development main store.

CHAPTER THREE

3.0 SYSTEM ANALYSIS AND DESIGN

At this stage. It is imperative to carry out a detailed investigation into the problem areas as way of developing a workable scheme that is computer oriented.

The word "manual" according to Langechief Menster University Dictionary means "done with hands", therefore as the name implies, it means keeping inventory records manually without the use of computer aids.

The effects are that due to large volume of papers accompanied by worn out and mutilations, there are inaccuracies in the stock records. Store personnel are always unable to maintain and produce instant reports on the state of stock levels on demand. Moreover, during the report of stock count which sometimes last for several days, activities in other sections are affected until after the exercise is ended. Again, due to the fact that there is no proper maximum and minimum stock levels, the unit occasionally run out of stock which equally bring business hours to a halt.

3.1 MERITS AND DMERITS OF MANUAL METHODS

There is no doubt that the manual inventory record methods have some merits over the computerized one. Some of these are:-

a) **Cost effective:** The manual method is less expensive than the computerized one in view of the current cheap labour in the country now.

b) **Error handling:** Correction of errors can be easily manipulated in the manual method. Moreover, there is no rigid procedure for corrections hence stores officers can manipulate figures to reflect the current stock level.

c) **Job Creation:** The manual method creates job opportunities for people of no professional standing hence more people are needed daily for the job.

Some of the disadvantages that are prevalent with the manual method are:

a) Delay in preparing terminal report on the state of the stock levels.

b) Sometimes, errors, pilferaging of valuable items and outright fraud go undetected.

c) Inefficiency of result due to the duplication of schedule among staff.

d) Due to its slow processes, management information needs for quick decision making is greatly hindered.

3.2 SYSTEM ANALYSIS

In other to evolve a qualitative scheme that would ensure adequate handling of stock inventory an control processes, the present method in use was reviewed critically and analyzed in an attempt to determine its weaknesses.

3.3 STORE ADMINISTRATION AND CONTROL

The store section is being administered by a store officer who makes all policy matters and supervision. The section has about 6 staff who are divided into about three units to take care of the followings:

1. **Issues:** The issuing officer takes the task of receiving demands from other sections by selecting the items and handle them over to the user. Issuing material from the store to other sections is a very important

function hence the efficiency of the section is judged by how well material needs are met.

2. **Receipts:** This officer receives and signs for all incoming items into the store from the supplier or buyer. He also prepare the store receipt voucher for the items.

3. **Store Cleaner/Messenger:** This officer is responsible for cleaning the main store and carry out any paper delivery to the appropriate unit or persons.

3.4 THE STORE BUSINESS IN VIEW.

The daily hours of business starts when other offices send in store requisition notes. The notes are always signed and approved by the designated departmental head usually head of administration and finance. The officer in charge checks to make sure that the requisition meets the criteria for issuance of stock items. He satisfied the requisition note is signed and passed to the issuing officer who prepares the stock issue voucher, pick the items and hand them over to the user.

When goods are brought to the store from the suppliers, the internal auditors verify the goods before the store officer or the goods

receipt officer received them. After this, the goods receipt officer prepares his goods receipt voucher called (SRV) duly signed before sending the document for payment. This is the only internal document which states the detail of what actually is received. It also form the basis for invoicing and payment.

Stock taking is a very rigorous exercise as this must be prepare on time to meet audit demands. Stock taking is done occasionally as the store officer in-charge memories balances of some valuable and expensive items with regards to human fatigue errors of memory balances is better imagined than said. And after the report is finally produced, it is not always exhaustive to meet the information need of the management. In most cases, discrepancies are worked up to cover balances and subsequently fraud.

3.5 **SYSTEM DESIGN**

The design efforts involves making decision about each of the integral part of the output desired, files to be maintained, planned inputs, data processing methods and procedures that link input with output. Actually, the output is basically the result of the new system.

An integral part of the system design work is answering many of the following questions that are necessary for indept review.

1. Can input, output methods and procedures be improved so as to accomplish the firm's objectives to the highest degree possible?
2. Are all operations necessary; does this result in duplication or overlapping of operations etc?
3. Is there any faster and more economical way of processing the data?
4. Are the data recorded in a manner that is compatible with their final use?
5. Is it possible to reduce the volume of work by notifying or changing policies organizational structure, organizational functions or other establishment organizational practice?
6. Can the system be improved through work simplifications?

The above questions are of importance to the writer as it is derived from many parts of the new system.

3.6 THE NEW SYSTEM IN VIEW

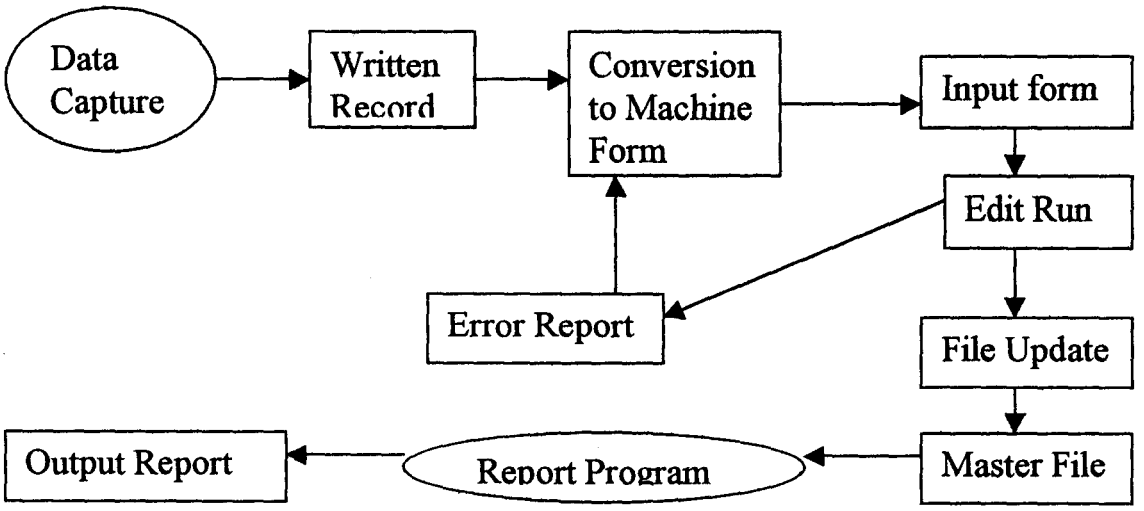
There are two conceptions used in the system design phase.

i. Logical model design, which produces and specified the major feathers of the new system.

ii. The physical design, which takes the logical design blueprint and produces a program specifications, physical, file and data base definitions.

The new system will involve the use of microcomputer system to support the processing of inventory and controls. The system will automate the entire processing of stock receipts and stock issues and update inventory on real time basis. The system was also designed to maintain computer inventory of stocks on disk files

The figure (3) below is a Logical Model of the new system.



A typical batch processing is shown in figure 3, the batch run begins by collecting a set of transactions. These transactions are entered into a form and the forms are passed for data entry into machine-readable form. The transactions are stored on the input file medium, which goes through updates existing file using transaction data. The file is then processed by a report program to produce a set of report, which is the output.

3.7 THE FLOW CHART

Flow chart is a series of boxes and symbols interconnected by flow lines, which reveals the overall structure of a computer system. It is also a convenient way of expressing on paper in diagrammatic form the activities involved in attaining a required objective, and the sequence in which these activities must be performed. These symbols are called flow charts templates, they are American National Standard Institute (ANSI). Flow chart serves purposes. These are:

1. It helps to workout how a problem can be best solved.
2. It helps in reviewing and evaluating the maintainability of the system.

3. It assists to illustrate a proposed system for management consideration
4. It serves as a permanent record for procedures and activities

3.8 SYSTEM FLOW CHART

This could also be referred to as a block diagram. It is an accepted convention, which uses symbols to show the activities and flow of information. The system flow chart is equally the model design put together by the designer. This was done after a thorough research on the logical models.

Generally, it aids to shows where input enters the system, how it is processed and controlled and finally, how is leaves the system in form of storage and output report.

