

ZB Financial Holdings Virtual Banking and Loan Application Systems



Douglas Mlambo

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By

Douglas Mlambo



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Supervisor: Mr M. Zhou

ABSTRACT

ZB Financial Holdings Virtual Banking and Loan Application system is a system that enables customers to log into the system and be able to carry out all the transactions such as having the access to view their account balances, view all latest transactions and be able to download bank statements in portable document format.

Data was gathered by the use of interviews, questionnaires and observations and this brought out the expectations of the customers and the employees as well as their grievances towards the manual system. The fact finding techniques helped the researcher to note that the customers wanted a system that can enable them to carry out transactions from their geographical locations and be able to track their requests removing the entire bore some procedures. The researcher also was able to note that the company employees wanted a system that reduces too much paperwork from the old system and saves time.

Upon the completion of the system, it was deployed to the end users together with the user manuals since the customers have showed the highest levels of appreciation towards the use of the new system. The researcher gained a lot of experience that can be used in the future when researching other projects. Therefore, the he or she can be able to overcome all the hindering factors that can be faced when proposing the projects in the future up to its completion since the implementation of the Virtual banking and Loan Application System for the ZB Bank left the researcher with highest levels of project management knowledge and skills.

DECLARATION

I **Douglas Mlambo** hereby declare that I am the sole author of this dissertation. I therefore authorize the **Midlands State University** to lend this dissertation to other institutions or individuals who wish to make use of the dissertation for scholarly research purposes.

Signature _____ Date _____

APPROVAL

This dissertation entitles **ZB Financial Holdings Virtual Banking and Loan Application System** by **Douglas Mlambo** meets the regulations governing the award of the degree of Information Systems of the Midlands State University, and is approved for its contribution to knowledge and literary presentation

Supervisor _____

Date _____

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I would like to thank the ZB Financial Holdings Company for granting me the permission to carry out the research study basing on the company. The ZB Bank granted me permission of using copyrighted pictures and logos that were needed to be included in the dissertation study. I really express my sincere gratitude to the company for they facilitated the completion of the dissertation.

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DEDICATION

This research is dedicated to my young brothers Darlington and Joseph Mlambo and to my parents Mr&MrsMlambo their solid support was magnificent. I Love you all.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

The introduction stage is the one which gives a detailed overview of the project topic Virtual Banking and Loan application System for ZB Financial Holdings. In this stage of the project the background of the organization is described. The nature of the problem is then identified and how the proposed system is going to address the problems within the organization. Within the introduction stage the system objectives are formulated giving a detailed view of how the proposed system is going to be a solution to the problems that are already existing as hindering factors at the company. Data gathering methodologies as well as the software tools needed for the successful implementation of the proposed system are highlighted. This chapter will also include the justification of the system to be implemented and all the estimated project duration and costs are put into consideration to enable the development of an effective system that can be a solution to the company.

1.2 Background of study

Virtual banking can also be known by the term cyber banking which includes all the banking activities that are conducted virtually thus, from roads, at homes or from the external environments. There are two models of virtual banking and loan application systems. The first one is the replacement of all existing services within the bank by the use of internet and telephone and the other one involves the offering of new services that were once been not able to be offered in the virtual form. Virtual banking started with the use Automated Teller machines in the 1970s where the move changed the banking sector by increasing efficiency and effectiveness. Agarwal (2006) argues that the banking industry has been operating effectively in the nineties but nowadays a banking sector without the implementation of the virtual banks are considered to be short of client satisfaction. This is because the implementation of the system is faster, accurate, and convenient and it makes the company to be referred to as the one that will be operating on the same pace with technological advancement within the banking sector. Therefore, it is obvious that implementation of the proposed system will increase efficiency and effectiveness since customer satisfaction which is at core of organizational success will be met by the implementation of the system where by all levels of customer sovereignty are attained.

According to Schatt (2014) technological advancement is transforming the banking industry and all the digital payments are considered to be a key within the banking sector to a greater extent. He further argued that customers are increasingly abandoning all the traditional banks to the other institutions that offer lower costs and more customer satisfaction. Thus, the implementation of the Virtual Banking and Loan application system is of greater importance to the ZB Financial Holdings since old banking systems are sailing on a track of extinction in the near future. Banks that operate using the Virtual systems have all the access to the information they need to be competitive within the environment and this can give them a room to thrive. Therefore, the implementation of the proposed system to the company will enable the company to be more competitive and effective than any of its rivals within the environment.

The use of the Virtual Banking and Loan application system detonate a situation where by customers can have access to the banking services without direct visit to the bank. This can reduce the problems of long queues and the congestion of network. The implementation of the proposed system to the company is without regrets this is because the system to be implemented has products or outputs which are of greater importance to the company since they can maximize efficiency and these are SMS banking, internet banking, Email banking, phone banking, kiosk banking and all these can lead to customer satisfaction. At ZB Financial Holdings there is the use of the Automated Teller Machines which easily are subjected to too long queues which can inconvenience the customers leading to low customer satisfaction. Thus, the implementation of the Virtual Banking and Loan Application System can be a solution to all the problems that are acting as stumbling blocks to the smooth flow of all the activities.

1.2.1 Background of the organization

ZB Financial Holdings Limited was first established in Zimbabwe in the month of May 1989 and it was operating as holding company for many companies in the country. The company was a holding organization for all the companies that were providing both commercial and merchant activities since 1951. In 1951 it was then the first operations of the company subsidiaries commenced. In the year of 1961 the company established nine branches which were operating countrywide. In the same year on the month of August the company was sold to the Netherlands Bank which was from Rhodesia Limited then it maintained steady operations which were

obtained through the purchase of related companies and also by increasing its scale of operations or growth.

The company then changed its name to The Netherlands Bank of Rhodesia and then started using Rhodesia Banking Corporation in 1972. Thereafter it changed again to Rhobank in the year 1979. After operating for two years its name was changed to Zimbabwe Banking Corporation that was after the government had purchased the majority of its shares in 1981. In 1989, the company directors undertook an exercise of restructuring with a goal of bringing the subsidiaries and some associates to be under one investment and holding company which was called Zimbabwe Financial Holdings Limited. This restructuring allowed the Bank to exclusively concentrate on offering services such as commercial banking to the people in the country. This new holding company was put in place to ideally explore other profitable activities which were previously not possible because of the stumbling blocks which were placed within the investment activities which was adhered to the terms of the Banking Act.

This acquisition of many subsidiaries over the years made it possible for the group to be able to offer a variety of services such as commercial banking, hire purchase, leasing, merchant banking and trust. On the 30th of October the Group managed to adopt the use of monolithic brand names which were new that was when it officially or formally changed its name and started using ZB Financial Holdings Limited. This change was meant to start the merge process with former Intermarket Holdings such as Intermarket Reinsurance, Intermarket Bank and some other banks which had since adopted the use of the ZB brand name on their operations. Thus the ZB Bank is one of the first diversified service counters in the country Zimbabwe.

1.2.2 Organization structure

Borrington (2013) defined an organizational structure as chart that shows authority and responsibility. He further argued that each and every organization that is operating in the business environment must have an organizational structure for it to operate successfully, efficiently and smoothly. The organizational structure of the ZB Financial Holdings is shown on the following figure.

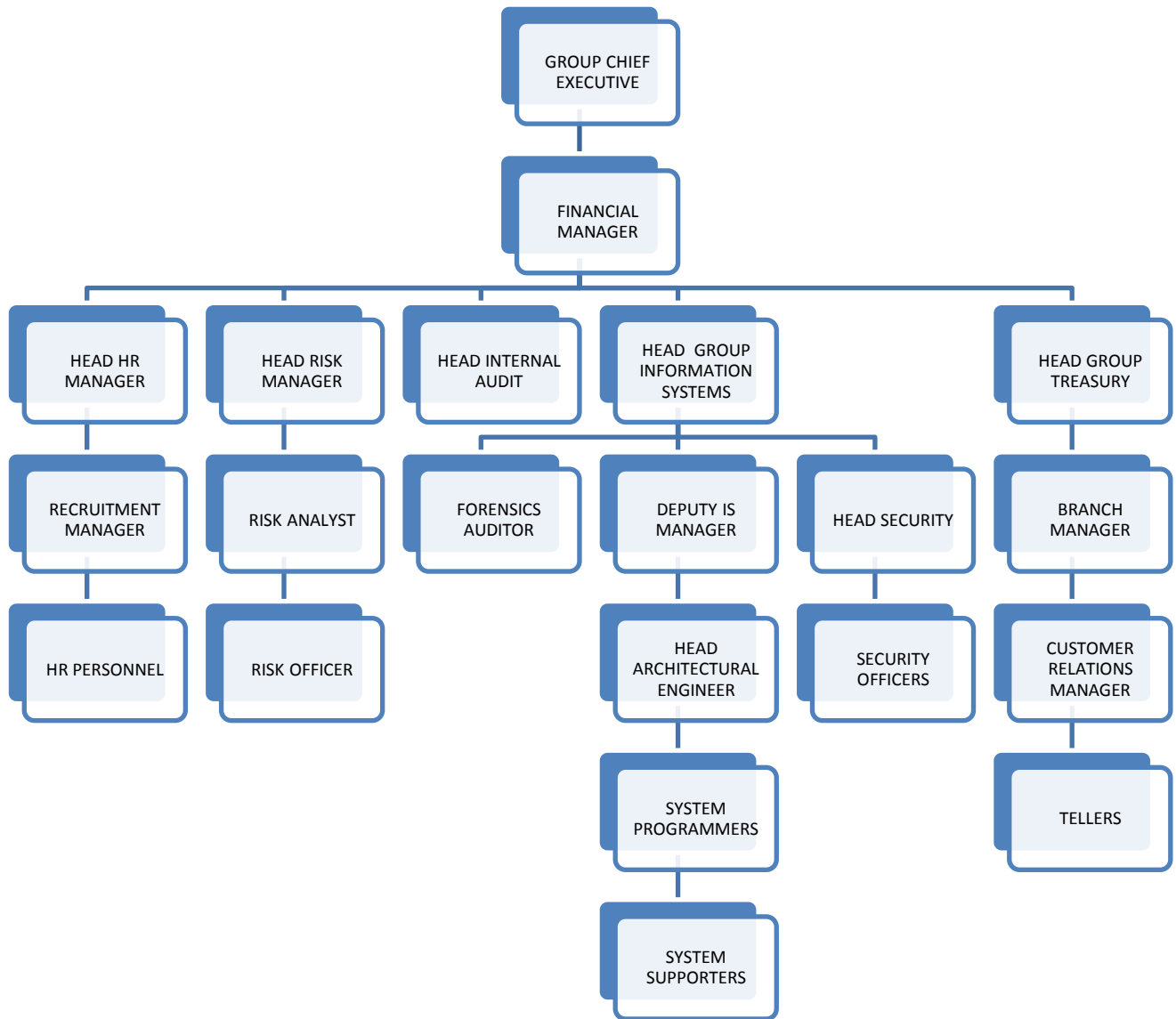


Figure 1.1 Organization structure

1.2.3 Organizations’ vision

According to Singla (2012) vision defines company’s’ operations in the future. Vision describes the organizations’ picture of an ideal world. The vision of the ZB Bank is being effective within the business environment

1.2.4 Organization's mission statement

Singla (2012) states that a mission statement of any organization provides detailed information of organization operations and it states what it does within the business environment. The mission statement of the ZB Bank is that the company is committed at becoming the best at creating as well as maintaining the relationships with the stakeholders profitably so that vision can be achieved effectively.

1.3 Problem definition

The ZB Financial Holdings is a huge organization which employs about over one thousand employees in the country. Due to the increased number of staff this lead to problems which includes the failure of both hardware and software and network problems because of too many people who will be getting or enjoying the services from the company's' branches around the country. All the ATMs and other machines that are malfunctioning within the company are not quickly attended to leading long queues, inconveniences and some of the problems are not quickly attended to by the IT staff resulting to poor overall banking activities leading to inefficiency and ineffectiveness. If the problem is not quickly attended to this can result in long queues, the loss of customers and revenues and that all the banking activities cannot flow smoothly.

Thus the proposed system addresses and solve all these problems since it can enables the ZB Bank customers to be able to carry out all the transactions they want. The customers can be able to view their accounts balances, be able to view latest transactions from the bank and even to download bank statements in portable document format. Therefore, the implementation of the proposed system can enable customers to perform or carry out all the transactions they deem necessary without physically visiting the bank and without any obstacles on their way.

1.4 Aim

The proposed system Virtual Banking and Loan Application System will allows customers to log into the system and be able to carry out all the transactions such as having the access to view their account balances, view all latest transactions and be able to download bank

statements in portable document format. The customers can be able to view all the images of both paid and unpaid cheque or even be able to make a request of new cheque books. They can be able to perform all those transactions from their geographical locations it can be nationally or internationally without physically visiting the walls of the bank. The bank customers will also be able to transfer funds from ones' account to another and be able to pay all their utility bills nationally or internationally. The system can enables the customers to apply for loans without visiting the bank as well. This can be of greater importance since the Financial administrator can be able to capable of managing multiple users with the privilege of varying levels of authority and all the approvals of all the transactions there by making the process of banking much more faster than its competitors.

1.5 Objectives of research

Mochal (2004) defined objectives as the deliveries and palpable products that the project intends to deliver. Each and every system designed or developed has certain goals it must meet. The researcher of the Virtual banking and loan application system managed to come up with the subsequent objectives

To enables customers to view their accounts balances, view their company shares values and download bank statements and save the document in any format they deem necessary

To enables customers to transfer funds from one customer to another account, paying their bills and be able to send their requests and queries from remote locations

To enable customers apply for loans fromthe company and be able to follow up and process the their loan application status

To enable customers to apply for cheque book, ATM cards and credits cards from their geographical locations

To enable the financial administrator to manage multiple users with the privilege of varying levels of authority and all the approvals of all the transactions from the customers.

To compute all the revenue reports such as loan reports, transfer reports and bank cards applications reports.

1.6 Instruments

According to Mall (2009) instruments comprise of both the hardware and software that will be of use in the building of projects. The system to be implemented will be developed using the different tools:

MySQL 2008

According to Halpin (2000) MySQL is used in the management of databases within the company's system, it is of greater importance as a tool in project development since it makes it easier in the storing of data and problem querying.

Wampserver

Halpin (2000) defined wampserver as software that helps in the interaction and commencing services for MySQL server. Wampserver is a flexible tool that is used in developing effective systems since it is easy to install and to configure a system.

Mozilla Firefox

According to Tidwell (2010) Mozilla Firefox is a web browsing tool that is used to crawl on the web pages. Mozilla Firefox downloads and uploads files at a high speed therefore it is worthwhile to adapt to its use in project development.

Adobe CS5

Tidwell (2010) defined Adobe CS5 as a tool that uses its graphical interfaces to facilitate in the development of web based interfaces. It is a flexible tool that can make the development of the proposed system easier.

An installed memory of 2GB with a processing rapidity of about 2.4GHz will also be needed for effective system implementation.

To successfully implement the proposed system there is a need of using the following data gathering techniques: interviews, questionnaires and observations. The project will have a time frame of

about fifty days to complete the following stages proposing, planning, analysis, designing and the implementation phase. After the completion of the stages the system will then be incorporated into the Virtual Banking and Loan Application System.

1.7 Justification

The implementation of the computerized system thus, the Virtual Banking and Loan Application System is worthwhile adopting within the organization this is because since the organization is huge all the activities will be made easier when the customers are able to log into the system and carry out all the transactions they want from their locations without visiting the bank in person. The proposed system will be an incredible prevalent since it is capable of eliminating the existence of long queues and also that all the operational costs can be reduced there by increasing efficiency, effectiveness and that all the activities can flow smoothly without any obstacles or hindering factors.

1.8 Conclusion

The whole of the chapter gives brief explanations of the problems that are currently faced by ZB Financial Holdings. The operations of the current system were put into consideration and all the objectives that are intended to be achieved or attained by the proposed system were set. Also the instruments and methods to be used when developing the system that can solve the problems that are currently being faced by the company was also provided, with justification to consider the continuation on the establishment of the proposed system thus, is it worthwhile to adapt to the implementation of the system. The next chapter which is the planning stage will highlight an insight of the business value of the proposed system thus, all the costs and benefits analysis of implementing the system are identified for an effective budget to be made. The next chapter will take into consideration all the technical feasibility, economic feasibility and schedules of the project.

CHAPTER 2: PLANNING PHASE

2.1 Introduction

The chapter gives a reader an overview of the business value of the system to be implemented with a clear justification of why it is worthwhile to adapt to the use of the new system and all the schedule, organisational, technical and economic feasibility of the system. Thompson (2005) defined a feasibility study as a tool that is concerned with the evaluation of all the expenses and benefits of the new system thus, all expenses and benefits of the system are assessed in order to reach a decision of how worth it is to adopt to the implementation of the proposed system. Since all the problem statement and aims of the project were highlighted in the introduction stage the planning phase will then take in consideration of all the costs and benefits of implementing the system so that questions of either the proposed system is feasible or not are answered. The planning stage also gives an explanation of the project plan that can be of greater importance since it enables the management team to be capable of monitoring the project progress so that effective decisions can be made.

2.2 Business Value

According to Alvarez (2007) a business value is defined as all the benefits that can be obtained or attained after the completion of a project, and these benefits can increase the goodwill of the company by enabling the smooth flow of all the activities, efficiency and effectiveness. The identification of a business value within a company is an incredible prevalent since it shows all the anticipated gains that an organisation can obtain or attain because of developing the project. Identification of a business value is done with a motive of undertaking an analysis of the company's costs and benefits that can be obtained after the implementation of project. The analyst of the will then try to achieve the values which will benefit the whole company thus the benefits that the company, employees, the management, and the customers will benefit from the implementation of the system.

2.2.1 Reasons for building the new system

There is need therefore for the ZB Financial Holding to implement a Virtual Banking and Loan Application System which will help the customers and the employees to easily carry out tasks since the system have got numerous merits which are:

Customers can have access to various services, lower costs transactions and the maintenance of their accounts without visiting the bank physically.

Virtual banks and loan application systems are safe and they capable of installing high firewalls and some encryption software that can enable integrity of all the customers' data there by increasing efficiency and effectiveness since high levels of data integrity are at core of having protected information at all the time.

An improved data consistency can exist within the organisation since the proposed system can have a centralised database.

To create a user friendliness environment since all the users' views are defined and put into consideration.

Evaluation and monitoring techniques will be easily done there making the problem solving issues a piece of cake.

The proposed system will run on a PHP platform which is capable of running at any operating systems.ZB Financial Holding has robust local area network therefore there no need for additional equipment since the company can be able to utilise the bandwidth by simply configuring the system with other transactional systems like Cashier and Equation just to mention a few.

Shareholder Value

According to the Act Chapter 24 of the companies a commercial company with a profit making motive should be registered with the registrar companies. ZB Financial Holdings shareholders can have the privilege of enjoying the following benefits after adapting to the use of the Virtual Banking and Loan Application System:

Reduced costs

The costs that are incurred by the company are reduced thus the money saved can be used on other on other important aspects within the organisation.

Effectiveness

Thus by the use of the new system less time can be required to facilitate everyday activities.

Efficiency

Reports can be obtained at the right time by the use of the system.

Security

That is by the implementation of the new system company data can be secured.

Profits maximisation

Profits margins can be increased by the implementation of the new system.

Goodwill

The reputation of the company can be increased within the banking sector there by increasing efficiency and effectiveness.

