

**AUTOMATED SAVINGS ACCOUNT SYSTEM
(A CASE STUDY OF GWADA COMMUNITY BANK)
NIGER STATE**

BY

**GADO ISAAC ADAMU
REG No.: PGD/MCS/2005/06/1184**

**DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA**

JULY, 2007

TITLE PAGE

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

JULY, 2007

CERTIFICATION

This is to certify that this project work titled, **Automated Savings Account System** a case study of Gwada community Bank, carried out by Isaac Adamu Gado, is found to have fully met the requirement for the award of Postgraduate Diploma in Computer Science.

Isaiah

ALH. AUDU ISAH
Supervisor

07-09-2007

DATE

DR. N. I. AKINWANDE
Head of Department

DATE

DEDICATION

This project is dedicated to Almighty God, for his immeasurable mercy, protection, and guidance throughout my period of learning. The memory of my dear Mum, Mrs. Jezhe A Gado for her relentless encouragement to learning.

ACKNOWLEDGEMENT

I must first start by expressing my profound gratitude to God, who did not only spare my life but also gave me the opportunity and wisdom of learning.

My sincere appreciation goes to my assiduous supervisor, Alh. Audu Isah, I am highly indebted to him for his tireless effort, sacrifice of his constrained valuable time to go through my manuscript and other useful guidelines, which made it possible for me to produce this manuscript.

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I must not also forget to mention my friends and colleagues within and outside F. U. T Minna who have one way or the other contribute to my present achievements. Adaji, Umar, Ajayi, Yemi, Temitope, Isah, and the whole lot of you out there. James and EJOR you help out with the programming challenges, I appreciate you both.

Finally not left out of this acknowledgement are the Staff and management of Gwada Community Bank for their support and co-operation through my research in the company.

ABSTRACT

Introduction of computer in banking operations has greatly improved banking services delivery. There are many software's on banking operation already in existence. Most of them were developed in U.S.A and Britain and lack the necessary ingredient common to our local banking operation. This project work is an attempt to formulate a system taking into consideration the universal banking operational procedures and our peculiarity. Java is used for the design of the software with adequate checks and control put in place to minimize fraud often carried out by unscrupulous customers and staffs in some cases. Passwords are also introduced such that every transaction made can be traced to a particular employee who might have operated the computer at any work station in case of fraud or mistake. The system provides confidence in the mind of customers and makes them to receive prompt attention since no transaction experienced is expected to last more than 10 minutes in the bank.

TABLE OF CONTENTS

Title page	i
Certification sheet	ii
Dedication	iii
Acknowledgement	iv
Abstract	vi
Table of contents	vii

CHAPTER ONE

GENERAL INTRODUCTION	1
1.1 Introduction	1
1.2 Brief overview of banking operation in Nigeria	2
1.3 Brief History of Gwada Community Bank	4
1.4 Organization structure of Gwada Community Bank	5
1.5 Objectives of the project	9
1.6 Significance	9
1.7 Scope of the study	10

CHAPTER TWO

LITERATURE REVIEW	11
2.1 Introduction of savings account	11
2.2 Steps for opening a new account	11
2.2.1 Requirement for opening a savings account	13
2.2.2 Crediting the account	13

2.2.3 Debiting the account	14
2.2.4 Interest calculation	15
2.2.5 Balance ledger	16
2.3 Closing of savings account	17

CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN	20
3.1 Introduction	20
3.2 Feasibility study	20
3.3 Fact-finding techniques	21
3.4 Operation of the existing system	25
3.5 Problem with the existing system	25
3.6 Benefit of the proposed system	26

CHAPTER FOUR

SYSTEM DESIGN AND IMPLEMENTATION	27
4.1 Introduction	27
4.2 Element of Design	27
4.3 Design of files	28
4.3.1 Data modeling/normalization	29
4.3.2 Design of Input	30
4.3.3 Design of control	31
4.3.4 Design of output	32
4.4 System requirement	32

4.4.1 Hardware requirement	32
4.4.2 Software requirement	33
4.4.3 System Implementation	34
4.4.4 Training	34
4.4.5 Conversion	35
4.5 System maintenance	39
CHAPTER FIVE	
SUMMARY AND CONCLUSION	40
Presentation and discussion of results	
5.1 Summary	40
5.2 Conclusion	40
5.3 Recommendation	41
References	42
Appendix	

CHAPTER ONE

GENERAL INTRODUCTION

1.1 INTRODUCTION

Accounting as it is practice today, evolved gradually over the years, and we cannot pinpoint the time of the first accounting system. Accounting arose to satisfy people's needs for information, and its origin predates recorded history. As societies become more complex, accounting was needed for maintaining tax records, answering to wealthy land owners, providing information about caravans, trading voyages, and other early business ventures.

Until fairly recent times, more business were small and easy to keep track of, however, with the industrial revolution, the sophisticated financial information was called for. Computers have come to be the standard tools of carrying out banking oration as well as indispensable in all branches of engineering, science, and the advances aeronautics and space travel in the recent past could not have taken place without them.

This work is therefore directed towards making contribution in the banking industry by developing a data base management system, (DBMS) that will automate the services in commercial banking operations. It is a type of management information system, which generates information for decision-making and problem solving. It provides input information system for managerial decision process from transaction process. Natures of decision to

be made have well defined procedures and as such that occur regularly (daily, weekly, and monthly). Since the decision process is well defined, the set of information needed to formulate decision are very easily identified, so the system has been developed and documented in the form of reports, based on the transactional level of activities such as regular report on deposits, withdrawals and summary report on the daily, weekly, and monthly transactions.

This information will be useful to the bank officials, indicating their performances, the level of cash reserves, interest paid to the depositors and other common performance indicators known to the bankers. This information will guide the officers in taking decisions about the level of interest to charge the following week for various types of loans. It will also help them to determine whether they must raise interest rate to pay customers to attract more depositors.

1.2 BRIEF OVERVIEW OF BANKING OPERATION IN NIGERIA

The process of transacting business with bank is referred to as banking. This indicates that banking involves two parties; there are customers and bankers. Several definition were given to tank, perhaps, the most accepted definition were given by the bill of exchange 1882 by which define a bank as "including a body of persons whether incorporated or not who carry on the business of banking". It is an institution that deals with money and its substitute as well as providing other financial services. Bank accepts deposit and make loan. They derived profit from difference in the interest rate paid and charged

respectively while commercial banks create money, the Central Bank mint money.

Banking originated from the Goldsmith who issued receipt for deposit of coins and other valuables in United Kingdom, promising to repay deposit on demand. Later, these receipts were accepted in settlement of debt and in effect were utilized as "money". The two major classes of banks are:-

Commercial banks, which accept savings and cheque deposit, make loan and other investment as offering financial assistance that facilitates the exchange of funds among individuals and institutions. This bank, also act as agent for customers e.g. as trustees and executors.