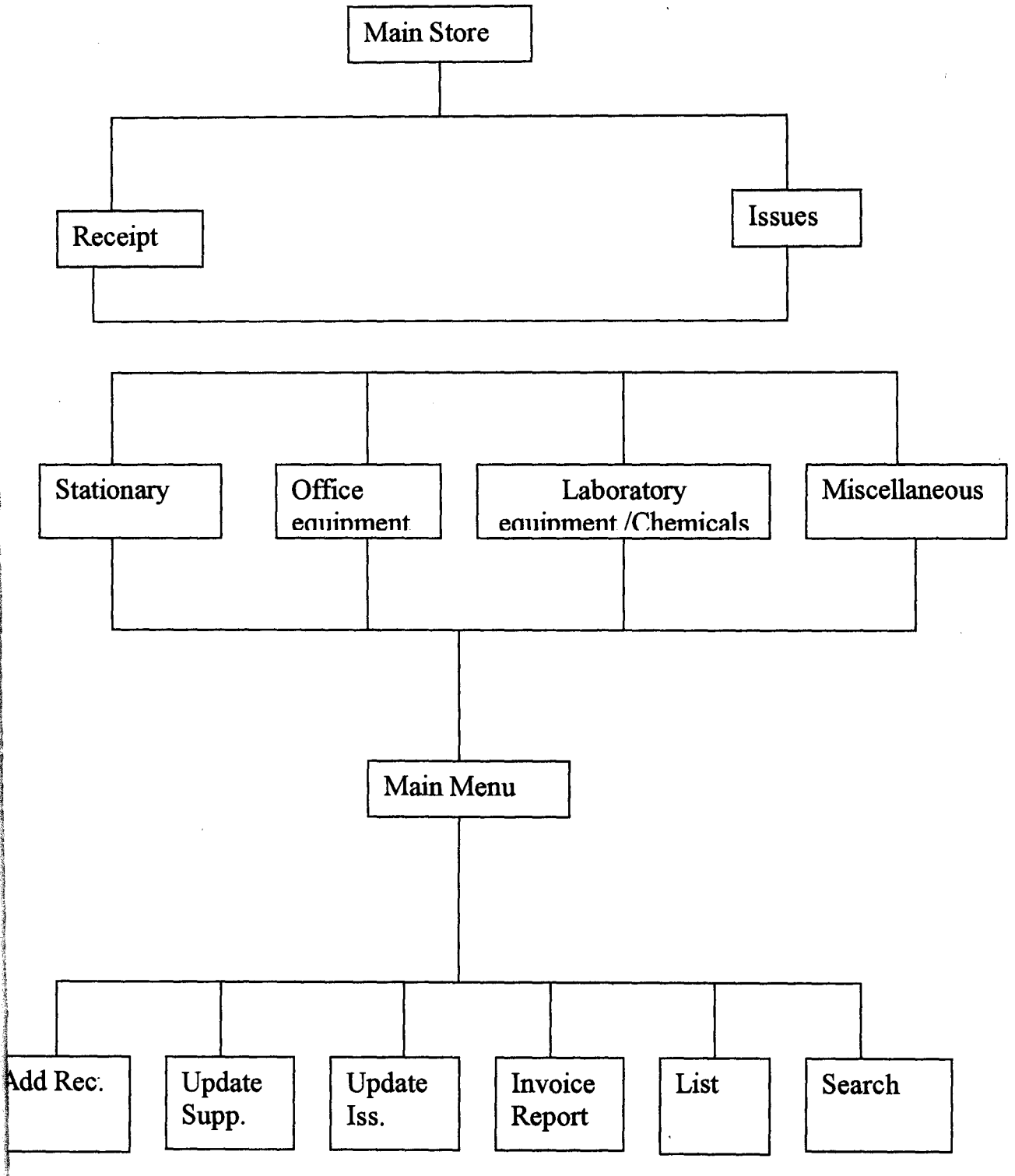
3.9 PROGRAM FLOW CHART

A program flow chart is more detailed and is needed to supplement a system flow chart for a computer-aided system. A program flow chart describes the specific steps and their sequence of operation for a particular computer program. The flow chart is constructed with arrows indicating the direction of the flow. And these

sequences of operations are necessary in coding the source program. The program flow chart also provides an excellent means of documenting the system.

3. 10 **STRUCTURED CHART OF NIPRD STORE**

A block diagram or structure chart consist of blocks and lines connecting those block. It shows the major elements of the program and their relationship to each other. The top block of the tree like structure represents the overall functions of the system as an entity. Each block on the set of structure chart becomes the bases for a program module. And module is an independent segment of coding that performs one particular function. (Essentials of information processing PP205 by Marylyn Baker).


Main Store
Receipt
Issues
Stationary
Office equipment
Laboratory equipment /Chemicals
Miscellaneous
Main Menu
Add Rec.
Update Supp.
Update Iss.
Invoice Report
List
Search

3.11 INPUT AND OUTPUT FORM DESIGNS

INPUT FORM DESIGN

Input was planned carefully in as much as it involves converting the raw data into meaningful information for example, the accuracy of data for editing and verifying methods in the edit run. In most cases, input can also be batches together before feeding them into the computer.

In the National Institute for Pharmaceutical Research and Development Idu Abuja, stores three input forms are used. One is taken from store Receipt Voucher, the second is store Requisition Note from the Departments and stores issues voucher.

The first document contains details of items received into the store, the second document contains details of items required by the users while the last document contains details of item issued.

Figure 5 above shows input form design

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STORES RECEIPT VOUCHER

No:_____

Date:_____

The under-listed items have been received into the stores

(each invoice must be supported by SRV)

Particul	Particulars	Ledger folio	Rate as per invoice	Quty. received	Value N	K

Name of supplier:_____

L.P.O. No:_____

Invoice No:_____

I hereby certify that the above mentioned items have been received in perfect condition into the store Date:_____

Name:_____ Sign:_____

Note:- goods that are not in perfect condition must not be received into the stores where one is in doubt of the condition of stock items, seek technical advice please.

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STORE REQUISITION NOTE

No:_____

Date:_____

Please supply to:_____

S/No	Particulars	Quantity Required	Quantity issued	Remark

This request is approved by

Head of Department:_____ Date:_____

Issued by:_____ Date:_____

Received by:_____ Date:_____

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Research and Development

IDU - ABUJA

STORE ISSUE VOUCHER

No:_____

Date:_____

This under-listed items have been issued to .....

Department/office based on stores requisition Note no .....

S/No.	Particulars	Folio In Stock Ledger	Rate	QTY Issue	Value

I ..... received the above mentioned items in Perfect condition.

Sign:_____ Date:_____

Stores Officer:_____ Date:_____

Store Keeping:_____ Date:_____

Recorded in Stores Ledger:_____ Date:_____

Figure 6 shows stock issuing note (Also see Appendix A).

3.12 OUTPUT FORM DESIGN

The output form could be called bin card or the main store ledger. The output forms is so designed to contain adequate information such as Description, Ledger Code, Date Particulars SRV or SIV, Rate, Quantity Received quantity issued and physical store balance at a given time.

All the information given by the output form will now be stored on disk files for quick accessing and retrieval in a minute second. The output form will be displayed either on the screen or on the print output paper which shows the position of all items received, their issues and balances all at a glance other output report will be on screen information to aid the storekeeper known item that has the minimum level. Another process of output from the system will search either by the code item or description to get inquiry on any item. This process will be on real time basis. (See output form below).