Employee or Staff Value

According to Thompson (2005) an employee is defined as people who is employed and receive a payment of wages. An employee is a person who takes part in the activities of accompany that can be done on daily basis. The employees of ZB Bank can receive the following benefits:

Work can be made easy

The employees can feel less effort when they are carrying out their duties. For example the proposed system can bring a perception of easy of usefulness.

Communication

The use of the system can make the communication process to be faster within the organisation.

Commitment

The employees can be motivated to work extra hard because of the user friendly system.

Management Value

Wrapp (2012) defined the management as the people who lead and guide the employees towards the attainment of goals. By the use of the new system the management can be able to carry out performance appraisals of their employees easily. The perceived easy of usefulness of the system can motivate the share to improve their performance there by increasing efficiency and effectiveness. The proposed system increases speed and accuracy of their work hence productivity can be increased.

Customer Value

Customers are defined as the people who had the privilege of enjoying the company's services. Gerald T (1999) described the employees as the individuals who hold the key for organisational existence. Thus, the companies had to meet their needs and wants from the benefits it had attained to enable the smooth flow of all the activities. The proposed system can increase the highest levels of customer satisfaction. The customers cannot face the existence of long queues and network problems since these problems can be solved by the implementation of the new system.

Alignment of IT and Business Value

Laudon (1999) argued that Information systems enhance business value because they are not only used to increase efficiency and also to enable new processes. Thus, since the vision of the ZB Bank is to become effective within the business environment the implementation of the Virtual Banking and Loan Application System will reduce all the costs or expenses which are currently faced by the customers because of the manual system. This can increase the competitive advantage of the company than any other bank within the business environment thus

the company can be able to meet its vision profitably by adopting to the use of the system. The Mission statement of the company is to be the best at maintaining relations with all the stakeholders within the environment. Therefore the proposed system can be of greater importance because the mission of the company can be met since system can satisfy the end users around there by improving the company reputation or goodwill, increasing profits margin, reducing all the expenses due to the competitive advantage that can be established by the information system.

2.4 Feasibility Study

Feasibility study is defined as the procedure where the feasibility of a particular project is measured (Bentley and Whitten 2007). According to Ghezzi (2004) feasibility is explained as activity that is performed before the commencement of the production process and it is used as a decision making tool that is to decide whether to adopt to the new development or not. Thompson (2005) explained feasibility as the process of identifying all the drawbacks and opportunities which is accompanied with the determination of objectives and defining all the situations and successful outcomes. Feasibility study is also concerned with the assessment of all the costs and benefits of the proposed system. Feasibility comprises of four diverse types which are technical, economic, social and operational feasibilities.

2.4.1 Technical feasibility

According to Bentley (2007) the term is generally defined as the gauge of whether the available resources in terms of technical are adequate enough to meet those required by the system. Rahardjo (2012) argued that technical feasibility is just an evaluation of whether the company has the entire infrastructure and all the resources such as both hardware and software and the network with a capability of supporting the application to be implemented and these are shown on the following tables:

Table 2.1 Database server requirements

Hardware	Minimum Requirements	Maximum Requirements
DVD Rom Drive	24x	18x
Network Card	10/500mbps	10/200mbps
Uninterrupted power supply	APC Smart-UPS 300VA	APC Executive-UPS 300VA
Tape Drive	13mm	13mm
Processor	2.8Ghz core i5	1.48Ghz Core2 duo
Cache Processor	4MB	1MB
Hard Drive Disk	1TERABYTE	320GIGABYTE
Memory	4GB	2GB

Table 2.2 Customers' Computer Specifications

Item	Recommendation
Network Card	10/100LAN
Memory	2GB
Hard Drive Disk	80GB
Processor	1.2GB

Table 2.3 Network Tools

Item	What is currently at the Organisation	Required
Communication	Modern:200K LAN:10/400Mbps Fast Network cable	Modern:1000K LAN:10/1000 Mbps Faster Network cable
Network tools	UTP Cat5e rock-solid wire RJ45 sockets/connectors 24 Strengthened Port Panel	UTP Cat6e rock-solid wire RJ45 sockets/connectors 24 Strengthened Port Panel

Table 2.4 Software Requirements

Software Package	Explanation
PHP (Hypertext Preprocessor)	<ul style="list-style-type: none">-Supports many databases-Compatible-Easy to learn-Its execution is pleasingly zippy-Runs on different platforms
MySQL 2008	It is database software comprised of application capabilities such as easily networked, ease of use and that the software can be networked.
Wampserver	Is software that helps in the interaction and commencing services for MySQL server. Wampserver is a flexible tool that is used in developing effective systems since it is easy to install and to configure a system.
Mozilla Firefox	Mozilla Firefox is a web browsing tool that is used to crawl on the web pages. Mozilla Firefox downloads and uploads files at a high speed therefore it is worthwhile to adapt to its use in project development.

Conclusively, the ZB Financial Holdings will have a technical know-how that can be of help in accommodating new structures of technical feasibility such as can the proposed system be upgraded, will the system provide adequate response to queries without concerned about the number of users and issues such as the technical guarantee of correctness reliability and ease of use of the system.

2.4.2 Economic feasibility

Castro (2002) described this type of feasibility as a technique that is used figure out if the benefit that the new system can yield overshadows the expenses of implementing a particular project. Bentley (2007) propagates economic feasibility as a cost usefulness measuring tool. They further argued that a project can be termed an economically feasible if all the proposed reimbursement overshadows that of the approximate costs that are incurred in both the installation and operation of the system. Thus, all in all feasibility study is used to determine whether the expected benefits of the new system overshadows or outweighs all the costs of carrying out the project. Each and every project can be implemented if the all the benefits exceeds the expenses. These benefits can be divided into two thus tangible and intangible benefits.

2.4.3 Costs

The ZB Financial Holdings can incur some costs or expenses such as development and maintenance costs in the process of developing the new systems. Development costs consist of the costs or expenses which are incurred during the System Development Life Cycle (SDLC). Examples of such costs or expenses are:

Communication costs

Research and travelling costs

Website developer expenses

Costs of purchasing hardware, software and some networking equipment

Stationery costs

Table 2.5 Development costs

Year	2015	2016	2017	Total
Development cost US\$)				
Computer hardware	2500	400	200	3100
Communication costs	100	50	10	160
Website developer expenses	700	500	100	1300
Software licences	100	70	60	230
Ink printers	100	30	10	140
User training	200	0	0	200
Networking equipment	150	50	0	200
Research and travelling costs	150	100	50	300
Total Development costs	4000	1200	430	5630

Installation and Training costs

These are costs or expenses which cover the process of setting up or installing the systems on the end users' machines or computers and also the expense that are incurred along the way of meeting all the training requirements of the users on all the aspects of the system to be implemented within the company.

Operational costs

Rosenblatt (2009) defined operational costs as costs that exists on the running system and the include costs such as stationery costs for printer cartridges and the printing of all the forms which are needed. They also coverall monthly payments which are made to Internet Service Provider (ISP).

Table 2.6 Operational costs

Year	2015	2016	2017	Total
Operational cost (US\$)				
Stationery	100	50	10	160
Hardware, Software and maintenance costs	0	20	10	30
Antivirus	30	30	30	90
Internet Service Provider	30	30	30	90
Total Operational Costs	160	130	80	370

2.4.4 Benefits (Tangible and Intangible)

Rosenblatt (2009) defined Tangible benefits as benefits that can be easily quantified.They are also defined as the benefits that can be expressed in monetary terms or in dollar terms. Intangible benefits are the benefits which are complicated or even unfeasible to measure.

Tangible benefits

Bentley (2009) states that these kinds of benefits are very easy to count and they are expressed in dollar terms. The ZB Bank Financial Holdings can have the privilege of enjoying the following tangible benefits

Speed and accuracy of work

Easy of work

Profit maximisation

Competitive advantage

Reduced labour costs

Increased customer base

Intangible benefits

Williams (1999) argued that intangible benefits are not of that easy to count or measuring them. Intangible benefits are those benefits that the company can enjoy their existence but not capable of quantifying those benefits.

Enhanced company reputation or goodwill

Improved user commitment

Effective communication between within the company members

Handling of enormous or large volumes of information

Being more competitive than competitors

Improved worker motivation and satisfaction

Table 2.7 Tangible and Intangible benefits

Year	2015	2016	2017	Total
Tangible benefits(US\$)				
Increased customer base	200	250	500	950
Increased profit	600	700	1000	2300
Increased market share	400	450	500	1350
Total Tangible Benefits	1200	1400	2000	4600
Intangible benefits				
Goodwill or Reputation	200	250	450	900
Employee morale	200	350	450	1000
Total intangible benefits	400	600	900	1900

2.4.5 Cost Benefit Analysis

Castro (2002) defined Cost benefit analysis as the measurement of financial impact of the proposed project. He further argued that it is a technique used to compare the full costs and full financial benefits of the proposed system. Williams (1999) defined Cost benefit analysis as framework that will begin by the defining of all the conceptual blocks that can aid the process of decision making to the IT projects. The mere purpose of the cost and benefit analysis is to help in the answering of questions such as can the project be successful given all the cost, the minimal costs of attaining the proposed system and does the projects' benefits overshadows the costs incurred?

Table 2.8 Cost Benefit Analysis

Year	2015	2016	2017	Total
Tangible benefits	1200	1400	2000	4600
Intangible benefits	400	600	900	1900
Total benefits	1600	2000	2900	6500
Less:				
Development cost	4000	1200	430	5630
Operational cost	160	130	80	370
Net Benefits/costs	(2560)	670	2390	500

Investment appraisal techniques

Three venture examination methods were utilized; these are Return on investment (ROI), Payback period and Net present value (NPV).

2.4.6 Return on investment (ROI)

Is an execution gauge used to assess productivity of a venture and analyse the effectiveness of various diverse speculations. Alvarez (2007) argued that ROI decides the life span productivity of diverse ventures. ROI is otherwise called the Accounting Rate of Return (ARR). This strategy gives a method for contrasting the productivity of a venture. ROI is calculated as:

Rate of investment = $\frac{\text{Average yearly benefit}}{\text{Investment}} \times 100$

Absolute venture

$$\text{ROI} = \frac{6500 - 500}{500} \times 100$$

$$= \frac{6000}{500} \times 100$$

$$= 1200\%$$

$$= 92\%$$

The degree of profitability is ideal or perfect because it has a positive percentage which demonstrates that there is gainfulness.

Strengths of return on investment

General rate of degree of profitability is effectively measured and it utilizes yearly values

Simple and easy method of calculating

2.4.7 Payback Period

According to Wood (2001) payback measures the time allotment that can be taken to recover the original cash lay out from the flood of the net money which continues or proceed from the original investment. Woodruff (2007) characterizes it as the time it takes for the initial investment to a capital speculation task to be equivalent the capital invested. An undertaking with a short payback time is ideal.

Payback time for the undertaking was:

Year	Cash flows\$	Accumulative Balance\$
0	(2000)	(2000)
1	1600	(2410)
2	2000	770
3	2900	800

$$\begin{aligned}\text{Payback period} &= 1\text{ year} + [400/2000*12] \\ &= 1\text{ year} + 2, 4\text{ months} \\ &= 1\text{ year } 2\text{ months}\end{aligned}$$

Strengths of Payback period

Finely turned appraisal of the time expected to recover the annual values are provided

Reduced cash streams can be obtained there by reducing the project period.

Weakness of the Payback Period

Does not put into consideration the time value of the money or capital

Observation

The payback time of the venture is extremely tolerable and effective because it will just take just 1 year and 2 months for the undertaking or the project to equal the initial investment. This can increase efficiency and effectiveness on all the proceedings of the company project.

Economic Feasibility Recommendation

All the projects' expected cash flows are favourable this can be of greater importance since all the cash deficiencies can be met or accounted for. Therefore, the proposed system must be implemented.

2.4.8 Social Feasibility

Schawable (2008) defined social feasibility as a technique used to identify how the workers associate after the implementation of the proposed system within an organisation. The fundamental objective of the social feasibility is to recognize how the work force or the specialists will associate after the usage of the system. It is critical to incorporate the cooperation of the specialists after usage on the since they will be working with the system. The new system must be effective in teaming up the employees. Social feasibility tries to tackle all the accompanying inquiries is the undertaking needed, what are the consequences and effects on individuals in and outside the company and that can the proposed system have a positive influence on the employees?

Social feasibility doesn't concentrate simply on human issues only. It also takes into consideration all the expenses to nature, an expense to society and an expense to organization culture this was by Brien (1996). Another modernized computer processing system may seem, by all accounts, to be a risk to a few representatives and their families who may confront conservation or the individuals who feel they may detach or retrenched from their employment or jobs. This thus, will effect on the specialists' families, friends and relatives.

Be that as it may, the management team will be able to reduce any retrenchments and guarantee the presentation of the system that cannot be a risk; rather it ought to engage and outfit them with better execution abilities or skills.

Social feasibility recommendation

Conclusively, the implementation of the proposed system will affect the environment, society and the internal society positively. The use electronic systems will minimises data storage since the information will be handled electronically, this can be incredible prevalent since the environment can be considered to be garbage free by the use of the system which reduces paperwork. The employees can be motivated to work extra hard because of the benefits the system can bring to them such as error reduction which can speed up the processing of the transactions there by making the working environment very conducive one.

2.4.9 Operational feasibility

According to Bentley (2007) it is the gauge of how effective the new system is at tackling issues and takes the opportunity notable through definition and problem examination stages and how fine it fulfils the proposed systems' fundamentals recognized within the analysis phase. According to Castro (2002) operational feasibility can be assessed utilizing the new system which can be an effective tool at helping in tackling problems and increase efficiency. To focus the operational feasibility of the new project, an investigation must be done amongst the existing system and the new system. This association is however thought about as far as the following are concerned appropriateness which explains on how much time do the tools and methods used takes to complete the new system, business mix which gives an overview of whether the system

bring together the organization's exercises or not and speed which is how effective the system is at answering questions.

2.4.10 Recommendations of feasibility study

The new system is effective for the ZB Financial Holdings to adapt to its implementation this is because all the systems' user requirements are matching with the system objectives. The company policy supports the development of different systems even external systems. The company's Information Systems department has workers who adapt to the introduction of a new system at a faster rate without any resistance to change which can be inevitable.

2.5 Risk analysis

According to Kendrick (2009) a risk can be any uncertain event that is typically associated with the project work. He further argued that a risk is a product of two factors which are the predictable costs of the occasion that is happening and the likelihood that the event can occur. Barlett (2004) defined risk analysis as the planning process where all the types and the level of severity of the risk on the project are identified. The ZB Financial Holding can face different types of risks that can hinder the smooth progress of the activities; these types of risks are Schedule, Budget, Operational and Technical risks

Schedule risk

According to Kendrick (2009) a schedule risk can occur when all projects tasks and all the schedules are not properly or effectively addressed due to different reasons such as:

Poor or incorrectly time estimation,

Not properly tracking the resources such as individuals skills and staff systems

Not able to or failing to identify or define complex functionalities and the specific time that is needed or required in developing the functionalities.

Project scope expansions which are even unexpected for the project

Thus, this type of risk can hinder the projects' successful implementation and there is need therefore for the company to address by that the project manager must have a reasonable project

time estimation to prevent unexpected project expansion which can be costly in order for the company to come up with the right system at the right time. The project developer of the ZB Bank can counter schedule risk by setting reasonable deadlines of the project.

Budget risk

According to Randall (2004) In order for a budget to be effectively created the costs estimates need to be allocated and the entire item heads. The company faces a budget risk if ineffective budgets are scheduled. Budget risks occur when the following had taken place:

Expansion of the project scope

Costs overruns or overshadows the budgeted resources

Incorrect budget estimation

Conclusively, the ZB Financial Holdings must have to create a budget which have all the costs estimations which cannot be overshadowed by the costs and avoid all the unnecessary project expansions which can disturb the budget to counter the existence of a so called budget risk.

Operational risk

Mishra(2012) explained thatoperational risk occurs due to improper implementation of the system and all external factors that hinder the progress of the project. Operational risks occur as a result of:

Poor or no communication withinthe team

Inadequate resources

Poor subject training

Shortage of effective resource planning

Failing to resolve the authority and responsibilities

For the ZB Bank to counter the existence of the operational risk there is need for effective communication since communication channels that are favorable are at core of organizational success. The company must have well-trained team members with the effective technical know-how of the project to increase efficiency and effectiveness. Thus, training programs must be introduced so that employees can have adequate skills of performing readily.

Technical risks

It is defined as the risks that are generally leads to the failing of all the functionality and the performance of the project. Examples of technical risks that can be faced are:

- No advancements in technology
- Difficulty in the integration of project modules
- Continuous changing requirements
- Implementation of complex products or resources

For the company to operate without encountering the technical risk it must make use of the advanced technologies so that it can keep pace with the changes in technology and that all the project modules must be well integrated for easy implementation. Also there is need of implementing resources that are not complex to the employees thus training programs in relation to the use or resources are recommended to avoid the risk.

2.6 Stakeholder analysis

Boehm (1989) argued that a project manager must put his or her focus on the stakeholders and effectively focus on their fears and their wishes about the proposed project. They further defined stakeholders as a member, an employee of the company or a senior manager. Stakeholders can also be defined as a group, a person or the institutions that have interests on a project. A stakeholder may not directly involved in the decision making process of the company. The stakeholders can be primary and secondary stakeholders. Primary stakeholders are those who are affected either positively or negatively thus, winners or losers. Secondary stakeholders are the

intermediaries. Therefore, the analyst must identify all the stakeholders of the system and how they are affected by the implementation of the system within the ZB Financial Holdings.

The primary stakeholders of the company and their reactions are:

Shareholders

Who are the owners of the company can react positively to the implementation of the system because they will be motivated since the system can be beneficial to them in terms of reduced expenses and increased company goodwill or image. They will expect to see the project prospering so that they can be more effective than their competitors within the business environment.

Directors

They can react positively to the project since it is beneficial to them they can provide all the necessary resources and environment for the project implementation since this can increase the company reputation or goodwill.

Managers

They can be motivated to work extra harder to ensure that the project will not fail and they will provide all the necessary satisfaction to the end users of the project.

Workers or employees-They will react positively to ensure company success but on the other hand they can be afraid of losing hence they can resist to the implementation of the project.

The secondary stakeholders and their reactions are:

Customers

They can react positively to the system since it has higher customer satisfaction which is at a necessity to them. The customer expects to be provided a system with a good interface and since the proposed system is going to meet that they will react positively to its implementation.

Competitors

Since the project can increase a competitive advantage the competitors within the business environment will be willing to know project being developed and how it is going to affect them

within the business environment. At the end they can be forced to develop and implement their own system to also increase their competitive advantage.

Organized labor NGOs, CBOs and other community structures

Trade unions

They can either react positively or negatively after they know whether the project can lead employees are fairly treated at work places because of the project. Since the proposed system can be of employee benefit the trade unions will be forced to react positively to the system.

Suppliers

Government

Since their interests are to see the project benefiting the people without any problems encountered, they will react positively because the implantation of the system has a lot of benefits to the customers around the globe.

Environment

The systems' implementation will not make the environment an eye sore since all the paperwork that is leading to the dumping of papers everywhere will be replaced by the proposed system which use electronic system.

Conclusively, as a project manager there is need therefore to balance off any conflicts that exist within the implementation of the project by considering the reactions of the stakeholders to the project. This can lead to the successful implementation of the system there by increasing efficiency and effectiveness.

