MICROBANK ONLINE BANKING SYSTEM PNG

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ABSTRACT

One of the major government own financial institution in Papua New Guinea known recorgnized as the Nationwide Microbank Limited (NMB). It serves to the growth of the economy in PNG banking sectors, mainly empowering of women, grassroots, unbanking and small businesses. The use of the existing system of Microbank in Papua New Guinea serves it's valuable clients with Passbook banking. Many clients of Microbank had experience disadvantages from the use of Passbook banking activities such as checking account balance, account statements, requesting bank products on Atm cards, Cheque books and doing transactions which makes them to travel to and from doing banking activities is a lot of struggle for them in time and costs consuming. Transfering funds on customer to customer account is also consume time and cost effects. Information process of client Passbook in the banking activities is sometimes found insufficient from the client and bank staffs regarding client bank statements, less monitoring and less consistent on updating clients.

To facilitate Passbook driven liability of Microbank client from using Passbook for the banking activities is that, one of the major tools is to have a automated banking system of Microbank in PNG. The web-based Microbank Online Banking System PNG for Microbank institution in Papua New Guinea proposed by the researcher is basically to automate the Passbook banking system into computerize system to make it more effective for the Microbank customers to do banking activities. The system is build on a platform of object-oriented and unified modeling language (UML).

The main package use of this system is expected to be used by this stalkholders of Microbank PNG such as, Admin, Staffs and the Customers to view online their banking details and enable them to perform banking activities via web-browser.

Keywords: Microbank institution, Web-based Microbank Online Banking system PNG, Passbook driven liability/Passbook banking system.

1.1. Background

The advent of computers has given rise to information systems being used as a business tool on large scale. Computers and more specifically information systems are being on a large scale by almost all businesses. The application of the capabilities of Information systems and technologies brings out improvement in business processes (Davenport and Short, 1990).One of the major sectors to reap the benefits of computers and information systems is the banks.

The nature of the banking industry along with other financial industries involves information and trust. Many banks currently in this 21 century are using Computer technology and more specifically information systems into the implementation of Online Banking.

The precursor for the modern home online banking services were the distance banking services over electronic media from the early 1980s. Through the development of the internet has driven global system of interconnecting computer networks that use the internet protocol suite (TCP/IP) to link devices worldwide. Online banking has being accepted through traditional banking by the use of advanced Computer technology. Online banking is also known as internet, e-banking or virtual banking, is an electronic payment system that enables customers of a bank or other financial institution to conduct a range of financial transactions through the financial institution's website. The online banking system will typically connect to or be part of the core banking system operated by a bank and is in contrast to branch banking which was the traditional way customers accessed banking services. Therefore, security is involve within the Online banking system for the protection of customer's data in the banking processes when accessing through the financial institution's website. Similarly, the reputational risks to the bank is important and also the security of a customer's financial information is very important. Some of the common security features include the secure server technology (SSL technology), Enforcement of laws like the Data protection acts enables for more careful banking by the banks. In today's digital world, online banking makes a lot of sense. It's convenient, secure, and can actually save money in the long-run. With online banking, anyone can fill applications, register and can transfer funds between accounts instantly anywhere at any time. To make a purchase and if there isn't enough money in the cheque account. With online is simply can be access from home PC or at anywhere can easily use smartphone and quickly transfer money to cover the cost. Whether it's 3:00 a.m. or 3:00 p.m. online banking manage the accounts to customer convenience. Transfer money whether at local bank or miles

away from home. Before the online revolution, people had no choice but stand in long line and wait their turn to pay bill, deposit cheques or transfer funds from one account to another using manual teller customer service. With today's technology, it takes only seconds to complete the banking processes and monitoring the bank customers is very effective and efficient through the implementation of Computer technology and information systems. Therefore, in most developing countries are still developing in Computer technology and information systems. Papua New Guinea is one of the developing country which still growing in its economy and infrastructures. To mostly financial institutions and businesses in Papua New Guinea still need developing especially in the banking sectors that have to engage the unautomated banking system to be automated by the use of web-base technology for online banking system.