The Central Bank on the other hand, acts as banker to government agent, and design of monetary and credit policies and lenders of last resort to commercial banks in case of financial crises. In addition, the services of central bank are to play the role of a guarantor of monetary system, supported by government bank insurance.

Commercial banking operation commence in Nigeria early back as 1882, there was then the First Bank and the African Banking Corporation come into existence six years later, the first banking legislation was enacted to control the establishment and mode of operation of banks.

A committee on Nigeria financial system was set up to collect information from various commissions and this later reveals that there are in existence

eighteen commercial banks in the country with a total of 456 offices. This period is known as the Free Banking Era where anybody can set up a banking institute provided he registered under the company's ordinance.

After the establishment of central bank on July 1959, there came the evolution of commercial banking through the control and legislation policy, ensuring Nigerian to own and control the commanding heights of their economy. Nigerian then took enough percentage interest in the three biggest expatriate commercial banks in the country.

1.3 BRIEF HISTORY OF GWADA COMMUNITY BANK

The idea of community banking in Nigeria was first noted in the year 1991 and a decree effecting its establishment subsequently promulgated in the year 1992 with community banking decree 46 of 1992.

Community Bank are established in Nigeria to stimulate economic development which hitherto the mainstream. Commercial Bank had not been able to effectively do at the grassroots area of the country, it was in line with this vision of economic development that Gwada Community Bank Limited Gwada also came into limelight in the year 1995 primarily to provide banking and financial services to the community in its area of operation.

Ownership Structure of Gwada Community Bank Limited Gwada

As a result of the decree establishing community bank, the ownership

structure of GCB is substantially held by the community development association in its area of its location and other ownership held basically by groups and individuals alike.

The authorized capital of the bank is prompt to about 5 million of ₦10.00k each into about 1.5 million of ₦1.00k each already paid up of this paid capital, about 30% is owned by the community development association while the balance is held by other groups and individuals.

The Board of Directors

The board of director of this bank is made up of personalities of diverse area of discipline from Agriculture, Banking and Finance. Engineering, Business and Law. The wealth and experience ranging in the personalities no doubt have a direct impact on the bank establishment and substance.

1.4 ORGANIZATIONAL STRUCTURE OF GWADA COMMUNITY BANK

l) The Manager

The bank manager is at the apex of the bank, he is responsible for decision making on every activities and transaction going on the bank. He determines who and whom to enjoy loan facilities an overdraft and to what extent among their daily increasing customers.

The manager must not be less than a degree holder and relates with his various staff through accountant who happens to be second top most staff in the bank.

ii) **The Accountant**

Accountant is the second most senior staff in the bank. He is the administrative head of the bank. He control and coordinates all the staff activities. He keeps the account of the bank as well as the account of every customer. An accountant must not be less than an ND holder with chartered institute of banking stage 1.

iii) **General Suppliers Officer**

They are in charge of bank stationeries and provide material needed by each department at appropriate time.

iv) **The banking officer**

The banking officer is an administrative head of the bank; he is in charge of administration of both the job and the staff. In some banks, he is known as personnel manager. He is in charge of management of resources. He must not be less than a degree holder in relevant field.

v) **Credit and Marketing Officer**

Marketing Officer as the name connotes, is in charge of marketing of the bank product, he sees to how to get new customers, new business, advertisement, he also plans strategy for new product. He must not be less than an ND holder in marketing.

vi) **Secretary**

This is a staff that keeps all bank important records and files. He is directly responsible to the bank manager and that is why he is specially enclosed in an officer near the manager. He gets directive from the manager. He types important documents as directed by the manager. He must have at least secondary school certificate and must be highly experienced as well as having some professional qualification

vii) **Operational Clerk**

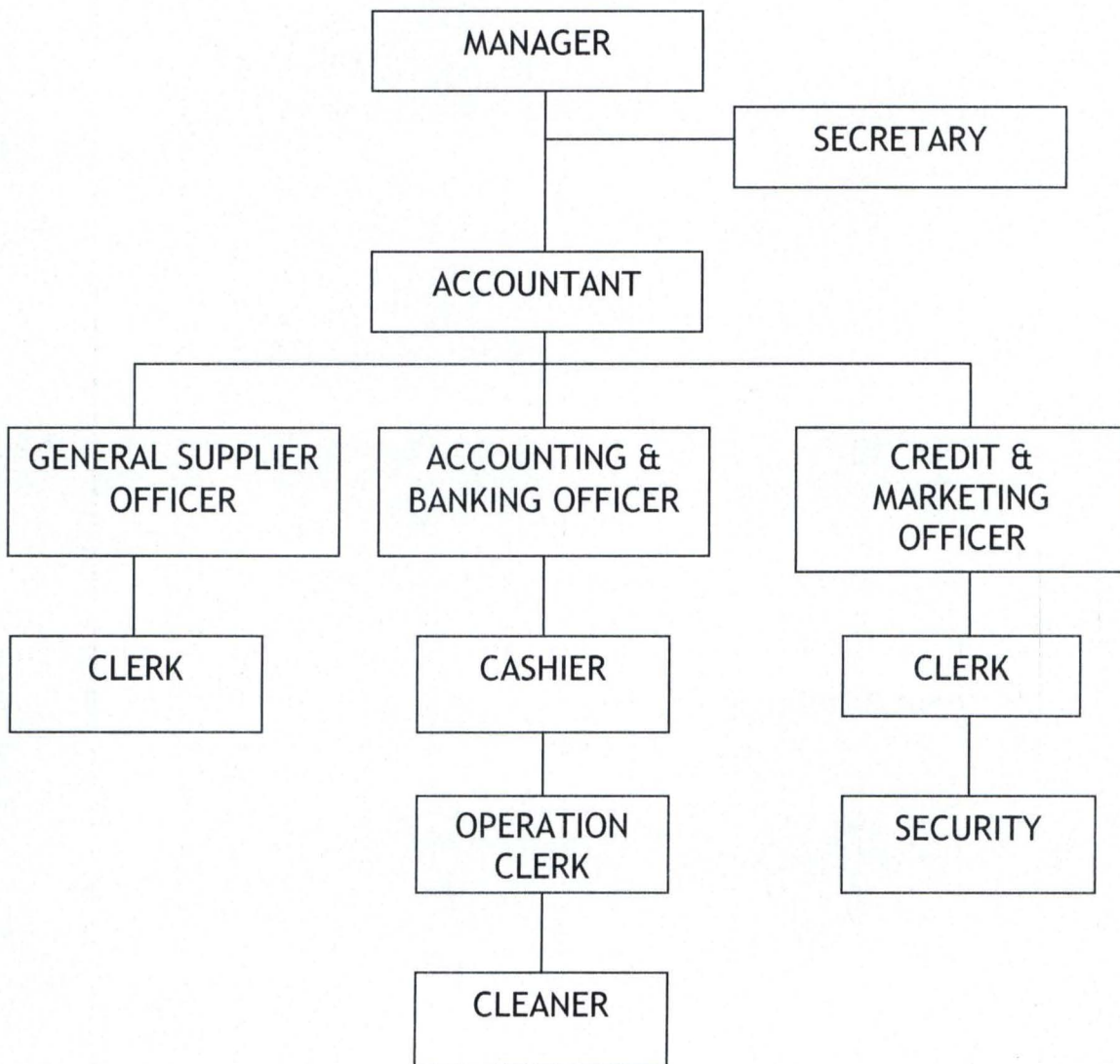
This is a staff that is responsible for routine job that is banking J transaction that has to do with general operation in bank. He is charge how money is been collected from the customer, how account is open and transferring of funds.