2.7 Work Plan

This speaks to the course of events of all broken tasks. The waterfall model that is going to be used has effective project management tools to successfully implement the building up the ZB Financial Holdings Virtual Banking and Loan Application System. The task of the time for each and every stage is demonstrated underneath in the work plan table and after that the Gantt chart will be outlined. The following is the breakdown of all the activities to be carried out:

Table 2.9 Tasks or activities to be done

Stage	Begin	Finish	Duration(Days)
Proposal	15/02/2015	22/02/2015	7
Planning	22/02/2015	28/02/2015	7
Analysis	28/02/2015	14/03/2015	14
Design	14/03/2015	28/03/2015	14
Implementation	28/03/2015	11/04/2015	14
Maintenance	11/04/2015	18/04/2015	7

Gantt chart

According to Bentley (2007) a Gantt chart is defined as a bar graph that is used to define tasks or undertakings against a drafted schedule. Every bar shows a named task assignment as shown on the following figure

ACTIVITY	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
Proposing									
Planning phase									
Analysis phase									
Design phase									
Implementation phase									
Maintenance phase									
Documentation phase									

Figure 2.1 Gantt chart

2.8 Conclusion

From the investigation carried out on the feasibility study of the new system, it proves that project Virtual Banking and Loan Application System is exceedingly feasible to build up since it is capable of meeting all the organization's particular objectives. The assets have been measured and coordinated to the objectives to be accomplished. The planning stage has demonstrated how the system will be working, highlighting all the time frames and the risks or hazards that were encountered. Furthermore, it has helped the company to consider the feasibility of the project in order to anticipate the feasibility of the project. Following honest enquiries, we have reasoned that the project is incredibly feasible. Therefore, we were given a go ahead of proceeding to the next stage which is the Analysis phase. The analysis stage will give highlight of the existing manual systems logical explanations such as dataflow and the context diagrams which shows how the transactions are being done carried out at the company for the mean time

CHAPTER 3: ANALYSIS PHASE

3.1 Introduction

The analysis phase is mainly concerned about providing the information of the currently existing system. In this chapter the existing system is analysed and the current logical descriptions are put into consideration, and these includes the dataflow and context diagrams. According to Shah(2008) the analysis phase is of greater importance since the main objective is the clear understanding of the complexity and the nature of the problems that are currently existing at the company so as to have detailed information about how the currently existing system functions and how it is going to be modelled into a proposed solution .The analysis phase provides all the information about the current users of the system, how transactions are being processed and all the types of records that are being used currently. The chapters' main goal is to determine the importance, complications and the scope or nature of the problems that are existing as stumbling blocks at the company. The chapter will be mainlyconcernedabout all the logical design of the system to be implemented.

3.2 Information gathering methodologies

A fact finding technique can be defined as an official process that is used by the researcher to effectively commence on a research, interviews, questionnaires and some other techniques of data gathering about the system problems its requirements and preferences. Arora (2007).Hartley (2000) defined information gathering as methods that are used for finding facts from a certain population model. The success of any company or organisation depends upon a higher degree of accuracy of the data available. The outline of the data gathering techniques or methodologies used to gather facts were Interviews, Questionnaires and Observations

3.2.1 Interviews

According to Bentley etal (2007) interviews are defined as the collection of information or data from the interviewee through a face to face communication. Vale (2010) argued that interviews are a formal way of getting deeper and comprehensive information through a face to face communication or a question and answer format. Collins (2006) explained interviews as a dialogue where by the interviewer educes information from another person who is the interviewee. In an interview different sets of questions are asked thus, the ones which the

interviewer has prepared and the ones which just explode depending on what the interviewee is responding to the questions being asked.

For the interviews to be implemented successfully the researcher conscripted a work plan which was the carrying out of interviews over chat platforms such as peer to peer of the boards members. The interviews were conducted and all the replies were obtained within an hour. The board members replied the questions within a short period of time by the use of electronic chat platforms which were very fast and effective there by enabling the smooth flow of all the activities.

Advantages of using interviews

They allow a direct interaction with the individuals who are involved in the process of managing, operating and who work within the company. Direct communication helped the researcher to obtain first-hand information from the ZB Bank employees about the key concepts, problems being faced and all the processes that are involved in the current system. The interviewer he or she can be able note of all the non-verbal answers from the interviewee. This can be of greater importance since an insight of how the employees are feeling towards the system is obtained. For example all the hostile aspects of the system can easily be noted even though the interviewee can be uncomfortable of expressing his or her ideas.

Disadvantages of using interviews

The use of interviews was time intensive by nature and this was very costly to the ZB Bank since a lot of employees can be interviewed. The interviews are subjected to bias if they are not successfully implemented or documented. The interviews carried out at the ZB Bank didn't provide all the information since they will be protecting their interests leading to biased information being obtained.

Findings from Interviews held at the company

Having approached the ZB Financial Holdings the technical department and all the company officials were delighted by the proposed system. They managed to review and conclude that the

system is worth adopting since it is sailing in the same ship with the current or recent emerging technologies and it is a solution to all the problems that the whole company is experiencing.

3.2.2 Questionnaires

According to Kwary (2009) questionnaires are questions that can either be a topic or topics that are to be answered by the respondent. Collins (2006) defined questionnaires as an instrument that can be used with a key goal of attaining information from the respondents. Questionnaires are also defined as a print out of questions that the respondent can respond with his or her choice of responses. Questionnaires maximises highest levels of reliability because the researcher cannot influence the subject to the respondent hence there is little or no bias. There are two different types of questionnaires which are explained below:

Closed-ended questionnaires

These are questionnaires which enables the researcher to provide an appropriate response like a Yes or No, thus they are mainly used for quantitative data.

Open-ended questionnaires

These are questionnaires which consist of questions where the researcher does not provide the respondent with a choice of responses that he or she can choose from but they are asked to respond using their own words. Thus, they are mainly used for qualitative data.

Advantages of using questionnaires

Information was gathered quickly at the ZB Financial Holding even the members were scattered thus; even though the ZB Financial Holdings have many branches around the country information can be easily gathered using questionnaires. It is easy to make an analysis and statistics of the data obtained from the questionnaires carried out.

Disadvantages of using questionnaires

In some cases respondents can refuse to cooperate if they are poorly motivated. Since there is no face to face communication between the researcher and the respondent this can result to different

interpretations of the questions there by compromising the validity of the questionnaires especially for a large company like the ZB Financial Holdings.

Findings from Questionnaires

The researcher managed to conclude that the system stakeholders were having a feeling that the currently existing system processes were not that efficient since they are very slow therefore they supported the idea of change. However, the questionnaires brought a different perception to the employees since they had a feeling that the implementation of the system can replace their jobs. Even though, the questionnaire proceedings were very successful since the answers were positively influential towards the implementation of the system.

3.2.3 Observations

Kumar (2008) defined observations as direct interaction and the observation of how the employees work and how the current system operates. Kyale (2010) also explained observations as a method that requires the researcher to observe and actively listen so that he or she can gather qualitative and authenticated information for the research. Thus, the researcher can be able to observe and see what is really happening at the company.

Advantages of Observations

The researcher experienced first-hand situations thus both inside and outside the company and this can provide an insight of how the company operates. Since the ZB Financial is huge the researcher cannot obtain sufficient information using questionnaires and interviews but also by observing the activities at the company. Observations were non-interfering fact finding technique hence there are no interruptions to the employees of the company. The researcher managed to have a clear understanding of all the processes, functions and operations on how things are being carried out. The questionnaires enable the researcher to carry out a survey for a large group of people. Therefore, they are worth to use for large companies like the ZB Financial Holdings unlike other fact finding techniques.

Disadvantages of Observations

There are many chances where the researcher can record incorrect data since there will be some activities he or she can fail to see. ZB Bank is a large company therefore the researcher cannot be capable observing each and every corner of the company. Some workers changed their normal attitudes upon realising that they are under observations there by making the observation process inevitable to a certain extend.

3.3 Analysis of the current system

The current system is expensive and had a poor response time when attending customer problems. ZB customers have to move from their geographical locations to carry out transactions such pay their utility bills, making deposits, processing of cheques, funds transfer get the company news and updates as far as the banking business is concerned and even to have a bank statements and this can be very expensive for the customers since some can have to pay some transport costs. The customers can also have to visit the bank to carry out transactions such as loan applications and there is need for them wait for a very long period for the loan application to be verified and validated. This can inconvenience some of the customers who need the loan urgently. The ATMs at the company will be subjected to too long queues and that the company network will be congested there by inconveniencing the customers.

Description of Current System

When the customer wants to carry out a transaction such withdrawing, making of deposits and transfer funds he or she completes the withdrawal, deposits and transfer slips respectively and then approaches the bank teller for the transaction to be verified and entered into the system. If the customer wants a loan he or she approaches the bank teller where they are given a loan application form to complete. After completing the form the customer will attach his or her identity and the original copy of a pay slip on the loan application form. The customers then take the form to the bank teller who then forwards the form to the branch manager for verification process. When the customers wants a bank statement they have to visit the bank to the bank teller who then download and print out the statement and also when the customer wants to make a request of a cheque book and to know the news of company updates and account changes he or

she have to visit the bank and ask the bank teller or the branch manager for the updates. The existing system is carried out manually where the company information is maintained manually, thus, information is searched manually from records. The current system makes the transfer of information to the customers around the branches using letters or documents which are time consuming. The system has got some inputs, processes and outputs which are involved upon its functionality.

Inputs

Transactions

Requests

Applications

Customers

Raw materials

Processes

Creating a transaction

Sending of requests

Applying for loans

Verifying requests

Outputs

Reports

Transaction carried out

Customers on loans

3.4 Process analysis

Defined as an highlight of all the processes and activities that are carried out and the data flows within those processes and activities (Laberge 2011).Trischler (2001) explained that process analysis is identification of all the systems processes with a clear goal of attaining outputs from the company system. The sequence and occurrence places of activities and the performers of activity are shown by the use of activity diagrams. He further argued that an activity diagram is of greater importance since it is used to picture all process flows within the organisation. A project consists of processes that are meant to add value by the transformation of inputs into outputs. The inputs of a project are capital, materials and the labour force, the outputs can be physical products or the service that is enjoyed the system end users. Processes can have an incredible influence on the performance of the company and on all the techniques that are used to improve a company's' competitive advantage. The analysis of the processes involves the following activities:

Definition of all the process margins of the process inputs thus the entry and exits points of both the process inputs and outputs.

Drawing of the process flow diagram that clarifies the process activities and all their interrelationships

Identifying the capability of each and every step in the process and the calculation of all measures of interests

Determine the hindering factors or the obstacles of all the activities

Evaluate the immediate drawbacks to measure the impact of the obstacle

Make the effective operating decisions by the use of the analysis in order to improve all the processes involved.

3.4.1 Activity diagram

According to Erickson (2011) an activity diagram is defined as a simple and spontaneous illustration of all the proceedings in the work flow, which activities can be done and what are the best paths within the work flow. Bentley (2007) further defined the activity diagram as a

diagrammatically illustration of the flow of company's' business processes and the steps involved and the logic of all the objects behaviour. An activity diagram is used to show the complete flow of all the activities and the authority and delegations.

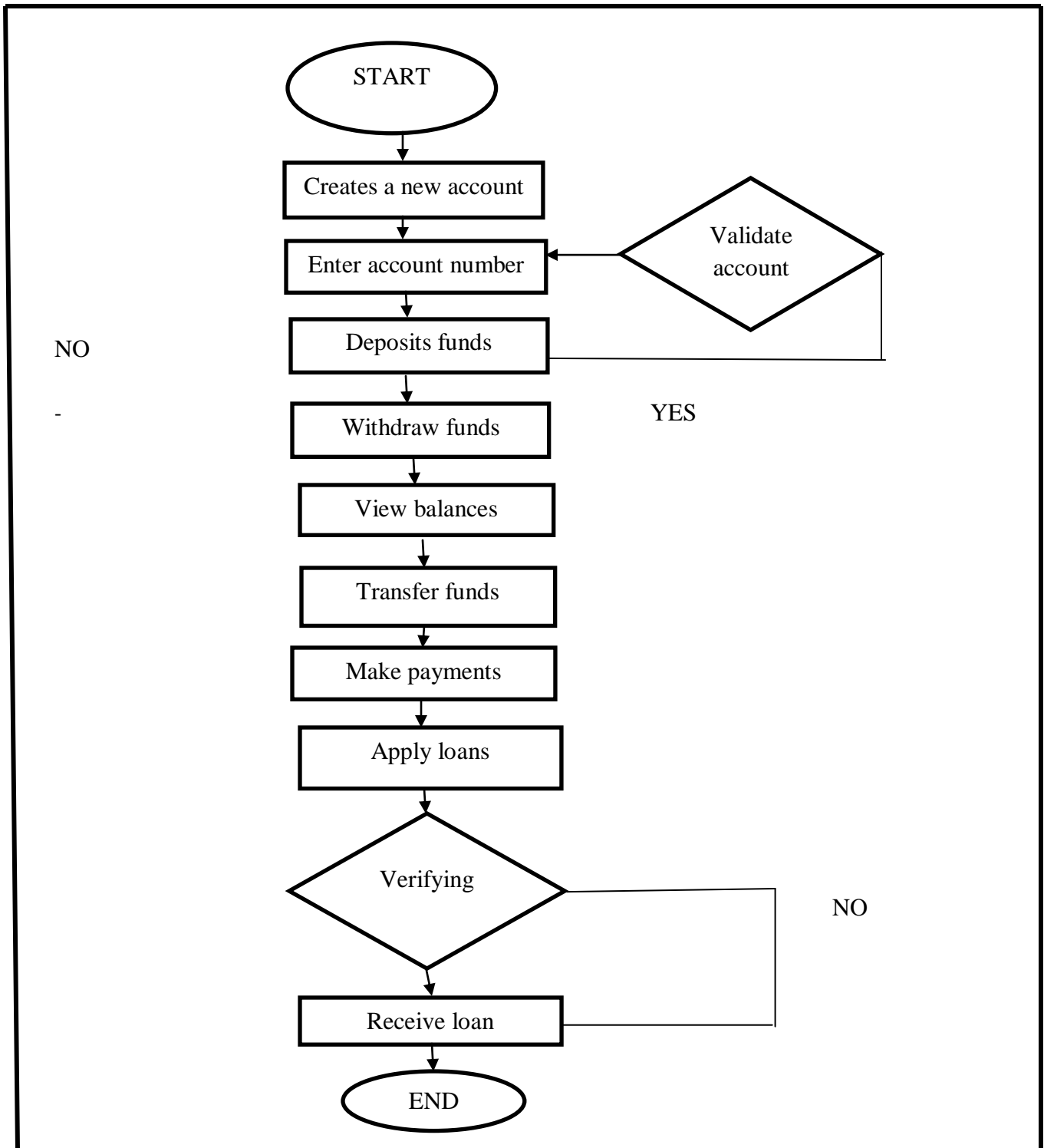


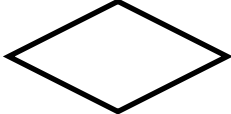



Figure 3.1 Activity diagram

Table 3.1 Activity diagram key

Symbol	Meaning	Symbol	Meaning
	First or final state		Activity or process
	Conclusion		Data control

3.5 Data Analysis

The main objective of data analysis is to exemplify all processes and all data flows within the existing manual system. Data analysis gives a clear picture of how entities within the company interact and it is also a process that involves analysing and modelling of the processes that are involved in the existing system so as to come up with all the essential data structures that can be capable of effectively mapping the currently existing manual system into a proposed electronic system.

3.5.1 Context diagram

According to Kendall (2002) states that a context diagram reflects how the system is identified outside the company in terms of that is it an open system or not. The following diagram shows the context diagram of ZB Financial Holdings' system.

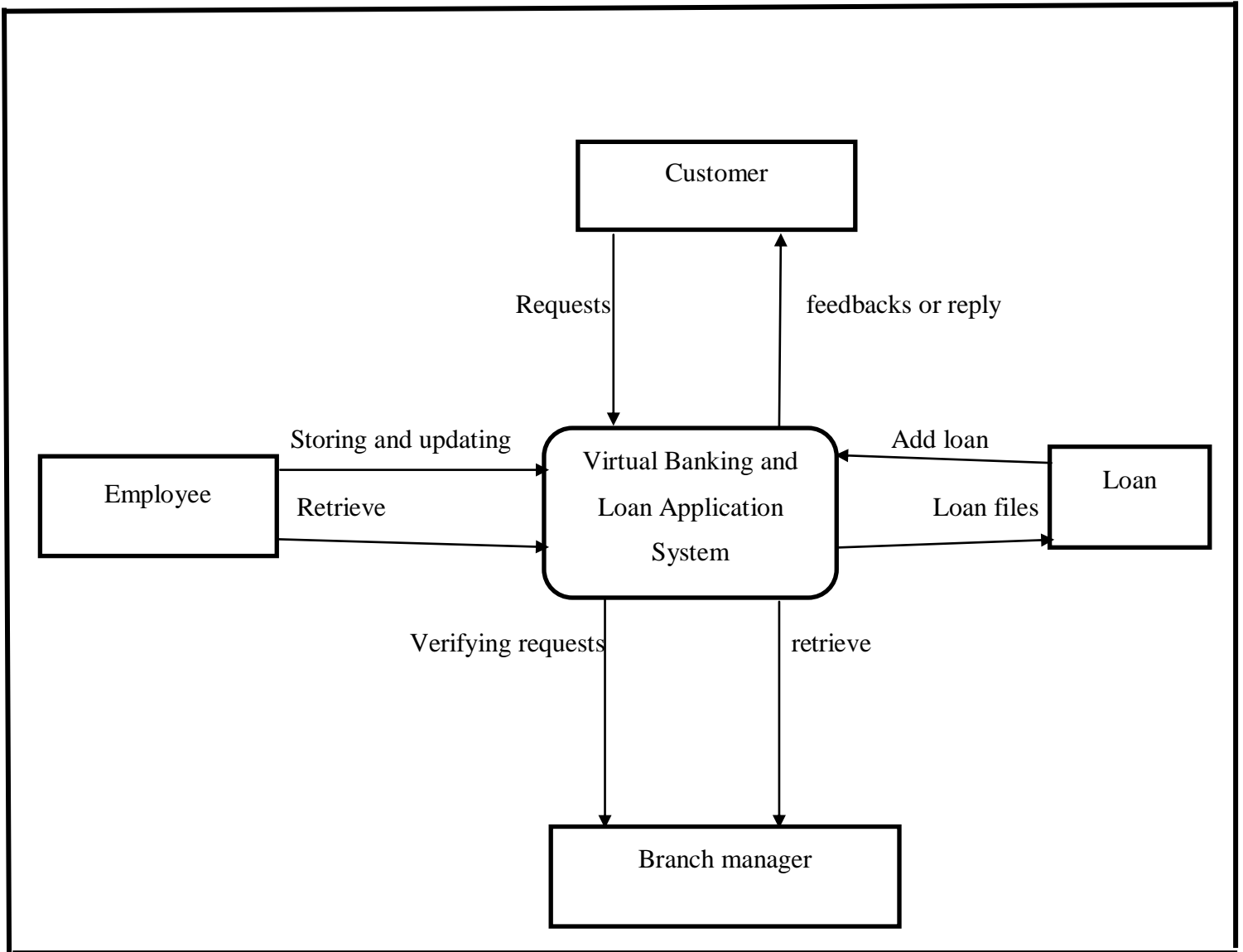


Figure 3.2 Context diagram of current system

3.5.2 Dataflow diagram (DFD)

It is diagram that is used to reveal the relationships that exists between the different components in a program or in the system, they are used in the modelling the real life events that occur within the company Le Vie (2000).Kendal 2002 states a DFD shows the flow of data and all system processes that are involved. A data flow diagram is an interface of the real events that occurs within the company and how these events can be converted in the system that can be installed in a computer