The one of the major government own financial institution in Papua New Guinea known recognized is the Nationwide Microbank Limited (NMB). In the gold rich township of Wau in Morobe Province Papua New Guinea, Nationwide Microbank, then known as Wau Microbank, began its life in April 2004. On the 29th of April 2008, the name Wau Microbank was changed to Nationwide Microbank Limited (NMB) and the Bank issue a full license to operate as Microbank under the Bank and Finance Companies Act 2000. The Microbank has now 12 branches across the country, providing innovative products and services to suit the rural and grassroots population in the country. For every new stakeholders goes to the Microbank office to apply and register in the Microbanking system. The current ongoing system of Microbank is by the use of Passbook banking system serving to its reliable stakeholders. However, there are several problems identified in Microbank financial institution system faced by the existing stakeholder's of Microbank. Passbook banking activity for the customers doing transactions and including other bank products as account balance, bank statement, request atm cards or cheque books consume lot of time and costs effect. Most stakeholders whom live far places turn to struggle their way to reach the bank for doing banking activities. Which those

stakeholders experience lot of costs and time to reach the Microbank. Although similar concept for the fund transfer from a customer to another customer account internally which brings the two parties in the bank to review their Passbook before approving and successfully transferring the funds into the accounts consist of time consuming and cost for them. Other disadvantages of Passbook banking also found insufficient information and less effective banking from the stakeholders experience such as client statements incorrect information's, less monitoring and less consistent on updating the customers about first hand information's from the Microbank banking system.

In this manner, the researcher proposed an implementation that will solve the current problems identified in Microbanking system. The development of the system will be based on transferring funds from two customers internally, check account balance, account statements, add beneficiaries and can enable them to request atm cards or cheque books by using web browser to access the web-based Microbank Online Banking System. Mainly this web-based system prioritize the existing customers whom are already being registered in the Microbank ongoing system. This banking system is for internal banking especially for the stakeholders in the Microbank system. Has for the new client into the bank will have to follow the traditional process internally with the bank to register before engaging them into the web-based banking system. There will be several panels to facilitate the developing of the banking system for this expected entities such as Admin panel, Staff panel and Customer panel in the web-based system for Microbank Online Banking System PNG. The administration gives the credentials for web-based banking system to the customer and staff that are already being registered in the Microbank. For such credentials has username and password other additional information to access their respective panels in the Microbank web-based banking system. In the Admin panel will register the bank staffs and customers into the web-based banking system. The Admin panel will be making update, delete and print out bank report stored in the system

to be submitted for the bank Management decision making. For the Staff panel will be serving the customer banking information internally in the admission for accurate data before approving the request from the customers using the bank facilities and the products. The Staff panel will be for making approval for customer request such as add beneficiaries, request atm cards or cheque books to the bank and make print out report to be submitted to the bank admission for bank management assessment and decision making in the bank system. Customer panel will only enable the customer to perform banking activities such as Add beneficiary for another customer to tranfer funds internally in to the account in the bank system, check account balance, account statement, request atm cards and cheque books to the bank. Therefore, these panels will manage the bank system to be access online from web browser to continue the ongoing banking system in the Microbank institution using from this proposed web-based banking system as Microbank Online Banking System.

1.2. Problem Identification and Formulation

The identification and formulation for Microbank is shown below on how the identified problems will be formulated into computerize system;

1.2.1. Identifying the Problem

The problems can be clearly identified as follows below:

1. Passbook banking activity for the customers doing transactions and including other bank products as account balance, bank statement, request atm cards or cheque books consume lot of time and costs effect.
2. Transfering funds on customer to customer account is also consume time and costs effect.
3. Information process of client Passbook in the banking activities is sometimes found insufficient from the client and bank staffs regarding client bank statements, less monitoring and less consistent on updating clients..

1.2.2 Problem Formulation.

According to the above stated problems, formulation of problems can be listed as:

1. How to analyze the current exsisting information system for Microbank of Papua New Guinea in each division such as from management, administration, supervision, customer services and tellers to determine the current issues being identified that will achieve them in an efficient way.
2. How to Design a web-base banking system for the solution to the problems occurs in the current banking system.
3. How to Test the web-base banking system for Microbank to ensure that it meets the requirement for banking management system with is operation work flows.
4. How to implement the web-base banking system so that it will become a ready-made system for the Microbank.
5. How to maintain the web-base banking system for the banking system that can manage to maintain with operation work flows.

1.3. Research Objectives

The research Objectives are described as follows:

1.3.1. Purpose

1. The main aim for this study is to design and develop a web-based Microbank Online Banking System for Microbank PNG. In which the researcher based this research on Microbank transfering funds and other banking activities for the valuable existing customers in Microbank banking sector. The web-base will manage the procedures under the banking system scheme for the customer banking informations in the banking operations of Microbank institution.