viii) **Cashier**

These are the staff in their various cages in the banking hall. They are responsible for collecting money from or paying money to customers depending on whether the customer intend to debit or credit his/her account. They .have direct contact with the customers and must not be less than school certificate holder. Cashier classified into paying and receiving, while the formal is responsible for paying the customer the latter is responsible for collecting money which customer wishes to deposit. In situation where there are many customers waiting other staff are recruited to attend to them.

vi) **Clerk**

They are responsible for save keeping of various files and record in the bank. They retrieve files and record whenever the need arises, they cross check balances and do any other assigned job by the supervisor. He must not be less than a secondary school certificate holder. Any of the clerks can take the position of the cashier.



THE ORGANISATIONAL CHART OF GWADA COMMUNITY BANK, GWADA

1.5 Objectives

The objectives of this study are to:-

1. Automate the banking procedures of Gwada community bank.
2. Minimize the turn around time that the customers spend at the banks.
3. Minimize the rate fraud and errors committed at the bank.
4. Attempt to provide a seamless office environment with modern information storage facilities.

1.6 SIGNIFICANCE

Since banking services demands for accurate record keeping and prompt services to customers. This therefore calls for automation of this important task to be able to meet the demand. Furthermore, monetary, financial, and economic activities of a country are centered on a banking system. In other word, it is the central focus of all economic activities both within and outside the country.

For instance, during payment of salary to workers, most banks where these services have not been automated will keep customers waiting for a very long period, just to withdraw money, In the course of this work, most banks that I visited that claim to have automated their services still have this problem. Most of their activities are still manually done which is then posted to the computer in batch at the close of the business each day.

Therefore, the aim of this work is to improve such semi-automated services, and to provide the standard banking system for those ones who are yet to be

computerized by developing computerized banking operations such that it will process input, maintain files of data (Ledger cards) about banking operations and produce information and other outputs. This is purely a transaction process system (TPS). It is aimed at assisting in carrying out day-to-day activities of the banking organization. It is therefore operation-oriented.

1.7 SCOPE OF STUDY

Gwada community bank deals with types of banking operation, which includes current, individual or personnel savings account, joint account, club/unions and society account. This project is therefore going to be limited to personal otherwise called individual savings account.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION OF SAVINGS ACCOUNT

Savings account is a form of interest bearing deposits established for customer, personalized in use and operated through the use of passbook. It is an account whose money can be collected at any time it is requested. It usually earns interest and the bank interest rate structure (IRS) is determined by the management and usually calculated monthly.

Savings account is operated on cash basis, cheque deposits are allowed and there is no borrowing; for this reason no references are necessary when opening this account.

2.2 STEPS FOR OPENING A NEW ACCOUNT

The reference clerk of the bank interview the new customer and issue out signature and index card to the customer. This is to make sure that he/she has the minimum amount i.e. ₦1, 000.00K (One Thousand Naira only) for opening the account.

The clerk collects back the documents and make sure that the customer's signature on the signature card corresponds with that on the index card. The clerk also collect two recent passports photograph from the customer and attach each to the reverse side of the two cards. The clerk passes these documents to the savings account officer who examines them before passing

them over to the accountant for permission to open the account. If the approval is granted, the clerk obtain a new passbook and a blank ledger card from the officer in- charge and complete the ledger card either by typing or manually the following particulars of the intending customer.

1. Full name
2. Address
3. Occupation
4. Signature etc.

The clerk also completes the open and close register by using the information on the signature card and the passbook and then gives a number of the account opened.

The clerk writes the new account number on the spaces provided for savings bank account number on signature/index card, and passbook. He writes the passbook number on both the ledger card as well as the signature/Index card.

The clerk then pass the passbook and index card to the cashier who in turn instruct the customer to make a payment of the initial deposits to him after filling the deposit slip form. The cashier receives the money, record same in the passbook, after which he pass the passbook, deposit form together with the index card to the ledger keeper.

Using the information on these forms, the ledger keeper confirms the records of the deposit made by the cashier in the passbook and initial the deposit form in the space provided term "ledger keeper initials". He then pass the

passbook, ledger card together with the signature/index card and deposit form to the savings account officer for authentication in the open and close account register.

The savings account officer authenticates the passport photographs attached to the reverse of the signature card by signing across the official stamp. The ledger card keeper receives back the above account after authentication.

2.2.1 Requirement for Opening a Savings Account

The requirement for opening a savings account is the same for almost all banks.

These include:-

- i. 2 recent color passport photograph of a prospective customer
- ii. Account opening form which consists of the customer's name, residential address, postal address, opening funds, occupation, position, and customer's signature.
- iii. The customer has to complete two signature/index cards, which is authenticated after the completion by the manager.

2.2.2 Crediting the Account

Crediting the account is usually referred to depositing money into the account. This can be done by the customer himself or his agent. The customer simply filled in "credit slip" and hands it over to the cashier (receiving cashier) together with the amount he/she is saving (i.e. filled in the credit slip) together with the passbook. The amount deposited is entered

in the credit column of the passbook, which will then be handed over to the customer. The "credit slip" is retained by the bank and will be used to make necessary entries in the ledger book.

2.2.3 Debiting the Account

The cashier issue out savings account withdrawal form to the customer for completion of both the amount to withdraw and the signature.

The cashier receives back the completed withdrawal form and passbook from the customer and records the amount required as per withdrawal form on the savings bank cash book.

The cashier passes the withdrawal form and passbook to the ledger keeper for processing, who then takes out signature card and the withdrawal form to ensure that the signature on the withdrawal form .agrees with the specimen signature on the signature card

The ledger keeper applies the signature-verified stamp on the withdrawal form and append signature on the space provided on the stamp. In J situation where the signature of the customer is not quite in line with the specimen on the signature card, the customer is identified by his/her photograph on the signature card while the officer append "identified by photograph" stamp and sign the Signature on the column provided on the stamp. The customer IS also asked to signature

Using information provided in the withdraw-1 form, the ledger keeper brings out the ledger card and compare the balance with the passbook, he ensure that the two are in agreement, and if there is any difference J the cause is identified.

He record the amount required as on the withdrawal form into the passbook and sign against the posting using the letter "W" for withdrawal. He also confirms that the passbook balance recorded after the withdrawal form.

