COMPUTER REVOLUTION AND BANKING SECTORS

A CASE STUDY OF NIGERIA - ARAB BANK LTD.

PROJECT SUBMITTED

TO

THE DEPARTMENT OF MATHEMATICS/ COMPUTER SCIENCE

BY

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CERTIFICATION

This is to certify that this project submitted by **NDAKO N. MOHAMMED** has been approved and accepted by undersigned on behalf of the Department of Mathematics/Computer Science in meeting the requirement for award of Post Graduate Diploma in Computer Science.

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DECLARATION

I solemnly declare that this project is an original work,andthat no part of it therefore was copied either partially or wholly from any past project in this Department or any other Department from this University or any other University.

MAL. NDAKO . N. MOHAMMAD.

DEDICATION

This project is dedicated to my entire family.

ACKNOWLEDGEMENT

I sincerely thank Allah for His humble guidance and blessing through my course of writing this project.

It is not possible for me to bestow recognition on all who have provided assistance and encouragement during the period of this project, however I wish to express my appreciation to my Head of Department Prof. K.R. Adeboye who is also my Supervisor for his patience to see that I submit perfect job and entire Lecturers in the Department with particular reference to Prince "Badmus".

Much gratitude to my guiding Area Manager Alhaji S.B. Usman for the courage always given while trying to achieve my set goals.

Finally, I thank my family for their patience and courage in the course of writing this project.

ABSTRACT

The entire world is dynamic, so its with computer development needs and usage.

The banking system in the country is highly competitive to meet the customer's needs as such every bank is trying for electronic information technology for rendering their services.

Considering the present challenges and competition in the banking service delivery especially with the country deregulated economy and licencing of more banks, the whole banking industry in Nigeria has strive to improve their service delivery using computer to enhence efficiency and reduces banking/customer problems.

The use of computer is highly accepted by Bank and it has brought about improvement in delivering banking services to customers in contrast with the manual system. However, some banks are yet to be fully computerised.

The problems and weakness of the manual system of banking are viewed for evolvement of computerisation as alternative solutions for a better and efficient banking services to cope with sudden and rapid increase in customer patronage of banks, thereby creating much more responsibilities to be shouldered by the banks.

Computerisation of the banking system seems to be only solution to the bank/customers problems but it has its own problems which can be over come to some extent.

Finally, computer revolution inthe banking sectors has reduced the perennial congestions often seen at bank counters and widespread of yesteryears fraud.

COMPUTER REVOLUTION AND BANKING SECTORS (CASE STUDY - NIGERIA-ARAB BANK LIMITED)

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striving to meet up, so that they will remain competitive in the industry. The full change to MICR cheques, the establishment of the Nigeria Inter-Bank Settlement System (NIBSS), the advent of electronic fund transfers (EFTS) and others which are expected to be electronic-based are indications of advancement in computer technology in our banking industry.

The operation of banking services with manual procedures are highly cumberson, time taking and energy sapping. With the competative nature of the industry, faster and accurate approaches are required to meet customers demand, so the introduction and use of computer technology in today's banking.

In Nigeria today, the intensity and spread of computer usage over the past few years have certainly exceeded all projections, it is now being introduced in almost all sphere of our national economy. Computer usage means radical change in speed and quality of transactions in which it is enjoyed and assumes less direct human intervention as such the rules and regulations based on the purely manual information processing and retrival must be examined.

The changes brought by computer technology now enables Managers of an organisations to create and maintain systems. It also enables them to access different kinds of information as may be required at my time with ease using database system, for example Network under database management system (DBMS) packages.

1.2 SCOPE AND LIMITATIONS:

This project "Computer Revolution and Banking Sectors" with special reference to Nigeria-Arab Bank Limited is conducted from the perspective of existing system in banking operations with the view of defining the inherent

problems of manually operated system and designing a suitable automated system to meet with the dynamic society.

The project will also consider cost analysis in evolving computer technology for banking operation, system conversion, manpower training and recruitment, system installation and evaluation and evaluation as well as maintenance.

The possible contraints of evolving computer into the banking sectors could be of change over which has to be done gradually and carefully by educating the users on the benefit of the system and its implementations.

1.3 PURPOSE AND SIGNIFICANCE:

Computer has great importance to the banking profession which is a service oriented commercial industry. With computer, the prime objective of a banker is to ensure competitive advantage by providing optimal automated services and satisfying information needs. If proper programs are built into computer system, they help in achieving efficient and effective personnel performance with highly co-ordinated chanelling of the job.

Considering what is meant by DBMS and Dbase, and changes in the society as a result of current trends in technological development brought by computer, the project work is conducted with the aim of finding ways of introducing automated computer system into an existing manual system of banking especially in Nigeria-Arab Bank Limited.

The project study will assist to create a Databank, Network operations using computer device for the purpose of increasing the speed and accuracy of informations required and to evaluate the cost benefit in the use of computerised information system.

The new system, when designed and implemented will assist in maintaining data security using central access code names (Passwords), reduces

misplacement of information and data redundancy, providing required information easily, becomes users-friendly and specify the users limit.

1.4 RESEARCH PRINCIPLES:

The project's aim is to study the revolution of computer in Nigeria with reference to its evolvement in banking sector, a proposal is put forward for the acceptance of Nigeria-Arab Bank Limited Management for the change from manual system to automation viewing in mind that system automation of their services considering the dynbamic nature of the entire banking sector, could provide faster services and responses, thereby increasing organisational growth, productivity and affording them to meet new challenges in the competitive economy as well exploit new opportunities.

To get enough data for achieving these, feasibility study aimed at finding out necessary information for systamatic analysis and subsequent design of proposed automated system by consulting various professionals in the banking sectors - Nigeria-Arab Bank Limited in particular is done through interview, observations, document review (literatures) and on the job experience.

CHAPTER TWO

2.0 REVIEW OF RELATED LITERATURE:

2.1 HISTORICAL BACKGROUND OF BANKING IN NIGERIA:

Bank is a Financial Institution with the responsibility of keeping money and valuables, safety and rendering financial services within its scope of establishment.

