

**CASH LODGEMENT AND WITHDRAWALS IN  
MODERN BANKING  
(A CASE STUDY OF DIAMOND BANK LIMITED,  
MARINA BRANCH, LAGOS)**

**BY**

**MOHAMMED AHMED  
PGD/MCS/2001/1084**

**BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF  
MATHS/COMPUTER SCIENCE, SCHOOL OF SCIENCE AND  
SCIENCE EDUCATION, FEDERAL UNIVERSITY TECHNOLOGY,  
MINNA, NIGERIA.**

**NOVEMBER, 2003**

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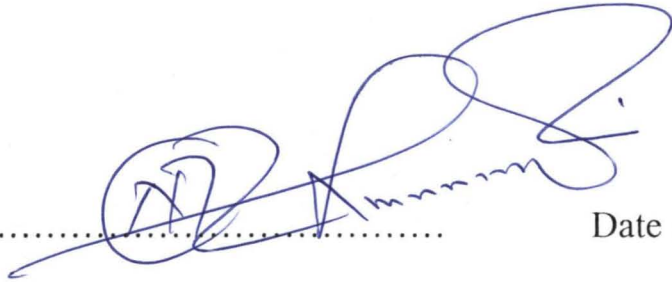
**BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF  
MATHEMATICS AND COMPUTER SCIENCE, IN PARTIAL  
FULLFILMENT OF THE REQUIREMENT FOR THE AWARD OF  
POST-GRATUATE DIPLOMA IN COMPUTER SCIENCE, SCHOOL  
OF SCIENCE AND SCIENCE EDUCATION, FEDERAL  
UNIVERSITY TECHNOLOGY, MINNA, NIGERIA.**

**NOVEMBER, 2003**

## DECLARATION

I Mohammed Ahmed declare that this research is to the best of Knowledge and believe the original product of my research findings and has not been submitted to any institution for the award of any certificate before. All the materials and ideas obtained from various sources have been duly acknowledged and I carry out the research.

Sign .....

A handwritten signature in blue ink, consisting of a large, stylized initial 'M' followed by a series of loops and a long horizontal stroke.

Date .....

8<sup>th</sup> → DECEMBER 2023

## CERTIFICATION

This project title "CASH LODGEMENT AND WITHDRAWALS IN MODERN BANKING (A CASE STUDY OF DIAMOND BANK LIMITED, MARINA BRANCH, LAGOS) by Mohammed Ahmed has met the regulation and requirement governing the award of Post Graduate Diploma Programme in Computer Science, Federal University of Technology Minna, and it has been approved for its contribution to knowledge.

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Mallam Audu Isah  
(Project supervisor)

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Date

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Mr. L. N. Ezeako  
(Head of Department)

.....

Date

.....

External Examiner

.....

Sign

.....

Date



## **DEDICATION**

I dedicate this project to the ALMIGHTY ALLAH for granting me success, prosperity, protection and blessing, thanking God for giving me the wisdom. Strength and good health to see this work through to the end. In all I also dedicate this work to my wife, Maimuna B. Ahmed and the Children, Aminu, Mahmood, Abdulkadir and Bintu. They were very patient and understanding through out the period of this programme.

## ACKNOWLEDGEMENT

In a work of this kind, it is pertinent to appreciate contribution of individuals or groups or persons who have contributed in one way or the other to the success of this programme.

First, my sincere and unreserved gratitude goes to God Almighty who makes all things possible. I heartly thank the project supervisor, Mallam Audu Isah for his invaluable assistance and whose encouragement, critical supervision and many other suggestions made this project a success. My thanks also go to the head of Department Mr. L .N. Ezeako, Dr. Yomi Aiyesimi, Prince Badmus, Mallam Hakimi and all other lecturers who for the lack of space their names could not be mentioned here, thank you all for your various contributions.

I am also deeply indebted to Alhaji A. O. Bashiru and Mr. Sunday Okere (sunny form). And the entire staff of Diamond Bank Marina Lagos for their immense contribution to this project. This acknowledgement will not be complete without thanking Alhaji Abubakar Mohammad Agaie (former Accountant general Niger State) My father Alhaji Ahamdu Katcha for their financial and moral support.

## ABSTRACT

Dynamism is a perpetual phenomenon permeating the entire facets of human endeavors. Right from the creation of man the heir of the earth, CHANGES have one time or the other been noticed in his engagements.

BANKING, one of the numerous functional activities of man is thus no exception, to the dynamic world. From its inception, to the recent, it has metamorphosed from the use of crude, naive implementation to the adoption of a well sophisticated technology, the consequence of which is the minimization, If not total annihilation of miniature banking paving way for large scale BANKING AUTOMATON. The focus of this project, which leads us to a close look at the automation in diamond Bank Limited, Marina branch, Lagos shows how technology has change life for so many people in this facets.

# CHAPTER ONE

## GENERAL INTRODUCTION

### 1.1. PREAMBLE

At the inception, when computer technology was becoming realistic, little was it thought that the onslaught could dominate the entire facts of the human activities much in particular the business endeavours. It is not surprising that soon after the great potentials of the machine, it becomes obviously useful in business ventures.

Over the years, computers are used to stock raw materials and finished products, bill customers, calculate employee's pay and taxes, analyse who is buying the company's product, and perform hundreds of other administrative functions. This of course has lead to reduction in administrative paper work and cost.

However, banks are among the largest users of computers. Loan customers account updating, deposits and withdrawals check processing are but a few of the computer applications in banking systems. These institutions (banks and other financial institutions) have developed different means of improving the efficiency and saving time of their operations. The zeal to reduce time while at the same time improves efficiency and better services, to customer has led to the introduction of computers for the various banking processes with the computers. Of course every business and other human organizations is concerned with processing facts or data about it's services, product making or other ventures. Processing such facts for efficient management decision-making and to stimulate greater customer services satisfaction produces useful information. The effective use of computer with it's diverse power of automation



coupled with high speed and accuracy, when used for processing data to generate facts, has greatly enhanced the efficiency of decision-making process while at the same time ensuring a well balanced customized services.

It is therefore not surprising that depositors, loan beneficiaries and the bank users these days besiege en-masse banks that have been computerized, simply as a result of fast customer services.

In this project work attempt shall be made to study fast and efficient cumputerised services as regards CASH LODGEMENTS AND WITHDRAWALS. As such, an appraisal of computer in banking relative to manual banking with a view to deposits and withdrawals shall be our focus.

It should quickly be pointed out here that in recent time, several banking automation products have been introduced into the industry.

These includes: -

- i Electronic Funds Transfer (EFT): - This is a means of transferring funds electronically from one location to another.
- ii Automated Teller Machine (ATM): - This is a system were some traditional banking services are provided without coming in contact with bank personnel. Request by customers are attended at once because it is electronically operated. The variety of functions that the system can be programmed to handle include withdrawals, provision of transfer of funds, payment of bills and display of promotional messages.
- iii SQL/ image machine: - This system is used to verify signatures. It is very useful for handling cheques transactions. Others include automated cheques sorter using magnetic ink character



recognition facility and electronic card and products. Unfortunately most of these facilities are at infant stage in Nigeria or in some cases not in existence at all.

## **1.2. STATEMENT OF THE PROBLEM**

Like aforementioned, the need to improve on banking services led to the introduction of automation in banks using computer with particular emphasis on deposits and withdrawals of cash. Major questions on integrity, accuracy, timeliness and security of the computer come to mind.

How easy is it for a computer personnel or user in banking system to satisfy all depositors and customers withdrawing without being attended to. How has management been able to solve these problems as regards ledger cards production, which takes a number of days before it can be ready for use? The promptness time lapse between the request for statement of accounts and promptness in granting such request. All these and many more form the core to which this project shall appropriately dwell and come out with useful findings.