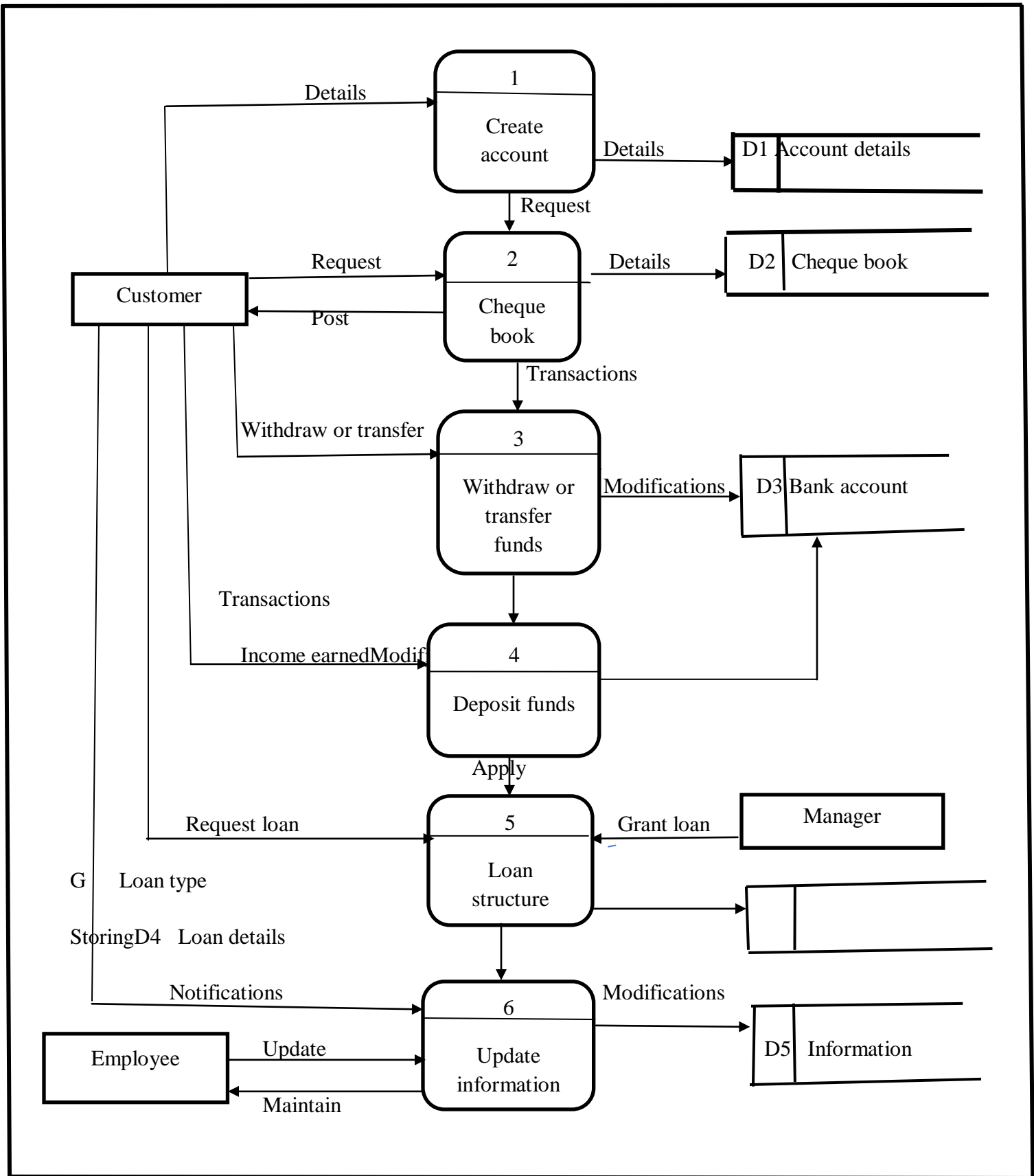






Figure 3.3 Data flow diagram

Table 3.2 Data flow diagram key

Symbol	Denotation	Symbol	Denotation
	Process		Data store
	Entity		Data flow

Conclusion on data analysis

The DFD and the context diagram can be capable of showing the analyst of the system all the processes of the existing system and that of the proposed system that are needed to address the needs of the customers.

3.6 Weaknesses and strengths of the current system

At ZB Financial Holdings there is a system that is used to carry out all the banking transactions such as cash deposits, withdrawals and cash transfers. By the use of techniques such as data analysis and process analysis the analyst managed to recognise all strengths and weaknesses of the currently existing system.

3.6.1 Weaknesses of the current system

Prone to errors thus, the compilation and sorting out of information is easily prone to errors which can go unnoticed since the process of validation and verification is done by the humans who can make some mistakes sometimes

Time consuming thus, the time that is spend on sending letters or calling customers to notify the about the changes in the banking systems or about the current news of the company can be used on other activities that are worth.

Existence of long queues and network congestions since the ZB Bank has got many customers who will be willing to be saved.

The system can lead to boredom of the employees especially the bank tellers who will be having a lot of customers waiting for their services this can reduce the smooth flow of all the activities

There is slow retrieval of data which can result in difficulty of compilation of reports

Lack of backup within the system results in the occurrence of disasters such as the loss of all company data

3.6.2 Strengths of the current system

However, the existing system though it has numerous weaknesses it is not without its strengths that are enjoyed by the employees. The operations of the current system require low costs or expenses and it does not require the hiring of many employees who can increase the company budget and also there is no need of acquiring of new resources.

3.7 Evaluation of alternatives

Even though the current system has weaknesses and problems there are some recommendations that are capable of becoming solutions to those weaknesses. From the current system analysis carried out it denotate that there is other option than replacing the currently existing system with the new one. To accomplish this exercise there is need therefore for the company to select the best alternative at the right time to increase efficiency of the system.

3.7.1 Improving the current system

According to Hughes (2005) this exercise involves the adjusting of the existing system so that it can work more efficient than the previous system. Capron (1995) making improvements on the existing system would mean that the employees of the ZB Bank will be subjected to more work by the use of the current system but they can be relieved by the improvement of the system. Improving the current system is very beneficial since it has highest levels of customers satisfaction the customers can easily accept it without any fear or doubts. Making improvements on the current system has some advantages which are that there is reduction of errors by the use of the electronic systems which is efficiency and effective. There is avoidance of all the financial and resource strains that are encountered along the way and the company can have an effective budget on all the financial resources. All tasks can be done within a short period of time thus

tasks which used to take long time can be executed without wasting a lot of precious time. No extensive training is needed because the end users will be familiar with existing system this can reduce some training costs

However, making improvements on the current system is not without drawbacks or limitations thus, some of the problems will remain unsolved by the process of improving on the manual system. These problems can resurface along the way or in the long run as the company expands leading to that the activities cannot flow smoothly. Technological advancements cannot be easily considered in the currently existing system leading to that the system cannot be the one that keep a pace with the evolving technologies. Operational costs can be incurred along the process leading to high budgets being set

3.7.2 Outsourcing

According to Michael (2003) outsourcing is a process where by a company or an organisation seeks for software that is already made by some vendors around the globe. Griffith (2005) argued that outsourcing is the use of external resources to carry out all the activities that are traditionally managed by the inside staff. Outsourcing is the process of contracting all the business processes which a company has an interests and is purchased back to be used as a service within the organisation (Capron 2005).Zizakovic (2004) states that outsourcing has disadvantages that outweigh the advantages. This is because the working system can be brought in very fast but the main problem with outsourcing is the customisation of the new system will not be easily met leading to that company needs and wants cannot be met profitably. Maintaining the system will be a problem because if an error occurs the company will pump out huge amounts of money to solve the problem. Adopting the outsourced system is ineffective because end users are not consulted and this can lead to that the system will not be user friendly.

However, outsourcing adoption is not without its strengths thus, there is no need of high technical staff this can save huge amounts of money due to training programmes and that no development costs can be incurred after adapting to its use.

3.7.3 In -House development

According to Michael (2003) an In- house development is where by a company develop an internal system by employing developers who can implement a customised system with a clear goal of meeting all the company's' requirements. According to Lewis (2006) in-house development is a software package that is developed to be capable of handling all the data requirements of a particular business environment. In-house development has some strength which is that it is capable of providing a customised system that can be in a position of meeting all the company or organisations' objectives. There is user involvement which denotates low levels of new system rejection by the users since they are consulted to make their own views or perceptions. Engaging in in-house development the ZB Bank will experience the privilege of no license costs since the process does not require licences like the off shell systems. In addition to that the in-house development is capable of providing a centralised database that can store all the company data in a manner that is secured and backed up. In-house development increases a sense of ownership thus the end users of the system can assume a complete ownership since all the system specifications are totally based on meeting user requirements. The process has low or no budgetary constraints because the in-house development is always in line with the company budget which can meet all the costs incurred in the process.

However, in-house development has some weaknesses which are that the company or the organisation can experience some training costs and that the process is time consuming since there is a lot of documentation which is actually voluminous.

Conclusion on alternatives

From the evaluations made it points out the best alternative that the ZB Financial Holding can adhere to its implementation though some limitations are attached to the alternative. Therefore, the In-House development is the best alternative because it has a capability of addressing all the aspects of project development that meet the user requirements. The in-house development is also highly recommended due to the existence of complete user ownership of the system to the company and its stakeholders.

3.8 Requirements analysis

According to Setende (2005) requirements analysis is a technique which helps to anticipate the users' requirements to the project being developed. Sommerville (2004) argued that a requirement analysis ranges from an abstract view of the system up to all the mathematical specifications. Thus, when carrying out the process of requirements analysis there is need therefore for project developers to involve the users so that they can keep pace with evolving changing needs of the users.

3.8.1 Functional requirements

According to Rouse (2007) functional requirements are the processes and all the procedures that the new system must meet. A Bentley (2007) functional requirement is clear description of all the services and activities that the new system is supposed to provide or meet. Thus, basing on the documentation given the proposed system has some functional requirements which are explained below:

Access control requirements

The new system must have all the control features that are capable of restricting all unauthorised access to the data by the use of username and passwords. Thus, new system must enable the customers of the ZB Bank to login and carry out all their transactions from their geographical locations without visiting the bank

Backup requirements

Backups within the new system can provide high levels of secured data from accidents such as fire and other natural hazards such as floods

Storage requirements

The new system must be capable of offering a secured and effective storage thus, a central database must be implemented to ensure highest levels of data capturing and data manipulation. The database must be distributed centrally so that its access can be enjoyed by all the ZB Bank customers

Processing requirements

The proposed system should both be able to process the data entered and allow the input of the data and rank the data according to high or low risk. The system must be capable of eliminating all the duplicate entry of information or data.

Data currency

The proposed system must ensure all the current data requests and all the requests must be updated and closed.

In addition to the above functional requirements the system analyst makes use of a Case diagram to further explain the requirements of the new system. According to Heathy (2000) a Case diagram is a set of activities which shows the interaction among the client and the customer. A Case diagram is an outside viewpoint of the system that shows the activities of the users who want to complete a transaction.

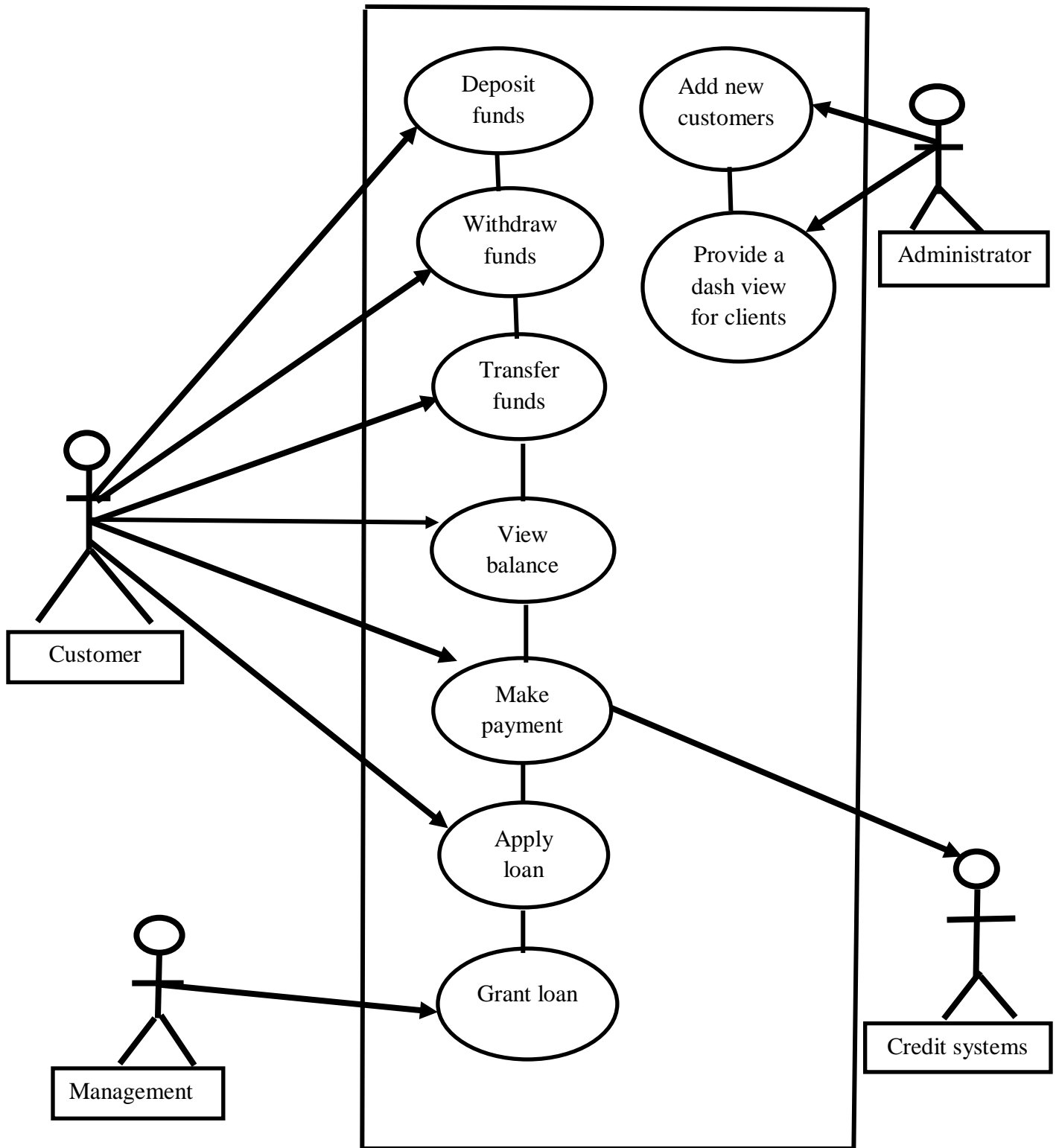


Figure 3.4 Use case diagrams

3.8.2 Non-functional requirements

Rouse (2007) defined non-functional requirements as the standards that the system is expected to meet without putting any focus on the project development. Rosenblatt (2009) explained non-functional requirements as the requirements which are not concerned with the functionality of a system. Therefore, basing on the documentation given, non-functional requirements of the system identified are:

Reliability

Handling of both expected and unexpected system failures

Maintainability

The new system must be easily modified and capable of providing new capabilities

Graphical user interface

The system to be implemented must have a user friendly interface that is capable of making the interactions between the user and the system fairly simple

Accessibility

Must be accessible to anyone within the company for it be said that it is meeting all the user expectations

Operability

Must operate within the range of meeting all the expectations of the users

Error handling

The system must quickly identify and troubleshoot all the errors when they occur

Response rate

The time that elapses between the sending of a request and the response to that request thus, the system must have a shorter transaction processing time for it to be effective and reliable.

Space utilisation

The system must have a large storage space databases and all the necessary access paths.

Security

The system must provide effective safeguards to all the threats that can occur

Conclusion on requirements analysis

Requirements analysis study carried out at the ZB Financial Holdings was incredible because it helped the developer to document all the user requirements and their expectations that they have towards the functionality of the new system. The system requirements were put into consideration by the developer and they were both traceable and testable. Through requirement analysis the developer was able to note that the user requirements can change with time due to different factors. Therefore, there is need for the developer to carry out continuous consultations of users so that their comments can be noted down and make some improvements on the systems delivery. This can increase efficiency and effectiveness within the ZB Financial Holdings' new system implementation.

3.9 Conclusion

The analysis phase is the most considerable stage of project development; it helps in outlying of all the problems that are currently faced hence solving these problems by implementing a new system that can be a solution to all the challenges that are being faced at ZB Financial Holdings. The analysis phase helped the developer to engage in the analysing of the user requirements which helped in knowing the system needs which are to be met. After carrying out the analysis stage the analyst then proceed with the project development to the design phase. The design phase involves both the creation and the development of the system to be implemented at the ZB Financial Holdings.

CHAPTER 4: DESIGN PHASE

4.1 Introduction

This chapter delivers a summary of implementing change from logical to physical model clearly displaying how the new system is supposed to perform. The design phase gives a system perspective of the new system and this can be made possible by engineering configuration, interface plan, database and physical outline. The design phase takes a look at the system outline which includes setting both the dataflow and chart outlines for the new system. The charts outlines highlight the correspondence of all the activities that are occurring inside the system and also at the manner by which the system techniques flow. Furthermore, the design phase will also consider the intelligible and system summaries which can be demarcated by the use of diagrams such as the package, sequence and class diagrams.

4.2 System design

Mylopoulos (2002) explained it as a process which includes coming out with a practical way of effectively solve all the challenges being faced by putting into consideration all the user requirements from the current system. Satzinger (2002) argued that system design defines the components, interfaces and data in order to please the user specifications. System design has the main objective which is the convention of the new system specifications to the successful implementation of a model that effectively addresses the needs and wants of the users. This is because the delivering a system that meets the following specifications to the users is worth it:

Efficiency

End users always expect to make use of a system has an effective response time when processing the requests.

Maintenance

A system is considered to be effective and efficiency when it is capable of delivering a non-difficult situation to service. Thus, it must be elastic to the implementation of new features and upgrading so that it can ensemble the existing hardware and software platforms.

Consistency

End users' expectations are to make use of a new system that is reliable as far as risks of failure are concerned. The system must not always fail so that it can build confidence of the users.