The Banking System is an essential ingredient in the growth and development of any national economy. In carrying out its role as intermediary, banks solicit for and accept deposit repayment on demand. Banking institutions not only oblige the depositors withdrawal of their funds but they also equate the balance sheet by granting credits to their customers at a price to be paid along with the principal. The banking functions include financial advisory, foreign exchange transactions and international payments systems to mention few.

The ggiant stride into the banking system in Nigeria was taken in 1892 with the establishment of African Banking Corporation. The banking sector operated under laissez-faire until 1958 when the first major banking legislation, the banking and the Central Bank of Nigeria ordinance were enached by then colonial masters through Mr. J.B. Loyness report.

There were only seven commercial banks as at 1958, few ill-equipped development finance institutions and non-merchant banks. The banking environment then was characterised by the dominance of foreign banks, limited banking cultures, a predominant government interest in indigenous banks, a discriminating attitude against indigenous business in credit advancement and shallow depth of financial systems.

With nationalist and indigenisation efforts, especially in 1960s and 1970s, the banking sector passed through various legislative processes which brought about many structural changes. The land marks were the 1969 banking Act and Amendment, Nigerian Enterprises promotion Decree 1972 and 1977, among others. Some developments include government acquisition of 60% shareholding in licensed banks, growth in banking and cheque habits, increased domestic influence on banking activities, activation of money and capital markets and establishment of development banks.

However, the regulatory control employed over the years generated major monetary and allocational distortions within the banking sector and indeed, the economic system, as such in 1986 a comprehensive economic recovery programme was adopted and supported by International Monetary Fund (IMF) to effect structural adjustment (SAP) which deregulated financial and economic activities, with its liberalisation of licensing of banking and other financial institution, credit administration, liberalisation of foreign exchange operations, interest rate determination and trading in treasury securities all of which were legally fortified by a reversed banking framework embodied in CBN Decree 24 and BOFI Decree 25 both of 1991.

By 1992, with effect of "SAP" Banking Sectors had grown to 67 Commercial Banks, 55 Merchant Banks, 145 Primary Mortgage Institutions, 228 branches of People's Bank, 618 Finance Companies (48 fully licensed), 401 Community Banks and about ten other development and specialised banks. Some years after SAP, Banking System in Nigeria became more complex and re-regulation policy of 1994 and the guided deregulation policy of 1995 were enacted, such decrees as failed banks (Debt Recovery) and other financial malpractices Decree 18, Money Laundering Decree No. 17.

Banking in Nigeria now is under tougher control especially with the recent increase of capital base to N500 million in 1997 budget speech.

2.2 HISTORICAL BACKGROUND OF COMPUTER IN NIGERIA:

Computer is a technological wonder machine that stores and recalls information. It automatically processes input data according to the programme stored in it and produces result when needed. Computer, unlike human brain, processes several millions of instructions per second accurately, depending on the accuracy of the programme and the quality of data passed to it.

Computer commands global acceptance as advantageous mode for saving time and alot of energy required to accomplish complex and tedious calculations in a few minutes that may take months or evenyears to be accomplished by human brain.

The Structural Adjustment Programme (SAP) and the attendant proliferation of banks have brought about increased pressure on the banks by customers. Their demands increase daily and appears more complex and sophisticated. The desire therefore, to meet the ever increasing demands of the customers prompted the introduction of computer system into banking industry.

The technology (Computer) dates back to the 40s in America and Europe. It was introduced in the 70s in Nigeria while banks embraced it during the following decade - 80s. By 80s, it has become a necessity for the day to day banking transactions.

The style which banks were employing before the advent of computer to render services was considered to be snail-pace method. This led the bank competitively request for computer engagement in their operations so as to reduce the average waiting hours of customers.

2.3 HISTORICAL BACKGROUND OF NIGERIA-ARAB BANK LIMITED:

Nigeria-Arab Bank, established as a profit-making organisation, commenced full commercial operation in November, 1962 as a branch of Arab Bank Limited - Amman-jordan, with two earlier Branches in Nigeria (Lagos and Kano). It became Arab (Nigeria) Limited in 1968 with Share Capital of #20 Million while later with indigenisation Decree of 1977 it assumed its present name Nigeria-Arab Bank Limited with Federal Government holding 60% centre of the shares.

The bank has widened its scope of operation with a networt of 40 branches nationwide with headquarter at Lagos and 16 affiliates world wide, a staff strength of over 1000.

The bank with its primary objective has made steady progress by servicing some merchant banks and enhancing the growth of both small as well as being industries in Nigeria. It has help in raising standard of living of her customers and a source of livelihood for its staffers.

The bank despite its achievements have passed through difficult situations as its own share of global economic depression just like other banks in the country. The bank had also been bedeviled by problems ranging from disregard to ethics of banking practice, mismanagement of resources and unauthorised lending. The situation became more heightened with the general down-turn of the economy which earned some banks "distressed and unhealthy".

With the effect of the existing management team and recent taken over of the bank by NICON from Federal Government and Arab Partners, we believe the sky will be its limit.

2.4 OPERATIONAL ACTIVITIES OF NIGERIA BANKS (NAB LTD)

The banking activities in Nigeria could be grouped as regards to the

nature of the banks. In this respect we shall concentrate on the commercial banks like Nigeria-Arab Bank Limited which is service oriented bank with profit motives having the following functions:-

(a) **Deposit:-** The bank eliminates the risk of keeping large sums of money by accepting deposit which could be in form of demand deposit, time deposit and savings account.

(b) **Safe Custody for Valuable:-** Valuable items as well as Certificates, trinkets and others are accepted for custody to avoid losses, misplacement and destruction through theft or other havocs.

(c) **Advance:-** Bank lend money to its customers in form of loan, over draft, advance etc. thus providing short, medium and long term capital for economic activities.

(d) The bank serves in advisory capacity by providing first class advices on investment.

(e) The banking activities further include clearing of instruments like cheques, bankdraft and other bills on behalf of their customers and convert same to money, standing order and foreign services are equally rendered by the bank.

(f) The bank provides interest for savings account deposits and charges on the services rendered to current account customers.

The bank has undergone many hundreds of a regulated economy and was able to survive while other collapsed.

CHAPTER THREE

3.0 FEASIBILITY STUDIES:

3.1 AIMS AND OBJECTIVES:

In conducting any feasibility study, it is usual to define clearly the object of that study for a proper and clear understanding of its requirements.