## **1.3. JUSTIFICATION FOR THE STUDY**

Manual approach to cash lodgments and withdrawals in banks are labourious, time consuming and particularly prone to inaccuracies. There is this wide spread prejudice that banks support and favour deposits but view cash withdrawals with scorn and displeasure. However this runs contrary to the ethics of the industry.

What transpires in virtually all manually operated banking system is a careful operation of entries and additions coupled with adequate security in terms of customer signatures and physical upkeeps of records? As such, where human beings undertake these, greater attention and time must be exercised. Hence stereotype adopted by the public.

As a result of this and to avoid other unnecessary complications, there arose the need for computerization of banks with special emphasis on deposits and withdrawals. It must be pointed out that with computers handling such onerous tasks as described above. Customers as well as bank officials are able to heave a sign of relieve since these machines are able to automate the processes and thus, relieve them some part of their responsibilities.

Consequent upon this, all efforts are made day in day out to improve on the existing processing systems in banking. They have been computerized. Thus, a justified appraisal of the study will be to further research into the existing with a view to ameliorating the more the problems of deposits of cash and it's withdrawals in the banking sector.

#### **1.4. PURPOSE OF STUDY**

Much as special focus is placed on improving the traditional banking deposits and withdrawals getting accounts computerized the purpose of this project is to design a computer programme suitably workable in any bank, taking full cognizance of cash deposits and withdrawals with minimal interaction with the bank personnel. The design is such that it can be implemented in a network where several customers can

access individually their account number in form passwords, which are known to them only. The purpose of this study in a nutshell can be broken down as follows.

- Improve productivity by ensuring efficient deposit system and prompt cash withdrawals if and when desired.
- Handle greater volumes without any unnecessary delays.
- Control transaction at its sources.
- Replace repetitive manual entries with full computerized documentation.
- Reduce clerical and paper based jobs.
- Produce more accurate and timely reports.
- Lower overall cost of labour.

#### **1.5. LIMITATION OF THE STUDY**

The paramount attention of the project work is only restricted to cash transactions like deposits, withdrawals, printing the statement of account at periodic intervals and or when required by customers. In other words, activities like opening of new accounts, closing of accounts, crediting and debiting relevant accounts are the primary aim on which the research is centered.

The work does not consider taking records of the number of people that come to bank on daily, weekly, monthly or yearly basis. It also excludes balancing of ledgers at the end of the day. Moreover, other transactions like foreign exchange transaction, loan and advances administration transaction and cost of other miscellaneous transactions in banking are not within the framework of this research.



## **1.6. OUTLINE OF THE PROJECT**

Chapter one gives the general introduction to the project. Chapter two gives a brief description of literature review while chapters three and four relay information about the present manual system and the proposed system to be designed respectively.

Chapter five discusses the documentation needed to effectively operate the software.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

The goal of this chapter is to provide the necessary theoretical framework or foundation for the work of this research study. Attempts shall be made to have an overview as regards the basic concepts of computers, the computer and banking industry, a case study of some available banking software and finally, advantages and disadvantages of computerization.

#### **2.2. BASIC CONCEPT OF COMPUTERS**

When people first began to use numbers, they knew only one way to work with them (i.e. counting). Man counted the numbers of sheep in the flock, the number of spears he owned. He at that time used stones, sticks, shell knots or marks in the sand to represent numbers. The absence or reality of suitable writing materials led to the use of fingers as a way of representing numbers from fingers notation, there develop an extensive use of finger computation. As society became more complicated. Men had to develop fairly elaborated calculations involving subtraction, multiplications and divisions that could not be done by finger computation only. And by not too far distance the present era of electronic computer technology came into existence.

Perhaps there are basic question we need to proffer solutions to, for a novice in this field is WHAT IS COMPUTER? By any standard, A Computer is a tool for performing diverse complex operations characteristically; it accepts data in a prepared form (i.e. "machine



sensible form”) processes the data and output the result. Having gotten this basic description of the machine, we now proceed to identify and analyze the various component make up of the system.

Generally, all computers are segmented into: -

- i. INPUT UNIT
- ii. CENTRAL PROCESSING UNIT (CPU)
- iii. OUTPUT UNIT

A thorough analysis of each of them will portray a sharp reflection of what they look like.

### **2.2.1. Input Unit**

This accepts the necessary input data and instructions. These media are machines that can read previously recorded data from certain form of external sources such as punched cards, punched papers tape, magnetic disk alongside with magnetic characters, printed characters and other forms of coding. Those aforementioned media are themselves input units, the importance of which cannot be under – rated in the computer world.

### **2.2.2. Central Processing Unit (CPU)**

This consists of three sectors namely the *arithmetic/logic unit*, *control unit and storage unit*.

- i. *Arithmetic/logic unit*: - This reflects where numbers can be added, subtracted, multiplied, divided and compared. These operations are performed at very high speed. The unit usually includes a small amount of storage to hold both operand (numbers to be added, subtracted etc.) and the practical answers

that are generated after calculation. As said it compares two numbers and determines if numbers are equal or not. It can also compare alphabetic information such as names, or determines whether one name is the same as or different from others.

- ii. ***The control unit:*** - This section performs the most vital function of the CPU. All program steps are interpreted here and instructions are issued out to carry out the required operations. The unit directs the computer and controls the data flow between them during the process of solving the problem. When the computer is operating under program control, the control unit brings in data, as required from the input devices and controls the routine of results to the required output device. This section is composed of many miles wires. In summary, it directs the operation of other units of the machine.
- iii. ***The storage Unit:*** - The storage unit or internal storage of the CPU is its memory. This is where instructions and data are located while they are being used or processed. The internal storage of most computers is magnetic core which is limited in supply and highly expensive to build. Hence, the need for auxiliary storage media. Essentially, these are external but they help in storing information that may not reside in the computer memory. A vivid example of this is magnetic diskette.

### **2.2.3. Output Unit**

An output unit provides the computer result in a useable form. It consists of machines that report information from computer processing in a form that can be understood by human beings or in a

form suitable for use as input for another computer system. Common output devices are printers and visual display Units (VDU). Input and output units are integral part of a computer system and appear under the control of the CPU as directed by computer program. After much deliberation on the concept of computer, it would do much good to relate a little on Banking and its activities.

A bank in its simplicity can be described as *A FINANCIAL INSTITUTION where money transactions take place (i.e. deposits and withdrawals)*

However, further explanation on this would analyze to us that banks are organizations set out among other aims;-

- \*To make loans and extend credit

- \*To facilitate the transmission of funds by cheque and bill of exchange or other forms of commercial papers.

- \*To receive and hold money on deposit and to disburse it.

- \*To exchange the currency of one country for another and to issue money.

This history of banking in Nigeria dated back to nineteenth century when a shipping company – ELDER DAMPSTER LINES: Started some form of banking operations in the country, then to facilitate its non business transaction. Then, there followed a growing impetus of banking companies among the indigenes as well as expatriates.

It must be noted that banks then operated manual data processing system. Among functions performed by banks are lending and accepting deposits. The use of cheques and some other miscellaneous functions.



### 2.3. THE COMPUTER AND THE BANKING INDUSTRY

Computer usage in banking industry was first experimented in 1955 by two banks, one in San Francisco and the other in New York at the introduction of IBM 650 models soon by 1960. The American Bankers Association issued its standard cheques under the common machine independent research into any system. Thus, all computerized banks were processing deposits uniformly across the country. The method of magnetic ink character then going through perfection advanced the process of cheque reading and sorting. This helps to deal with the difficulty in paper work.

Computer application in banks and the sundry complex programs related to them now cover virtually every sphere of banking operation from the routine operation such as processing of cheques with **electronic data process (EDP)** to the very sophisticated investment and management information analysis.