1.3.2. Objectives

The purpose of this study is as follows:

1. To analyze the current exsisting information system for Microbank of Papua New Guinea in each division such as the management, administrations, supervision, customer services and tellers to determine the current issues being identified that will achieve them in an efficient way.
2. To Design a web-base banking system for the solution to the problems occurs on the current banking system.
3. To Test the web-base banking system for Microbank to making sure that it meets the requirement from the management, administration, supervisor, customer services and tellers.
4. To implement the web-base banking system so that it will become a ready-made system for the Microbank.
5. To maintaine the web-base banking system so that it can sustatin as a part of the banking procedure and process for Microbank.

1.4. Research Implications

This study is expected to the following parties:

1.4.1. Practical Uses

This development of the web-based banking system will be operated by the Microbank institution to improve the Passbook banking system in a more effective and efficient way to make it easier for Microbank can manage to reach their reliable customers and better management information system for the bank management in decision making. To the extends of this online banking system can also be proposed to other financial institutions which has the similar issues as Microbank.

1.4.2 Academic Uses

1. Institutions

This research paper is openly usable and referenced journal for future students which will work on this similar projects.

2. **For Other Researchers**

The determination of this research is mostly possible for the future researchers whom wish to further their knowledge in the study of information system.

1.5 Limitations of Study

To clarify the time limit and ability of the researcher, the discussion of this study disseminate for the restrictions to the development on the web-based banking system for Microbank.

1. **Administration**

   To perform an easy access and accurate verification to make sure the customer and staffs are accepted for registration, managing staff and customer by providing better services and decisions. For the customer extends on the bank account has the limitations among required to the customer account and with the other bank processes included internal banking for only Microbank members.

2. **Staff**

To perform an easy access to record, report, approve and disapprove customer information when using the bank facilities from using banking services. The information's are process accurately and delivers to the customers. To the use of the facilities are maintained to the procedure from the bank requirements.

3. **Customer**

   To perform an easy access to view account balance, monthly statement, request atm card, request cheque book and make transaction. The customer is only required to maintain the bank amount required from the bank and only internal banking.

1.6. Research Time

The research location was set at Indonesian Computer University (UNIKOM), Bandung, West Java, Indonesia.

The schedule of the research is as follows:

THEORETICAL

2.1.Understanding Information

Information is simply a data that is (1) accurate and timely, (2) specific and organized for a purpose, (3) presented within a context that gives it meaning and relevance, and (4) can lead to an increase in understanding and decrease in uncertainty.

Information is valuable because it can affect behavior, a decision, or an outcome. For example, if a manager is told his/her company's net profit decreased in the past month, he/she may use this information as reason to cut financial spending for the next month. A piece of information is considered valueless if, after receiving it, things remain unchanged.

[1] As Machlup (1983, 642) has noted, the original meaning of the word "information" derives from the Latin, *informare*, which means "to put into form." "Informing" therefore carries the sense of "imparting learning or instruction" or more generally conveys the sense "to tell (one) of something." Thus, "information" refers to the action of informing or to that which is told. These meanings of the term are carried along with it wherever it occurs and are the basis of our commonsense notions of "information." [2] As Webster (1995, 26-7) points out, the semantic definition of information conveys that "information is meaningful, it has a subject, it is intelligence or instruction about something or someone.

2.2.Understanding System

[3] According to Information System (CS507) stated a system is a group of elements that are integrated with the common purpose of achieving an objective. Organization having common goal for the achievement are functionally interactive units. All systems have inputs, outputs, and feedback, and maintain a basic level of equilibrium. For example, in the human body the heart function to support the circulatory system, which is vital to the survival of the entire body.

2.3.Understanding Information Systems

[4] According to (MIS 2011/2012 Lecture 3) stated information system has been defined in terms of two perspectives: one relating to its function; the other relating to its structure. From a functional perspective; an information system is a technologically implemented medium for the purpose of recording, storing, and disseminating linguistic expressions as well as for the supporting of inference making. From a structural perspective; an information system consist of a collection of people, processes, data, models, technology and partly formalized language, forming a cohesive structure which serves some organizational purpose or function.

An information system can be defined technically as a set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making and control in an organization. In addition to supporting decision making, coordination and control of information systems may also help managers and workers analyze problems, visualize complex subjects and create new products.

2.4 Research Case

The main purpose of this reseach is for the development of Microbank banking system in Papua New Guinea. The following will be further explaination for the research case;

2.4.1 Microbanking system

A Microbanking system is banking system that process the customer banking information and processes then does manage the flow of the banking operation system. A basic banking system consist of 3 sections as follows;

1. **Admin**

   This section manage the registration for staffs and customer into the banking system. It process the banking information delivered from the bank top management to operate the banking system with it's bank staffs serving and facilitating their valuable customer.