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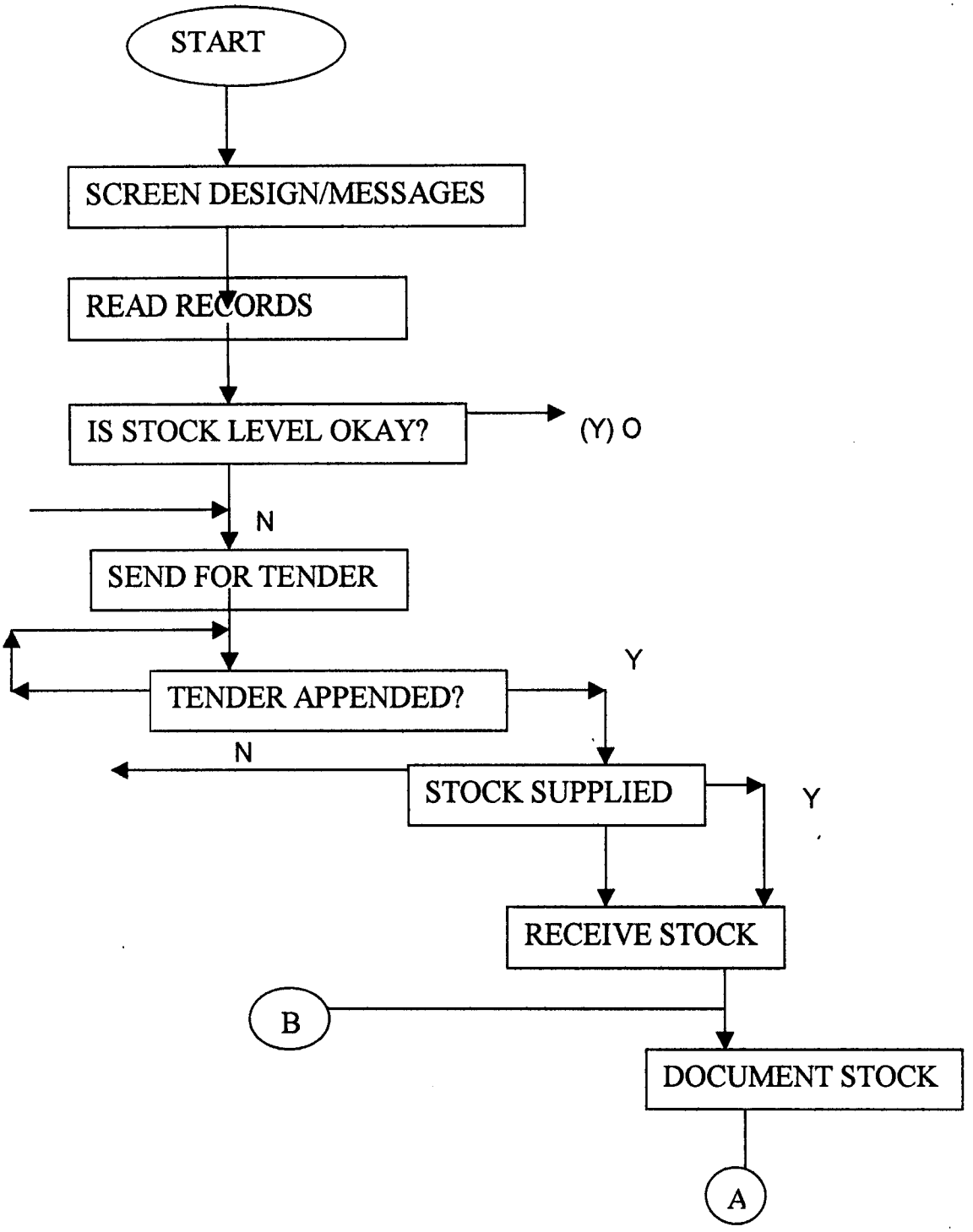
THE SYSTEM FLOW CHART