4.2.1 Context Diagram

According to Kendall (2009) there is need of incorporating new entities so that the system can work more efficiently. The context diagram of the proposed system for ZB Financial Holdings and the processes are highlighted on the following figure

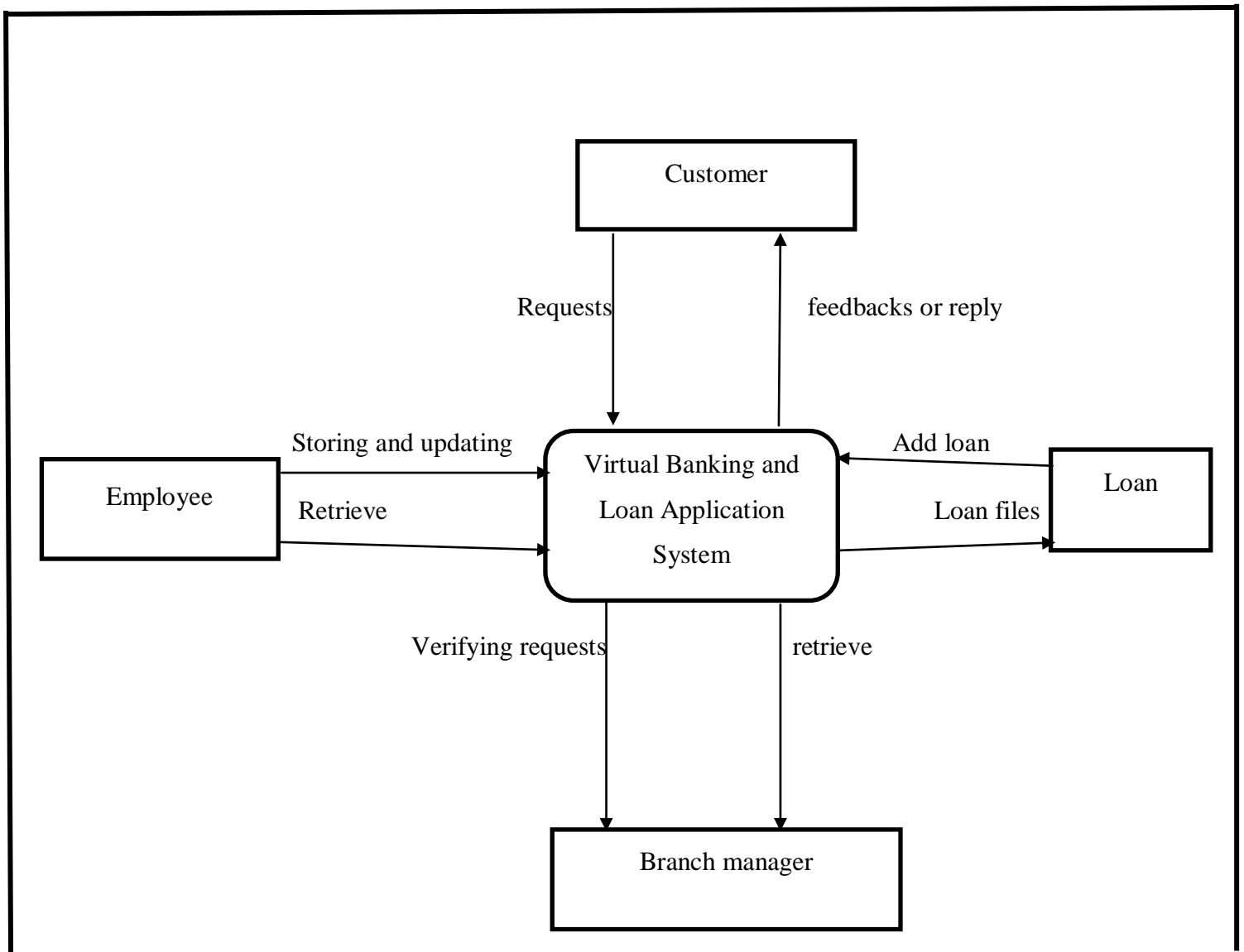


Figure 4.1 Context diagram

4.2.2 Data flow diagram (DFD)

Shelly and Rosenblatt (2012) states that a DFD provides an authentic model that is capable of displaying the capability of system deliveries. A DFD indicates the flow of information within an organisation.

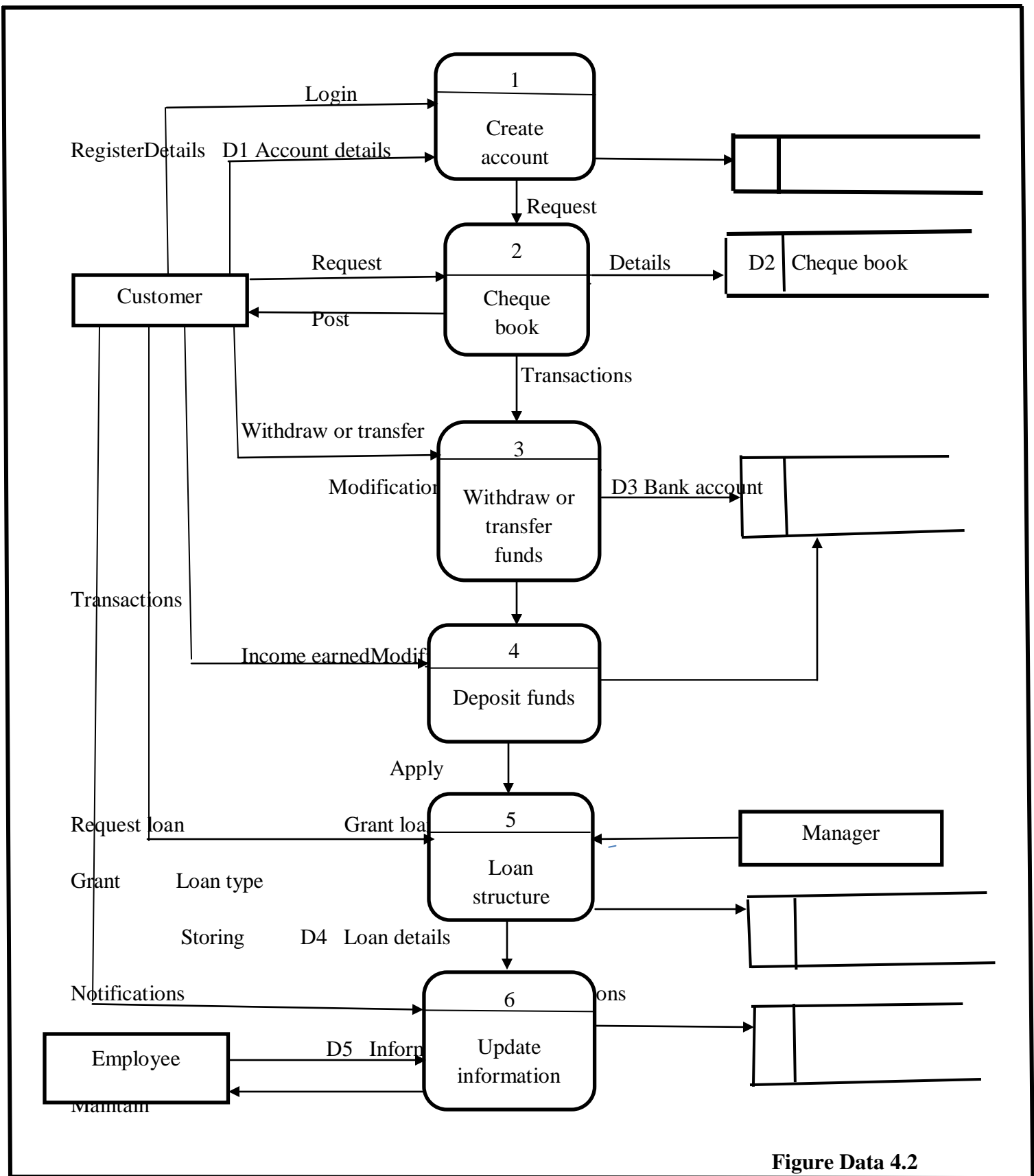






Figure Data 4.2

flow diagram

Table 4.1 Key for a DFD

Symbol	Meaning	Symbol	Symbol
	Process		Data store
	Entity		Data flow

4.3 Architectural design

Rosenblatt (2011) states that the technical platforms that each and every system is provided to debug on must be capable of recitation of both the logical and physical layout of the system as well as the hardware and software requirements, data, events and people involved. Pressman (2011) argued that architectural design speaks of the structure, information and projects sections that are gratified to the manufacturing of machinery built system. Architectural design shows the building of the system and the interrelationships that occurs in the design sections of the system.

4.3.1 Client- server model

According to Hemmendinger (1998) a client server model is a computing model that is distributed to enable client applications to request services from the server processes. Client and server runs on different computers that are connected on a network. The accessibility is done via a Personal Computer that provides an effective (GUI) Graphical user interface. Within a client server network there is a server which offer services to the clients who are the mainframes in a peer to peer relationships. The following diagram shows how client processors interrelate with the web server.

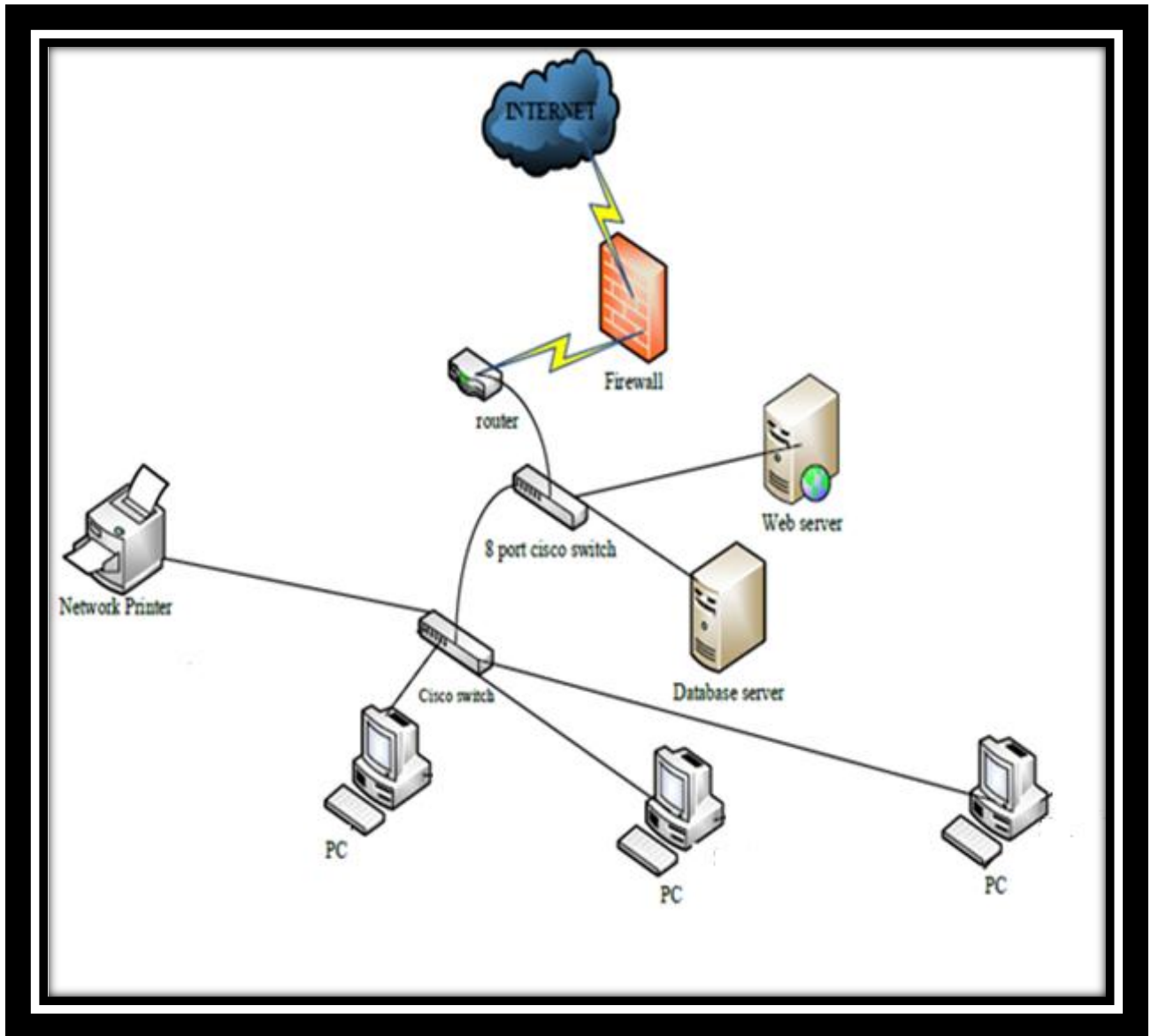


Figure 4.3 Architectural design

4.4 Physical design

According to Wixon (2008) physical design outlines both the hardware and physical devices of the new system, their arrangements and how are they going to be capable of communicating to each other. Bentley (2007) explained physical design as the conversion of user specifications to a new model. Physical design shows the collaboration among the hardware and software which are on-going on the development process. Computers of the ZB Financial Holdings will be connected to both the customer and database server so that they can store the company's' customers files.

The physical design architecture of the new system is shown on the figure below:

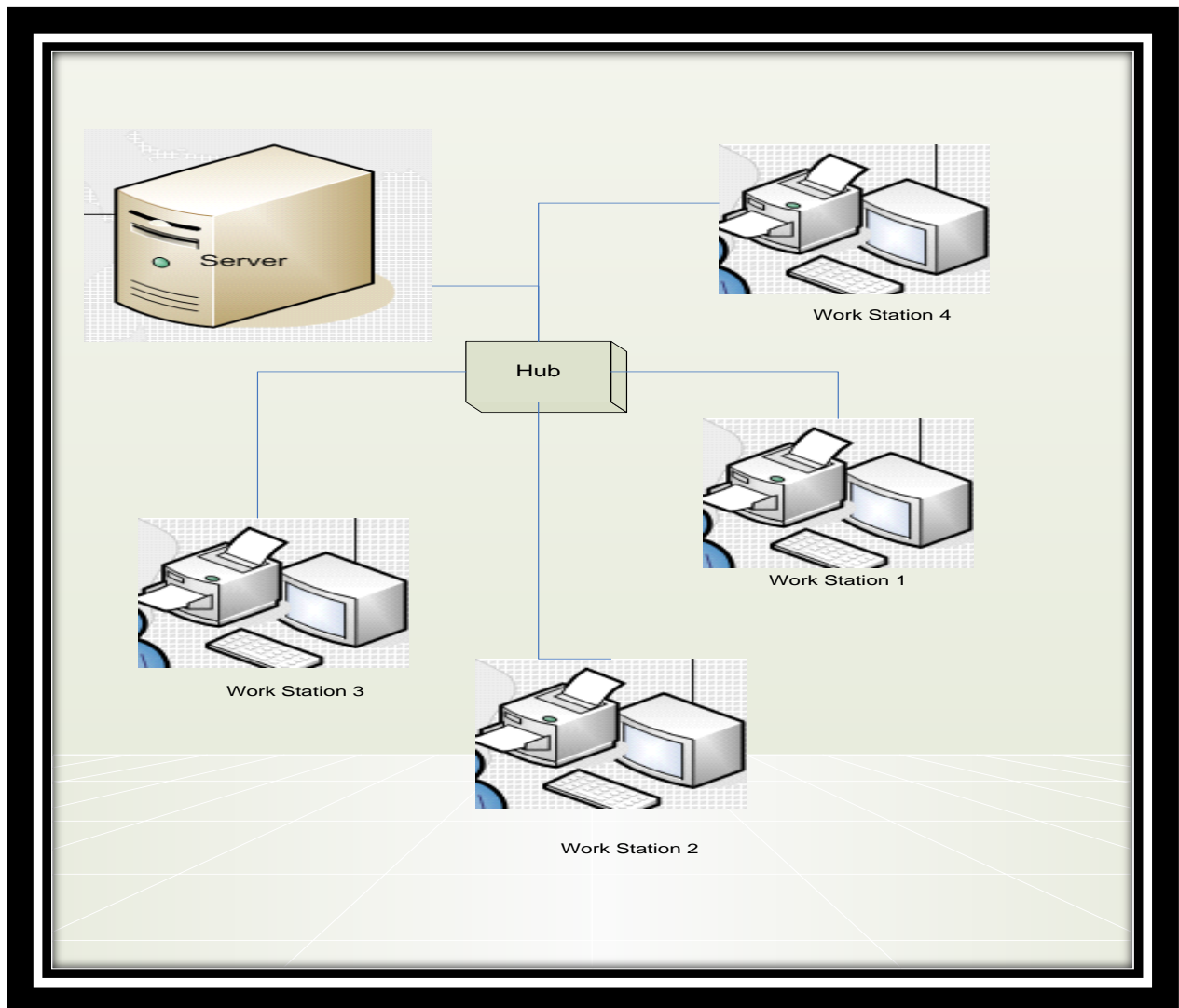


Figure 4.4 Physical design architecture

4.5 Database design

According to Kreines (2003) database design is the listing of terms and their data stores in the information. Database design involves drafting a database for the new system which is a foundation of system forms. The utilisation of MySQL was implemented because its accessibility as an open source software. The database projected for the ZB Financial Holdings reckoned how to give an assurance of information uprightness, consistence and impoverishment of information duplication.

4.5.1 Database architecture design

It is referred to as the prearrangement of information inside a database file. The data can be arranged in the form of schema. A schema is the explanation of the designing process of a database. In creating the new system ANSI SPARC database prototypical will be utilised.

ANSI SPARC three-level architecture

The model establishes a database as a three level building strategy and it is an imitation of a database which clearly shows how data or information is organized in the database layers such as external, conceptual and internal layers.

The figure below shows an illustrative analysis of database construction.

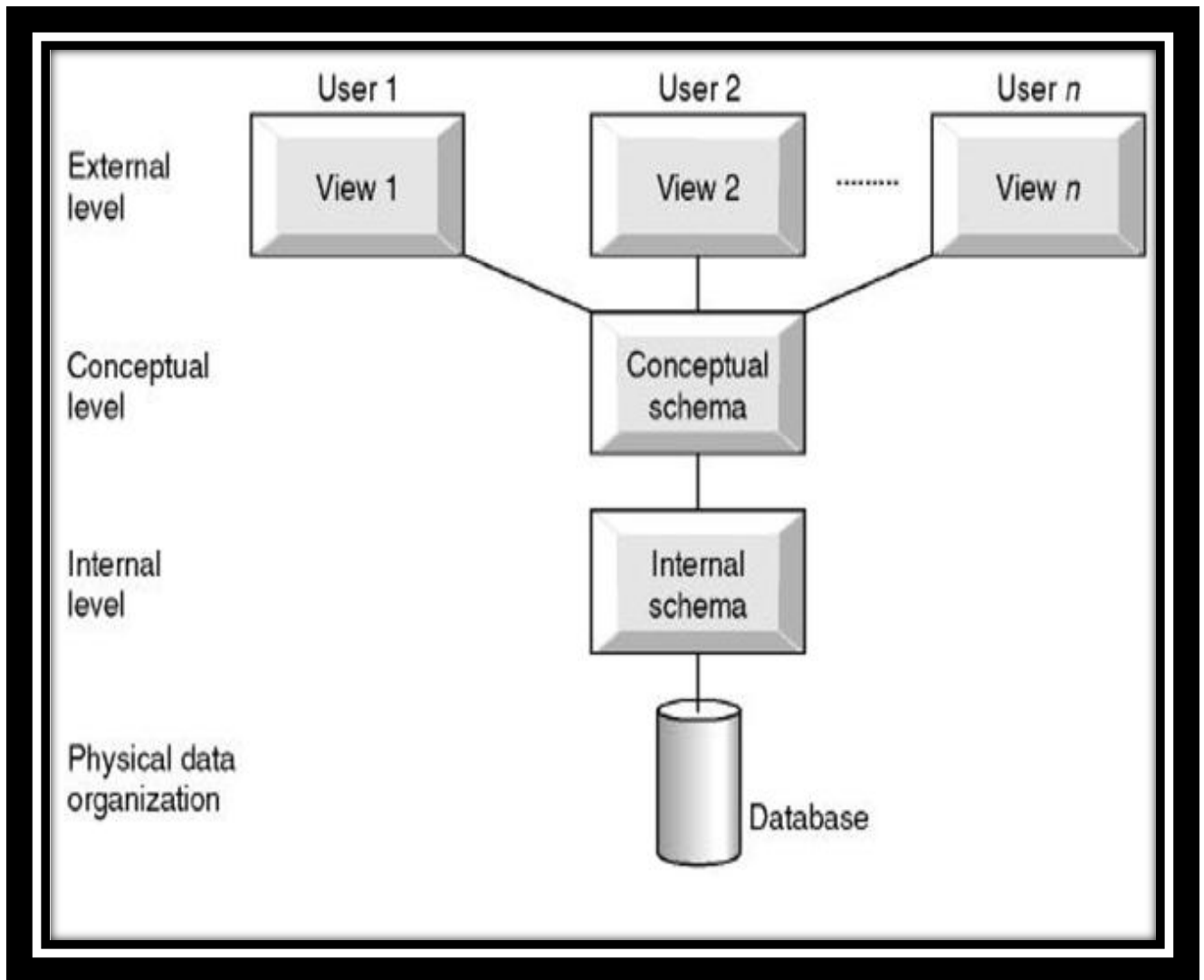


Figure 4.5 Database architecture of the new system

External level

This level validates the end users of the file and it designates the part of the data file that is pertinent to the users. This level entails of different outside views towards the database. Each end user inside this level has an interpretation of the real world that is described in the procedure that is relevant to the users at the ZB Financial Holdings.