2. **Staff**

   This section manage the customer information when the customer performs the banking activities such as enquiries, request for beneficiary, request atm card, request cheque book, monthly statement, check account balance.

3. **Customer**

   The is section is for the bank customer newly to be registered in the banking system such as opening of bank account, receiving atm card and cheque book, deposit and does transaction.

2.4.1.1 Staff

Staff is the main operation body for the admin to serve the bank customers and attend to any enquiries and requests from the customer. The staff follows the information format given from the administration and work accordingly to the banking information system. Is work is to receive the customers information and process internally in the bank to check before doing approve to the correct information from the customer. The staff mainly checks the beneficiary before approval, Issuing atm card and cheque book, and process further enquiries and requests from the convenient to the customer.

2.4.1.2 Customer

The customer is the person that invest and involves into the bank to use the rent the bank facilities and save it's finance in the bank. Where else, the customer adds its beneficiary, request atm card and cheque book, check monthly statement, check account balance and does transaction. If theirs convenient to the customer, mostly it is likely for the customer does contacts the bank staff for the further information and services to the bank.

OBJECT AND METHOD

3.1. Research Object

The object of the research is purposely for Microbank in Central province of Papua New Guinea. The research is mainly based on the focuses of implementing the Online Banking System into the Microbanking exsisting system in which the Microbank members can use the system Online via the use of internet has the primary requirement for them to fill in applications, register, make payments and request loans. Thus, the Online system for the Microbank can Monitor the performance of the members in payment and the co-maker in the Microbanking system Online. Therefore. This research is processed and taken place at the Computer University Indonesia (UNIKOM), West Java province, Bandung.

3.1.1. History of the Company

In the gold rich township of Wau in Morobe Province Papua New Guinea, Nationwide Microbank, then known as Wau Microbank, began its life in April 2004, when the Bank of PNG gave a Certificate of Exemption to operate as a Microbank institution in accordance with the Microbank Pilot Scheme Project Proposal submitted to the Bank in August 2003. This was the beginning of an extraordinary growth of microfinance activities in Papua New Guinea.

On the 29th of April 2008, the name Wau Microbank was changed to Nationwide Microbank Limited (NMB), and the Bank issued a full banking licensed to operate as a Microbank under the Banks and Finance Companies Act 2000. Moving it's head office from Lae, Morobe Province to the PNG Institute of Banking and Business Management (IBBM) in Port Moresby, the Microbank has now 12 branches across the country, providing innovative products and services to suit the rural and grassroots population in the country.

NMB's vision is 'to be the most innovative Microbank in PNG and the Pacific region' and 'to enable access to banking services for the unbanked and small buisnesses'.

Over the last 10 years, the Bank has licensed 5 Microfinance institutions in the country, three of which licensed in the last three years as a result of the Government's vision to promote wealth creation in the rural communities where more than 85% percent of our population live with a view to reducing poverty and achieving inclusive economic growth in the long run.

3.1.2. Organizational Structure of Microbank

Below is the Organizational Structure of Microbank hierarchy within the organization.