He then passes on the passbook and the withdrawals from to the customer, if it is within the limit of the ledger keeper. For withdrawal beyond the limit of the ledger keeper, he pass the necessary documents to the senior officer concern i.e. the supervisors accountant or even the manager as the case may be, who has the power to make approval for payments.

2.2.4 Interest Calculation

At GWADA Community Bank, interest for savings account is usually calculated and paid by the bank on the balance held in savings account. And this based on 6.5% of the total savings that have lasted for a month. It is calculated from the 25th, of a particular month and reflected quarterly. If a customer makes withdrawal thrice in a month, the bank - will not pay such customer any interest for that month. The interest rate is made applicable as advised by the management.

Procedures for apply interest .is as follows:-

- i. Using the Ewethur 33 numerical , Accounting Machine, the officer feed the machine with' interest program as per operation manual of the machine.
- ii. He picks the balance on the account as the 30th of the month after inserting the ledger card and the proof sheet.
- iii. Touch the interest knob as per operation manual of the machine.
- iv. Run down the machine by touching other knobs as directed by the operation manual.
- v. Repeat the above procedure for every account provided withdrawal made on the account by the customer does not exceed three times from the 26th days of the previous month.

2.2.5 Balancing Ledger

It is expected that savings account ledgers be balanced every month. Twice in the month at any date, savings officer assigned letters to all clerks indicating ledger to be balanced against their names. At close of business on the balancing date clerks takes ledgers assigned to them, and carryout the following activities.

- i. Using adding machine, cast the balance on each ledger card in the ledger tray to be balanced.
- ii. On finishing the casting the; ledger card balanced in a tray comparing the grand total with the control cards. If the control cards have not been posted with the day's transaction, a reconciliation of the position is made in order to agree with the figures as follows:-

- a. Add total of all credit operation of the balancing day to the previous day's balance on the control card
- b. Subtract total debit operation on the balancing day from the grand total obtained above, the balance arrived at will now agree with what is obtained on the machine cast and write at the reverse. "Ledger" (insert number "balance" as at (Insert date) and sign. The clerks then hand over the machine cast to the savings officer or any officer assigned to supervise the balancing exercise.

2.3 CLOSING OF SAVINGS ACCOUNT

To close an individual account, the customer needs to write to the manager indicating his/her intention to close the account. The procedures for doing this are:-

Verify the signature on the letter and pass to the manager who will interview the customer before approval. The ledger keeper collects the passbook from the customer and updates the balance so as to agree with the ledger account. He then passes the passbook to the customer and directs him/her to the cashier.

The cashier issues out withdrawal form, for completion and signature of the customer. The total balance on the passbook is to be written on the withdrawal form. Cashier passes the passbook and duly completed withdrawal form to the ledger keeper for processing.

The ledger keeper brings out the signature on the withdrawal form and put "signature verified" stamp on the withdrawal form and sign on the space provided. In cases of difference between the specimen and the one on the withdrawal form, uses customer photograph on the signature card for identification and put "identified by photograph" on same, and then sign on the column provided.

He records the entry in the passbook and initial column marked on the passbook after entry.

He cancels the remaining pages in the passbook and stamp "account close" on same. He also cancels the signature card/index card using the canceling stamp and then stamps it with the account-closed stamps. He also records the passbook particulars in the open and closed account register.

The ledger keeper put the signature/index card, ledger, and passbook and withdrawal slip in the open and close register and hand over to the savings officer for his signature.

He collects back the same items above and distributes as follows:-

- i. Return the passbook and withdrawal slip to the cashier
- ii. Put aside the signature/index card and ledger sheet after the days posting

He receives the passbook from the cashier after payment has been effected to the customer, stapled the signature card and index card together and put them in the passbook.

At the end of the business each day, the ledger keeper hands over all the closed account passbooks, signature and index card to the officer in charge for vetting.

Ledger keeper collects back same for filling' in the closed account file and then raise the following entries and pass to the cashier.

CR Commission account and mark same "bash" with account closing charges, cash is to be paid to the cashier by the customer.

CHAPTER THREE

SYSTEM ANALYSIS AND DETAIL INVESTIGATION

3.1 INTRODUCTION

This chapter specifically deals with the major findings as regard the operational procedures of savings accounts in the bank.

Accounts represent a favorable establishment of relationship between the bank and the customer. It is therefore important to obtain necessary documents to open an account correctly completed by the customer.

3.2 FEASIBILITY STUDY

The aim of carrying out a feasibility: study in any system development is to find out fact about the operation of he organization as regard the officers involved, the process that takes place, the problem he faced and how the section or departments that constitute the system interact to generates various information for efficient decision making, effective operation and good relationship between the organization and their customers. During the course of feasibility study different approaches are usually employed to gather enough information necessary for the design of effective system, which will help to improve the organization services; detail of these approaches is discussed in 2.1.

Purpose of feasibility study can be listed as follows:-

1. To investigate the present system

2. To evaluate a possible application of computer method
3. To select a tentative system
4. To evaluate cost and benefit of the proposed system
5. To evaluate the impact of the proposed system on the organization and personnel.

The major objective of a feasibility study is to:-

1. Estimate the financial impact on the organization
2. Improve record keeping
3. Minimize mistakes of computation etc.

3.3 FACT FINDING TECHNIQUES

The specific methods used for collecting data requires for a certain operations are called fact finding technique. And in so doing various methods are applied among whom are:-

- Interviewing
- Questionnaire
- Record inspection (on-site review)
- Observation etc.

Usually more than one of these techniques is employed to help ensure an accurate and comprehensive investigation. Three of the various methods are employed in the course of my project.

1. Interviewing

"Interviews are used to collect information from individual or groups".

The respondents are generally current users of the existing system or potential users of the proposed system.

The respondents interviewed were the officers of Gwada Community Bank, Gwada; who are saddled with the task of overseeing the information management of the bank. These persons interviewed were the cashiers, accountant, clerk and manager of the bank.

The interview provided opportunities for gathering information from the selected personnel who have been chosen for their knowledge of the system under study.

"This method is frequently the best source qualitative information (opinions, policies, and subjective descriptions of activities and problems)".

It is very important to note that respondents and the analyst converse during an interview - the respondents are not being interrogated. The format used for the interview was unstructured since it deals with questioning; the respondents' in-turn provides correct answer to each question. The advantage is that it encourages the analyst to acquire general information about the system, and allows the respondent to *share* their findings, ideas, and beliefs. As stated earlier, it is important

to have adequate verification of data through other data collection methods.

2. **Record Review**

Records and reports can provide valuable information about any organizations and operations. In record reviews, information are examined which has been recorded about the system and the users.

Records kept by the organization may include manuals, regulations, and standard operation procedures etc used by as a guide for managers and employees. Though they may not show what activities are actually occurring, where the decision-making power lies, or how tasks are performed, however, it helped me to understand the system by familiarizing myself with what operations must be supported and with - formal relations within the organization.