With the capability to perform millions of consecutive operations without error, EDP, can now provide any bank with a workable, reasonable, correct, useful data facts for the business financial and industrial capital market of the world. As such, decision, accountability is braced with more facts and fewer **PSYCHIC** visions and today bankers are able to manage corporate investment more wisely and with more assurance of profitability. For distributed computer based banking process, several branches of a bank within the country are inter-connected by teleprocessing lines in a network of terminals. The connectors, **Multiplexors Demultiplexors** and other similar units represent network control functions for message routine circuit selection and other activities necessary for efficient use of long

distance communication facilities banks operating this scheme would have duplication of processing virtually in all outlying branches such that entries in a branch affects other branches. A typical example of bank under this implementation is **diamond bank**.

Another area of application of computers in the banking industry is the area of fund transfer. This means transferring funds electronically from one location to another. A vivid example of this is the ESCAR where money can be withdrawn or transferred with the use of transfer cards. Another is the FIRST CASH CARD operated by first Bank of Nigeria PLC. One should not forget to mention the Automated Teller Machine (ATM), which is another useful computer instrument in banking sector. This we have already discussed in the introductory section of this research work. Although computers in Nigeria banks is recent and still at the innovation stage notwithstanding, the trend is uprising and the traditional manual and physical processes will soon become a thing of the past.

#### **2.4. A CASE STUDY OF SOME AVAILABLE BANKING**

##### **SOFTWARE;-**

Computer software with reference to banking are as old as application of computer in banking system. Generally, soft wares are usually developed by software houses often times quite independent of hardware engineers. These (software) after having been developed and tested fully are there after made available to customers or prospective users among which bankers are one group. It is pertinent to note here that, some banks are able to employ and finance competent programmers such that a unique package is made available



only to the bank in question. Nigeria, still in the wake of computerization has a few number of such experienced programmers such that majority of software packages are largely imported from advanced overseas countries. For simplicity and because of the limitation by this project topic, we shall restrict ourselves to software meant only for savings and withdrawals in AUTOMATED SAVING MACHINES.

**(1) Automated Teller Machines**

**(2) Cash Dispenser**

#### **2.4.1 The Automated Teller Machine (ATM)**

These machines are in effect on line computer terminals operated by the customers, they can perform about 80 percent of the services normally available from human teller. These machines could be used to deposit funds, withdraw cash by debiting savings, checking or credit card accounts and transfer funds from one account to another. Some can be used by customers to pay bills normally handled by the financial institution, although this service usually is not highly automated because bills, stubs and enclosures containing customer identification numbers must be deposited in a slot in the machine and later handled by the bank.

To gain access to the services required customers insert their ATM cards and key in their PERSONAL IDENTIFICATION NUMBERS (PIN). At the end of the transaction, the card will be returned by the machine. These machines are completely unattended. The information is transmitted to the bank computer system, which

updates the account being accessed and allow the terminal to release cash for withdrawal transaction.

The ATM also provides cash dispensing facilities these are the most important services offered and the customer may select the amount required. Some banks restrict the maximum amount to be withdrawn a day. More importantly, before cash is paid out, the customers balance is vetted, taking account of any overdraft limit marked on the account; the transaction will be refused if the account contains insufficient funds. At the banks discretion. The ATM cards themselves may be enclosed with a small overdraft to permit unforeseen contingency resulting in emergency withdrawals.

Other facilities available, capitalize on the connection between this machine and the bank's central computers, although not all the services mentioned have been introduced by all the banks, which operate ATM.

Customers will usually be able to request the machine to display their balance and may even be able to obtain a mini-statement showing the last few entries to their account. This often is inform of statement of account. The machine is also capable of allowing customers to make transfer between accounts to make payment to third parties through the credit transfer system and even to get up standing orders.

An addition to the features aforementioned is the function of interbank reciprocity. This is the latest stage in broadening pre use of ATM, unit recently bank customers could use only the activities, which are installed and restricted to their respective bankers. But now, interbank

cash withdrawal network are being set up. The midland and National Westminster bank in U. K first realized this.

A great advantage of the ATM is that it gives customers excessive access to basic banking facilities with ease without any particular credit risk for the banks. It opens doors to completely new types of account such as the first banks "CASHLINE ACCOUNT" designed specifically to be operated through the use of "FIRST CASH" This type of account is intended predominantly for those workers who require a safe home for their wages pending expenditure and regular cash withdrawals but only need limited money transfer facilities.

#### **2.4.2 The Cash Dispensers (CD)**

Cash Dispensers give out CASH, to a limit and debit the customers account. It makes use of the cash cards to perform efficient functions. Some examples are BURROUGHS CASH DISPENSERS, CHUBB CASH dispenser and METIOR BANKOMAT. A brief description of these will sharpen out reflection.

- i. Burroughs cash dispenser: - This cash dispenser is of an advanced, electronic based design, which incorporates a number of every distinct features. Unlike other machines of this kind, the Burroughs system has been designed so that with future models "On - line" operation to a banks computer will be possible. This allows the amount of a withdrawal to be decided by the customers as the dispenser will make a prior check on his balance and automatically updates his account.



For multiple dispenses, the machine will dispense a given sum of money on receipt and verification of a cash card and after correct indexing of the customers code number. The card, which is of standard international credit card size has a life of twenty transactions and is returned by the machine after each withdrawal. To prevent customers from leaving the card in the machines cash is dispensed only when the card is withdrawn from the customers record. The card is embossed with a dot, at each dispense. On the twentieth occasion, the card is returned by the machine and a new card is posted to the customer.

The card is also embossed with account details from which a separate record of each transaction is obtained. The very advanced security system incorporated in this new cash dispenser affords both banks and the customers unique protection against forgery.

- ii. Chubb Cash Dispenser: - The Chubb cash dispensers provide cash at any time of the day or night it is fed with correct information by the user. The Chubb cash dispenser accepts cards and personalized codes so that clients of a particular bank can obtain cash from any dispenser at any branch of that bank where dispensers are installed Diamond Bank Lagos for example movement of cash is made easy for customers with this type of system.

The automatic services of the machine relieves pressure at bank counters and in cashiers offices at peak periods. The machine also provide cash on account in large organisation. So eliminating a time consuming chore for cashiers department.

For security externally, the dispenser's appear to be little more than a sophisticated stamp machines attractively designed in a stainless steel. But behind this façade, there is sound physical protection surrounding sophisticated electronic circuitry.

The dispenser will not operate in the first instance, unless the card is of correct size substance, Thickness coded to the system and inserted the right way up. The personal identification numbers (PIN) will only be accepted by the machine after the card has been accepted. If this number has been too soon or incorrect, a panel lights up requesting that the number be repeated. If the wrong number is inserted three times in succession, the dispenser retains the card but does not deliver any money. Thus, the obtaining of money by inserting a selection of identification number is thwarted. Should a customer, through either failure of memory or mischance, insert an incorrect identification number three times the dispenser marks the card so that no debit is made to the account.

The electronics of the dispenser are capable of recognizing many millions of personal identification numbers. The method of encoding cards with these numbers is sufficiently complex to eliminate the chance of a number relationship being discovered. The club cash dispenser is a unique blend of security experience and advance electronic thinking, offering a service which has long been lacking in cash handling. It not only supplies a long felt want, it has considerable prestige.

iii. MENTIOP BANKOMAT: -The bankomat is operated with a bankomat card of international credit size (CR 80) and guarantees the identify of the holder of the bankomat is load



with loose bank notes. They need not be new one. The bankomat then “Swallows” blocked bankomat cards and prevent withdrawals being made too frequently with the same bankomat card. The blocking system is easy to operate and has a high capacity. After three wrong attempts to withdraw money, the Bankomat “Swallows” the card.

In accordance with a programmed pattern in the terminal unit, a personal four figure code must agree with the input information read from bankomat card. A correct worker received in this way states the recording equipment and the issue of a designed number of bank notes.