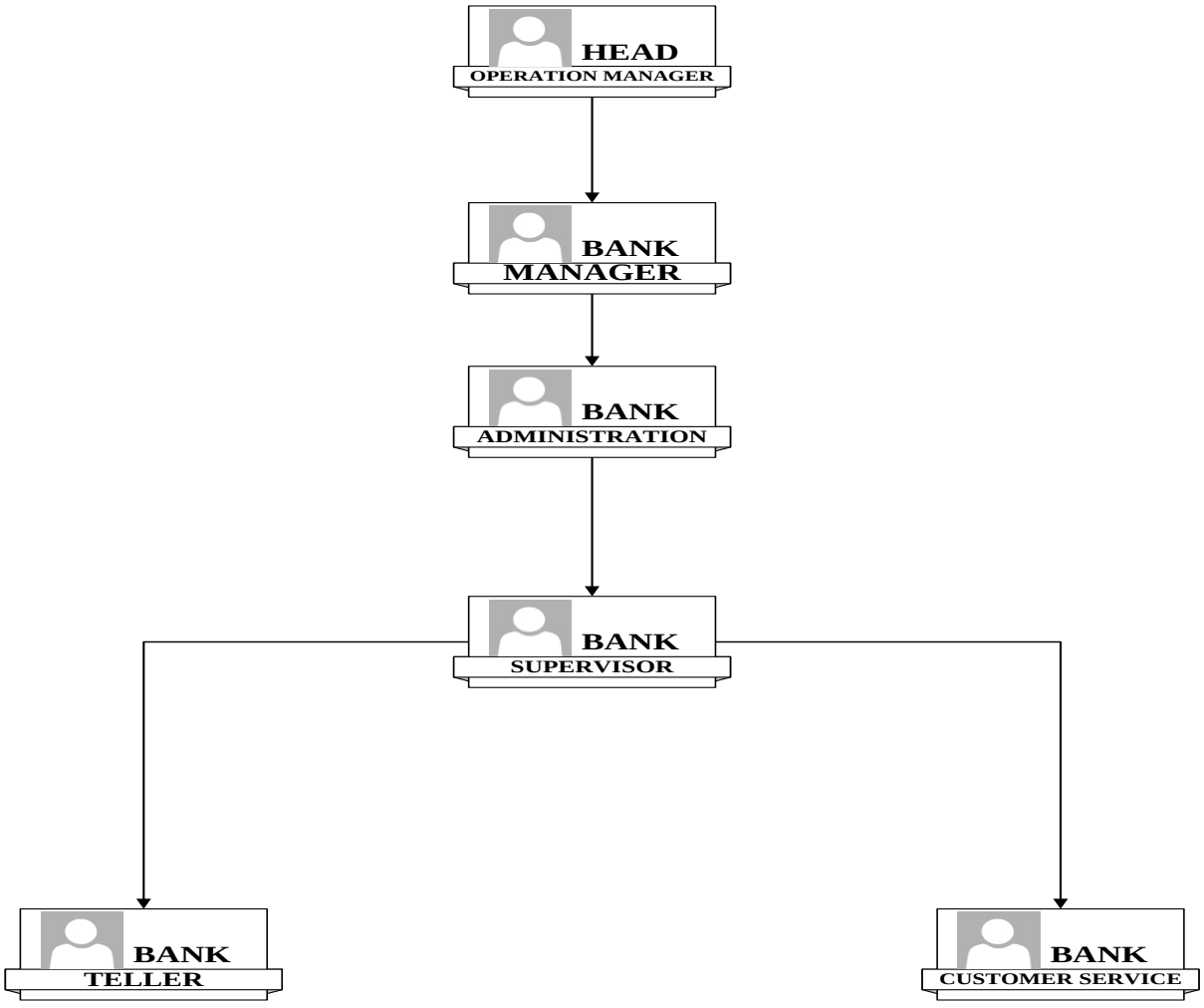


Figure 3.1 Organizational Structure of Microbank

3.2 Research Method

The Research Methods preparation of this research, Descriptive Qualitative Approach was used to collect data, analyze and explained about the observation of this field.

3.2.1 Research Design

The definition of research design is a detail outline an investigation will take place. A research design will typically include how data is to be collected, what instruments will be employed, how the instruments will be used and the intended means for analysis data collected.

According to Robert Glass describes, "great software designers as having a large set of standard patterns that they carry around with them and apply to their designs". This is what design experience all about. Doing design over and over again learning from experience. Butler Lampson says, "Most of the time, a new program is a refinement, extension, generalization or improvement of an existing program.

3.2.2. Types and Data Collection Methods

Types and data collections are as follows;

3.2.2.1. Collecting Primary Data

Primary data is unknown data which the researcher have conduct an investigation on particular areas. Through the investigation of the researcher identifies the unknown data from gathering information from different sources. For this research, these two methods of collecting primary data consider into consideration.

1. **The Observation Method**

The researcher observes and collect in-depth information about particular behaviour related to the expected subject research. This has being varified through obeserving and examining the problems that have being unidentified by Microbank.

2. The Interview Method

The researcher as use this interview method to collect the expected data through direct conversation with the representative of the researched area. According to McNamara, 1999. Interview are particularly useful for getting the story behind a participant's experiences. The researcher proceed direct phone calls and does conversation on call to the representative staff to Microbank and collected the expected data and informations.

3.2.2.2. Collecting Secondary Data

Secondary data is collect from data source which have being existing. To this research, the researcher collected data from the previous research, web-based informations and historical data about Microbank.

3.2.3 Method and System Development Approach

In this section, it explains about system approach, the development of systems, method analysis and design analysis tools. Following is the description of the approach and system development.

3.2.3.1. System Approach Method

The method researcher used in the system approach is the Object Oriented System Approach and is visualize with UML (Unified Modeling Language) diagrams as follows: Use Case Diagram, Activity Diagram, Sequesnce Diagrams, Class Diagrams Collaboration Diagrams, Component Diagrams and Development Diagrams.