The project intends to make changes in banking operation system of pre-computer era - (manual operation) to computer automation system (Computerisation) with its revolution to enhance productivity and growth of the entire banking sector in Nigeria with special interest on Nigeria-Arab Bank Limited.

The purpose of the feasibility study is to investigate the project in sufficient depth to be able to provide information which rather justifies the development of the new system.

The objective put into consideration the desire to:-

1. Provide a better service for customers
2. Reduce number of staff and administrators
3. Improve the flow of information for the management
4. Reduce cost, time of processing a unit of data
5. Improve stock centre and better credit control
6. Improve the accuracy of information and data on business documents.
7. Improve accounting procedures
8. Provide effective means of system integration.

The feasibility study leads to how to:-

- Create and maintain data files
- Link or intergrate the information files
- Retrieve information need for the operation of the organisation
- Generate reports for further managerial decisions
- Create and maintain a customer file in which details informations about individual customer are recorded.

In view of above,a feasibility study which is the preliminary investigation stage was conducted through the observation of techniques, interview and review of the existing documents.

3.2 NATURE OF BANKING (NAB) BEFORE COMPUTER ERA:

In the case of Nigeria-Arab Bank Limited, the administrative set up for the entire bank move down from Managing Director who is the Chief Executive functioning along with his directors down to branches or departments which are controlled by Managers. The decision and information flow both ways while the branch management are Chief Supervisory of the operational branches and departments, under whom operations of the branches area co-ordinated through various operational staff.

With typical example of commercial bank like Nigeria-Arab Bank Limited, the Executive Managements are loaded with roles like:-

- Establishing policy and monitory same
- Formulating and influencing plans for corporate development.
- Selecting area of application, set objectives and ideally participating de velopment.
- Providing resources for smooth operation as well as evaluating operations.

While the branch management:-

- Influence and execute management policies
- Recommend and evaluate pattern of processing
- Recommend to management area for applications
- Help establish performance criteria and evaluate quality service for operational application.
- Establish criteria and evaluate alternatives for selection of equipment or services.
- Monitor and report any anomaly.

At the branch level, it was discovered that the branch Manager is the chief administrative officer with the responsibility for administrative work assisted by assistant Manager and Secretary Typist. The branch accountant is the operational officer of the branch assisted by other officers/clerks for day to day operation of the branch.

The branch set-up has the manager at the top with his administrative and operational units down to the clerk as shown in the diagram below:-

The Bank is service oriented under manual operations to various customers, having several units of operations. The bank first contact with customer is at the counter control by clerk for every transactions - deposit/withdrawal and enquiries. The chain of transactions pass through the clerks for banking services up to Manager on manual basis.

The records are made manual for up-dating and retrieving of data using ledger cards for concerned individual customers after they have established banking relationship with the bank by opening of account such as savings, current and fixed or as they may wish.

The entire daily transactions are recorded into a control journal called WASTE JOURNAL, reconciled on RECONCILEMENT JOURNAL and later transferred into Summary Book called GENERAL LEDGER which serves the same purpose with BALANCE SHEETS except that it does not contain details analysis like balance sheet.

The branch management reports to executive management on the operation of the branches through various returns rendered manually on weekly, monthly, quarterly basis or as may be required. These returns include position of each customer's balance down to balance sheet of the branch which states the position and effort of the entire branch operations.

3.3 PRE-COMPUTER FILE BASE SYSTEM:

Nigeria-Arab Bank Limited as commercial entity started transaction with customers from opening of account as a way of initiating the banking transactions. The accounts are of many kinds (Demand, Savings, Loan and Fixed Accounts) but have the same information requirement about the intended customer such as:-

ACCOUNT NUMBER:

NAME:

ADDRESS:

NATURE/TYPE OF ACCOUNT:

when the account documentation are fully done, customer start operation by depositing of minimal amount requirement and a record card (Ledger) is created containing details of earlier information and opening of account forms and amount deposited.

The ledger card is ruled in a way that shows:-

Date of transaction:

Nature of transaction:

Amount deposited as credit or amount withdrawn as debit:

The balance after any transaction is up-dated.

The above serves as individual customers file which could be consilidated into other records files for control of the entire operations.

The daily transaction are recorded into initial control journal called WASTE JOURNAL showing details of debit and credit transactions of the day into column of several types of account such as Current, Savings, Impersonals and profit & Loss Accounts to mention a few. The journal records every credit transaction with its corresponding debits. The journal always has to be balanced for control purposes.

The waste journal is further reconciled and summarised into another journal called RECONCILED JOURNAL by grouping the related transaction into specific transaction code for both cash and per account transaction.

The reconciled journal is then transfered to summary book called GENERAL LEDGE which shows the entire records and position of the branch at a glance.

Other books of control:-

Cash Book:-Which is controlled daily by Cashier to monitor daily cash transactions. It details the total cash deposited, cash withdrawal and cash at hand on daily bais.

Bills payable Registers:- For control of certified cheques issued and drawn on the branch itself.

Bills Bought Registers:- Which controls the cheques deposit by customers on daily basis.

The branch entire operations include:-

- Opening of account
- Creating of Ledger Cards
- Up-dating the ledger cards for transaction as they occur
- Controlling and co-ordinating the daily operational transactions from individual record cards to consolidated one.
- Providing information at a glance for customers enquiries for their account balances.
- Reporting periodic information to necessary management level.

The filing system in the branch is very cumberson as many cabinets are filled up with files, inrespect of the nature and purposes, thereby taking much time to get access to a particular file when in need.

The records are not straight forward and information from them could not be properly co-ordinated to meet timely need of management decisions.

3.4 MERITS AND DEMERITS OF THE PRE-COMPUTER BANKING

Nigerian Banking Systems before computer era were mainly on manual basis which are faced with lot of disadvantages and advantages.

The operations of the entire banking was highly cumberson and tedious, as any transaction has to be done manually through searching of relevant books of control.

Accessibility to required information is very slow and inaccurate. Delays in retrieving the files, up-dating of records and responding to customers enquiries occurs due to inability to locate the concerned file within minimal time creating further delay in responding fast to immediate and urgent matters thereby frustrating the customers.

The manual system required large number of staff to achieve a little task. The staff may not be of high calibre, experienced or specialised personnel.