Among the records reviewed are:

- History, business and ownership of Gwada Community Bank
- Background information/status report of the Bank
- Procedure manual of the Bank
- Daily, weekly and monthly reports of transactions

3. **Observation**

Observation allowed the opportunity to gain useful information, which could not be obtained by any other fact-finding techniques. Through

observation, analyst can obtain first hand information about how activities are carried out.

(a) WHAT SHOULD HAPPEN?

1. Standard operation process
2. Controls and checks for accuracy and completeness
3. Properly completed documents
4. Efficiency and timely completion of work

(b) WHAT ACTUALLY OCCURS?

1. Delay in work execution.
2. Information recalled from memory
3. Skipped steps
4. Extra photocopy needed
5. New controls needed
6. Information not in files
7. Telephone calls needed
8. Documents not completed as required
9. Employees not aware of prescribed procedures

This method was most useful when thinking on how to actually observe how documents are handled, how processes are carried out, and whether specified steps are actually followed.

Observation was made at various operations point and in some other

banking firms. Observation was made at the cash payments and receiving point (counters) to see how processes are carried out. Observation of how accounts are updated after withdrawal or deposit has been made was also carried out including that of entry of processed accounts into the computer for each date are made.

3.4 OPERATION OF THE EXISTING SYSTEM

Gwada Community Bank savings account operation is at present done manually except the ledger Analysis that is carried out via the software in house.

The various transactions that take place via savings operations include opening of account, deposit, and withdrawal procedures as well as closure of account, and interest charges.

The documents use for the above transaction are ledger card, passbook/signature card, withdrawal and deposit forms as well as open and close register. The officials in-charge of the operations are the cashier, reference clerk saving account supervisor, accountant and also manager as the case may be.

3.5 PROBLEMS WITH THE EXISTING SYSTEM

The major problem with operational systems of the bank is delay in services. One of the advantages of employing computer in process information is speed and accuracy; but since the bank still do all the operation manually, customers have to queue for long period before they are attended to.

Normally it is not expected of one to spend more than ten minutes in the banking hall for whatever transaction he/she wants to do with the bank.

Another problem encountered is when balancing the account at the end of the daily business. There may be a situation where by either over payment or under payment is made and it becomes difficult to balance the account. The usual practice is to refer to the record of payment and check each of the denominations and by so doing the error is discovered. There is no such record for reference in case of unbalanced account. What the cashier does is to scribe something at the back of the cheque, which later may not be readable.

3.6 BENEFITS OF THE PROPOSED SYSTEM

The benefit that can be derived as a result of the computerization cannot be over emphasized since the volume of work to be carried out manually would have been done automatically, saving also a lot of time with reduced computational error. Also the number of staff require for the processing operation will be reduced thereby given room for maximization of profit.

The training of staff on the use of and operation of the computer is said to be done in house, thereby minimizing cost.

CHAPTER FOUR

SYSTEM DESIGN AND IMPLEMENTATION

4.1 INTRODUCTION

The design of an information system produces the details that state how - a system will meet the requirements identified during the system study.

From the information gathered during this study about the current operations, the next issue is the identification of system requirement, which is followed by the formulation of design alternatives, that is, recommendation of strategies for designing a new system, the analysis of data collected to consider the capacity, control, complexity and information accessibility in the organization.

Information system design is necessary to specify the logical design for new system by describing features such as, inputs, output, procedures, files, and databases to meet system requirements.

4.2 ELEMENT OF DESIGN

Since system design deals with all the technical specification that may be applied in implementing a new system, which include construction of programs and program testing, it therefore means that design consist of important elements such as:-

1. **Input:** Which are made up of all things the system receives from its environment that are necessary for its operation.

2. **Output:** Which we refer to as result or information.
3. **Control (otherwise called procedure):** These unify the whole process and link the input together to produce the desired output.
4. Files are the element in the system that linked to input and output. This is because the input is processed against the file to produce an output. This is because the input is processed against the file to produce an output.

4.3 DESIGN OF FILE

The design of files includes decision about the nature and content of the file itself such as whether it is to be used for strong transaction details, historical data, or for reference purposes. In my program, 2 files are used namely: master .dbf and transaction .dbf. Master .dbf contains all the information about each customer of the bank such as he/her name, sex, contact address, and permanent home address etc and transaction file contains the daily transaction of the bank about each customer, the field include Account number of the customer, date, amount deposited, amount withdrawn etc. The dbf extension after the file name indicates that the file is an indexed one.

Among the decision taken during file design are:-

1. Which data items to include in a record of individuals.
2. Length of each data items on which the record is based.
3. Type of each data items (fields) on the file.

4. The arrangement or sequence of records within the file (i.e. The - storage structure, such as sequential, index or relative)

These two files are called the data file; also there are program files design with the objective of processing the inputted data and storing it on the appropriate data file.

4.3.1 Data Modelling / Normalization

Data models define the structure of a file and make clearer the data needs of a business. Data were segregated into files and it does integrate data structure when developing the database. Items, which are independent of one another, were separated into groups for recording in different files (Normalized). Since the two files used serve different purposes, it ensured that each file has unique identifiers, which descry the object in a record, and a relationship was established based on this key (identifiers) to link the two files together. The files structured used were drawn out and normalized, the normalized structures are as follows:-

1. Name of file: master .dbf - master file for customer record

Field	Field of file	Type	Width	Dec	Index
1.	Acct_no	c	10		y
2.	F_name	c	15		n
3.	M_name	c	15		n
4.	L_name	c	15		n

5.	Cont_add	c	30	n
6.	Hm_add	c	30	n
7.	Occupation	c	30	n
8.	Sex	c	1	n
9.	Date	d	8	n
10.	Pass_no	c	5	n
11.	Open	f	10	n
12.	Balance	f	10	n
13.	Interest	f	10	n

2. Name of file: Transaction .dbf-transaction file

Field	Field of file	Type	Width	Dec	Index
1.	Acct_no	c	10		Y
2.	Amt_w	f	10	2	N
3.	Amt_d	f	10	2	N
4.	Date	d	8		n
5.	Balance	f	10	2	n
6.	Interest	f	5	2	n

4.3.2 Design of Input

The design decision of handling input specifies how data are accepted for computer processing. For this system, data will be entered directly through

workstation by using the source documents such as saving/withdrawal form, ledger card, etc.

The system is designed to be on-line, where there is a dialogue between the users and the system. Through this interaction, users can tell the system when to perform a certain function such as whether or not to accept input, process it, produce a report, or end processing and the system too tell the user to do certain thing before it proceed with its r-: operation. For instance, after each entry were made, the system requested for confirmation on the entries before taken the next action based on the user response.

Also the display of heading, titles and menu on the screen is well considered and placement of data or source documents, which is also part of the input design, is considered as well.