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BIN CARD Bin No_____

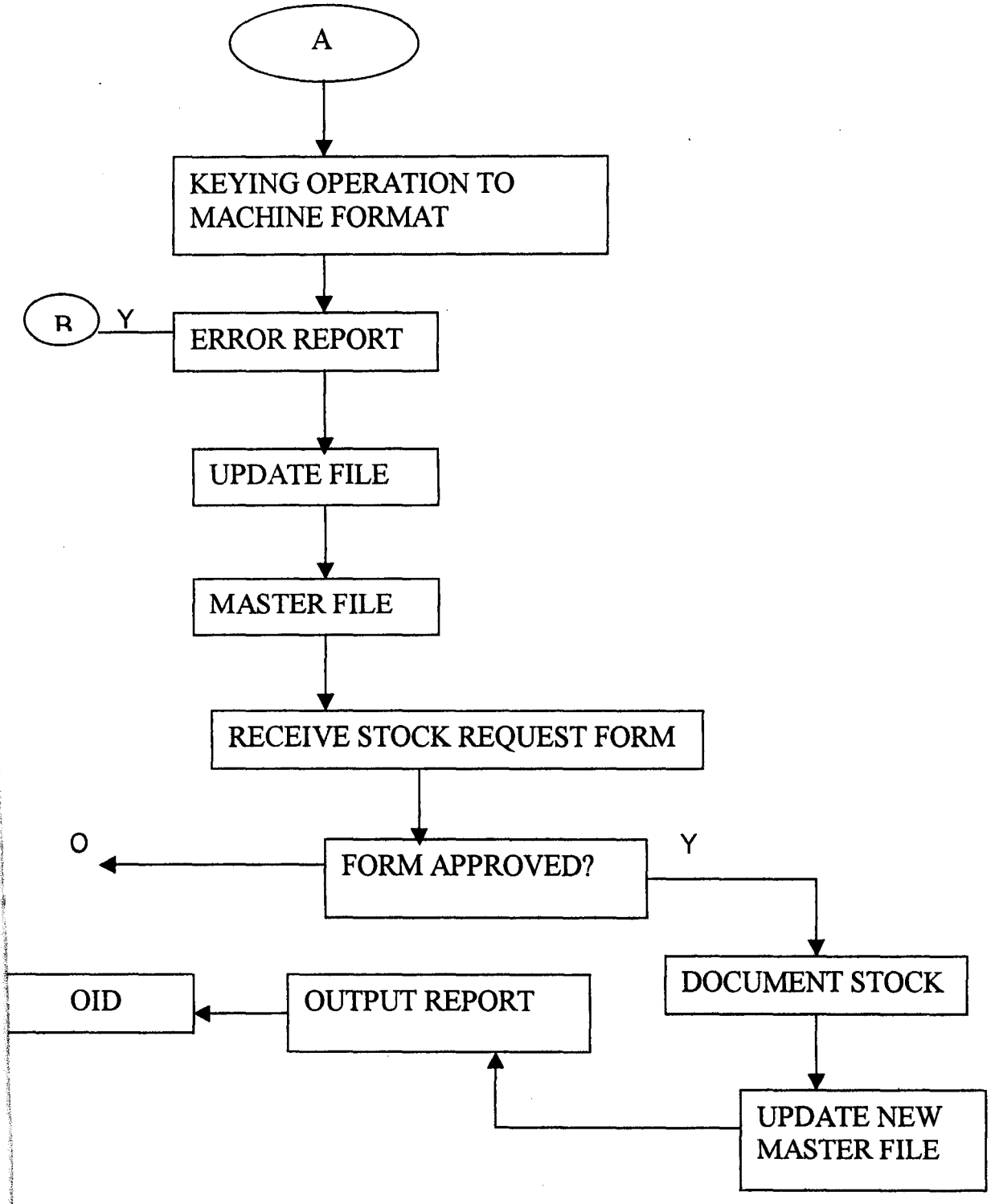
Maximum_____

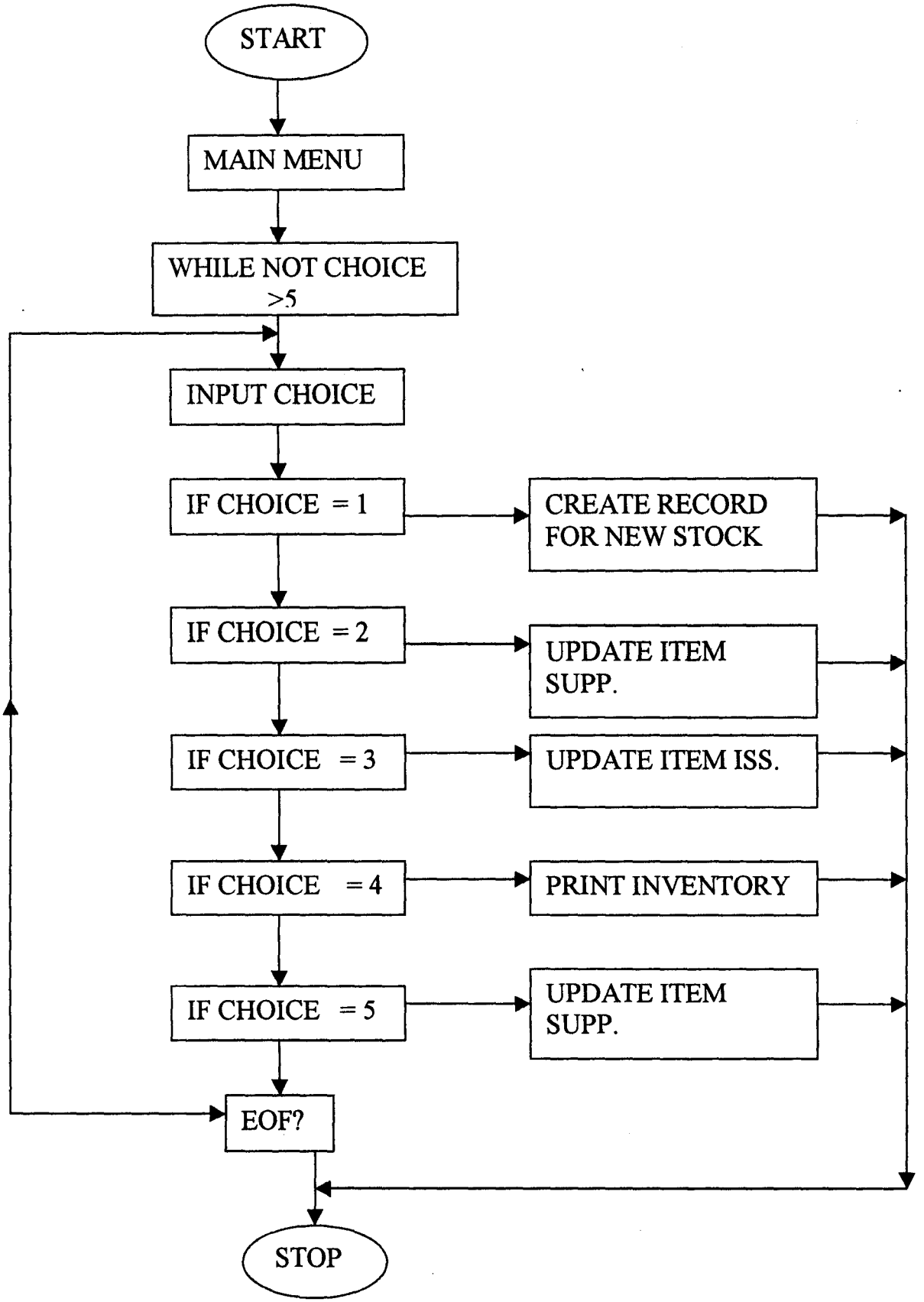
Description Minimum _____

Ledger Folio Re-order level ____

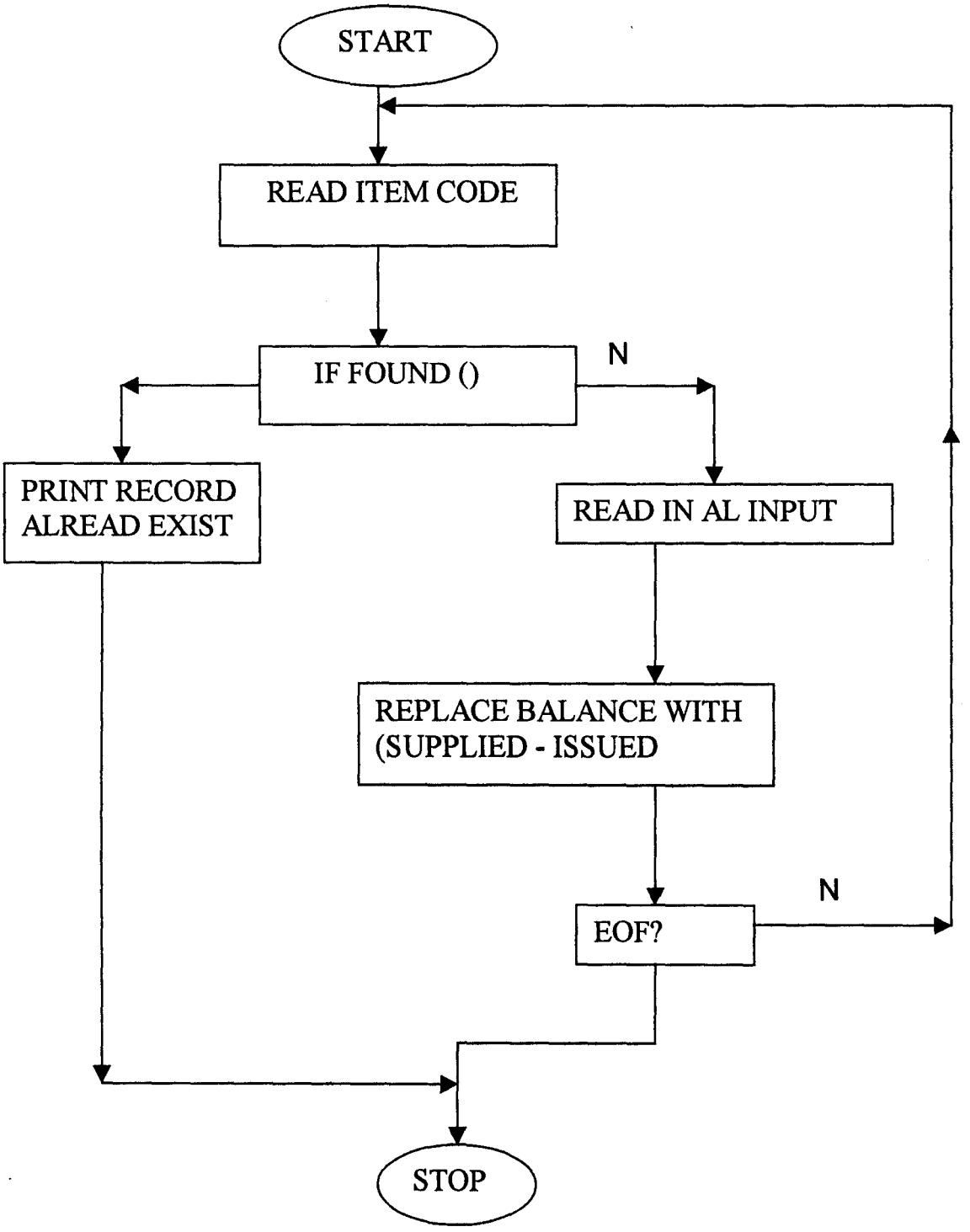
e	Particulars	SIN SRV GTN NO	Rate	Quantity Received	Quantity Issued	alance Quantity	Remarks	Sign

THE SYSTEM FLOW CHART (COUNT)