Under pre-computer banking, storage of records is highly built up in no order or sequence and access to them is time taking and energy sapping.

The pre-computer banking created opportunity for employing every calibre of personnel at little cost.

Stationery usage cost is less with manual system of operation.

Demerits of pre-computer banking overweights the merits as overrall transactions involves searching through individual customers ledger cards which are many and passing them over to many officers/clerks who are with responsibility of posting and updating each account manually in chain without instant information and with lot of tediousness making the entire job cumberson.

3.5 PROPOSED DEVELOPMENT OF COMPUTERIZED BANKING OPERATIONS

The solutions to the problems encountered involve designing and hopefully implimenting a computer information system (Management information system - MIS) that will maintain the data in banking sectors, so that information is provided timely and accurately.

The system should be able to co-ordinate the whole operation of the bank and providing necessary information faster, efficiently and effectively within the minimum time lapse.

The project is to Automate the entire operation system of the country banking system with particular reference to Nigeria-Arab Bank Limited aiming at:-

Reducing staff/Administrative cost

Improving better service for customers

Improving flow of information for management

Improving stress and better credit control

Improving data documentation and accuracy of information.

The system Network under Database management system will be introduced to enable the bank:-

- Make its job easier as the traditional old generation of carrying ledger will be abandoned.
- To create and maintain a customer file in which each record will contain detailed information about the customer.
- To display any information at a glance.

- To make necessary amendment as when required
- To generate reports for management and official purposes whenever required with ease.
- To co-ordinate and control its general operations of the bank.

The system should have the capability of maintaining the customers file by adding (Creating) new records, modifying and deleting.

The system query screen should be able to search and display any information required on particular customer.

Computerized system developed will be useful in:-

(i) Interest/commission/deductions calculations

(ii) **Signature verification** - checking and confirming of customers signatures to avoid forgery.

(iii) **Cash/Cheque withdrawal/deposit** - updating of accounts.

(iv) Statement of account productions

(v) Daily reconciliation of journal balances.

(vi) Balance sheet production

(vii) Customers/account management in respect of:-

- Account opening and closing
- Rates modification
- Customers' Particulars
- Others.

(viii) Fund transfers.

(ix) Inward and Outward Clearing.

The database will built up gradually, starting from opening of the account to production of reports. This should be accessible for amendment as changes occurs.

3.6 SUGGESTIONS AND RECOMMENDATIONS:

With the development of computer aid technology, the banking industries in Nigeria is highly moving toward computerization of their operations to meet customers need and faces the competitive challenges in the industry as computerized are falling out of the business as they could not cope with the competition of those computerized ones nor could they attract more and lucrative customers.

It is in my opinion that Nigeria_Arab Bank Limited should change its operations from old system of manual operation to computerized one to meet up with the competitive nature of the industry and allow proper and accurate flow of information leading to smooth running of operations capable of seeing the bank toward more successful and expandable operations.

It will also facilitate the accessibility to on-line network facilities for faster communication between the departments, offices as well as branches.

I thus recommend the establishment of information technology department (Computer Centre) at the head office with branch distributive units for coordinating the general operation of the entire bank using Net work on-line system capable of displaying information on screen and printing reports as may be required.

The systems installed in the branches should have computer room with quality cooling system and uninterrupted power supply.

CHAPTER FOUR

4.0 SYSTEM ANALYSIS AND DESIGN:

For a computerised version of banking operation to be developed, the indept studies of existing method of operations are considered in view of the transactions involved, level of operation and the books of accounts in control. In the light of this, it becomes imperative that to enhance the decision making process, efficiency in operation, effective access and control of the system, a required design is adopted.

The system design produces the details of how a system will meet the requirement identified during system study.

4.1 SYSTEM SPECIFICATION:

This details the design of input and output requirement of the system by specifying the required input and expected output for any transaction that occured.

4.1.1 INPUT SPECIFICATION:

The following input design details were considered:-

(i) What data to input

(ii) What medium to use

(iii) How the data should be arranged or coded

(iv) The dialogue to guide users in providing input

(v) Data items and transaction needing validation to detect errors

(vi) Methods for performing input validation and steps to follow when errors occur.

The design decisions for handling input specify how data are accepted for computer processing.

It was decided that data should be entered directly through work station (Terminals) by using the source documents such as cheques.

The design of inputs also includes specifying the means by which end-users direct the system on which action to take e.g. the system users interacting through a work station is able to tell the system whether to accept, input, produce a report or end processing.

The system is designed to be on - line which includes a dialogues or conversation between the user and the system.

The arrangement of messages and comments as well as the placement of data, headings and titles on display screen or source documents which is also part of input design is well considered. The system is fully menu-driven and is user friendly.

4.1.2 **OUTPUT SPECIFICATION:**

The following were accomplished during design:-

(i) The information to present were determined

(ii) It was decided that it could be displayed or printed

(iii) The acceptable format of presentation was used

(iv) The distribution of the output to intended receipients is already determined by the bank.

The format of column headings, totals and sub - total of daily transactions were considered to make for easy interpretation of reports.

NIGERIA-ARAB BANK LIMITED
DAILY REPORT ON CURRENT ACCOUNT

DATE	N A M E	A/C NO.	WITHDRAWAL (DR)	DEPOSIT (CR)	BALANCE
Various	Various	Various	Various	Various	Various
TOTAL			***	***	***

4.2 SYSTEM DESIGN LIFE CYCLE:

4.2.1 LEVEL OF OPERATIONS:

The bank is structured to facilitate administrative and operational activities. With references to the unit and volume of operations, an operating network system with main CPU man by computer operator and terminals for feeding in transactions for administrative and operating members of staff are evolved.

The bank network connects Head Office/Area Offices as administrative unit and branches as operationals.

The branch Managers are administrative officers that oversee the operations of the branches and with sole responsibility of deciding who gets access to the system and at what level. The programs built-in creates enrolling, grouping, authorising limit, facility granting and normal operating sections.

On installation of the system, the system analyst/parogramme will enrol the manager who in turn have to enrol the operational staff according to their level of participation in the operating e.g. for authorisation, cashiering, etc.

The program specifications were outlined and this involved statement of a program requirements including initialisations, parameters,test data and testing procedures to be applied, checks and controls to be incorporated and exception routines.