Conceptual level

This conceptual level defines what and which data is to be warehoused in the database and all the relations that are taking place within the data. It covers the rational structure of the whole

database as clarified by the file administrator. This level characterises all the entities and attributes, associations, constraints, semantic, safety and reliability of information.

Internal level

This level is the bodily depiction of the data file or database on the processor and it designates how data is warehoused in the files. This level is largely alarmed on things such as the storing space and apportionment of data, records of descriptions, and record of placement, data compressions and data encryption techniques.

4.5.2 Tables design and attributes

The system developer pointed out that there is need for the construction of eleven tables which are shown in the following table together with their attributes. The following table is for creating a new user showing all the details that will be required

Table 4.1 Creating new user

Field name	Data type	Explanation
User_id	Int(15)	Exclusive identification of user
Username	Varchar(25)	Term that is used when login
Password	Varchar(10)	PIN of the customer
First_name	Varchar(25)	First name of customer
Surname	Varchar(30)	Last name of customer
National_id	Varchar(25)	National ID of customer
Tittle	Varchar(10)	Title of user
Sex	Varchar(10)	Sex of user
Date of birth	Int(25)	Date of birth of user
Account number	Varchar(30)	Account number of customer
Status	Varchar(25)	Status of customer
Country	Varchar(30)	Country of the customer
Town	Varchar(30)	Town of customer
Suburb	Varchar(30)	Suburb of customer
Address	Varchar(30)	Address of customer
Phone number	Int(15)	Phone number of customer
Security code	Int(10)	Security code of customer

The following table holds the details of Administrators' login details that he or she fills or complete when login into the system

Table 4.2 Administrator login

Field name	Data type	Explanation
Admin_id	Int(10)	Exceptional identification of administrator
Username	Varchar(25)	Name the administrator uses when login
Passwords	Varchar(25)	Password of administrator
Level	Int(10)	Rank of the administrator

The following Table holds the information of all the transactions such as deposits, withdrawals and cash transfers that the customer had carried out.

Table 4.3 Transactions made by the customer

Field name	Data type	Explanation
Transaction_id	Int(10)	Transaction unique identification
Account_from	Varchar(25)	The account number from which the cash is being transferred
Account_to	Varchar(25)	The account number which is receiving the cash
Date/Time	Int(15)	The date and time on which the transaction had been carried out
Deposits	Int(30)	Amount deposited in the account
Withdrawals	Int(30)	Amount withdrawal from the account

The following table the information about the currently borrowed loans from the company by the clients.

Table 4.4 Details of borrowed loans

Field name	Data type	Explanation
Loan_id	Int(10)	Loan unique identification
Member_id	Int(10)	Member unique identification
Salaryrange_id	Int(30)	Salary range identification
Instalments	Int(30)	Monthly instalments on which the loan is repaid
Total due	Int(30)	Amount to be repaid
Period	Varchar(25)	The period in which the loan was borrowed
Date of issue	Varchar(25)	Date on which the loan was borrowed
Status	Varchar(30)	Current status of the loan

The following tables holds the salary range values (from the start value to the end value) that can denote the type of loan an individual can be offered.

Table 4.5 Salary range values

Field name	Data type	Explanation
Salary_id	Int(10)	Salary unique identification
Start value	Int(30)	Starting salary value
End value	Int(30)	Ending salary value
Amount	Int(30)	Amount of loan offered
Category	Varchar(30)	Loan category

The following table holds the information of the assets that the customer possesses so that he or she can borrow a loan from the company.

Table 4.6 Customers' assets

Field name	Data type	Explanation
Asset_id	Int(10)	Asset unique identification
Registration number	Varchar(25)	Registration number of the asset
Value	Int(30)	The value of asset at hand
Type	Varchar(25)	The name of the asset

The following table holds the information of the asset revaluation that is carried at the company so that a net value of customers' assets after revaluation can be shown.

Table 4.7 Asset revaluation

Field name	Data type	Explanation
Asset_id	Int(10)	Asset unique identification
Member_id	Int(10)	Member unique identification
Registration number	Varchar(30)	Registration number of the asset
Value	Int(30)	Value of the asset after revaluation
Type	Varchar(25)	The name of the asset

The following table holds information of the problems and requests that are sent by the customers to the company from their geographical locations.

Table 4.8 Customers' problems/request to the company

Field name	Data type	Explanation
Request/problem_id	Int(10)	Request/problem unique identification
User_id	Int(10)	User unique identification
Problem	Varchar(100)	Narration of the problem
Status	Int(20)	Status of the problem

The following table holds information of the responses and updates of company news which are sent to the customers from the company to the customers.

Table 4.9 Company responses/updates

Field name	Data type	Explanation
Response/updates_id	Int(10)	Response/update unique identification
Issue_id	Int(10)	Issue unique identification
Reply	Varchar(100)	Response or news update

The following table holds information of the shares that are being sold by the company to the public.

Table 4.10 Company shares

Field name	Data type	Explanation
Share_id	Int(10)	Share unique identification
Share	Varchar(100)	Type of share
Price	Decimal(60,2)	Price of the share

The following table holds the information about the that both the admin and system had logged in and out of the system (system audit trail)

Table 4.11 System audit trail

Field name	Data type	Description
Admin_id	Int(10)	Administrator or management unique identification
User_id	Int(10)	User unique identification
Login time	Varchar(20)	Time logged in the system
Logout time	Varchar(20)	Time logged out of the system

4.6 Logical design

Sommerville (2004) defined logical design as method that is used to identify data groups and their associations within a database. It is the design of the entity relationship diagram for the new system. An entity relationship diagram has two types of relationships which are one to many and many to many and it explains the associations of the entities and attributes. Logical design helped the developer in the assessment of the data stored within the database.

4.6.1 Entity relationship diagram for the proposed system

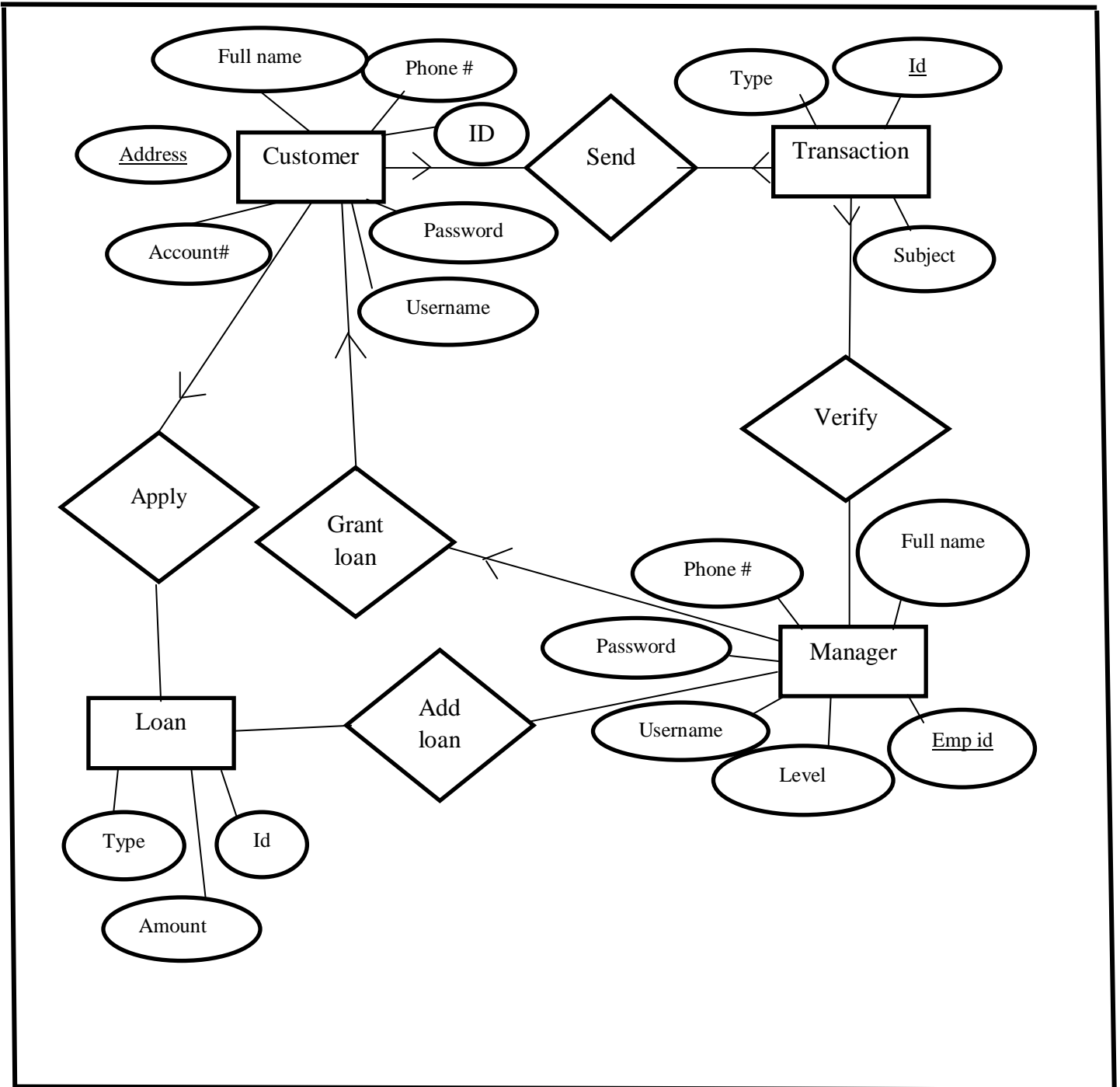


Figure 4.5 Entity relationship diagram

4.6.2 Enhanced Entity relationship diagram

According to Mylopoulos (2002) an EER diagram is the relationships that exist between the entities and inheritance of the attributes within the system. The figure below shows the enhanced entity diagram of the ZB Financial Holdings.

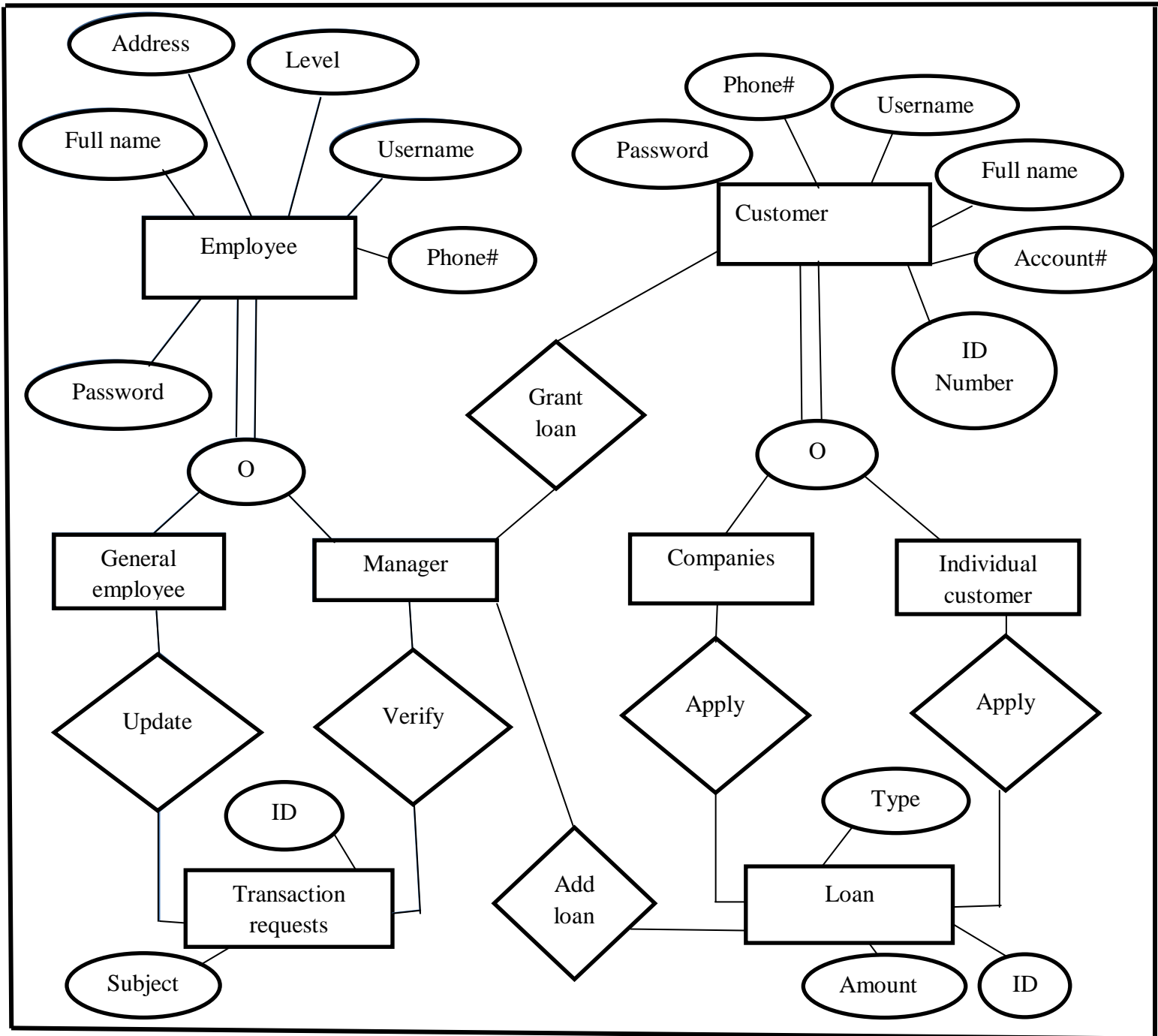

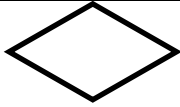




Figure 4.6 Enhanced entity relationship diagram

Table 4.14 Entity relationship diagram and Enhanced entity relationship diagram key

Symbol	Denotation	Symbol	Denotation
	Attributes		Relationships
	Entity		Sequence of relationships

4.7 Program design

Schmidt (2006) states that program design involves the stages that the system programmer must complete before commencing on the coding process. Program design includes designing of the system modules and how they network with end users. It includes class, sequence and package diagrams.

A good program design can be characterised as:

Reusability

The programmer must code a program that can be used in different projects

Extensibility

The programmer should design a program that is capable of adding or removing elements without causing any malfunctions to the existing system

Easy to maintain

The code must be easy to update, the programmers must be able of find the changes of the code and implement the updates at the right time.

Minimal complexity

There should be minimal complexity in the system to enable the developers to maintain and upgrade the system effectively.

4.7.1 Package diagram

Anderson (2002) recommended that package drawing aids in the segmental creation of a system that shows the breakdown of the proposed system specifications and connections among them. Amber (2005) explained that a package diagram enables the moulding together of the system classes and groups. It shows the dependencies that exist between the sub-systems. The following diagram shows the package diagram of the ZB Financial Holdings' proposed system showing all the interrelated components.

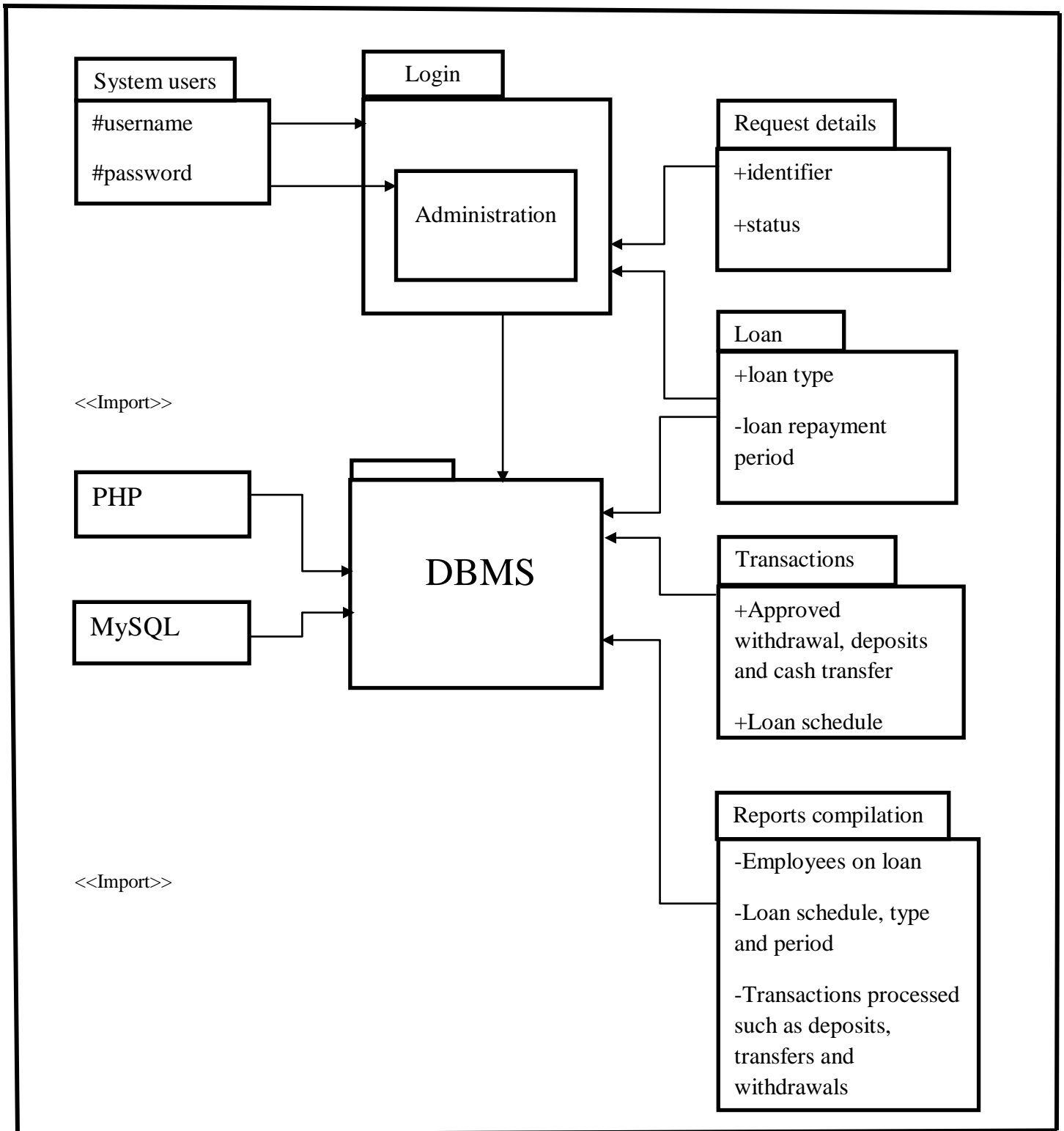


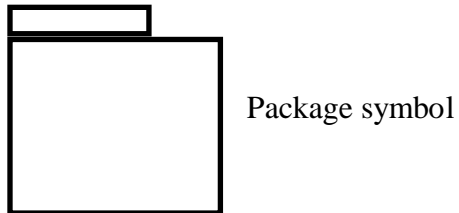
Figure 4.7 Package diagram

Package diagram key

+ Community attributes

- Secluded attributes

Secured attributes



<<Import>> Reliance

4.7.2 Class diagram

According to Chitnis (2003) a class diagram is described as an entity that is concerned with the expressing of both the system state and its behaviour. Class diagram provide a system overview by clearly showing all the classes and the co-relationships that exist among them.