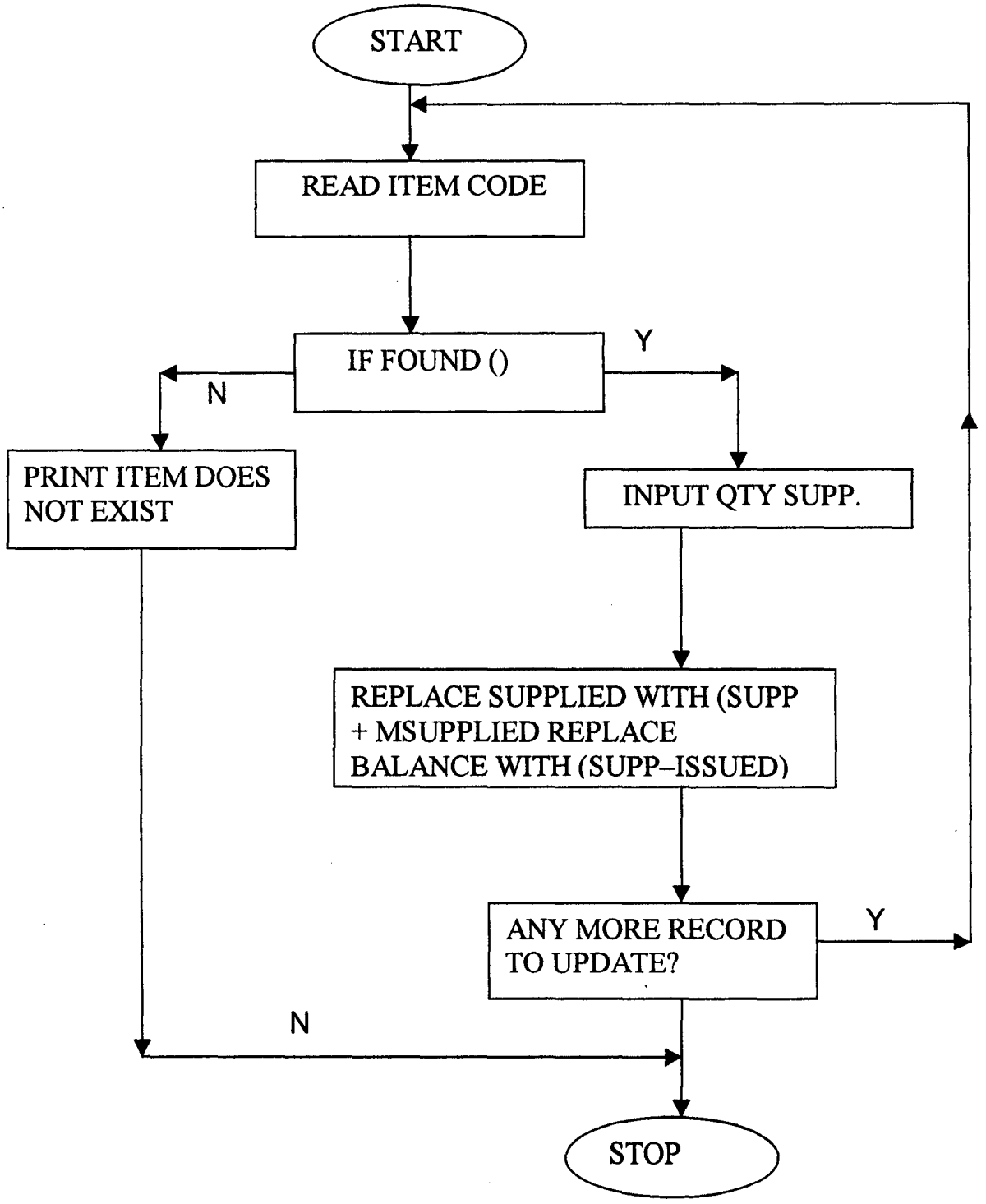



START
MAIN MENU
WHILE NOT CHOICE >5
INPUT CHOICE
IF CHOICE = 1
CREATE RECORD FOR NEW STOCK
IF CHOICE = 2
UPDATE ITEM SUPP.
IF CHOICE = 3
UPDATE ITEM ISS.
IF CHOICE = 4
PRINT INVENTORY
IF CHOICE = 5
UPDATE ITEM SUPP.
EOF?
STOP