Further considerations are made on the transaction between the bank branches by co-ordinating their operations for better services to up - country customers who may be desirous of transaction where their accounts are not existing but effected immediately in the mother branches - simply referred to as Inter-branch.

4.2.2. **NETWORK AUTOMATION:**

The automated banking system was designed and consist of three modules namely:-

i. Branch customer accounting module
ii. Branch central accounting module
iii. Consolidated accounting module

These modules are based on oracle Relational Database management system (RDBMT) - a fourth Generation tool running on xenix operating system.

With the package, each branch is to maintain its own database and computer system while the Head Office holds the consolidated data of all branches.

The branch Network is made up of a CPU which is connected to various users terminal for central operator and clerks for authorisation and inputation of daily transaction with queries on screen.

Branch customer accounting module holds standing and accounting data about customers. Financial transactions affecting customers accounts, have a real - time effect on the balances and are handle in forms of:-

i. Withdrawals which can be either cash or inward clearing

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i. Deposits which can be made to any account through cash and outward clearing.

Branch central accounting module has the general ledger data as its pivotal subsystem which is automatically up-dated as the end of day from transactions effecting subsidiary ledgers. Subsidiary ledgers can be further split into sub-accounting structures called subserials.

Financial transaction here involve internal debit or credit vouchers which are entered on branch account at the subsidiary ledger level or subserial level as the case may be.

4.2.3 **DESIGN OF CONTROL**

Data entry control is provided for via the second copy entry where each accounting transaction is entered a second time by a different person.

Various accounting and auditing report are generated daily, monthly or on request to check the nature of transaction involved to effect necessary corrections if need be.

Assume mistake occured at entry point and need to be corrected, delection is used and confirmed, so also every entry needs to be confirmed by system operators.

4.3 FILE DESIGN:

The design of files includes decision about the nature and content of the file itself such as whether it is to be used for storing transaction details, historical data or reference information.

Two files for cash paying and receiving are recognised.

Among the decisions made during file design are the followings:-

i. Which data items to include in a record format within the file.

ii. Length of each record, based on the characteristic of the data items on which it is based.

iii. The sequencing or arrangement of records within the file (storage structure, such as sequential, indexed or relative).

DATA MODELLING/NORMALISATION:

Data models define the structure of files and make clearer the need of business. Data are segregated into seperate files and the integrated data sturcture when developing the data base.

Items which are independent of one another were separated into groups for recording in different files (Normalised). It was ensured that each of the data files has a 'key' which uniquently identifies the object that the data describes.

File structures used were drawn out and normalised, the normalised structure are as follows:-

NAME OF FILE: MASTER CU.DBT - MASTER FILE FOR C/A

FIELD	NAME	TYPE	WIDTH	DECIMAL
1.	S. Name	C	15	
2.	Other Name	C	15	
3.	Account	N	18	
4.	Address	C	20	
5.	Type	C	10	
6.	Withdrawal	N	10	2
7.	Deposit	N	10	2
8.	Balance	N	16	2
9.	Date	D	8	
10.	Interest	N	10	
11.	Com.	N		2
12.	Interest Rate	N		
13.	OD Limit	N		
14.	Ex date	D		
15.	Garantor	C		
16.	Open Date	D		

2. **NAME OF FILE -MASTER SU. DBT - MASTER FILE FOR S/A**

FIELD	NAME	TYPE	WIDTH	DECIMAL
1.	S. Name	C	18	
2.	Other Name	C	20	
3.	Account	N	18	
4.	W-Per mth	N	16	
5.	Interest	N	10	
6.	Interest Rate	N	3	
7.	Open Date	D	8	
8.	Passbook No.	N	10	
9.	Occupation	C	15	

3. **NAME OF FILE PTRANSAC DBT - TRANSACTION FILE FOR C/A PAYING CASHIER**

FIELD	NAME	TYPE	WIDTH	DECIMAL
1.	Account	N	18	
2.	Name c	C	18	
3.	Voucher No.	N	18	2
4.	Cheque No.	N	10	2
5.	Date	D	8	
6.	M. Order	N	16	2
7.	P. Order	N	16	2
8.	B. Draft	N	16	2
9.	Debit	N	20	2

4. **NAME OF FILE - RTRANSAC DBT - TRANSACTION FILE FOR C/A RECEIVING CASHIER**

FIELD	NAME	TYPE	WIDTH	DECIMAL
1.	Account	N	18	
2.	Name	C	18	
3.	Paid by	C	18	
4.	Cash	N	18	2
5.	Others	N	18	2
6.	M. Order	N	16	2
7.	P. Order	N	16	2
8.	Credit	N	20	2
9.	Date	D	8	

5. **NAME OF FILE: PAYSAME - DBT - TRANSACTION FILE FOR S/A WITHDRAWAL**

FIELD	NAME	TYPE	WIDTH	DECIMAL
1.	Account	N	18	
2.	Name	C	18	
3.	Passbook No.	N	16	
4.	Date	N	8	
5.	Withdrawal	N	20	2

6. **NAME OF FILE - SD TRANSACTION - S/A DEPOSIT**

FIELD	NAME	TYPE	WIDTH	DECIMAL
1.	Account	N	18	
2.	Date	D	8	
3.	Deposit	N	16	2
4.	Paid by	C	18	

CHAPTER FIVE

5.0 SYSTEM IMPLEMENTATION

5.1 PROGRAMS ACQUISITION/DEVELOPMENT

The choice of programming language is influenced by the need to develop a package that is users -friendly, support enquiry and report generation.

The programs used in this project were written using STRUCTURAL QUERY LANGUAGE - SQL called DBASE III PLUS.

Dbase III plus is a highly rated database program from Ashton-tate. It is very powerful, flexible and is capable of storing, organising, analysing and retrieving information on a micro computer.

This programming language includes commands to perform conditional branching, looping, calculations, sort records, format input screens and output reports. With its built in-functions which include mathematical, string manipulation, data type conversion, time and date functions.

Dbase III plus has an improved interface between the user and its information which allow the users to interact with its data through menu selections while its powerful software allows professional programmers to develop new commands, functions and debugging capabilities.