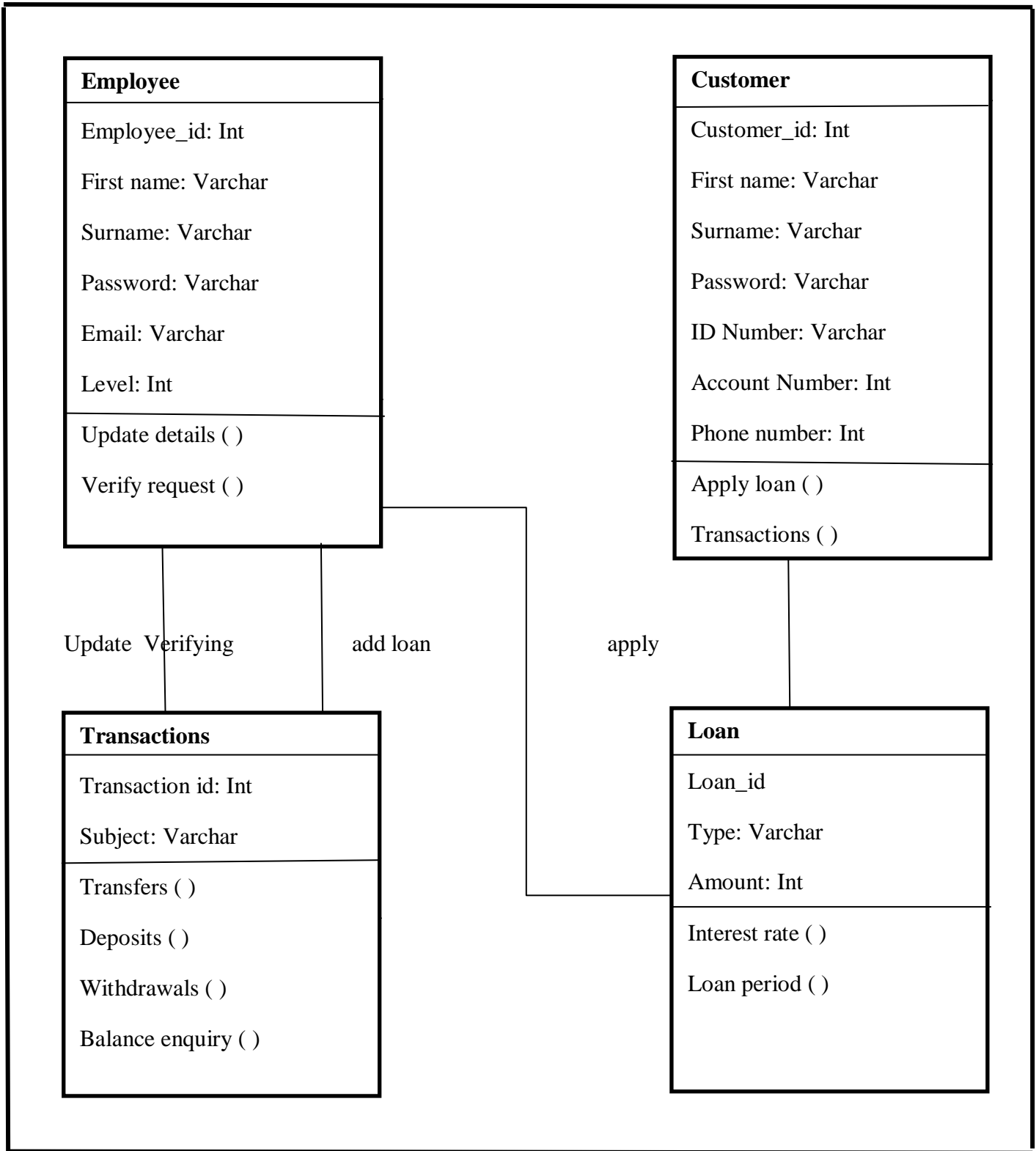


Figure 4.8 Class diagram

4.7.3 Sequence diagram

Bentley (2007) argued that a sequence diagram shows the collaborations that exists within the system objects. The following figure shows the sequence diagram for the ZB Financial Holdings' proposed system.

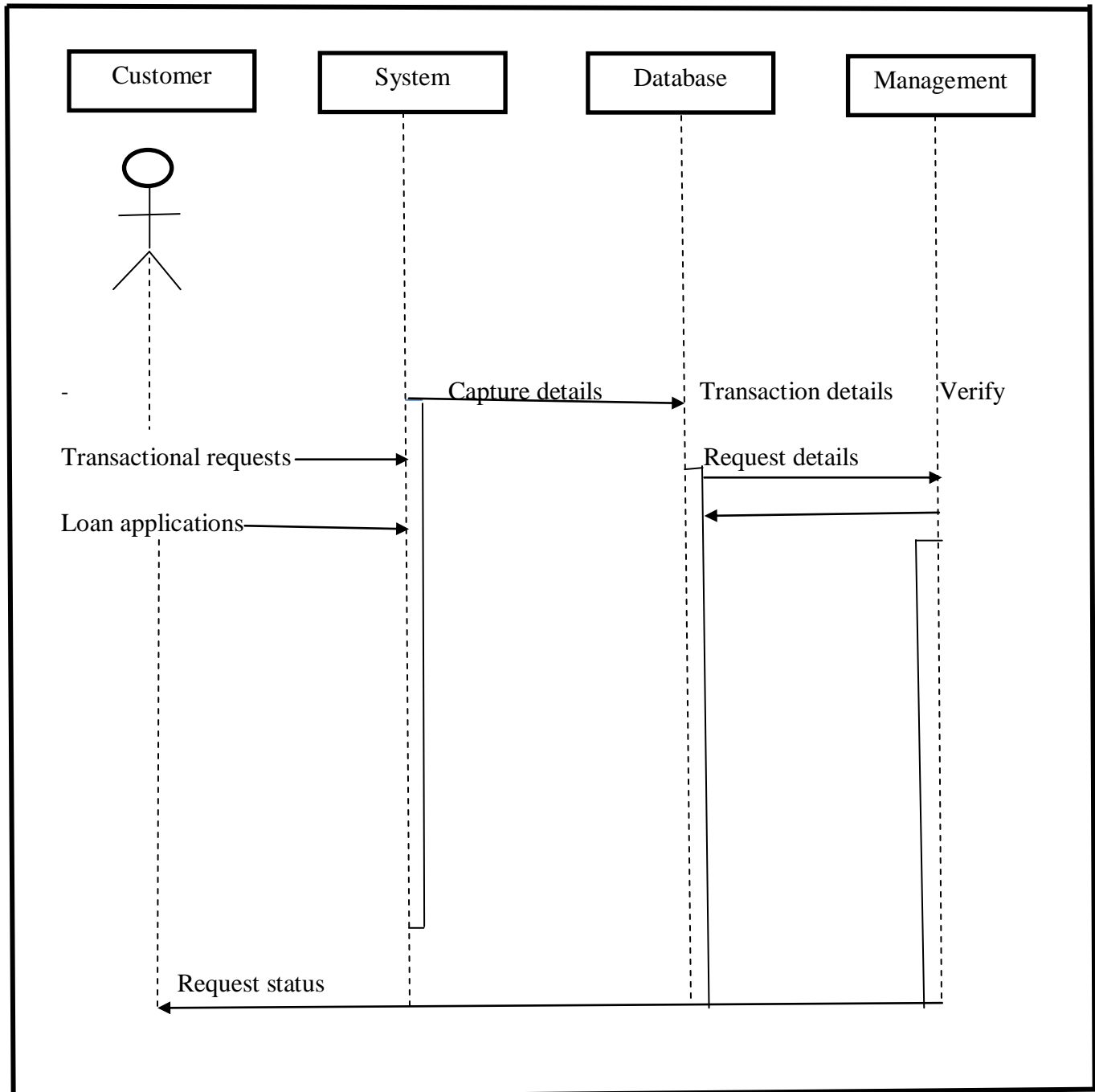


Figure 4.9 Sequence diagram

4.8 Interface design

According to Moggridge (2002) interface design is referred to as a graphical control that the user will interact with during the system development process. It outlines the designing of forms and the forms must provide an effective graphical user interface that is friendly. Interface design

involves the creating of programs that helps the user to interact with the hardware and software components. The project developer will be able to outline the menus and the forms that the user will use when performing the viewing of inputs and outputs. Sommerville (2004) argued that for an interface to be effective it must meet the following factors:

Minimal surprise

The users of the system must never be surprised by the behaviour of the proposed system

Recoverability

The interface must allow users to recover the errors that occurs, it must include some mechanisms which facilitates error recovery

User guidance

The interface should be capable of providing feedbacks in case of error occurrence and also some help facilities for the users

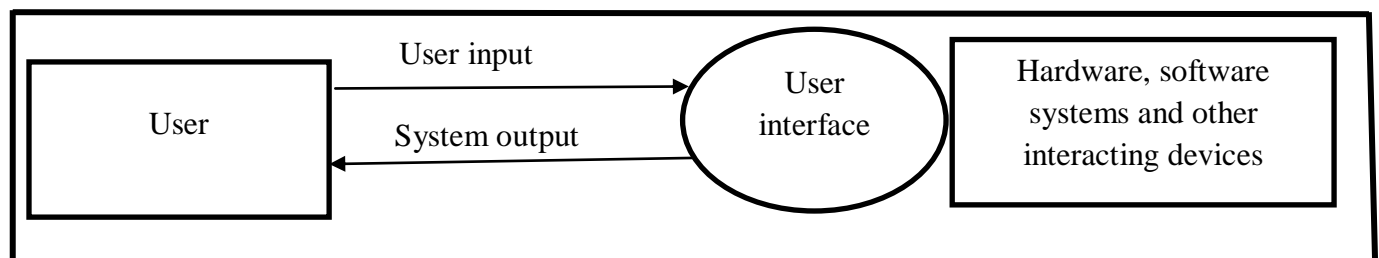


Figure 4.10 Interface diagram

User friendly interfaces are at core of providing an effective interaction of all the activities that users deems necessary to perform. System interfaces must be friendly to the users to counter all the difficulties that can occur during system operating.

At ZB Financial Holdings there will be for different types of users which are the administrator, management, employees and the customer. The main entities are the customers, employees and the management since they will be the ones in full contact of the system. The administrator will have the privileges of viewing the whole system modules.

The figure below shows the functional structure for the management

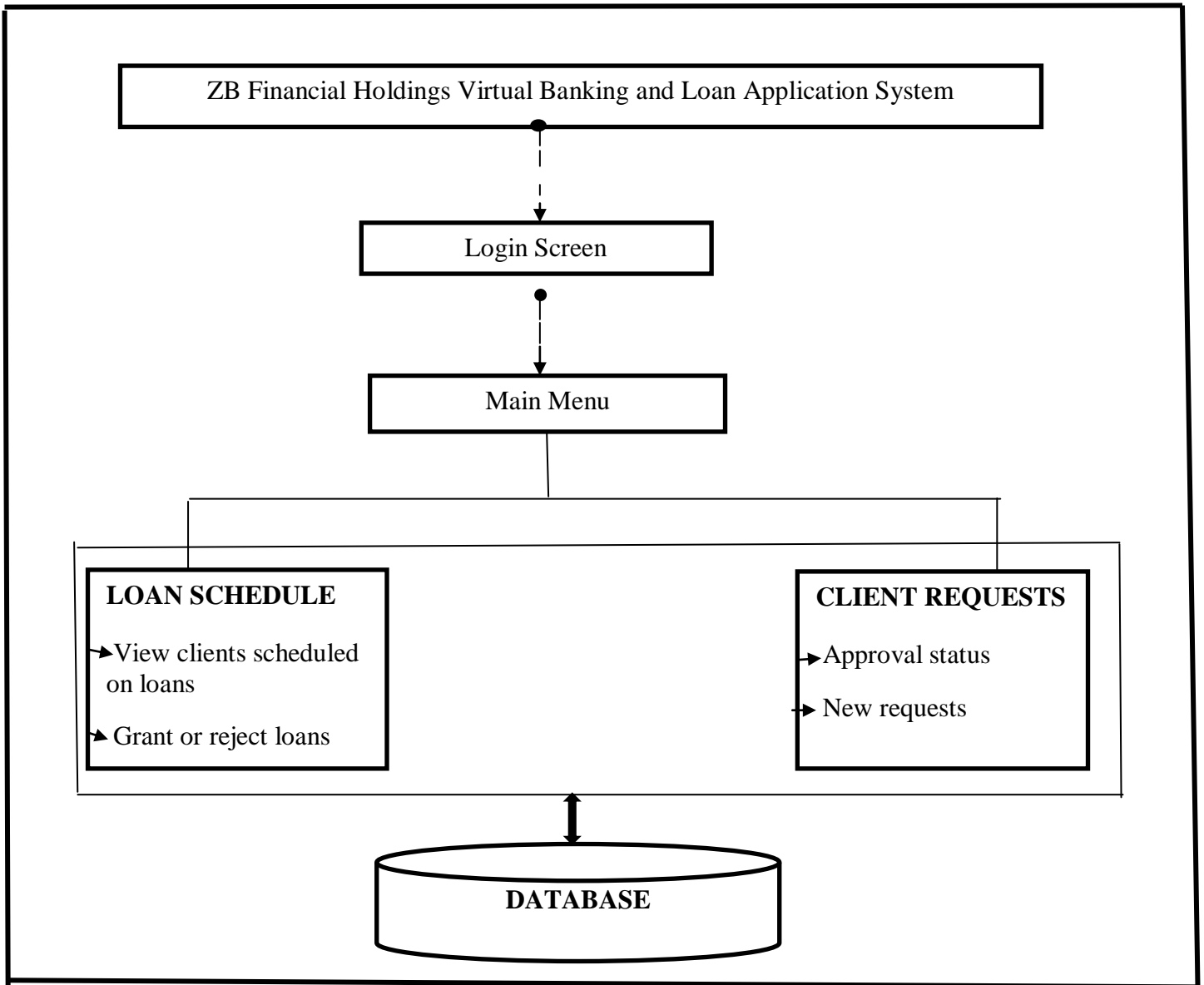


Figure 4.11 Functional design structures for the Management

The following diagram shows employees' navigation menus with the new system

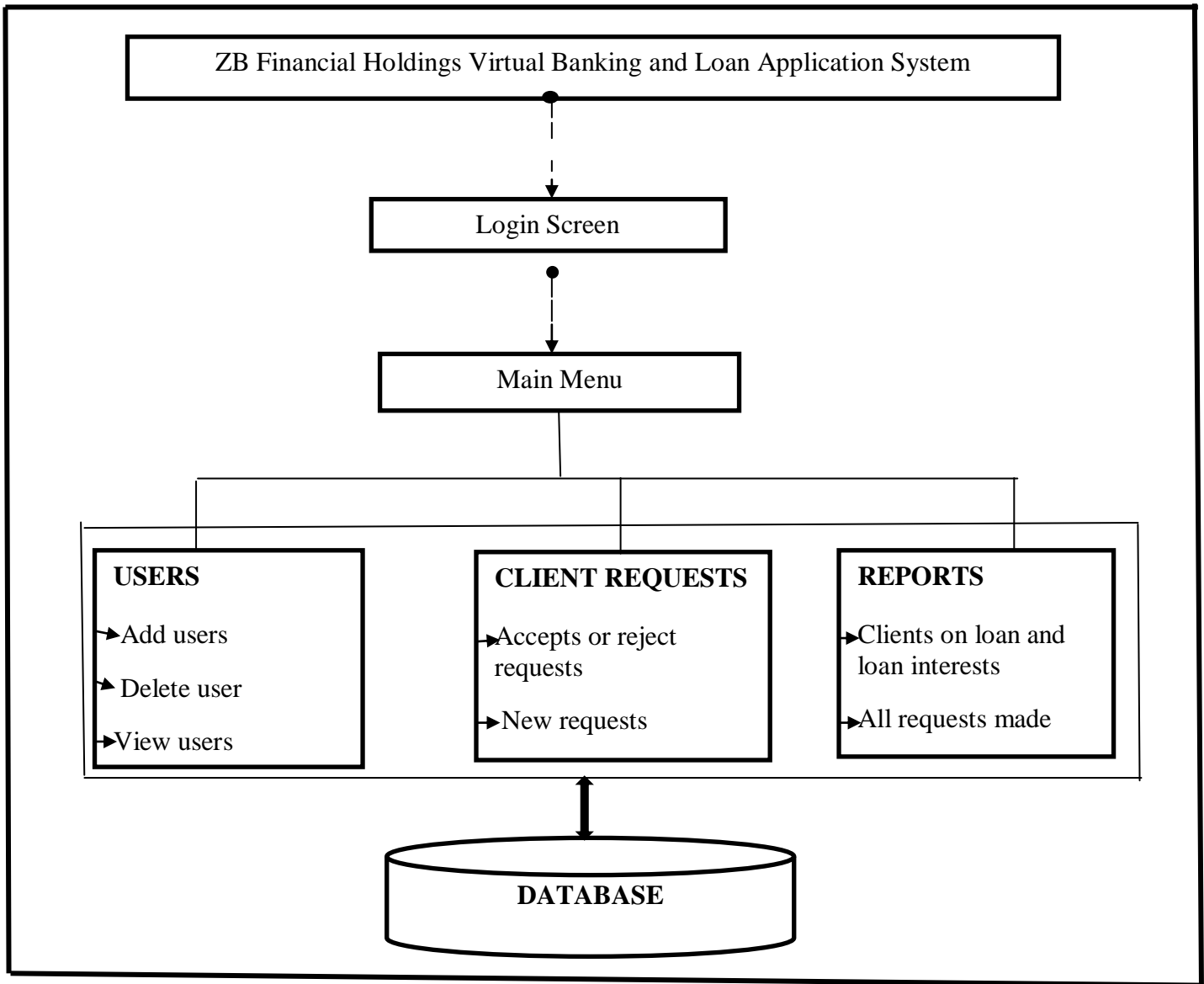


Figure 4.12 Functional design structures for the employees

The following figure shows the navigation menus of the system administrator of the ZB Bank