## **2.5. MERITS AND DEMERITS OF BANKING**

### **COMPUTERIZATION**

With the introduction of computer system into banking operations, the following benefits are derived: -

- i. Optimum use of resources: - Computer gives the industry the opportunity to use its resources to a maximum levels since the work done manually, for a couple of weeks can now be done, error free, in a day, hence makes the use of clerical staff services in other crucial sections of the industry very possible.
- ii. Cost reduction: - More money is spend on producing the storage facilities of large volumes of paper and other stationery items that are manually used. At the introduction of computer, this cost gets minimized because computers have facilities for storing a very amount of information with the adequate provision for secondary storage which required very little

spaces and at the same time reduces the labour force cost due to its accuracy which disallows extra pay on overtime as a result of which occur because of the inaccuracies in the conventional mode of operation found imperative.

- iii. File security: - During the process of information which requires the transfer of files from desk to desk, some processing accessories like files are malhandled resulting in disfigure or often times outright loss sometimes, these accessories are defaced by rodents or other pest locked up in cabinets. All these are what computers have strong protection against and make adequate provision for.
- iv. Time saving: - As the pace at which information processing about customer is conventionally time consuming, the customers get bored and spend much time in the banking hall awaiting their transactions done. In the light of the above the new technology system, the computer with the pace at which it processes information makes the customer be more lively, confident and interested in banking operations. And moreover, the computer enhances the bank a great deal of reputation for the fastness and accuracy qualities it possesses.
- v. Fraudulence restriction: - Computer limits the access to customers accounts by the clerks and some other unscrupulous and elements to a minimum level, which was the aid to fraudulent practice in the manual model of the operation because only a few eyes and hands will have the opportunity and therefore makes the detection of such odd practice, if any simpler. The above listed points can be summarised thus: -

- increased system performance by increased throughput enhance response time and increase capacity.
- Improved resources sharing capacity
- Improved reliability and availability
- Graceful degradation / growth
- Ease of expansion / enhancement

It should however be imperatively said that computer renders a lot of laudable benefits for the management, employees and the customers as effective as in decision making, reduction in repetitive operations and quantity services respectively.

### **Demerits**

The following disadvantages can be identified: -

- (i) Computerization reduces human labour, hence it increase unemployment
- (ii) The cost of initial system design and implementation may be too expensive for some bankers.
- (iii) In a time-sharing environment where users can be many, the terminal response time would be relatively slow for the users. This is due to query delays at controllers and the low priority of remote users and the cashiers/staffs.

The next chapter analysis the present system in term of types of account of the manual system and the need for computerisation.



## CHAPTER THREE

### SYSTEM DESIGN AND ANALYSIS

#### 3.1. INTRODUCTION

Banks generally are perceived as an inevitable organ of growth in an economy simply because of diverse functions of resource allocation, which they perform. They help in stimulating the level of economic activities in various sectors of the economy by mobilizing and channeling resources (funds) from saving surplus economy unit to saving deficit units. This helps increase or rather maximize the level of utility and wants of individuals. It should be noted that banks are much more involved in the development of the economy more than other financial institutions, thus, they occupy strategic position and are known to hold the economic main stay of the economy.

In this chapter, a detailed analysis of the system design and analysis is decreased. The present manual operational method as regards cash lodgments and withdrawals would be studied. We thus start by looking at types of Accounting system.

#### 3.2. TYPES OF ACCOUNT

In as much as we are concerned with deposits and withdrawals and for the purpose of this study, we shall limit ourselves to two types of account Viz: -

- i. The current Accounts
- ii. The deposit accounts

Let us now describe each in details.

**3.2.1 The Current Account:** - The current Account is an archetypal bank account and with a look at Diamond Bank marina branch, Lagos as an example, it is opened to enable payment to be made by cheque and avoid the dangers involved in keeping large sum of money in the office. The balance of a current account is withdraw able either by way of cash withdrawals or through the use of cheques which are the principal identifying features of the current account, when this type of account is opened, the bank provides a cheque book, a paying in – slip book and a wallet to hold the bank statements which provide a copy of the customers account as it appears in the books of the bank. These are used for reconciliation purposes.

A paying in – slip completed either in duplicate or triplicate is filled each time money is deposited into the account. These are slips installed at payment by bank cashiers itemize notes and coins of different denominations, cheques and postal orders filing it is however, for safety and conveniences reasons, common among all the banks to ask their client to fill cheques and cash on separate sheets of the slip as appropriate.

Since banks provide services for their customers by clearing drawn cheque and other negotiable instruments they are entitled to lay some charges against their customers. Generally, the arrangement is for a charge to be levied on each different instrument processing of cheques, for instance involves more work than processing automated standing orders and therefore, the charge is higher, no credit interest as such is paid on current account balance (except for interest bearing accounts).

Moreover, part of current account system includes OVERDRAFT. An overdraft by identification means granting customers authority to draw cheques or other for the payment of funds in excess of the balance standing to the account. Interest is charged on this facility provided by the bank. Also at regular intervals or at the request of the clients. The bank issue statement of Account, reflecting the financial stands of their customers. As said earlier, a recent development in current account banking strategies is the interest bearing current account. This combines the facility of using a checkbook card other money transmission services) with the payment of interest on credit balances. This account is something of a hybrid between traditional currents and normal deposit accounts.

### **3.2.2 Deposit Accounts**

Deposit accounts in its entirety can be refined to two account V.2: -

- i. Saving account
  - ii. Time Deposit otherwise known as fixed deposit
- 
- i. Saving Account: - The saving account is one of the most popular account – type systems in banks. It is characterized by personal withdrawal of funds if desired. That is, it does not employ the use of surrogates or check book when there is withdrawal even though deposit in favour of the account can be received from persons other than the account holder.

Credit interest, unlike current account, is paid on savings account by the bank. Some banks saving account schemes provide for regular savings. Through schemes such as the provision of money boxes



(home safe) for the accumulation of deposits. This account is something of an anachronism in the modern world and they are now actively promoted, Diamond banks, they however make up a very small proportion of total bank deposit.

All in all, savings account transactions are recorded manually in passbook which the account holder must produce at every deposit or withdrawal. This account has however now been transferred on to the more modern statement system. Under which statements of account are produced periodically through the banks computer system and forwarded to the account holder as a record of all transactions since the last statement. Even then, the use of passbook still permanent.

ii. The Deposits (Fixed Deposit): - While current accounts are designed to facilitate the processing of a short-term fund flows, time deposits accounts are for the holding of medium term and long term surplus of funds cheque are not available for use with this deposit account, which therefore provides banks with a much less volatile source of funds for use in lending payments into a deposit may be made in cash by credit transfer from current or savings account or by cheques.

Credit interest is paid on the balances standing to the credit of a deposit account. Deposit rate generally follows the fluctuations of base rate. In theory, the bank compete for deposits through advertisement on their interest rates, but in practice they tend to conform very closely to one another.

Withdrawals from deposit account are subject to prior notice, although it is usual to permit, withdrawals on demand in consideration of the depositor losing some accrued interest is paid net of tax, tax at

the composite rate being deducted by the bank from the amount due to all personal accounts. There are other types of accounts like loan accounts, budget accounts and the rest, all of which are outside of this project.

### **3.3. ANALYSIS OF MANUAL SYSTEM AND ITS PROBLEMS**

Manual banking transaction system is prone to inadequacies. Attempts shall be made here to study the operational method of Diamond Bank. The customers' deposits and withdrawals are controlled in the general ledger accounts. Individual customers accounts are recorded in the branch customers' savings/current ledger account. This ledger is maintained for each customer and 1-250 customers' ledger cards or pages from the central ledger in the general ledger. The aggregate of customers deposits/withdrawals recorded must agree with balance of the general ledger account monthly.