In short, the motive behind choosing Dbase III plus are:-

i. **Programming command:-** The commands are precise and unabiqous and as as such, more understandable and easy to use.

ii. **Report Generations:-** It supports the generation of report to meet all level of users.

iii. **Information Retrieval:-** It handles storage, retrieval and

organisation of information in an efficient manner.

iv. Debugging:- It provides efficient means of eliminating bugs.

v. **User Friendliness:**- It offers interactive environment that allows the user to query and get response from the system.

5.2 SYSTEM INSTALLATION:

The on-line network computer system having some or all data files directly accessible to user via application with software (that is, set of programs, instructions, procedure and documentation that directs the operation of computer system) for interrogation purposes are installed. It is a technique of processing data in which the data entry equipment (Terminals) are connected to and controlled by CPU of computer.

The on-line system:-

- Assists in harnessing the activities of clerical staff by use of terminals.
- Eliminates routines clerical tedious tasks thereby increasing the degree of operating efficiency and job satisfactions.
- Reduces the volume of printouts requirement for management reports as information may be displayed on terminals screens on demand thereby reducing associated administrative costs.
- Improves the level of computer services especially with account enquiries, holiday bookings, etc.
- Reduces data preparation cost since data can be input directly, without the need to convert human sensible data into machine sensible data manually.
- Makes management information readily available by direct access facilities which enable management to obtain a greater degree of control of the entire operations.

- Makes it easily to up-date files.

The installed computer system can also be regarded as time sharing or interractive. Time sharing is an on - line processing technique which enables many users to gain access to a centrally located computer by means of terminals.

Users are geographically remote from the computer and from each other, as such each user is unaware that the computer is being accessed by anyone else, which creates the impresson of having a computer for one's sole use.

This is made possible by the comuter continually switching between the various terminals at extremely high speed under the control of an operating system.

5.3 SYSTEM EVALUATION:

The main programs are operating system capable of controls and monitors the execution of all other programs without much human intervention, and built in application programs for financial application such as Automatic cheque clearing which ensured cheque payment only on due date, general purpose to provide detail information about customers, account balances and regular payment with automatic up dated records.

The operating system so adopted enables us to:-

- Execute and monitor input or output operations
- Monitor the status of hardware devices
- Assign priority to the users - that is jobs award execution are scheduled according to either a predetermined or dynamic assignment plans.
- Handle control of multi-programming allowing the process of

several jobs at the same time.

- Maintain operations log, that is maintenance of details of all jobs carried out by the computer.
- Control data transmissions between terminals and the computer.
- Control data base management system
- Control assemblies, complies, utility software and subroutiness so that these are immediately available when required.
- Debug and edit new programs in conjunction with the computer and passing error messages to the users.
- Dynamically allocate the main and backing storage including virtual storage. Virtual storage operates on the principle of holding programs on disk and transferring segments (pages) of the programs into main store for execution.
- Allow many terminal users of the computer to use it as though it were at the disposal of each of them exclusively.
- Control program library.
- Implement the use of passwords
- Format new disks
- Use executive disk reading and writing operations
- Diagnose disk errors
- Execute disk command relating to the delection, copying, renaming and dumping of files.
- Spool the control of input/output paripheries in order to achieve their best utilization. For example, if printer is not available, the operating system spools the output.
- Report on the status of disks usage and bytes available.
- Use computer to receive, interpret and execute commands from the human operator that is operator communication via the con-

sole printer or video display unit (VDU).

Furthermore operating system is preferred for implementation while computerising for the following reasons:-

- **Cost** - Cost of implementing is relatively moderate.
- **Reliability** - It is capable of being used for a long time and error free.
- **Flexibility** - It is capable of amendment and further development.
- **Time of processing** - Processing time is minimal has such reduces wages payment or man-hour wastage.
- **Type of processing** - The input medium is not costly and not problematic.
- Intergration with other system is high and easy.
- Hardware required are available and long lasting.

On implementation, the CPU is stationed in the computer room which is spacious and comfortable for the installation with available electricity or stand by generator. The terminal, are install on users tables for feeding input to the system while the CPU is controlled by designated computer operator.

5.4 SYSTEM MANPOWER REQUIREMENT AND TRAINING:

The existing staff are fairly acquainted with the system; few more specialist (Programmers and system Engineers) are employed to augument the systems need.

5.5. SYSTEM TESTING:

The system is tested and found to be correct and is being used in parallel style of change over where the current line data are processed along with the old system for cross checking and the result established is satisfactory.

5.6 SYSTEM CHANGE OVER FROM MANUAL TO COMPUTERISATION:

The parallel style of change over is adopted. This allows the processing of data by new and old system con-currently with gradual phase out of old system, which provides for comparising and effecting corrections immediately for proper emergence of new system. This system of change over further provide the personnel enough training on how to implement the new system while still using the old system to avoid misplacement and delays.

5.7 SYSTEM MAINTENANCE:

The new system evolved is quite simple to implement and much more reliable with ease of maintenance. The system is users-friendly and allows easy error corrections while in use. It provides information required immediately on screen for adoption in management decision making.

5.8 SYSTEM CONTROL:

The system so adopted is prone to many problems arising from human

factors to machine errors.

The worst criticism of computer - based system is as result of in-accurae data. Data inaccuracy arises in three ways:-

i. Hardware, software or transmission line may introduce errors.

ii. The personnel who feed information to the system may have made errors. Human data entry errors are more difficult to control than machine errors and are far more numerous.

iii. The input to the system may become methodically distorted. The users may deliberately enter self - adjusted figures to perpertuate fraud.

However, for control, various checks and control are placed on data in-put, e.g. data validation and second copy of entries by different operators.

The computer equipment is also prone to many dangers ranging from physical and electric checks as well as static electricity, internal heat, vibration and other assaults.

However, with the environment in which the system is located couple with the programs built-in, rules guiding the system usage and professional technicians, the abuse is reduce to minimum.

CONCLUSION:

The prime objective for computerizing the branch is to support the branch and the bank in general to ensure competative advantage by providing optimal automated services and satisying information needs.

At inception it was proved difficult but within available financial resources of the bank. We now provide a real-time multi-user system which have a multiple work station arrangement whereby several users are hooked onto the system con-currently and processing on-line.

Being on-line in real-time, transactions are immediately reflected in the various accounts.