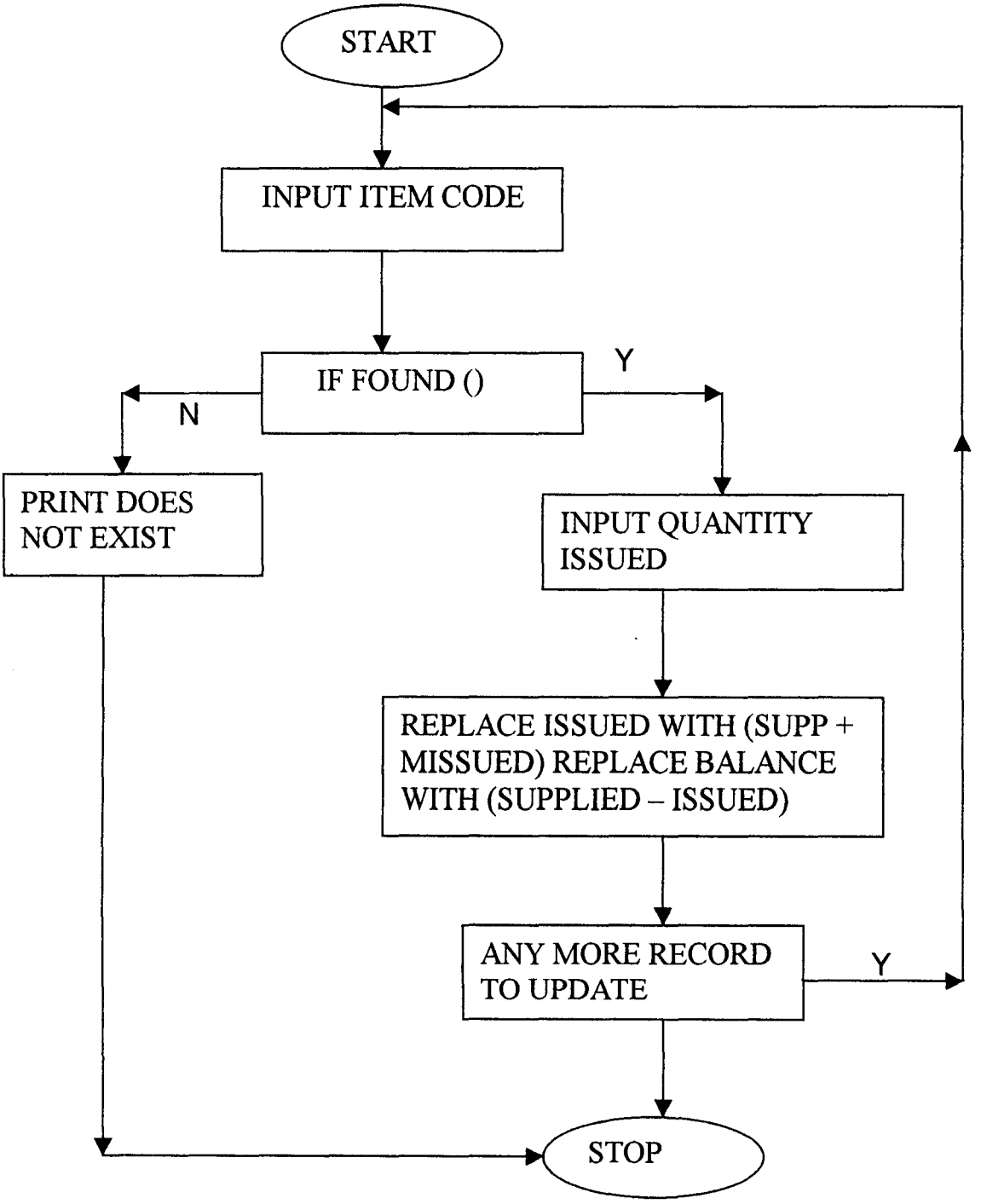
FLOW CHART CREATE NEW RECORD



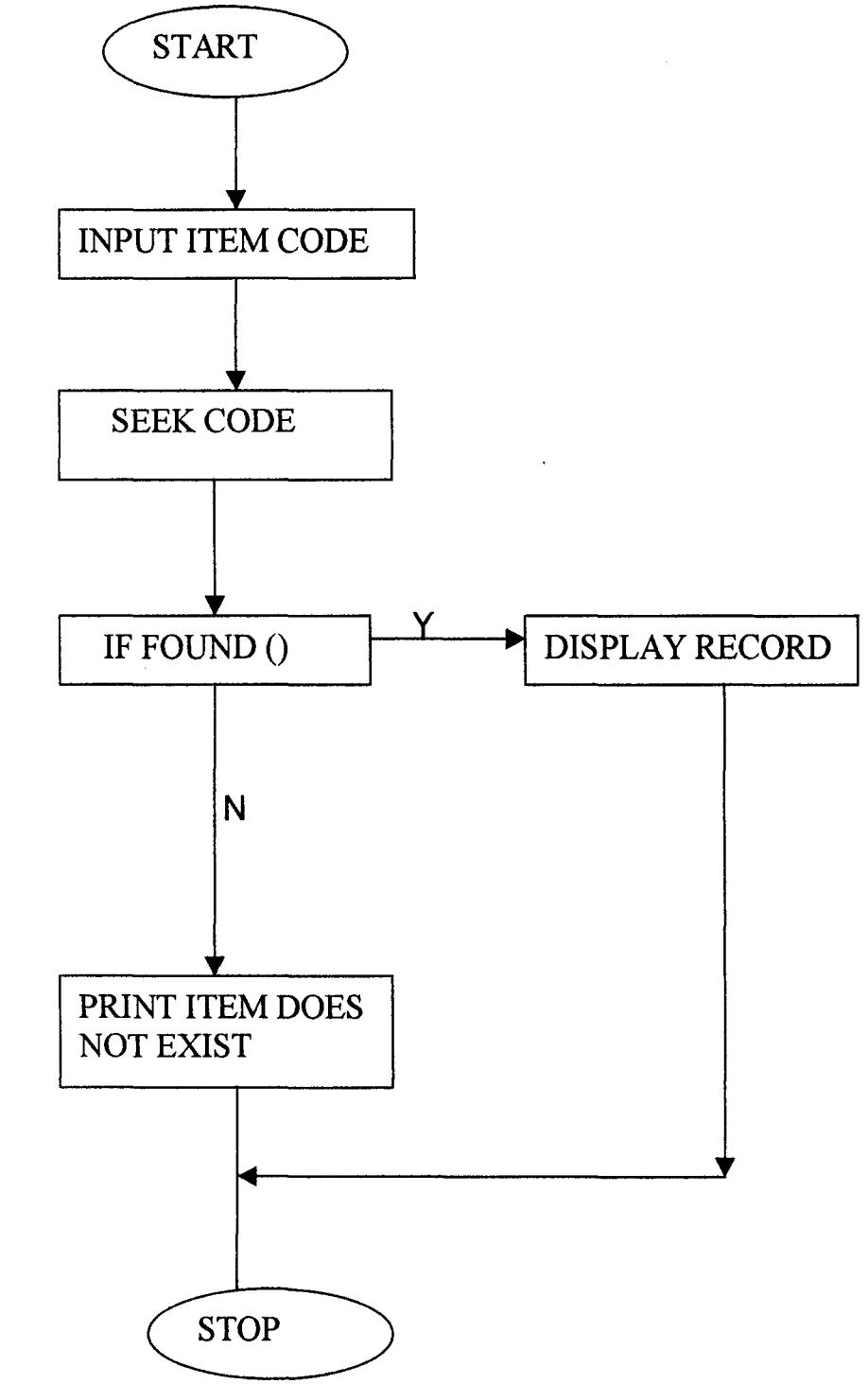
FLOW CHART TO UPDATE NEW SUPPLIED



FLOW CHART UPDATE ITEM ISSUED



FLOW CHART TO SEARCH ITEM BY CODE



CHAPTER FOUR

4.0 IMPLEMENTATION

System implementation involves changing from the old system (manual) to a new one (computerized) and making the new one operational. After the system has been fully investigated and the alternative designs have been successfully be ready for implementation. The major steps for system implementation can be summarized as follows:

1. Preparatory of work of the new system
2. Operation of the new system
3. Periodic review of the new system.

Certain preparatory work must be accomplished before the new system can become operational on daily basis. These includes:

a. Preparing a detailed time and activity schedule
b. Selecting and training qualified personal
c. Testing and acceptance of new equipment
d. File conversion.

4.1 PROGRAM LISTING.

The term program listing is the actual code or the source program for computer-automated scheme for the management of stores (COSMAGTS). The listing shows an interconnected logic, which controls the operations of hardware. The computer program for

this project is structured and such structure performs function which is later linked together by controlling program.

This program is coded in Dbase iv on a coding paper after it has been flow charted. The Dbase is high level language that is simple to code, but required a computer to produce the output. When the computer is read into the C. U. P it then calls for the source program and begins compilation and errors of any kind are debugged before the output could be finally produced.

THE LISTING

```
SET DATE TO BRITISH
SET SAFETY ON
SET ECHO OFF
SET COLOR RG+/B
DO WHILE T
@1, 15 SAY H ***** INTRODUCTION ******H COLOR W+/R
@3, 2 SAY H ***** ***** ***** ***** ***** *****H
@5, 2 SAY "PROJECT WORK SUBMITTED TO THE UNIVERSITY
          OF"
@7, 2 SAY "MINNA IN PARTIAL FULFILMENT OF THE
          REQUIREMENT"
@9, 2 SAY "FOR THE AWARD OF POST GRADUATE DIPLOMA IN
          COMPUTER SCIENCE"
@11, 2 SAY "WRITTEN BY AKALE OBADIAH ARIMJA REG NO
            PGD/MCS/98/99/763"
@12, 2 SAY "DATE MARCH, 2001"
          ?
@13, 2 SAY "THIS PROGRAM IS NAMED COSMGTS IT IS AN
            ACRONYM"
@15, 2 SAY "FOR COMPUTERIZATION SCHEME FOR STORES
             MANAGEMENT AND FUNCTIONS
@17, 2 SAY "IT IS A PROGRAM DESIGNED TO
           MAINTAIN"
A!! @18, 2 SAY "STATUS ON THE CURRENT LEVEL OF
                ADJUSTMENT MAND"
@19, 2 SAY "TO INVENTORY"
```

```
@20, 10 SAY " "
WAIT
CLEAR
EXIT
ENDDO
RETURN
** THE MANU Prg USED TO CHOOSE ACTION TO BE
      PERFORMED
SET DATE TO BRITISH
SET COLOR ON
SET SAFETY ON
SET TALK OFF
STORE O TO CHOICE
DO WHILE DO CHOICE >5
CLEAR
@1, 2 SAY "** WELCOME TO NIPRD INVENTORY MANAGEMENT
            SYSTEM".
SET CLOCK TO 4, 48
@4, 25 SAY "*******" MAIN MENU ******* COLOR R+/W
@03, 13 TO 17, 60 DOUBLE COLOR GB+/R
@06, 18 SAY "1 ADDNEW RECORDS"
@8, 18 SAY "2 UPDATE ITEM SUPPLIED"
@10, 18 SAY "3 UPDATE ITEM ISSUED"
@12, 18 SAY "4 PRINT REPORT
@14, 18 SAY "5 SEARCH FOR A RECORD"
@16, 18 SAY "6 LIST RECORD"
@18, 18 SAY "0 QUIT THE PROGRAM"
```

```
?

INPUT " ENTER YOUR CHOICE" TO CHOICE
DO CASE: CASE CHOICE = 1
DO NEW
CASE CHOICE = 2
DO ADD
CASE CHOICE = 3
DO SUBTRA
CASE CHOICE = 4
DO REPORT
CASE CHOICE = 5
DO SEARCH
CASE CHOICE = 6
DO LIST
CASE CHOICE 0
RETURN
OTHERWISE LOOP
END CASE
END DO
** NEW Prg CREATES RECORD FOR NEW ITEMS
SET DATA TO BRITISH
SET TALK OFF
SET SAFETYON
SET SCOREBOARD OFF
USE INVENTORY ORDER ITCODE
STORE 0 TOMCODE
```

```
ENTRY = T
ANS = T
ANSWER = " "
DO WHILE ENTRY AND ANS
CLEAR
SEEK MCODE
IF FOUND ( )
CLEAR
@22, 10 SAY "RECORD ACREADY EXISTS"
WAIT: USE
RETURN
ENDIF & IFFOUND
IF NOT FOUND ( )
CLEAR SET FORMAT TO FORM1
REPLACE ITCODE WITH MCODE
READ SET FORMAT TO
REPLACE BALANCE WITH (SUPPLIED – ISSUED)
ENDIF 7& IF NOT FOUND 0
CLEAR
ACCEPT "DO YOU WANT TO ENTER MORE RECORDS (Y/N)" TO
        ANSWER
ANS = ANSWER "Yy"
CLEAR
ENDDO
CLOSE DATABASES RETURN
```

```
*THE ADD Prg UPDATES ITEM SUPPLIED
SET DATE TO BRITISH
SET TALK OFF
SET BELL ON SET SCOREBOARD OFF
STORE O TO MCODE
CLEAR
ANS = T
ENTRY = T
ANSWER = " "
DO WHILE ENTRY AND ANS
INPUT "ENTRY ITEM CODE"
SEEK MCODE
DOCASE
CASE NOT FOUND O
@22, 10 SAY "ITEM DOES NOT EXIST; TRY NEW'
USE
WAIT
RETURN
CASE FOUND O
STORE O TO MSUPPLIED
CLEAR
@7, 5 SAY "ENTRY QUANTITY SUPPLIED"
@7, 36 SAY GET SUPPLIED
READ
READ REPLACE SUPPLIED WITH (SUPPLIED + MSUPPLIED)
```

```
REPLACE BALANCE WITH (SUPPLIED – ISSUED)

ACCEPT "DO YOU WANT TO UPDATE MORE RECOREDS Y/N"
            TO ANSWER
ANS = ANSWER & "Yy"
CLEAR
END CASE
ENDDO
CLOSE DATABASE
RETURN
** SUBTRA Prg UPDATE ITEM ISSUED **
SET DATE TO BRITISH
SET SAFETY ON
SET COLOR ON
USE EVENTORY ORDER ITCODE
STORE O TO CHOICE
CLEAR
ANS = T
ENTERY = T
ANSWER = " "
DO WHILE ENTRY AND ANS
INPUT "ENTRY ITEM CODE" TO MCODE
SEEK MCODE
DOCASE NOT FOUND O
CLEAR
@22, 10 SAY "ITEM DOES NOT EXIST, TRY NEW"
USE
```

```
WAIT
RETURN
CASE FOUND O
CLEAR STORE O TO MISSUED
CLEAR
@7, 5 SAY "ENTRY QUANTITY ISSUED"
@7, 36 GET MISSUED
READ
IF MINIMUM BALANCE OR MISSUED > = BALANCE
CLEAR
@18, 10 SAY "YOU HAVE REACH THE MINIMUM LEVEL FOR
                THIS STOCK"
ELSE
REPLACE ISSUED WITH (ISSUED + MISSUED)
REPLACE BALANCE WITH (SUPPLIED – ISSUED)
CLEAR
ACCEPT "DO YOU WANT TO UPDATE MORE RECORDS (Y/N)"
            TO ANSWER
ANS = ANSWER & "Yy"
CLEAR END CASES ENDDO
CLOSE DATABASES
RETURN
** THE REPORT Prg PRINTS INVENTORY REPORT**
SET DATA TO BRITISH
SET BELL ON
USE INVENTORY ORDER IT CODE
SET DEVICE TO PRINT
```

```
PRINT JOB REPORT FORM INVENTORY
ENDPRINT JOB
SET PRINTER OFF
USE
CLEAR
RETURN
** THE SEARCH Prg SEARCHES JOB FOR A RECORD
SET COLOR ON
SET SAFETY ON
USE INVENTORY ORDER IT CODE
STORE O TO MCODE
CLEAR
INPUT "ENTER ITEM CODE TO SEARCH" TO MCODE
SEEK MCODE
DOCASE
CASE NOT FOUND ()
CLEAR
@22, 10 SAY "ITEM DOES NOT EXIST"
USE
WAIT
RETURN
"LIST Prg DISPLAYS THE INVENTORY FILES
SET TALK OFF
SET STATUS OFF
SET HEADING OFF
CLEAR
LIST OFF IT CODE, DESC, UNIT, SUPPLIED, ISSUED, BALANCE
```