For the savings account department, cashiers accept deposit from the customers and allow s customers to make withdrawals, cash are deposited or withdrawn by the use of the standard forms. Designated officer known as saving officer is responsible to ensure that there are sufficient funds in the customers account before allowing the customer to withdraw and pass relative entries. Interests are calculated and applied monthly on the outstanding credit balance. The calculated interest must be clearly checked for correction and necessary vouchers raised for it before it is applied to individual ledger cards.

Account balances are obtained at the close of each working day and compared with the general ledger balance. At the end of every

month, balance on the individual customer saving ledger card will be addressed and compared with balance in the General ledger. Returns are prepared at periodic time intervals. A number of forms and cards manually used can be analysed thus:-

- i. **SAVING LEDGER/INTEREST CARD:** - This card contains particulars of the customers and the transactions made. Among items entered into this card include Name, Account, Numbers, Address, occupation, Date, Deposit and withdrawals etc.
- ii. **DEPOSIT / WITHDRAWAL SLIPS:** - These slips are used to deposit and withdraw from the customer-saving account information in these slips include Name, Account Number, Amount to be deposited or withdrawn.
- iii. **MANDATE /SIGNATORY CARD:** - This card is used to open a new account for a customer. The card contains the particulars of the customers. The signatory part of the card is used to verify the customers signature before withdrawal is made. This serves to check against fraud.
- iv. **DEBIT AND CREDIT VOUCHERS:** - These sums are used to pass debt and credit entries to the general ledger through the waste sheets

**THE WASTE SHEET:** - This sum is used to capture all the transactions made and from there, entries are made into general ledger.

**GENERAL LEDGER SYSTEM:** - This is the centre of various accounts in the bank. It contains balances of all personal and impersonal accounts in the branch including current accounts and



savings accounts. At regular interval, the balance of all accounts in the branch are compared with balances in the appropriate account and this serves as a control to all the accounts in the branch from which saving is one.

For current account section, the services or activities performed are much more similar to those outlined above. The only difference being in forms and document used in processing the information. The few available different forms are discussed below.

- i. Cheques: - Cheques to some extent are a form of legal tender. It is a convenient means of handling cash without physical existence of the cash. It bears the name of the payee, date, the amount to be paid and the signature of the payer. Specifically, it instructs the bank to pay the bearer a stated sum of money on demand or at a determinable future date. The amount – stated therein is debited to the account of the payer.
- ii. Pay – in tellers: - These are in form of credit vouchers in saving account except that they are in more details and initialed and stamped by the receiving cashiers. They are used to lodge in money in favour of the account holder and are always completed either in duplicate or triplicate.

Other necessary forms share the same functions as described under savings account above.

Having discussed in details, the manual banking protocols, the poser question then is what are the problems encountered using this manual banking system. These could be listed below: -

- i. Shortage of qualified and competent personnel to handle this high volume of transaction. And where they are available, the banks cannot afford to pay their salaries.
- ii. Ledgers maintained are not usually posted up to date as a timely and reliable ledger balances are difficult to produce and guaranteed. Hence, they cannot be easily comeby.
- iii. The inadequacies and inaccuracies resulting from fatigue and boredom is inherent in human processing.
- iv. Returns needed by management for prompt decision-making are not always available on schedule.
- v. Customers dissatisfaction as a result of slow response time from human processors.

#### **3.4. NEED FOR COMPUTERIZATION**

One area of commercial banking that could benefit a great deal from the covered personnel requirement and costs associated with increased automation of routine and repetitive operations would be the processing of multiple standard verification before payment.

Electronic computers are found to be suitable in solving banking and financial institutions problems because of the nature of the operations of these institutions. Computers are suitable in handling well-defined procedures with clear and attainable objectives which every bank / financial institution has computers are also suitable where the operations involves defined steps that are performed over and over again. Most routine jobs that consume a lot of manpower hours can conveniently by handled using computers.





### INDIRECT COST FOR STAFF PERSONNEL

Equipment purchase	
10 IBM PCs Model 4122, 150 MHZ at ₦ 40,000 each	400,000
5 display terminal at ₦ 20,000 each	100,000
6 line printers at ₦ 60,000	360,000
Computer furniture	120,000
Installation	45,000
Training of staff	75,000
UPS (Uninterrupted Power Supply)	<u>30,000</u>
	<u>₦ 1,130,000</u>

### COST OF OPERATING THE SYSTEM

Stationery i.e.

Ribbon, paper, Diskette	45,000	
Equipment maintenance	35,000	
Miscellaneous Expenses	<u>50,000</u>	
Total	<u>₦ 130,000</u>	
Over all cost		<u>₦ 4,740,000</u>

#### **3.5.2. The Benefit Of The System**

It is very desirable to justify computerization by considering the cost, time and accuracy of the and result. Infact, computer application in banking system has led to reduction in cost and it improved efficiency and speed. Merit of the new system might not be easy to identify or quantify immediately.

However, it saves time and cost, it will eliminate duplication of paper work and frequent omission of some vital transaction in the bank. And also, it will reduce generation of high volume of prepare

work and computer is equally synonymous to time and since computers work at a phenomenal speed coupled with its ability to access records. This will reduce delay in receipts and payment preparation and concerning the withdrawals and depositors in banking sectors or industries. The next chapter now considers the proposed system and software design specification, software design, implementation and testing.

## CHAPTER FOUR

### SOFTWARE DESIGN AND IMPLEMENTATION

#### 4.1. INTRODUCTION

Having exhaustively viewed the banking industry and a closer look at Diamond Bank with emphasis on relevance of computer application, we now turn our attention towards using the machine computer to design a system which will be of help in solving some of the bottleneck hindering plaguing the banking industry with specific focus on cash lodgments and withdrawals.

This chapter deals with the design of the software. The design defines the software package that meet the requirements and the framework into which these pieces fit to act as a system working as whole. The emphasis on software design is to develop a new system that helps to achieve the goals of the organization and to overcome some of the shortcomings and limitation of the existing system.

#### 4.2. SYSTEM SPECIFICATION

Bearing in mind the objectives of the system. It would be pertinent to now have a broad analysis of how our objectives can be realized. In this section, some detailed requirements of the proposed software to be built are specification and consequently designed.

Since the software specification also serves to dormant, the proposed system to be designed, it serves as a means of communicating all that is required to be known to all interested parties in the system. The users (customers and cashiers) who will ultimately be responsible for running the new system need to be kept fully aware of the specification. The programming stage that suite the programs



would be written needs to be conversant with the specification. Also the specification will serve as a consulting record of the system so as to make easy for evaluation modification and training purposes.

The design specification for this software will be presented concisely under the following sub headings:

- i. OPEN A NEW ACCOUNT
- ii. DEPOSIT
- iii. WITHDRAWALS
- iv. BANK STATEMENT
- v. EXIT

#### **i. OPEN A NEW ACCOUNT**

The software to be designed will accommodate customers who are operating with the bank for the first time. In other words, clients who want to transact business with the bank should be given special focus. To this end their biodata is requested to be supplied at the inception of the transaction. Information supplied would then be added to the existing database from which the software can make queries for future references.

#### **ii. DEPOSIT**

Customers transacting business for the first time as well as already existing customers have this item mode as one of their principle activities with the bank. Deposits are lodged by customers in order to swell their accounts with the bank. In addition at any point in time, deposits are accepted by banks authorized cashiers via counter/cages excepts otherwise directed by the bank management. Standard form

(DEPOSIT VOUCHER) specifying the account number, the name of account holder, the amount deposited and other parametric information would be conspicuously shown on the deposit voucher. The Cashier at the reception of the lodgements thereafter makes system entry and further adjustment as regards balance takes place within the system.

### **iii. WITHDRAWALS**

Just as there is deposit there should also be withdrawals. One point that should be noted however is that withdrawal does not apply to clients transacting business with the bank for the first time. It is only relevant to already existing customers. From such customers would be requested such information as account number serene account loaders name amount to withdraw and other deemed necessary. The system then makes a brief entry and comparison of the above stated data with the existing are in the database. Any discrepancies is then flagged and the account holder notified for specification and a subsequent denial of access if the holder still falls to remedy the data supplied. If on the other land the entries and the database correlate further adjustments are made as to the amount to be withdrawn and the customer is paid.