Branch customer accounting module holds standing and accounting data about customers. Financial transaction affecting customers have a real-time effect on the balances these are handled in form of:

- Withdrawal which can be either cash or inward clearing.
- Deposits which can be made to any account through cash and outward clearing.

Data entry control is provided via the second copy entry where each accounting transaction is entered a second time by a different person for control purpose.

Branch central accounting module has the general ledger data as its pivotal sub-system which is automatically up-dated at the end of the day from transactions affecting subsidiary ledgers. The subsidiary ledgers could further be split into sub-accounting structures call: Sub-serials. Financial transactions are made with the internal debit or credit vouchers which are entered on branch

account as the subsidiary ledger level or sub-serial level as the case may be. The above modules of banking system satisfy the automation of the branch as a separate entity from the transactions level to the balance sheet.

All transactions will be merged into one consolidated balance sheet. Currently, this is achieved via spreadsheet, various accounting and auditing reports are generated (daily, monthly, yearly or on request), interest, COT, handling charges etc. are also calculated by the system.

Users are grouped into work classes and the facilities of the system are aligned in that way to ensure separation of duties for control purposes.

The data management and control are frequently review to meet the situational changes.

Remarkebly, the branch package is easy to use, it is menu-driven with list of items provided by the computer from which the user makes a choice.

Finanlly, the hardware and software of the system work together smoothly into the branch established way of working and has capability of sustaining growth. The systems are designed to protect our investment and not to trap us in an unprofitable cul-de-sac. We can, for example add extra memory, extra devices and extra softwares as and when the need arises without having to replace the entire system.

I submit that computer is very useful tool but it cannot be an answer to every man's problem.

APPENDIX

```
RETURN

* * * * * *          OPENING MENU
* * * * * *          AUTHOR    -      N.N. MOHAMMAD
* * * * * *          DATE WRITTEN .....

SET  COLO  TO  B
PUBLIC  DATE,  TALK,  ECHO,  STATUS,  DELIMILER

SET  DATE  BRITISH

      Set  talk  off
      Set  delim  to "[  ]"
      Set  echo  off.

SET  ESCAPE  ON
SET  STATUS  off.
SET  COLO  TO  W/R+

A  =  1

Do  while  A  <  =  20
@  A, 4 SAY REPL  (CHR  (176, 74) )

A  =  A + 1
End do

SET  COLO  TO  W/B+
B  =  19
Do  while  B  >  =  2
@ B, 8  SAY REPLY  (CHR  (178, 67)  )
B  =  B  -  1
End do

SET  COLO  TO  G/N+
@  3,  11  Clear  to  18,  71
@  4,  13  TO  17, 69  Double

      Sub   1     =     "This integrated bank System was developed by"

            2     =     " N.N. Mohammad. PGD/024/93/94.

            3     =     "Computer Science 1993/94  F.U.T. Minna"
```

```
R       =       R + 2
A       =       1
B       =       17
Do while A < 50
@ R, B Say Substr. (Sub. 5, A, 1)

        A       =       A + 1
        B       =       B + 1
End do.

R       =       R + 2
A       =       1
B       =       20
Do while A < 45
@ R, B Say Substr. (Sub. 6, A, 1)

        A       =       A + 1
        B       =       B + 1
End do.

Set Colo to G/N *

?
?
?
?
?       Space (60) + Chr. (014) + Chr (196) + Chr (196) + Chr (21&
        Set Colo to G/N

AK      =       0
Set Console off
Do while AK < = 300
?
Ak      =       AK + 1
End do.

Set Console on
Do while .T.
Do Asc11
@ 2, 5 to 4, 75 Double
@ 3, 6 Say  "Current"
@ 3, 18 Say "Saving"
@ 3, 30 Say "New A/C"
@ 3, 46 Say "Updating"
@ 3, 59 Say "Print"
@ 3, 69 Say "Exit"
```

```
Set Colo to R+
@ 3, 6 Say "C"
@ 3, 18 Say "S"
@ 3, 30 Say "N"
@ 3, 46 Say "U"
@ 3, 59 Say "P"
@ 3, 65 Say "E"

Store      " "  to choice

@ 3, 95 get choice pict "I"
Read
Do case
Case Choice          =      "C"

Do Current
Case Choice          =      "S"

Do Saving
Choice               =      " "
Case Choice          =      "N"

Do new account.
Choice               =      " "
Case Choice          =      "U"

Do update cu

Choice               =      " "
Case Choice          =      "P"

Set Colo to W/B

Do p menu.

Choice               =      " "
Case Choice          =      "E"

Do Exit.

Choice               =      " "
Exit
Other wise
@ 10, 15 Say "Press any of the highlighted letters from the menu above"

Wait
End do case
End do.
```

*** * * * * ENTRY ROUTINE FOR NEW CURRENT ACCOUNT * * * * *.**

```
Set talk off.
Set echo off.
Use Master cu Index Master cu

Begin          =      0
New Act        =      .T.
Do while New Acct.

Entr           =      " "
Store Space (15) to Surname, Others
Store Space (40) to Maddress, Garant

Maccount       =      0
Store Space (10) to Mtype
Store Space (40) to Garant
Store CTOD (" / / ") to open Date

MOD LIMIT =      0
Store CTOD (" // ") to MExp Date
Set Colo to W/B+

M intEate      =      0
M Deposit      =      0
M Withdraw     =      0
M Balance      =      0
Store CTOD (" / / ") to Mdate
If. Not. E of ( )
      Go. BOTT.
End if.

MACCOUNT  =      ACCOUNT + 1
CLEA.
Do while .T.
Do New Acct.
Read
@ 23, 20
Set Colo to G/B+
Wait Space (26) + "Entry confirmed? (Y/N)" to entre
Set Colo to W/B
      if upper (Entr)      = "N"
      Loop
Else
If Upper (Entr)      =      "Y"
End if
End if
Append Blank.
```

```
Replace     S. Name          with   Surname
Replace     Other Name       with   Others
Replace     Address          with   Maddress
Replace     Acct             with   Maccount
Replace     Type             with   Mtype
Replace     Opendate         with   Open
Replace     Odlimit          with   mod Limit
Replace     Exp.Date         with   MEXpdate
Replace     IntRate          with   M Intrate
Replace     Deposit          with   M Deposit
Replace     Withdraw         with   M Withdraw
Replace     Balance          with   M balance
Replace     Date             with   Mdate
Replace     Garant           with   Garant

Begin       =     Begin + 1
Close       format
Exit.
End do
@ 23, 0 clear
Set Colo to G/B+
@ 23, 26 Say "any more entry? (Y/N)" Get newacct pick "Y"
Set Colo to W/B+
Read
End do
Clear
@ 10, 21, Say "You have opened" + STR (Begin, 3) + "New Accts".
@ 12, 20 Say "You now have a total of" + LTRIM (STR (Recount (') ) +
Acct.
@ 13, 25 Wait Space (25) + "any key to Return to menu"
Close Database
Return.
```