MINIMUM

USE

WAIT

CLEAR

RETURN

4.2 TEST RUNNING

In this chapter, the writer of this project work tries to carry out a brief tour of the system by testing the system's operational standard. The system is menu driven, which guides the user on how to use the system. This system is titled COSMAGTS and it is structured into five modules, each module performs a different operation.

The main menu is the controlling program from which a user can select options to work on A user goes into the system by typing Dbase at the C:\> prompt, this immediately invokes the Dbase compiler. First, an assistant menu is displayed, press ALT + E and press enter on Exit to dot prompt.

At the dot prompt, type Do COSMAGTS and press enter key, the system responds with a menu of five options The first option is a module of NEW Prg, which create records for each new item that is brought to the store. This module accepts new item that is brought to the store. This module accepts new item code that has not been captured in the database file. an entry data form is displayed with about seven field items. At the end of the last field, the system asked if you want to enter more records. Enter 'Y' to continue and 'N' to quit the menu.

The second option is a module of ADD. Prg, This program updates items that are supplied to the store, which already has item code existing in the file. the third option is a module of SUBTRA. Prg, This update items issued out from the store. The fourth option, REPORT. Prg, Prints the file inventory dbf using a formatted headings. The print out always show the current status of inventory. The system identifies stock items by their codes, different item cannot have the same item code and moreover, identical codes cannot exist in the file.

The fifth is a SEARCH. Prg, Module which searches the file and display records of the required item on the screen. This defeat the use of bin cards for each stock item. Sixth option is to use list of the records contained in the file without printing when a user is done with the program, he now enters the seventh option which is (zero) quits the program.

In addition, in the course of test running the program, a hypothetical test data was used to verify the working of the system and to check for errors as well.

4.3 DOCUMENTATION

The purpose of documentation is an indication of a system operational status, which involves initial investigations, documents and system proposals. Its main aim is for records against the future. Other purposes includes the following:

a. **Analyzing:** With the proper documentation of records the management is able to effectively analyze in details the objective of the program.

b. **Aids to completeness:** This ensures that a specified job is not unduly repeated so that the pattern stated for its completeness is fully adhere to.

c. **Aid to Design:** It aids the design and re-designing of a new or existing system, in that three are already laid down procedure to follow so as to achieve defined objective.

d. **Aids to Training:** It aids the trained or the newly employed staff to get familiar with the standard or procedure of the system he is working with.

Documentation contains vast number of parts, those that are notable include:

1. **THE PROGRAM SPECIFICATION**

This includes the general description of the individual program together with a brief synopsis of the overall system showing how the programs fit into each other.

2. **THE PROGRAM LISTNG**

This contains both the source symbolic program language and the resultant object or internal machine language, together with all memory allocation in relative and absolute form.

3. **THE OPERATING INSTRUCTION**

This specified the series of operating instructions encoded, which explains what each means, so that the operators can be able to follow the procedures of the new system. It also includes all documentation necessary for the satisfactory operators of user written programs.

4.4 FILE CONVERSION

This phase is started long before testing the programs are completed because of the large files that must be converted from one medium to another. The cost and related problems of file conversions are significant whether they are manual, punched card, magnetic

tapes, drum or magnetic disk file. Manual and punched card files are likely to be inaccurate and incomplete as deviations from the accepted format are common computer generated files tend to be more accurate and consistent since they are under the control of a computer program.

The procedure for a changer over area of different approaches. The writer has however considered the more suitable ones:

a. **Direct Conversion:** This type of conversion is where a designer copied out system that is already existing elsewhere and then install it in the new system. This approach may encounter some hazards among which are:-

   i. A flaw in the new system may not become apparent until the system is running.

   ii. There are no result from the old system to validate the new one.

   iii. Errors are difficult to correct if the copied system is incompatible with hardware.

b. **Parallel Conversion:** Parallel conversion or running is the method adopted when the old and new systems are operated together by feeding them with the same input for an initial

period. This allows a comparison of the old and new system. In this effort, the results of the new system are validated using the old system. This method is possibly the safest way of bringing about the change over which the author wishes to recommend. However, there is considerable duplication of effort.

c. **Pilot Conversion:** Pilot Conversion has no much difference from parallel conversion. It is only that in parallel, live data are used while pilot re-runs source data from a previews period.

4.5 SPECIFICATION OF INPUT/OUTPUT FILES

A file is simply a collection of records, each related to one particular entity in this case store item. In designing file, the writer bore in mind that much should be contained in them than is required for output needs. However, this system has been designed to maintain storage at a minimum, which will be consistent with the ability to meet satisfied output needs now and in the future, as well as those that may rise unexpectedly. Another thing to note is the update and security of files, which requires copying the whole file into another disk or tape for safekeeping.

In the course of this work, I shall be referring to one specific file that was handled, and that is the file INVENTORY. dbt, which also

4.6 EQUIPMENT SPECIFICATIONS

Equipment or system configuration has to do with two basic concepts; the hardware and the software. The system is designed to run on any extended industrial standard architecture (EISA) machine such as Intel, Gateway 2000, Amstrad, Compag Pcs etc.

The writer is however, recommending a compag 4/25C model with a processing speed of 486DX – 33HX. The hard disk should have a capacity of 540MB with 256KB cache and 8MB RAM. The system is to be accompanied with a tower CPU. The processor should be 80486 models and will easily be upgraded to 16MB. There should also be two 15inch vivitorn CRT on a network of 2 comm 16-32 Eternett Adaptor card, attached to a 101 enhanced keyboard and a ms mouse 3.0 version.