### **iv. BANKING STATEMENT**

The bank statement in effect is to print at specified time interval the transaction between the bank and clients, showing such elements as deposit withdrawals, date and the balance to the credit of the customer. Starting from the day the last of the bank statement was issued.

## **v. EXIT**

From the main menu section, when the EXIT command is highlighted system should be able to return the customer back to the “ PAGE INFORMATION” section from where would be asked if he wants to operate the software or not.

## **SYSTEM FLOWCHART**

It shows the overall logic of the systems processing, including the input and files and the segmentation of processes in to programs. It gives a picture of what the does (as opposed to how it is done) its logical complexity is low. This is shown overleaf.

### **4.3. SOFTWARE DESIGN**

The objectives and specification described above now come into play during the software design. With regards to design, the following would be analysed:-

- i. Input design
- ii. Output design
- iii. File definition
- iv. Procedure or processes specification

## **INPUT DESIGN**

Consideration of the input will be greatly influenced by the need of the output. For instance, the necessity for quick response from the system would determine the need for an on-line, interactive type of input. One major concern at this stage is the data collection methods and validation. Since the major data for the system come in the form



of "ACCOUNT OPENING FORM " and "SAVINGS DEPOSIT VOUCHER". It is hoped that the user of the system would pick out the input data easily.

a ACCOUNT OPENING FORM

This is used for opening a new account as specified in the system design specification. From here, the initial data of the new customer are recorded and entered into the system. These includes the account numbers, names of names of customers, date of opening account, initial amount and the address of customer as shown in table 4.1. Before these are entered permanently into the system, verifications are made so that correct information is entered. This is achieved by the series of data entry correction subroutine available.

ACCOUNT	CUSTOMER	DATE	AMOUNT	ADDRESS
NUM	LENGTH	LENGTH	LENGTH	LENGTH
LENGTH	40 CHAR	8 CHAR	10 DIGITS	40 CHAR
8 CHAR				

Table 4.0

b. SAVING DEPOSIT VOUCHER: - The input data obtained from this form are account numbers, customers names, amount to deposit and present date.

c. The format is as shown

	CUSTOMER	DATE	AMOUNT
ACCOUNT	LENGTH	LENGTH	LENGTH
NUM	40 CHAR	8 CHAR	10 DIGITS
LENGTH			
8 CHAR			

Table 4.1

For each of the field specified for the two data input modes above, if the length is longer than necessary messages are displayed to the user so as to correct the error such that the data entered into the system conform with the design.

## **OUTPUT DESIGN**

It is necessary to consider what is required from the system before deciding how to get about producing it within certain clients. It is necessary to develop the best and most useful output possible without worrying about how we produce it.

The major considerations in the design of the output are: -

- i. Recipient of the output.
- ii. Media i.e. whether the output is on the screen or files.
- iii. Contents: information to be conveyed to the user.
- iv. Layout-way in which data and information are spread out on input document or screen.

The above factors have been blended together to determine the categories of output from this system. In what follows, we present the component fields and formats of each of the desired output from the system.

a. **WITHDRAWALS:** - The output will be on the screen and contain such fields as name of customer, address, date, old balance, amount withdrawn and new balance displayed using the format below: -

CUSTOMER	ADDRESS	DATE	AMOUNT	OLD	NEW
NANTE	LENGTH	LENGTH	WITHDRAW	BALANCE	BALANCE
LENGTH	40 CHAR		N	E	E
40 CHAR		8 CHAR	LENGTH	LENGTH	LENGTH
			10 DIGITS	10	10
				DIGITS	DIGITS

Table 4.2

The bank makes use of standard withdrawal voucher/cheque to effect withdrawal.

This can be presented as shown overleaf.

b. **BANK STATEMENT:** - the output of the bank statement option is on the line printer or the screen. The output contains such fields as deposits, withdrawals, customers name, address, balance, and last date of interaction with the system as well as the present date. The format of the field is shown below: -



CUSTOMER	ADDRESS	DATE	WITHDRAW	BALANCE	NEW	LAST	PRESS
ER	SS	LENGTH	LENGTH	CE	BAL.	DATE	NT
NAME	LENGTH	H 10	T	LENGTH	CE	LENGTH	DATE
LENGTH	H	DIGITS	10	H	LENGTH		H
LENGTH							
40 CHAR	40		DIGITS	10	H	8	H
	CHAR			DIGITS	10	CHAR	8
					DIGITS		CHAR

Table 4.3.

### FILE DEFINITION

A file is a collection of related records. The volume of any file is the size of that file. This is determined by calculating the number of characters in a record and multiplying it by then number of records in the file. For this software designed, two files have been used. These are the data base file accessed randomly and the bank statement file for each customer.

The file is declared to have a dimension of one thousand customers. The account numbers is used to access each record as the account number is unique for each customer i.e. no two customer have the same account number. The output file-bank statement file contains such fields as customer names, address, deposits withdrawals, balance – all from the last data of the bank statement.

## **PROCESSING SPECIFICATION**

The input and output have been presented in previous section. The file to achieve these has also been presented. There is however a need to link the outputs files and inputs together. This is realized using flowcharts of the five major modules described in section 4.3. All these are shown overleaf.

### **4.4. IMPLEMENTATION AND TESTING**

Implementation concerns the most efficient way by which the system can be put to effective usage. Having designed the software as analysed above, we now schedule ourselves to transforming the various designs to computer level using its languages as our medium.

Because of the current trend and for its simplicity, we have chosen the DATABASE APPLICATION LANGUAGE as our medium mode by which our design above can be implemented. DATABASE for short, is a language generator with ease of screen and powerful graphic structure for programming. Besides, the language supports and makes for exclusive distinction ion each broad function, which it can handle. In other words, the language is divided into six broad functions. Each function redefined towards subdivisions, which are further redefined, thus, making the language modular in nature. The broad functions are mostly called panels and are: -

- i Data panel
- ii Queries panel
- iii Forms panel
- iv Label panel

- v Reports panel
- vi Application panel

Modularity in programming refers to breaking down of the main task into sub tasks. Each sub-tasks, is regarded as an independent logical entity, having its entity and exit point, being coded as units such that the integration of all the units achieve the overall objective for which the main task is instituted. Because of this intrinsic appeal of modular structured programming, we devise to implement the design using the modular approach.

The software consists of the executive module- THE MAIN MENU five sub- modules, each of which acts as a supervisor module.

The five modules are: -

- a. OPEN A NEW ACCOUNT module
- b. DEPOPSIT module
- c. WITHDRAWAL module
- d. BANK STATEMENT module
- e. EXIT module

Each of the above listed modules performs a specific function at the end of which control is transferred back to the supervisor module.

**TESTING:** - There are various method of software testing some of which are parallel testing, phase approach testing e.t.c.

Using the Phase approach testing, the module are tested separately for workability and thereafter integrated. After the



integration, the whole unit is tested as a single unit. Test data are chosen to test all the branches and conditions supported by the system.

Even though testing cannot exhaustively reveal the efficiency of the system, notwithstanding, some apparent deficiencies revealed are corrected to enhance further resuements. The tested program together with the output generated are displayed in appendix two of this project study.

#### 4.5. OUTPUT OF THE PROGRAM

This section deals with the generated output, obtained after running the program for the computerization of cash lodgement and withdrawals; (A case study of Diamond bank limited, Marina branch, Lagos).

The generated output is in conformity with the design of the project. Having achieved this first objective, we now go ahead to discuss or comment on each of the five generated reports.