PROGRAM THAT CHECKS BALANCE IN CURRENT ACCOUNT

```
Store Space (1) to sure, check
N Total          =     0.00
M Balance        =     0.00
M Acct           =     0
M Withdraw       =     0.00
Use master cu    Index master cu.
Do while .T.
    Do while .T.
    Store Space (1) to sure, check
    M Account    =     0
    Go to p
    Store Space (1) to sure, check
    M Withdraw   =     0.00
    @ 15, 18 to 19, 63 Double
    @ 16, 19 Clea To 18, 62
    @ 16, 22 say "Enter account Number" Get Maccount.
    @ 18, 22 say "Enter amount" Get M Withdrawal Pict "9999999.99"

    Read
    Seek Maccount
    If found ( )

    Mbalance     =     Balance
    If M withdraw  > Mbalance
    @ 16, 19 Clear to 18, 62
    (@ 16, 22 say "The balance in Account Number" + LTRIM (STR
    (MACCT) )
    @ 17, 30 SAY "As at now is N" .
    @ 19, 45 say "Mbalance Pict " @ B 9999999.99"
    @ 18, 30 say "Do not approve"

    Else
    @ 16, 19 Clear to 18, 62
    @ 16, 22 say "Balance in Account Number" + LTRIM (STR
    (MACCT) )
    @ 18, 30 say "As at Now is N'
    @ 18, 45 say "Mbalance Pict "@ B 9999999.99"
    End if
    @ 20, 24 say "Any more account to check? (Y/N)" Get check pict.
    Read
    If upper (check)  =     "N"
    Exit
```

```
Else
If uper (check)    =     "Y"
Loop
End if
End if
Else
@ 16, 19 Clea to 18, 62
@ 17, 30 say "account does not exist"
@ 20, 24 say "Any more account to check? (Y/N)" Get check pict"

Read
if upper (Check)   =     "N"
Exit

Else
If upper (Check)   =     "Y"

      Loop
      End if
      End if
      End if
      End do.
@ 16, 22 CLEA to 18, 64
@ 17, 28 say "Are you sure? (Y/N)" Get sure pict "Y"

Read
If upper (sure)    =     "Y"
Exit

Else
If upper (Sure)    =     "N"
      Loop
      End if
      End if
      End do
      Close Database
      Return.
```

SAVING DEPOSIT PROGRAM.

```
N Deposit          =     0
Savings            =     .T.
Counter            =     0
Do while Savings
Clea
Store CTOD (" / / ") to Mdate
Store Space (20) to S.name, Mpaid by
MAcct              =     0
Mtotal             =     0
N50                =     0
N20                =     0
N10                =     0
N5                 =     0
N1                 =     0
K50                =     0
Store Space (1) to AKA
Sele 1
Use Sdtransac
Sele 2
Use master SV Index master SV
Clea
Do while .T.

MAcct              =     0
Sele               =     2
@ 12, 20 to 20, 60 Double.
@ 13, 27 say "NAB KAGORO"
@ 14, 29 say "Savings Deposit form"
@ 15, 29 to 15, 48
@ 19, 22 Clea to 19, 59
@ 18, 22 say "Enter your Account Number" Get MAcct ict "9999999.99"
Read
Seek MAcct.
If . Not. found (.)
@ 18, 22 Clea to 19, 59
Set Colo to Rt
@ 17, 26 say "You have no account with us"
Set Colo to W/B
@ 19, 29, say "Any key to continue"
Wait " "
Loop
End if
```

```
Exit
End do.
Clea
Do while .T.
Sele 2
Do test
Read
fifty   =     k50/2
@ 12, 58 say "N" + LTRIM (STR (N50 * 50) )
@ 13, 58 say "N" + LTRIM (STR (N20 * 20 ) )
@ 14, 58 say "N" + LTRIM (STR (N10 * 10 ) )
@ 15, 58 say "N" + LTRIM (STR (N5  *  5 ) )
@ 16, 58 say "N" + LTRIM (STR (N1) )
@ 17, 58 say "N"
@ 17, 59 say k50/2 pict" @ B 999.99"
M total =N50 * 50 + N20 * 20 + N10 * 10 + N5 * 5 + N1 + k50/2
Set Colo to Rt
@ 18, 52 say "N"
@ 18, 53 say Mtotal pict" @ B. 99"
Set Colo to G/B+
@ 12, 25 say "Entry confirmed? (Y/N)" Get AKA
Set Colo to W/B
Read
If Upper (AKA)    =     "N"
      Loop
      Else
      If upper (AKA     = "Y"
      Exit
      End if
      End if
      End do.

Counter     =     Counter + 1
NDeposit    =     NDeposit + Mtotal
Sele 1
Append blank
Replace Date with Mdate
Replace Account with Macct.
Replace Deposit with Mtotal
Replace paidby  with Mpaidby
Replace fifty with N50, Twenty with N20.....kobo with k50
Store Space (1) to AKA'
Sele 2
Seek Macct
Replace Deposit with Mtotal
Replace Balance with Balance + Mtotal
```

```
Replace Date with Mdate
Replace W-per-month with W-per month + 1
Set Colo to G/B+
@ 21, 0 Clea
@ 21, 25 say "Any more Entry? (Y/N)" Get Saving.
Set Colo to W/B
Read
End do.
Close Database
Clea
@ 12, 23 say "You have treated. + LTRIM (STR (Counter) ) + "Customer(s)"
@ 14, 20 say "You have received the sum of N"
@ 14, 50 say NDeposit Pict "@ B. 99"
?
@ 15, 25
Wait Space (22) + "Press any key to return to menu"
Return.
```

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