Jia-Chin Lin (University of Missouri, St. Louis 2011), states "The object oriented approach looks at a system from a bottom-up view. It combines data and processes (methods) into objects. Within an information system, objects could be customers, suppliers, contracts, and rental agreements. A set of diagrams or models is used to represent various views and functionality of the system and is commonly known as Unified Modeling Language (UML).

The object-oriented approach later becomes known as the unified process when these models are used along with a particular method of systems development. Unified process is an iterative and incremental approach to systems development. The goal of object-oriented analysis and design is to improve system quality and productivity of systems analysis and design by making it more usable. Objects are grouped into classes to share structural and behavioral characteristics. Object-oriented analysis and design also incorporates the use of inheritance; it allows the creation of new classes that share the characteristics of existing classes. Similar to the agile methodologies, the object-oriented approach to systems development is similar in the way of iterative development approach. In the analysis phase, object-oriented models are used to fill the gap between a problem and the solution. The aim, in essence, is to transform the use cases into analysis model to realize the associated goals".

3.2.3.2. Systems Development Method

The system development method used in the research is the Prototype Model. The software prototyping referes to build software application prototype which displays the functionality of the product under development but may not actually hold the exact logic of the original software. Software prototyping is becoming very popular as a software development model, as it enables to understand the customer requirements at an early stage of development. It helps gets valuable feebacks from the customer and helps software designers and developers understand about what is expected from the development.

According to Sona Malhotra (International Journal of Advance in Information Technology), "Instead of freezing the requirements before a design or coding can proceed, a thow away prototype is built to understand the requirements. This prototyping is an attractive idea for complicated and large systems for which there is no manual process or existing system to help determining the requirements. A prototype is a toy implementation of a system; usually exhibiting limited functional capabilities, low reliablity and inefficient perfomance. "

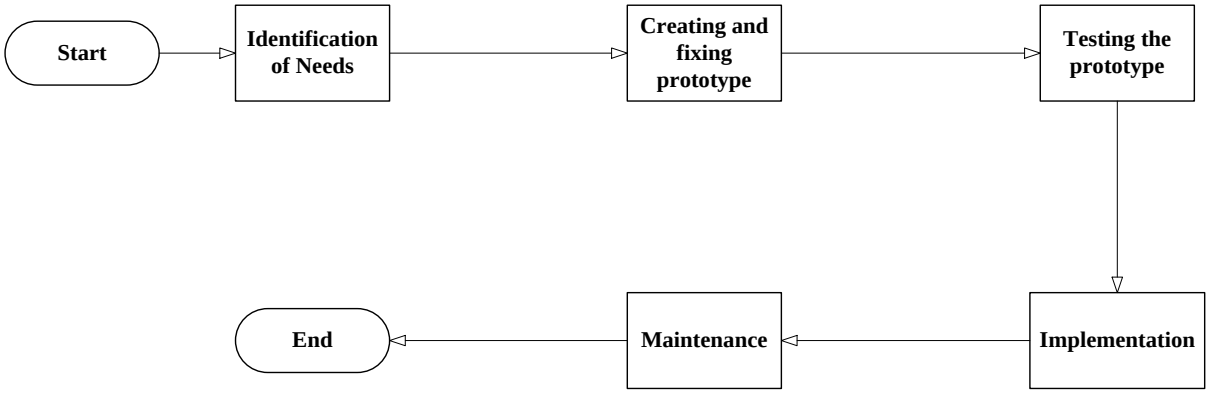


Figure 3.2 Prototype (Source: Seema, Sona Malhotra "International Journal of Advance in Information Technology")

The following is the stepwise approach taken to design Mibrobank Online banking systems software prototype.

1. **Basic Requirements Identified:** This step involves understanding the very basic system requirements of Microbank banking system especially in the terms of user interface. The more intricate details of the internal design and external aspects like performance and security were neglected in this stage.
2. **Developing the initial Prototype:** The initial Prototype of Microbank banking system was developed in this stage, where provided. These features may not exactly work in the same manner internally in actual software developed and the work arounds we used to give the same look and feel to the customer in the prototype developed.
3. **Review of the Prototype:** The prototype of the Microbank System developed was presented to the customer and the other important stakeholders in the research. The

feedback were collected in a organized manner and used for further enhancements in the system development.

4. **Revise and Enhance the Prototype :** The feeback and the review comments were discussed during this stage. The changes accepted were again incorporate in the new Prototyping developed and the cycle repeats until customer expectations were met.