Among the decision taken when considering how the input medium ~ will look like are:-

1. What data is to be inputted?
2. What medium is to be use?
3. How the data should be coded
4. The dialogue to guide the users in providing input
5. Methods of data validation and steps to follow when error occur.

4.3.3 Design of Control

Since human being is not perfect, we do make mistakes occasionally, so there is need to guide against such mistakes because it may be very costly. Some

mistakes may be minor and inconsequential; while some can be so serious that they could lead to erasure of data or improper use of the system. For example, every entry made must be confirmed before it is saved. Also password is introduced to ensure that unauthorized users do not have access to the system: since the operation is a very sensitive one. Similarly, when opening new account, the account number, which is the distinguishing factor, cannot be duplicated. Also before any record is deleted, it must be displayed for you to see and make sure it is the required record marked for deletion and will go further to allow you to confirm the deletion.

4.3.4 Design of Output

Output as we know, is refers to the results and information that are generated by the system. For many end-users, output is the main reason for developing the system and the basis on which they evaluate the usefulness of the application. This output may even serve as input to other end-users.

During design of output, the following were considered:

1. The information to present based on the input.
2. Format of presenting the information
3. Method of presentation i.e. whether to be displayed or printed

4.4 SYSTEM REQUIREMENT

4.4.1 Hardware Requirement

Hardware of a computer system refers to all mechanical electrical and electronic components along with peripherals. A computer system is made of

these; they are the visible and touchable component of a computer and its environment.

The required hardware for the effective operation and documentation of the designed systems are:-

1. An IBM processing unit of 386 and above with a memory capacity not less than 80 megabyte.
2. A keyboard terminal an input device to input data into the computer.
3. A video display adapter (VDA) or monitor.
4. A line printer preferably an EPSON brand for printing document and information.
5. A voltage stabilizer of about 240 volts capacity for voltage stabilization incase of voltage fluctuation.
6. An interrupted power supply (UPS) unit to provide alternative power supply in case of abrupt interruption due to power failure.
7. Air conditioning unit and fan to cool the system and the environment.
8. Anti-spark device to protect the system against sparks and lightening

4.4.2 Software Requirement

Software is the general term used to prescribe air the various program that are used by computer system together with their associated documentation, program on the other hand referred to a set of instruction, written in a language of computer that is used to make such as calculation, data manipulation etc Possible by a computer. In other word, we can call them a

driven force of a computer system. The software required for this system includes:-

1. Microsoft Access (ODBC)
2. Java Runtime Environment (JRE) 6.0.

4.4.3 System Implementation

Implementation includes all those activities that take place to convert from the old system to the new one. The system may be totally new; replacing an existing manual or automated system, or it may be a major modification to an existing system. In either case, proper implementation is essential to provide a reliable system to meet organization requirements. There are some steps taken during implementation; these are:-

- i. Training of personnel
- ii. Conversion routine (i.e. conversion procedure)

4.4.4 Training

Any system success or failure depends on its usage level and the users of the such system. Even most elegant technically designed systems can succeed or fail because of the way they are operated and used.

Therefore, adequate training of the personnel's saddled with the responsibility of using this system must be carted for. Those who will be associated with or affected by the system must know in detail what their roles will be, how they can use the system and what the system will or will

not do. Both the operators and users need training.

The training of system operators must ensure that they are able to handle all possible operations both routine and extra ordinary. Such training may include how to switch the equipment-on and use it, how to power it down, recognizing each components and their names, common malfunction that may occur, how to identify them and steps to take when they arise. Also aspect of trouble shooting of system must be included in the training programme and contact address of the designer (analyst) should be kept in case of unexpected.

4.4.5 Conversion

Conversion is a process of changing the old system to the new one.

There are different approaches to conversion namely:-

1. Parallel method
2. Direct cutover method
3. Pilot method
4. Phase - in method

Each method is considered in light of the opportunity that it offers and problems that it may cause. However, some situation dictates the use of one method over others, even though other methods may be more beneficial. In general, systems conversion should be accomplished as quickly as possible.

Parallel method

Parallel method of system conversion is the most recommended and secured method of converting from old system to new one. In parallel method of conversion, both the new and old system is used simultaneously. In other word they serve as a check and balance to one another. This method is the safest approach, since in case of problems such as errors in processing or inability to handle certain type of transaction arise in using this new system, the organization can fall back to the old system without loss of time, revenue or services.

This method is recommended for the proposed Banking system because of the sensitive nature of banking business.

The shortcoming of the parallel method is very significant. Firstly, it costs double, since there are two sets of system costs. In some instance, it is necessary to hit temporary personnel to assist in the operation of the new system. Secondly, the fact that users know they can fall back to old way which they are use to may be disadvantage if there is potential resistance to the change or if user prefer the old system i.e. the new system may not get fair trial. All in all, the method offers the most secure implementation plan if things goes wrong.

Direct cut - over method

The direct cutover method converts from the old system to the new one abruptly, sometimes over a weekend or even overnight. The old system is

used until a planned conversion day, when it is replaced by the new system.

The advantage of not having a fallback system can turn into a disadvantage if serious problems arise with the new system. In some instances, organizations even stop operation when problems arise so that difficulties can be corrected.

Pilot approach

When new system will bring about new technique or drastic changes in organization performance, the pilot approach is often preferred. In pilot method, a working version of the system is implemented in some part of the organization, such as a single work area or department; and the efficiency of the system in that department will determine whether or not the whole organization will be automated, this is usually observed over a period of time say a year or less than a year. When the system is deemed efficient and accurate, it is installed throughout the organization either at once (or direct cutover) or gradually phase in method.

Phase -in method

The phase- in method is usually employed when it is not possible to install a new system throughout an organization all at once. The conversion of files, training of personnel's, or arrival of equipment may force the staging of the implementation over a period of time, ranging from weeks to months.

After the systems implemented and conversion is completed, a review of the system is usually conducted to determine how well the system is working, how it has been accepted, and whether adjustments are needed. This is called post implementation review.

This review is important, since it will help to gather enough information needed to carryout the maintenance of the system. Since no system is ever complete, it will be maintained as new users or business activities, and external developments, such as new legal requirements, industrial standards, or competition.

The most fundamental concern during post implementation review is determining whether the system has met its objective, that is, knowing if the performance level of users has improved .and if the system is producing the required result. If neither is happening, one may question whether the system can be considered successful.

The system's output quality merits special attention. The concerns raised during analysis and design about the accuracy of information, the timelessness of presentation, completeness, and the appropriateness of format continue to indicate system quality. Reports that are awkward to use or that do not contain sufficient information to be useful may require redesigning, or the review may reveal that information previously thought unnecessary must be provided after all. This issue may in turn affect input requirements.

Ease of use and tendency toward errors in input are fundamental questions for the analyst to address during this review. Is the system easy to use? Are there adequate safe guards to prevent errors in input and to detect, report, and correct them if they occur? If the answer to these questions is not favorable, the reliability and quality of the entire system may be doubted.