In case of power surge there should be an AU 750 Emerson Uninterrupted Power Supply (UPS). The output of the program is normally also be displayed on the screen. A LX – 100 Epson line Printer will do a continuous and perforated 15" x 11" form feed.

serves as the master file. it contains all the details of items that were received and issued in and out of the store. In this case too, forms were designed both for issue and receipt and a program then use the contents or data on the forms to update the master file soon as a transaction is made.

4. FILE SPECIFICATIONS

BLOCKING FACTOR	RECORD LENGTH	DISK	CARD	TAPE	ACCESS MODE	REVISION
NONE		YES	NO	NO	RANDOM	YES

DESCRIPTION OF INVENTORY. DBF

FIELD DESCR.	FIELD COLUMN	FIELD WIDTH	DATA FORM
SEQ/N	1-4	4	NUMERIC
ITEM CODE	9-12	4	NUMERIC
ITEM DESCR	17-35	18	CHARACTER
UNIT	38-44	6	NUMERIC
QTY SUPPLIED	52-59	7	NUMERIC
QTY ISSUED	65-72	7	NUMERIC
QTY BALANCE	76-83	7	NUMERIC
MINIMUM	83-87	7	NUMERIC

4.7 STAFF TRAINING

It is needful that training of staff should commence as soon as the implementation is completed. All stores personnel will be required to undergo one extensive training on how to work with the new installed system. In this process user's guide should be available to aid them in effective training. There should be also operators and data entry operators to run on regular basis. For further details on training, see Documentation. A resident programmer may be also needed to ensure that the system runs within the acceptable standard. He will also be involved in the maintainability of the software aspect of the system.

The aim of this system is that the information need of the organisation will be met with minimum or no delay, suffice me to suggest that there may be need for some changes in the work place, this is not directed to replace staff with computer system but that the newly installed system may not be manned by the store personnel of mischievous characters. However, there may be need for some administrative charges to ensure maximum efficiency. In other words, staff could still be trained, re-designated and re-assigned.

4.8 MAINTENANCE

The process of changing an existing program is called maintenance as the new system is used, the management may become sensitive to needed improvements. This improvements are model to prolong the system life cycles changes might be made to the program library in order to keep the document current. In this process maintenance of all system documentation and users should be made references to maintain also the hardware or software, because as computer systems continue to advance with increased technology each day, there will be need to keep within the current and newest concept. This could be achieved by upgrading the memory to a higher processing speed, or by modifying the program so as to meet users requirements.

Although, there is no specific number of records that the system should handle at a particular time, but as the need arises any specific dimension can be introduced as away of effecting some minor changes.

4.9 CONTRAINTS OF THE SYSTEM

Every system developed newly must have initial problems, that is specific limitations or conditions within which the system must operate;

1. **Time:** It is no gain saying that the design of the system is time consuming and require time before its components could run effectively.
2. **Budget:** Budget in this light is referring to the huge financial outlay in implementing a system of this nature. Due to cost management may not like to procure all the necessary equipment to run the system but a wonderful investment that would pay off for itself if they could put cost behind them and achieve the program.

4.10 SCREEN PROMPT

Screen prompt is the user interfaces or dialogues and messages which the system prompts the user on the screen. This was made user friendly and is intended to guide a prospective user on how the system functions. The screen first prompt a user with some messages and then the main menu. The menu contains options for different operations (below is the format of the main menu)

*** WELCOME TO NIPRD INVENTORY MANAGE SYSTEM **
**** MAIN MENU **** 15:01:001
1. CREATE NEW RECOR
2. UPDATE ITEM SUPPLIED
3. UPDATE ITEM ISSUED
4. PRINT INVENTORY REPORT
5. SEAC\RCH FOR A RECORD
6. LIST REORDS
0. QUIT TO DOT PROMPT

Enter your choice – 1

Enter the item code – 100

Item already exist try new

Press any key to continue

Enter your choice – 2

Enter the item code – 100

Enter quantity supplied – 130

Do you want to update more record Y/Nn

Enter your choice – 3

Enter the item code – 300

Enter quantity issued – 300

Do you want to update more records Y/Nn

database structure, which reports are used in creating header, date and time. The files used in these areas generated an extension of FRM and SCR respectively. The data also assisted the writer in coding the programs. In developing this program, the writer has put to rest the myriad of weaknesses that were intensified in the problem analysis. (see Appendix E for sample output).

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Enter your choice – 4

The printer is either unconnected or turn off

Press any key to continue....

(With this option, the Printer must be on)

Enter your choice – 5

Enter the item code to search – 100

S/N	ITEM CODE	ITEM DESCRIPTION	UNIT	QTY SUPP.	QTY ISS.	QTY BAL.
1	100	1.44MB DISKETTE	BACK	130	40	90

Enter description – IBM Computer

This item has already gotten a code that is unique to it. You cannot use one code for different items.

Press any key to continue.....

The system goes back to the menu where the user select option o (zero) to quit the program.

At this stage, efforts have been made to establish tentative human – machine interface, in addition the way in which user would communicate with the new system earlier described. One aspect that is of paramount importance is the report and form facilities. Forms were used to display the output file in a format independent of the

CHAPTER FIVE

5.0 SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1 SUMMARY

The study of this nature demands in-depth investigation and analysis which the writer successfully carried out before coming out with a solution.

First and foremost, the first chapter started with the introduction of the National Institute for Pharmaceutical Research and Development Idu - Abuja, its brief history and overview of its activities. Chapter two began with a highlight on the theoretical frame work which reveals the importance of computer automation in so many work places. The approach of other authors and authorities with regard to the topic under study were also mentioned.

In chapter three, the writer tried to analyze the existing manual method in use and equally pinpointed some areas of weakness in the system. Mention was made of the input design under the input design under the input design it described what input file and input forms, description of system and program chart were made. Chapter four commenced with the system implementations. The order of the

program listing, the structure of the data base file and the most economic method for a complete changeover is also highlighted.

There were also details on hardware installations with a recommendation on compag 4/25C model. The writer further specified the order of training for personnel who will man and work with the new system. A user documentation or reference manual was provided also to serve as guidelines into the system. Purpose and methods of maintenance were also mentioned with a brief detail into the constraints of the system. The last chapter started with the summary of the write up, which ended with recommendations and conclusion.

5.2 RECOMMENDATIONS

Office automation is the key factor now, which can ensure maximum efficiency with relatively low labour cost. However, there is the need for a careful and painstaking detail study before embarking on a gigantic project of computerization.

A thorough planning and appraisal would involve the following:

a. Establish the aims and setting goal for the project.

b. Determine the main activities and events to attain the required goal

c. Specify the manpower requirement and other resources to achieve the set goals

d. Define the proper sequencing of these activities.

All these have to be thoroughly planned and proper controls put in place to ensure reliability of results. Moreover, a good audit procedure need to be applied to guarantee prompt detection and correction of errors to eradicate or minimize official abuses. Also developing a computerized information network which every organisation should look forward to.

In National Institute for Pharmaceutical Research and Development the old system of operation has remained manual, but now that we are changing over to a new system there is need to keep the both systems a life where and when necessary. For this purpose therefore the system conversion suitable for objective operation is PARALLE RUNNING.

This involves processing current data side by side with the old and new systems to cross examine results until the new system

proved beyond reasonable doubt to be in workable operation before the old system could be finally face out.

For proper managerial information system, the hardware and peripherals suitable for the system are:-

Hardware (Computer)

Size = 4/25C

Model = 486D x – 33HX

Hard-disk = 540MB

Cache type = 256KB

RAM = 8MB

Processor Model = 80486

Software = WordPerfect

Dbase iv

FoxPro x

Drago

Clipper

Power Supply = Au750 Emerson

UPS.

Printer = Epson.

5.3 CONCLUSION

The purpose of this project is strictly limited to the use of educational research work only. It should therefore not be used as a measure to access the efficiency of National Institute for Pharmaceutical Research and Development. However the result of the work should not be rendered totally invalid.

The project work itself is not a means to an end but could be reviewed by the N.I.P.R.D management from time to time to allow further improvements as more resources are allocated and reallocated from time to time.