3.2.3.3. Analysis and Design Tool

With a systems approach that is object-oriented, the researcher used a modeling language called the Unified Modeling Language (UML). According to IBM (ibm.com website), UML is a visual language for specifying, constructing, and documenting the artifacts of systems. Therefore, the developing system is visualize by the following UML diagrams:

3.2.4. Testing Software

There is a lot of testing techniques that can be used to test a software, including: Block Box Testing and White Box Testing. As for software testing that is done on this project is the Black Box Testing. According to Vangie Beal (webopedia.com), "Also known as funtional testing. A software testing technique whereby the internal workings of the item begin tested are not known by the tester. For example, in a black box test on a software design the tester only knows the inputs and what expected outcomes should be and not how the program arrives at those outputs. The tester does not ever examine the programming code and does not need any further knowledge of program other than it's specifications."

RESULT AND DISCUSSIONS

4.1 System Design

The system to be develop in this study will be the web-based online banking system for Microbank in Papua New Guinea. The system will assist the ongoing banking operation including the bank management, administration and the bank staffs working on this system of serving the customers banking processes. In the following section, the system design of the proposed system will be outlined.

4.1.1 System Design Objectives

1. The web-base banking information system of Microbank aims to assist the customers and staff to carry out the banking procedures, such as for registering customer and staffs, customer monthly statements, customer account balance check, customer request atm card, customer request cheque book and customer does transaction. Thus for staff does approval for customer requests for atm card and cheque book.

2. The web-base banking information system of Microbank enables the registered customers and staff process the bank procedures. The customer can have access at any time to the account to check monthly statement, account balance, request atm card, request cheque book and do transaction. The staff receives request from customer and can easily check through the banking system requirements and response approval to the customer requests.

3. The web-base banking system of Microbank can process information without the customer physically appearing at the bank. The staff only receives the information's and does record and report the information with the administration and does processes the customer requests. The customer can communicate with the bank staff to their use of the bank products and services.

4.1.2 Propose System Overview

The proposed web-based banking information system of Microbank will contain the client-server concept, where the application will be installed and run on PHP and MYSQL servers and can be access by the user or client through a web browser, via internet or intranet connection.

4.4 Testing

After implementation of the system, tests were carried out check the functionality of the system. In this study, the black box testing method was used to carry out testing.

4.4.1 Testing plan

Following are the results from the testing of the Microbank banking system.

Table 4.8 Testing Plan Admin Page

No	Component tested	Submenu	Scenario Item	Testing Result
1.	Display admin user		Display admin user login	BlackBox
2.	Admin account menu	Staff	Display Add Staff Edit Staff Delete Staff	BlackBox BlackBox BlackBox
		Customer	Display Add Customer	BlackBox
			Edit Customer	BlackBox
			Delete Customer	BlackBox

Table 4.9 Testing Plan Staff page.

No	Component tested	Submenu	Scenario Item	Testing Result
1.	Display staff user		Display staff user login	BlackBox
2.	staff account menu	Beneficiary Requests	Display Beneficiary Requests	BlackBox
		Atm approval Requests	Display Atm approval Requests	BlackBox
		Cheque book approval Requests	Display Cheque book approval requests	BlackBox

Table 4.10 Testing Plan Customer page.

No	Component tested	Submenu	Scenario Item	Testing Result
1.	Display customer user.		Display customer user login.	BlackBox
2.	Customer account menu.	Account Balance.	Display Account Balance.	BlackBox

		Monthly Statement.	Display Monthly Statement.	BlackBox
		Account Statement.	Display Account Statement.	BlackBox
		Add Beneficiary.	Display Add Beneficiary.	BlackBox
		View Add Beneficiary.	Display view add beneficiary.	BlackBox
		Transfer Funds.	Display Transfer funds.	BlackBox
		Issue Atm card/Cheque Book.	Display Issue Atm .card/Cheque book.	BlackBox

4.5 Cases and Test Results

Based on the testing method above, the following is a case to test the proposed system.

Table 4.11 Cases and Test Results Admin account.

No.	**Menu**	**Test Case**	**Scenario Test Item**	**Expected Result**	**Testing Result**
1	Admin login.	Display user login.	Selecting login form to login	Enter Admin login address display admin login.	Accepted [√] Denied

					[ ]
2	Add Staff.	Display Add staff.	Selecting Add staff register staff	Click on Add staff menu Display staff form.	Accepted [√] Denied [ ]
3	Edit Staff.	Display edit staff.	Selecting Edit staff to edit staff information.	Click on Edit staff menu display staff.	Accepted [√] Denied [ ]
4	Delete Staff.	Display delete staff.	Selecting delete staff to delete staff information.	Click on delete menu display staff.	Accepted [√] Denied [ ]
5	Add Customer.	Display Add Customer.	Selecting Add Customer.	Click on Add Customer menu display customer.	Accepted [√] Denied [ ]
6	Edit Customer.	Display Edit Customer.	Selecting Edit Customer.	Click on Edit Customer menu display customer edit information.	Accepted [√] Denied [ ]
7	Delete Customer.	Display Delete Customer.	Selecting Delete Customer.	Click on Delete Customer menu display customer information to be delete.	Accepted [√] Denied [ ]