4.5 SYSTEM MAINTENANCE

As I have mentioned earlier that post implementation is necessary so as to gather enough information that will serve as a guide in carrying out system maintenance. It shows that maintenance is necessary in the development of information systems. However, making changes and adjustments does not necessarily signal corrections of errors or the occurrence of problems, but rather to forestall system failure, which can occur in hardware or software.

Among the most frequent changes requested by end-users is the addition of information to report format. Information requirements may be revised and the result of system usage or changing operational needs. Perhaps oversights that occurred during the development process need to be corrected.

Often, there may be need to capture additional data for storage in a database or in transaction file or, perhaps it will be necessary to add error-detection features to prevent system users from inadvertently taking an unwanted action.

CHAPTER FIVE

PRESENTATION AND DISCUSSIONS OF RESULTS

5.1 Summary

Accounting as it is practice today, evolved gradually over the years, and we cannot pinpoint the time of the first accounting system. But its major objective is to satisfy people's needs for information, and its origin predates recorded history. But banking service demanded for accurate record keeping and prompt service to customer and the fact that monetary, economics and financial activities of a country is centered on banking system, this therefore call for automation of the banking operation to meet the demand. The system objective is to assist in carrying out day-to-day activities of the banking operation and it is limited to only personal savings account otherwise called the individual savings account.

5.2 CONCLUSION

The goal of developing a computerized banking operation that can operate in a Local Area Network (LAN) has been well achieved. The system is limited to savings account operations only.

The system covers from opening new account, depositing money, withdrawing money, checking balance etc to report generation.

Limitations due to financial and time contributed to limiting the work to savings account operation.

If the development of the system is sponsored, it is certain that nearly all the banking operations will be fully automated, and that has been the aim of employing computer in banking industry.

5.3 RECOMMENDATION

Having achieved the set goal of developing a database management system that automates the savings account operation, which is common in our today's banking operations, it is therefore recommended to all community banks to improve on their services.

This system has the capacity of being: used in the Local Area Network (LAN). It will save cost improve services; will build confidence in the mind of the customers.

In cases where some aspects needs modification to suit a particular form, it will be readily taken care off.

I therefore recommend that other banks other than Gwada Community Bank, because of its numerous advantages should use this system.

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Admin Name

Password

Login

Exit

Gwada Community Bank



Master



Perc



FilePanel

setup - Irno Setu...

banking

Admin Login

The Community Bank

login - Paint

Library

3:42 PM

New Account

Last Name

Middle Name

First Name

Phone Number

E Mail

Contact Address

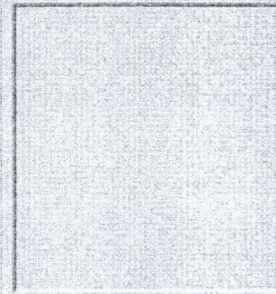
Local Govt.

State Of Origin

Sex

Age Group

Passport



Date of Birth

Account Date

Amount Deposit

New Account Number

Withdrawal

Account Name	<input type="text"/>	Passport	<input type="text"/>	
Account Number	<input type="text"/>	<input type="text"/>		
Previous Balance	<input type="text"/>			...
Withdraw Amount	<input type="text"/>			
Current Balance	<input type="text"/>			
Comment	<input type="text"/>			
<input type="button" value="Clear"/>		<input type="button" value="Withdraw"/>	<input type="button" value="Exit"/>	

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- bank images 12-06
- ccnp mat 12-06
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- SwadaComm... AW
- MacossnetCli... BG1
- MacossnetS... CramMaster Perc
- Reason Files BCC0093 PicPanel

Deposit

Account Name

Account Number

Previous Balance

Deposit Amount

Current Balance

Comment

Passport

Clear

Deposit

Exit



CrimMaster



Perc



PicPanel

Edit Account

Enter Account Number

 Last Name Middle Name First Name Phone Number E-Mail Contact Address Local Govt. Area State Of Origin Sex Date Of Birth Account Date

Deposit

Account Name

Account Number

Previous Balance ...

Deposit Amount

Current Balance

Comment

Passport



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- ccnp mat 12-06
- D:\call
- D:\swadaComm...
- D:\Mansonetcl... BGD
- D:\CramMaster
- D:\5230096
- D:\RCPanel

Bank Account

Total Bank Balance

Amount In Bank

View OK

```

/*
 * MainFrame.java
 *
 * Created on June 11, 2007, 11:23 PM
 */

package banking;

import javax.swing.*;
import java.awt.*;
import java.awt.image.*;
import java.net.*;

/**
 *
 * @author Isaac
 */
public class MainFrame extends javax.swing.JFrame {

    Image image;
    URL url;
    String imageURL="C:\\myjava\\banking\\bank images\\bankBgd.png";
    // NewAccountFrame accFrame=new NewAccountFrame();

    /** Creates new form MainFrame */
    public MainFrame() {
        // NewAccountFrame nf=new NewAccountFrame();
        //nf.setVisible(true);
        initComponents();

        try
        {
            UIManager.setLookAndFeel
("com.sun.java.swing.plaf.windows.WindowsLookAndFeel");
            SwingUtilities.updateComponentTreeUI(this);

        }
        catch (Exception ex) {}

        url = getClass().getResource(imageURL);
        image = getToolkit().getImage(url);

        Dimension dim=Toolkit.getDefaultToolkit().getScreenSize();
        setBounds((dim.width/2)-(this.getWidth()/2),
(dim.height/20)-20,this.getWidth(),this.getHeight());
        setSize(800,550);
        //setIconImage(setImageIcon(getImage(new ImageIcon
("deposit.png"))));
        this.setIconImage(new ImageIcon("bank images
\\deposit.png").getImage());

    }
    public void paintComponent(Graphics g)
    {
        g.drawImage(image, 0, 0,this.getWidth(),this.getHeight
(),this);

        repaint();
    }

    /** This method is called from within the constructor to