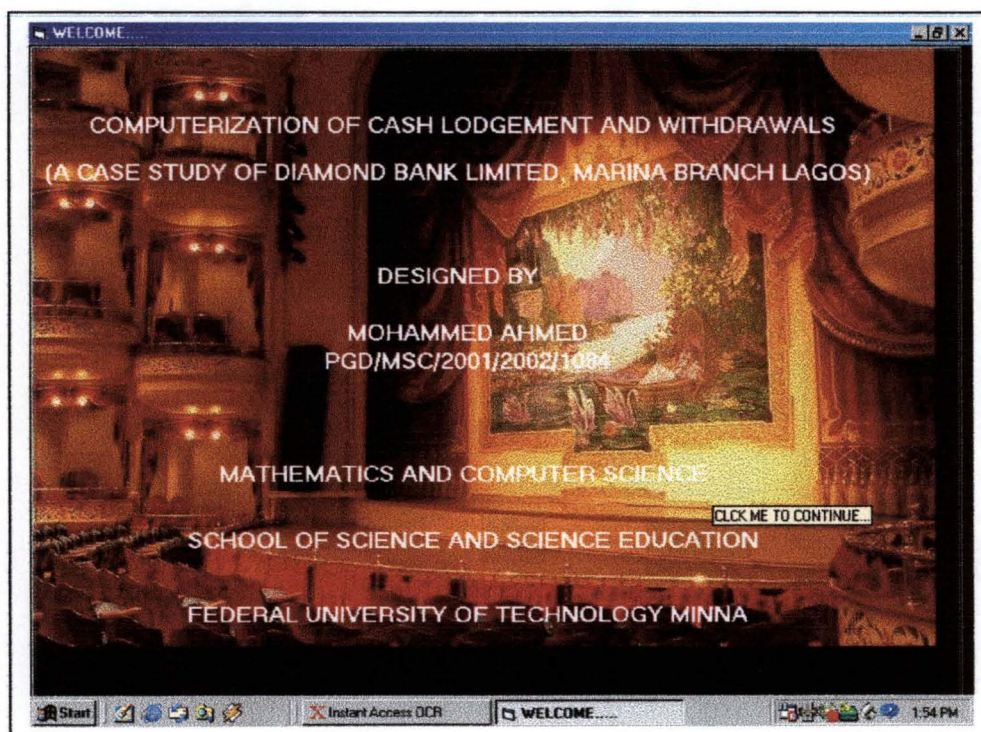


Fig. I

Fig. I above show the desktop and welcome page display on the monitor. It consists of the name of the program, or job carried out, specific area or scope, the name of the designer, the department, faculty and the school to which it has been submitted.

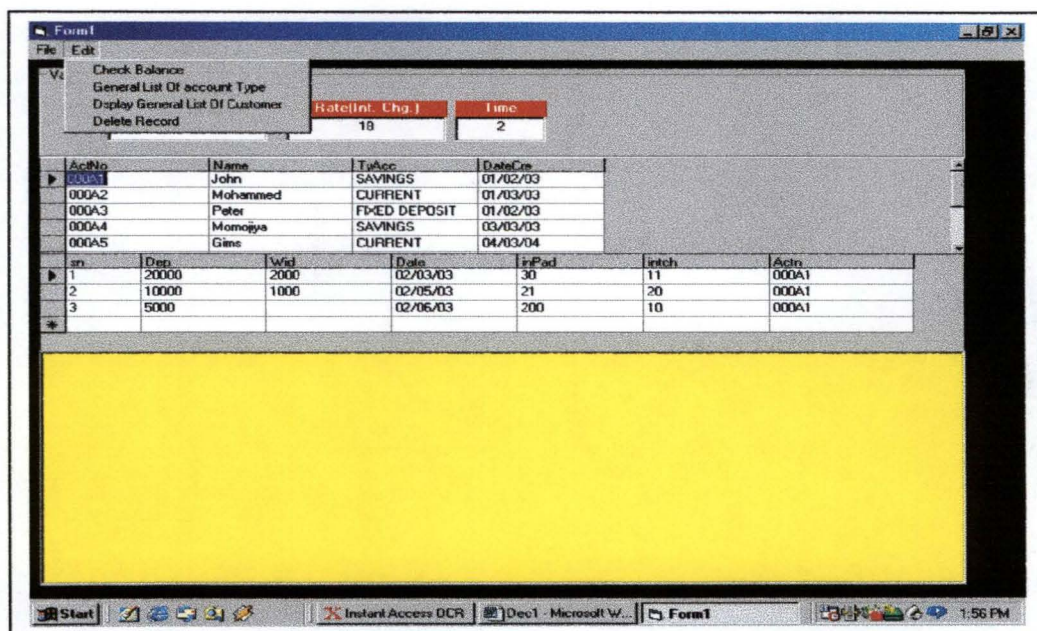


Fig. II

Fig. II. Shows (from edit) the operations that can be carried out otherwise known as main menu. For the avoidance of doubt balances can be checked, General list of customers can be displayed as well as that of account type. Also, record can be deleted.

Fig. II consist of the general list of account type. It contains among other things interest charges and interest payment or paid. Interest charge is applicable to a customer who borrows money from the bank whereas interest paid is applicable to customers who deposit money into their accounts with the bank. In any case the formula for calculating the interest is thus,



$$r = \frac{P \times R \times T}{100}$$

Where

r = Interest

P = Principal (i.e. the money borrowed or deposited).

R = Rate (i.e. percentage to be charged or paid).

T = Time (i.e. annually, biannually, Quarterly, Monthly, Weekly e.t.c.).

The principal is the actual amount of money involve in the transaction. The rate varies from account to account, fixed deposits has a higher interest rate followed by current account and lastly savings account. And even here the rate is not fixed or constant as it fluctuates from time to time.

The next generated output is the general type of account type in which case the first column contains the account number, the second column has customer's names, third column has type of account and fourth column has the date the account was created.

A careful look on the first output will indicate that Account Number 000A1 has been highlighted. This means the user wants to see the details of transactions carried out on the account.

The next generated output which gives the details of operation carried out on account 000A1, has seven columns the first of which contains the serial number, the second has the deposits made, the third has the withdrawals made the a fourth has the date of transaction, the fifth column has interest paid, the sixth has the interest charge on



customers and the seventh has the account number on which the transaction was made.