Table 4.12 Cases and Test Result Staff account

No.	**Menu**	**Test Case**	**Scenario Test Item**	**Expected Result**	**Testing Result**
1	Staff login.	Display user login.	Selecting login form to login.	Enter staff login address display staff login.	Accepted [√] Denied [ ]

2	Beneficiary Requests.	Display Beneficiary Requests information.	Selecting Beneficiary Requests to approve.	Click on Beneficiary Requests menu Display Beneficiary Requests.	Accepted [√] Denied [ ]
3	Atm Approval Requets.	Display Atm Approval Requests.	Selecting Atm Approval Requests to approve request.	Click on Atm Approval Requests menu display Atm card request information.	Accepted [√] Denied [ ]
4	Cheque Book Approval Requests.	Display cheque book approval requests.	Selecting Cheque book Approval Requests to approve request.	Click on Cheque book Approvals Requests menu display Cheques book request information.	Accepted [√] Denied [ ]

Table 4.13 Cases and Test Result Customer account.

No.	**Menu**	**Test Case**	**Scenario Test Item**	**Expected Result**	**Testing Result**
1	Customer login.	Display user login.	Selecting login form to login.	Click on menu display Customer login.	Accepted [√] Denied [ ]
2	Account Balance.	Display Account Balance.	Selecting Account Balance to view account balance.	Click on Account Balance menu Display Account Balance information.	Accepted [√] Denied [ ]

3	Monthly Statement.	Display Monthly Statement.	Selecting Monthly Statement to view account information.	Click on Monthly statement menu display monthly statement information.	Accepted [√] Denied [ ]
4	Account Statement.	Display Account Statement.	Selecting Account Statement to insert date to check view account statement.	Click on Account Statement menu display Account Statement information.	Accepted [√] Denied [ ]
5	Add Beneficiary.	Display Add beneficiary information.	Selecting Add Beneficiary to add information for transaction	Click on Add Beneficiary menu display Add Beneficiary information form.	Accepted [√] Denied [ ]
6	View added Beneficiary.	Display View Added Beneficiary	Selecting View Added Beneficiary to view beneficiary added.	Click on View added Beneficiary menu display added beneficiary information	Accepted [√] Denied [ ]
7	Transfer Funds.	Display Transfer Funds	Selecting Transfer Funds for transaction	Click on Transfer Funds menu display Transfer Funds information.	Accepted [√] Denied [ ]
8	Issue Atm card/Cheque book.	Display Issue Atm Card/Cheque book request form information.	Select Issue Atm card/Cheque book to request	Click on Issue Atm card/Cheque book menu display Atm card/Cheque	Accepted [√] Denied [ ]

				book information.	

4.5.1 Conclusion Results of Testing

From the results gathered from the testing of the above cases, it can be concluded that the system is functioning well and thus is free from errors.

CONCLUSSIONS AND SUGGESTIONS

5.1 Conclusion

The conclusion of this research titled “Microbank online banking system" is as follows;

1. The web-based application can manage the customer banking activities for doing transactions and including other bank products such as checking account balance, account statement, request atm cards and cheque books which is more easier at anywhere or at anytime to access the bank system.
2. This web-based banking application can manage to transfer funds effectively from a customer account to another customer account with in the bank system. From just easily accessing the bank system via web-browser and transfering funds into the bank account.
3. This application keeps the record of the customer banking automated information. The customer will always be up to date by checking the account status by this web-based application. Informations for the customer banking activities will be updated by the bank admin and staffs to keep the customer updated and monitored. That manage the banking information effective and updated.

3.2 Suggestion

This Microbank Online Banking System will have more improvement into it. Thus, it is reviewable and can be re-developed more by contributing innovations to increase its features and functions to the existing software program. This are some suggestions of the features and functions that can be added on to this application.

1. Online application form for both customer and people whom are interested to be employed in the bank can apply online.

2. To join with other third party banks for external transfer from the main bank to the third bank for the customer interest by different perspective of accounts in the banks.

3. To have mobile application for the customers to use from their smart phones and tablets. The mobile application will be downloaded from the playstore by the customer.

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