```

```

* initialize the form.
* WARNING: Do NOT modify this code. The content of this method
is
* always regenerated by the Form Editor.
*/
// <editor-fold defaultstate="collapsed" desc=" Generated Code
">//GEN-BEGIN: initComponents
private void initComponents() {

    jPanel1 = new javax.swing.JPanel();
    jLabel1 = new javax.swing.JLabel();
    jMenuItemBar1 = new javax.swing.JMenuBar();
    fileMenu = new javax.swing.JMenu();
    exitMenu = new javax.swing.JMenuItem();
    transMenu = new javax.swing.JMenu();
    newAccountMenu = new javax.swing.JMenuItem();
    withdrawMenu = new javax.swing.JMenuItem();
    depositMenu = new javax.swing.JMenuItem();
    editAccountMenu = new javax.swing.JMenuItem();
    deleteAccountMenu = new javax.swing.JMenuItem();
    bankFinanceInfo = new javax.swing.JMenu();
    accBalance = new javax.swing.JMenuItem();
    viewMenu = new javax.swing.JMenu();
    reportMenuItem = new javax.swing.JMenuItem();
    helpMenu = new javax.swing.JMenu();
    helpTopicsMenu = new javax.swing.JMenuItem();
    jSeparator1 = new javax.swing.JSeparator();
    aboutMenu = new javax.swing.JMenuItem();

    setDefaultCloseOperation
(javax.swing.WindowConstants.EXIT_ON_CLOSE);
    setTitle("The Community Bank");
    setFocusCycleRoot(false);
    setResizable(false);

    jPanel1.setLayout(new java.awt.BorderLayout());

    jLabel1.setIcon(new javax.swing.ImageIcon("C:\\myjava
\\banking\\dist\\bank images\\bankBgd.png"));
    jPanel1.add(jLabel1, java.awt.BorderLayout.CENTER);

    fileMenu.setText("File");

    exitMenu.setMnemonic('X');
    exitMenu.setText("Exit");
    exitMenu.setToolTipText("Exit");
    fileMenu.add(exitMenu);

    jMenuItemBar1.add(fileMenu);

    transMenu.setText("Transactions");

    newAccountMenu.setText("New Account");
    newAccountMenu.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent
evt) {
        newAccountMenuActionPerformed(evt);
    }
});
    transMenu.add(newAccountMenu);

    withdrawMenu.setText("Withdraw");

```

```

        withdrawMenu.addActionListener (new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                withdrawMenuActionPerformed(evt);
            }
        });
transMenu.add(withdrawMenu);

depositMenu.setText("Deposit");
depositMenu.addActionListener (new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                depositMenuActionPerformed(evt);
            }
        });
transMenu.add(depositMenu);

editAccountMenu.setText("Edit Account");
editAccountMenu.addActionListener (new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                editAccountMenuActionPerformed(evt);
            }
        });
transMenu.add(editAccountMenu);

deleteAccountMenu.setText("Delete Account");
deleteAccountMenu.addActionListener (new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                deleteAccountMenuActionPerformed(evt);
            }
        });
transMenu.add(deleteAccountMenu);

jMenuBar1.add(transMenu);

bankFinanceInfo.setText("Financial Info");

accBalance.setText("Account Balance");
accBalance.addActionListener (new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                accBalanceActionPerformed(evt);
            }
        });
bankFinanceInfo.add(accBalance);

jMenuBar1.add(bankFinanceInfo);

viewMenu.setText("View");

reportMenuItem.setText("View Reports");
reportMenuItem.addActionListener (new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                reportMenuItemActionPerformed(evt);
            }
        });

```

```

    }
  });
  viewMenu.add(reportMenuItem);

  jMenuBar1.add(viewMenu);

  helpMenu.setText("Help");

  helpTopicsMenu.setText("Help Topics");
  helpMenu.add(helpTopicsMenu);
  helpMenu.add(jSeparator1);

  aboutMenu.setText("About Menu");
  helpMenu.add(aboutMenu);

  jMenuBar1.add(helpMenu);

  setJMenuBar(jMenuBar1);

  javax.swing.GroupLayout layout = new javax.swing.GroupLayout
(getContentPane());
  getContentPane().setLayout(layout);
  layout.setHorizontalGroup(
    layout.createParallelGroup
(javax.swing.GroupLayout.Alignment.LEADING)
    .addComponent(jPanell,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
  );
  layout.setVerticalGroup(
    layout.createParallelGroup
(javax.swing.GroupLayout.Alignment.LEADING)
    .addComponent(jPanell,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
  );

  pack();
} // </editor-fold> // GEN-END: initComponents

private void accBalanceActionPerformed(java.awt.event.ActionEvent
evt) { // GEN-FIRST: event_accBalanceActionPerformed
  // TODO add your handling code here:
  new TotalBankAccount().setVisible(true);
} // GEN-LAST: event_accBalanceActionPerformed

private void reportMenuItemActionPerformed
(java.awt.event.ActionEvent evt) { // GEN-
FIRST: event_reportMenuItemActionPerformed
  // TODO add your handling code here:
  new ViewFrame(this, false).setVisible(true);
} // GEN-LAST: event_reportMenuItemActionPerformed

private void deleteAccountMenuActionPerformed
(java.awt.event.ActionEvent evt) { // GEN-
FIRST: event_deleteAccountMenuActionPerformed
  // TODO add your handling code here:
  new DeleteFrame(this, true).setVisible(true);
} // GEN-LAST: event_deleteAccountMenuActionPerformed

private void editAccountMenuActionPerformed
(java.awt.event.ActionEvent evt) { // GEN-
FIRST: event_editAccountMenuActionPerformed

```



```

    // TODO add your handling code here:
    new EditAccountFrame(this, true).setVisible(true);
} //GEN-LAST:event_editAccountMenuActionPerformed

private void depositMenuActionPerformed(java.awt.event.ActionEvent
evt) { //GEN-FIRST:event_depositMenuActionPerformed
    // TODO add your handling code here:
    new DepositFrame(this, true).setVisible(true);
} //GEN-LAST:event_depositMenuActionPerformed

private void withdrawMenuActionPerformed(java.awt.event.ActionEvent
evt) { //GEN-FIRST:event_withdrawMenuActionPerformed
    // TODO add your handling code here:
    new WithdrawFrame(this, true).setVisible(true);
} //GEN-LAST:event_withdrawMenuActionPerformed

private void newAccountMenuActionPerformed(java.awt.event.ActionEvent
evt) { //GEN-FIRST:event_newAccountMenuActionPerformed
    // TODO add your handling code here:
    new NewAccountFrame();
} //GEN-LAST:event_newAccountMenuActionPerformed

/**
 * @param args the command line arguments
 */
public static void main(String args[]) {
    java.awt.EventQueue.invokeLater(new Runnable() {
        public void run() {
            new Splash();
        }
    });
}

// Variables declaration - do not modify //GEN-BEGIN:variables
private javax.swing.JMenuItem aboutMenu;
private javax.swing.JMenuItem accBalance;
private javax.swing.JMenu bankFinanceInfo;
private javax.swing.JMenuItem deleteAccountMenu;
private javax.swing.JMenuItem depositMenu;
private javax.swing.JMenuItem editAccountMenu;
private javax.swing.JMenuItem exitMenu;
private javax.swing.JMenu fileMenu;
private javax.swing.JMenu helpMenu;
private javax.swing.JMenuItem helpTopicsMenu;
private javax.swing.JLabel jLabel1;
private javax.swing.JMenuBar jMenuBar1;
private javax.swing.JPanel jPanel1;
private javax.swing.JSeparator jSeparator1;
private javax.swing.JMenuItem newAccountMenu;
private javax.swing.JMenuItem reportMenuItem;
private javax.swing.JMenu transMenu;
private javax.swing.JMenu viewMenu;
private javax.swing.JMenuItem withdrawMenu;
// End of variables declaration //GEN-END:variables
}

```