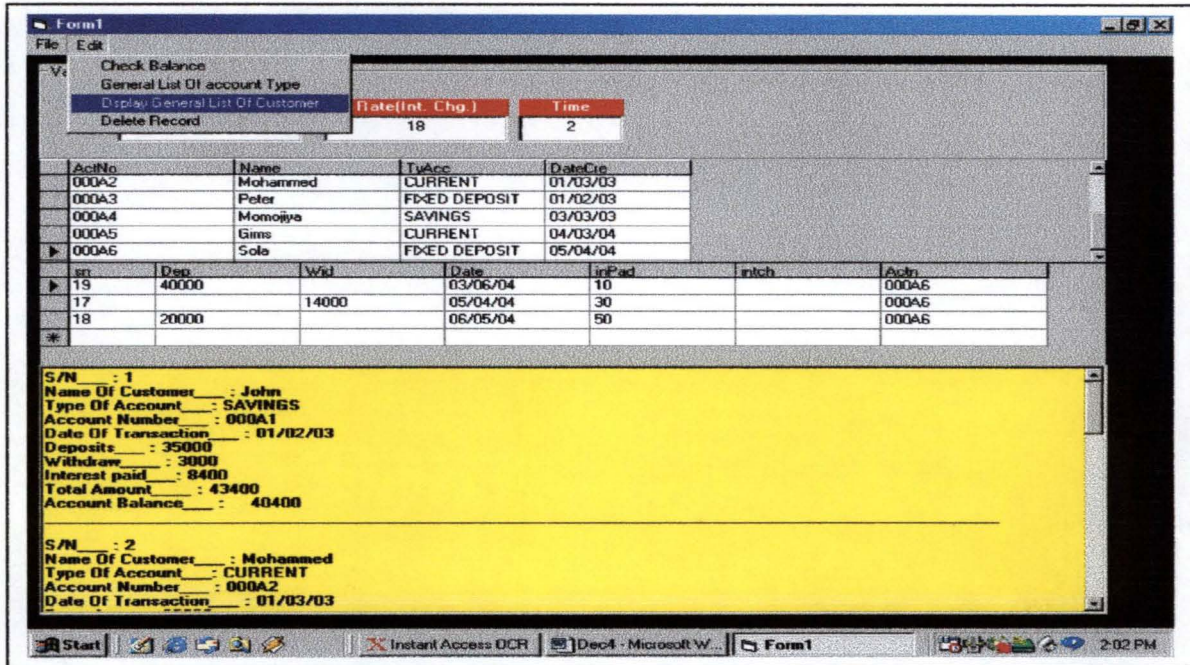


Fig. III

Fig. III. This display the general list of customers, regardless of the type of account they are operating. A careful look on this output will indicate that the same operation carried out on fig. II was repeated here on different account number (i.e. 000A6).

In addition this output contain the general list of customers serially. It is arranged into 10 rows and in each case each record has the followings

- i. Serial Number of customer
- ii. Name of customer
- iii. Type of account
- iv. Account number
- v. Date of transaction
- vi. Deposits

- vii. Withdrawals
- viii. Interest paid
- ix. Total amount
- x. Account balance

Using this format the entire customers are listed from the first to the last without using any specific criteria other than account number.

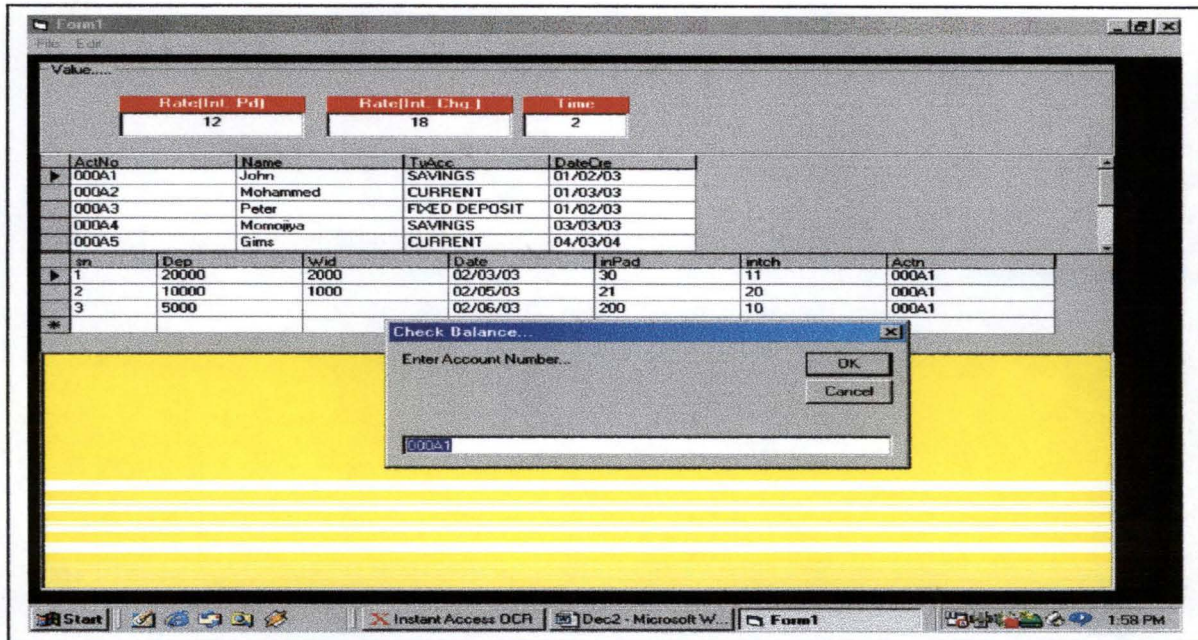


Fig. IV

Fig IV. This section deals with the issue of balance checking, when a customer comes to the bank seeking to know his balance, the operator will click on the edit button and from the displayed option he/she should click on “check balance” this will lead to the display of a dialogue box requesting the user to “Enter Account Number” once he has done that, he/she should click on OK using his mouse or Keyboard, this will lead to the display the balance record in a particular account.



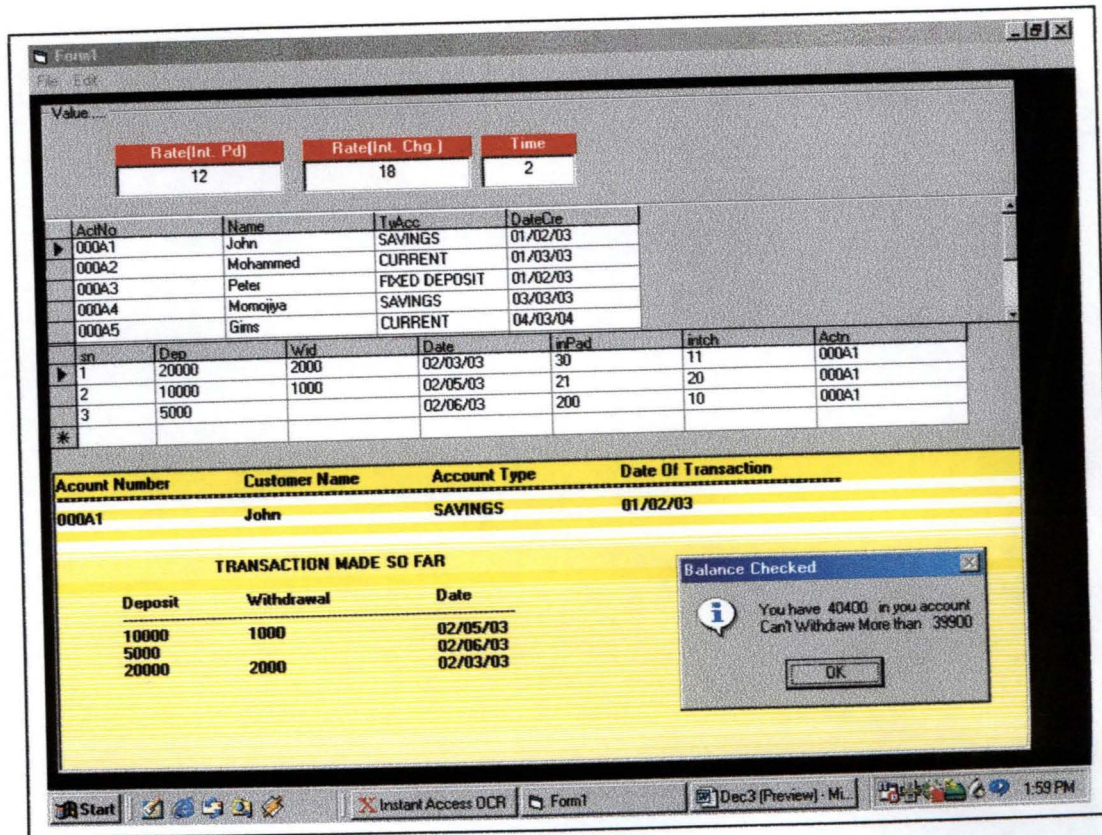


Fig. V

Fig V. This output shows balances of account number 000A1. The first part of the balance record shows a summary of a customers record with four columns, the first has account number, second column has the customers name, the third has the account type and the last has Date of transaction. The second part has the record of transactions made so far and it has three columns of Deposits, Withdrawals and Date. The last and final part is the result of the balance checked. It shows the total balance in the account and the amount of money beyond which a customer cannot make any withdrawals.