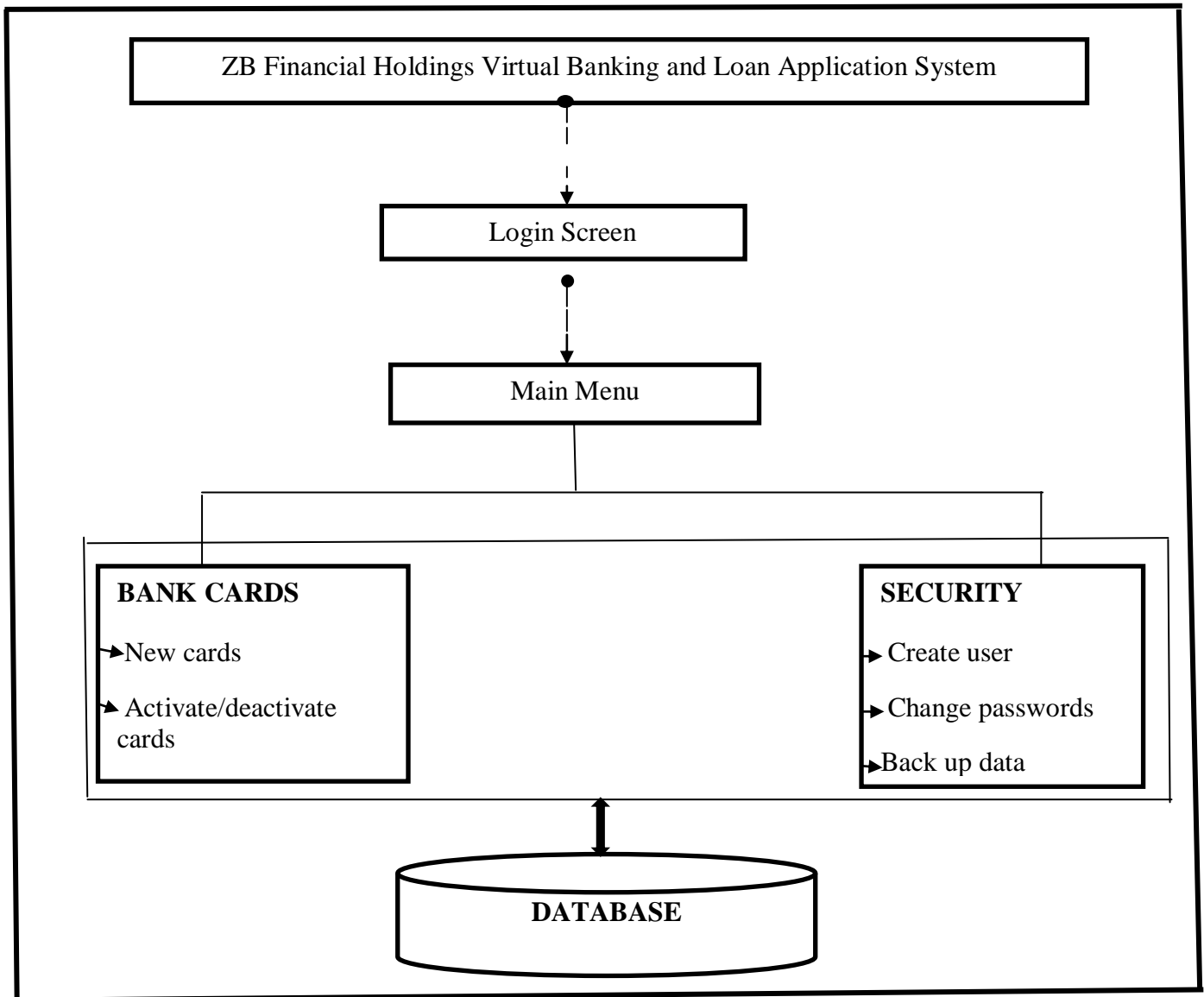


Figure 4.13 Functional design structures for the system administrator

The following diagram shows the navigation menus of the ZB Banks' customers of the new system

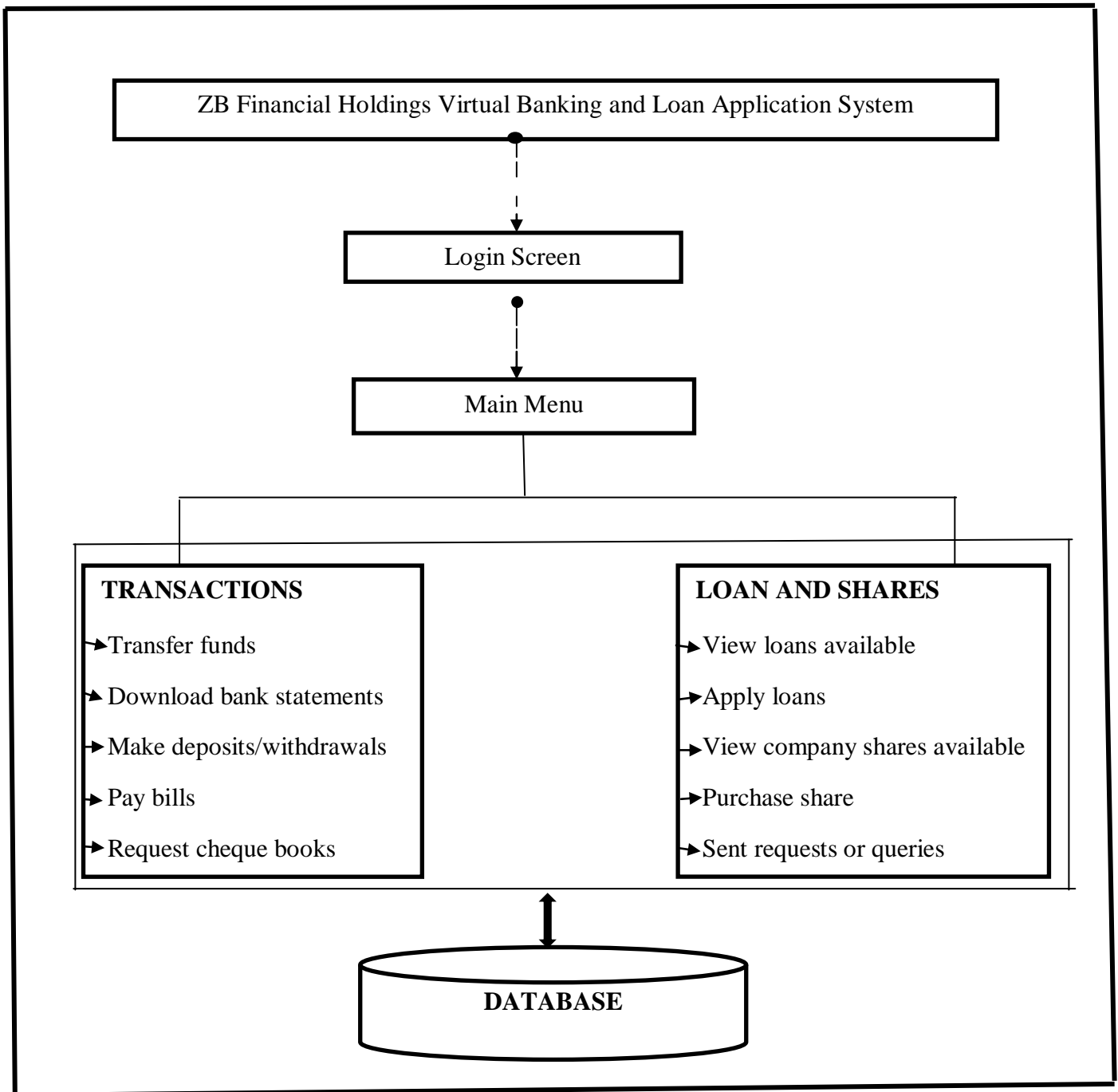


Figure 4.14 Functional design structures of the customers

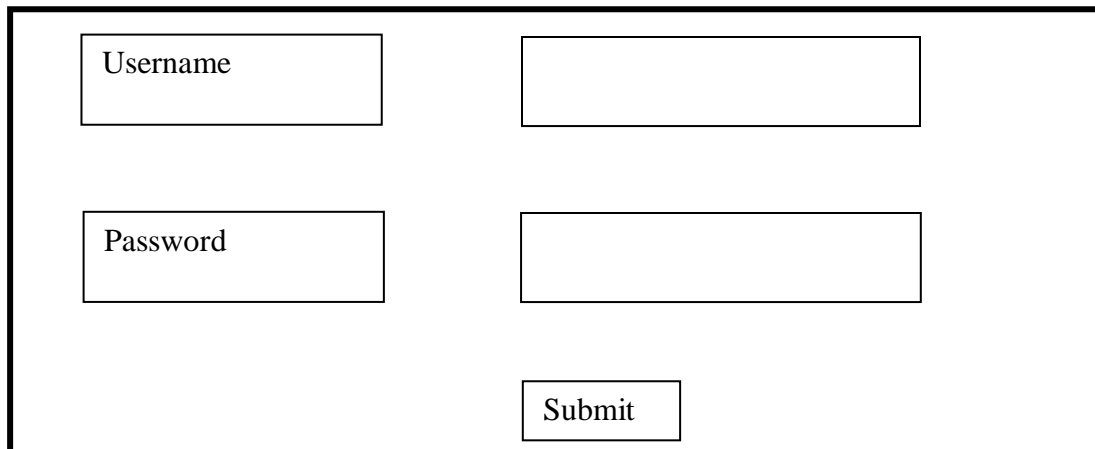
4.8.1 Input design

The system menu will have an option for user login which will enables the user to enter username and passwords to access the system. After entering the correct username and

passwords the user can be able to view the main menu where he or she can select the execution task.

Log in form

The user can enter his or her correct login credentials so that they can access the system.



The diagram shows a login form enclosed in a rectangular border. It contains three input fields and one button. The first row has a label 'Username' in a box on the left and an empty input box on the right. The second row has a label 'Password' in a box on the left and an empty input box on the right. The third row has a 'Submit' button centered below the input boxes.

Figure 4.15 login form

Add new employee

This is where the administrator add new staff so that they can have access with the system

The form is enclosed in a black rectangular border. It contains five input fields and one submit button. The fields are arranged in two columns. The left column contains four fields: 'Username', 'Password', 'Confirm password', and 'Level'. The right column contains three fields: an empty field, another empty field, and a third empty field. The 'Submit' button is centered at the bottom of the form.

Username	
Password	
Confirm password	
Level	
Submit	

Figure 4.16 Creating new staff user form

Loan application form

This new customer register their details with the company so that they can be able to carry out the transactions such loan applications and cash transfers just to mention a few.

Customer_id	<input type="text"/>
Full name	<input type="text"/>
Loan type	<input type="text"/>
Date	<input type="text"/>
Assets	<input type="text"/>
Salary	<input type="text"/>
National ID	<input type="text"/>
Sex	<input type="text"/>
Phone number	<input type="text"/>
Account number	<input type="text"/>
Submit	

Figure 4.17 Loan application form

4.8.2 Output design

It gives an overview of the outputs of ZB Financial Holdings Virtual Banking and Loan Application System in the form of reports that both the management and the shop flow workers will view. The output design of any system should be readable so that the users cannot face any difficulty when using the system

The following diagram that shows how the new system will give a screening of results that are designated for viewing.

username	Password	Level

Figure 4.18 Report of new added employee

The diagram below shows how the system reports of the customers who have created an account will be outputted

Customer_id	Full name	Loan type	Date	Assets	Salary	Account number	Phone number	ID Number

Figure 4.19 Report of customers who applied for loans

4.9 Security Design

According to Moggridge (2002) system design is defined as a collaborative effort that is implemented to ensure the system security applications that are required. The system developer must review or identify the database and the server applications to ensure that they are secure. Ashland (2002) argued that security design has been put in place to prevent damages that are found on the data. The ZB Financial Holding Virtual Banking and loan application system to be implemented effectively it must have both physical security and software security.

Physical security involves the physical locks, log in books and equipment that are used to control fire within the company. The server room must always locked or there is need of implementing the biometric systems such as finger print scan within the server room. This can protect the data and all the hardware equipment.

Software security measures are put in place to secure the data of the company. The following are the software security designs that were put in place at the ZB Financial Holdings for data security:

Audit trails

Used to track back the operations of a user and they are designed track the data manipulations that can exist at the company system.

Username and Passwords

The users of the Virtual Banking and Loan Application System will be assigned with some profiles that provides authentication on their username and passwords to restrict data access by unauthorised people.

Access Passwords on the database

The access to the data on the server must be strictly limited to the ones who hold the password to the server. The operations of the users on the server must be determined by the access levels that the end user has been assigned. This can protect the company data at the right time and at the right place.

4.10 Pseudo Codes

According to Synergy (2001) a pseudo code is a structured algorithm that shows the logical operations of a particular system. The pseudo codes of the Virtual Banking and Loan Application System were compiled in English and their compilation was made possible by the use of PHP statements, Java Scripts and Hypertext mark-up language. The following pseudo code exists at the ZB Financial Holdings' Virtual Banking and Loan Application System:

Logging in

To login in into the system the following are adhered to:

Open link for the system

Enter approved identification

Connect to database folder

Checking the details

If true are entered then login successful

Fresh session automatically created

Else if incorrect details inputted

Then reload the page

End if

Add user

Click on create new staff user icon

Input user particulars

Select user access level

Validation and verification

If details are correct

Automatically connect to the database files

Then new staff user is successfully added to the system

Else show validation of users' particulars has failed.

End If

Create request

When a customer makes a transaction or applies for a loan he or she completes the following:

Validate customer particulars

If validation is accurate

Then automatically connect to database files

Enter the request, applications or transactions

Print request successful send

Else

Output message error

End if

The pseudo code enables the system analyst to manage and completely understands how the instructions are supposed to relate and also the documenting of system errors can be made easier.

4.11 Conclusion

The developer was able to come up with the interface of the proposed system since system designing was carried out in the design phase. The flow of activities within the new system was designed to provide highest levels of assistance in the coding and construction of the new system. The design phase explained the information gathering techniques which were made possible by asking and observing the end users' views towards the new system. The end users' views helped in the designing of both the input and outputs mechanisms of the new system and to prevent software crisis which can be caused by delivering the system that fails to meet end users' expectations. The accomplishment of the design phase flushed a green light of proceeding to the implementation phase. The implementation phase involves the installations, carrying out system tests and coding. The next stage will clearly highlight on how the new system will be integrated into ZB Financial Holdings' Virtual Banking and Loan Application System

CHAPTER 5: IMPLEMENTATION PHASE

5.1 Introduction

This chapter gives a detailed highlight of how the proposed system will be integrated into ZB Financial Holdings Virtual Banking and Loan Application Systems. Shaw (2012) defined Implementation as the realization of all the technical requirements or specifications, software components and program algorithm by the use of programming languages and deployments. Implementation phase will highlight on the actual coding of the system which can be carried out basing on the proposed system output design. The coding of the new system will be carried out using the top-down technique. The modules within the design segment will be identified, followed by the conversion methods and the decision on which method to adopt will be made. The implementation phase encompasses of testing, implementation, software maintenance, system coding and end user training programs.

5.2 Coding

According to Synergy (2001) coding is the process of converting program logic into a set of commands that are installed and executed by a computer. Coding process is when the system is programmed using a compatible programming language so that it can be capable of delivering all the functionalities that are specified during the system analysis stage. Data dictionary elements that are specified during the designing of the database are then plotted into the tables that are applicable. The system functionalities were developed in the form of modules which are then combined into a working system. Database connection was made so that the system will be completely functional as some of the operations that are executed require a high degree of information retrieval from the database. The actual code of the Virtual Banking and Loan Application system will be shown on the appendices.

5.3 Testing

According to Quadri (2010) software testing is merely the process of verifying and validating the software program with an objective of identifying whether the system meets both the business and technical specifications or not. Software testing is carried out to check if the system is working towards end user expectations and to check whether the system is effectively capable at identifying errors. Quadri (2010) further argued that software testing has some goals which are verification and validation thus, testing as a quality control techniques that are used to verify

whether the right product is implemented at the right time at the right place. Software testing must be capable of revealing system flaws or errors to yield out a recommended quality level. The following figure shows the testing procedures that are to be carried out.

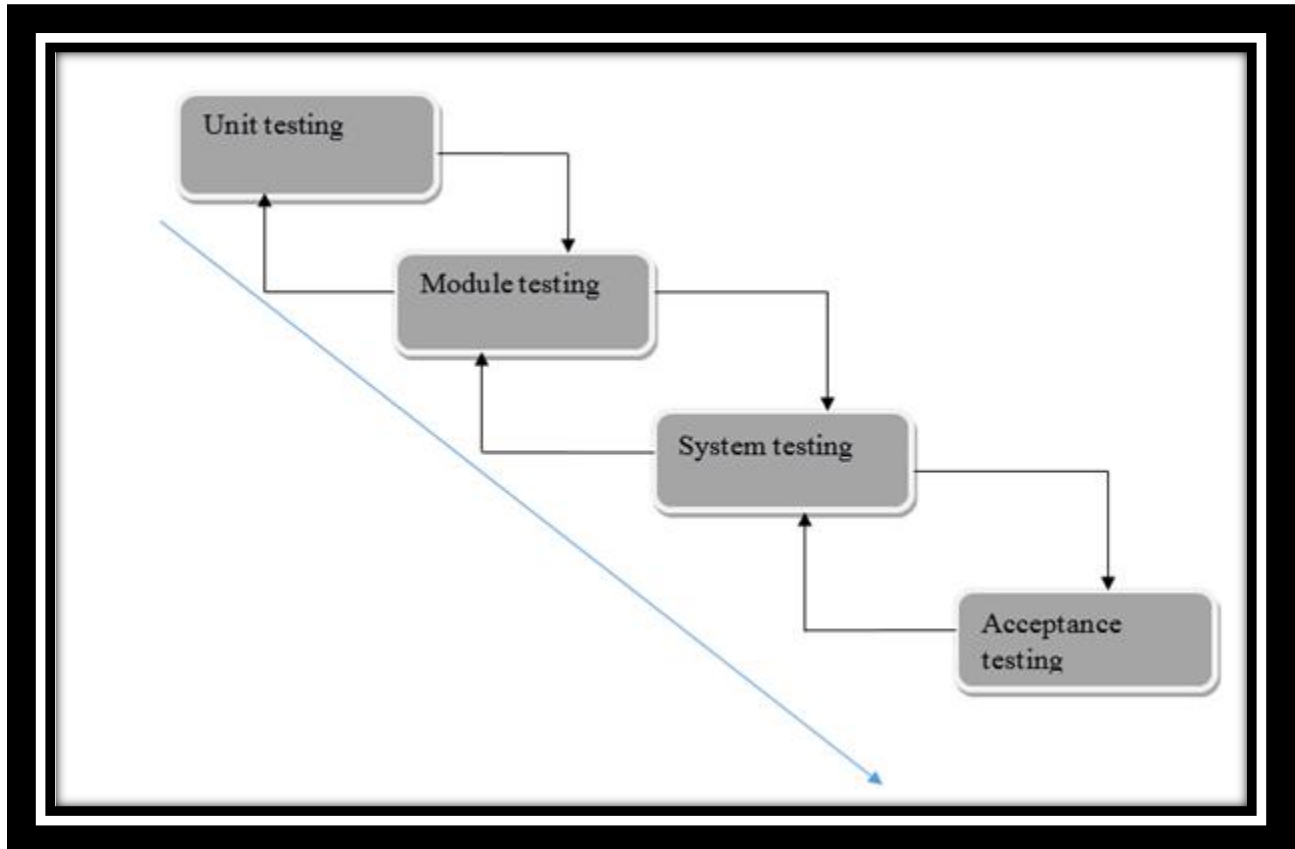


Figure 5.1 Testing process

To effectively implement the testing process the analyst made an effective choice of implementing both the black box (Functional testing) and white- box testing (logical testing).

Black box

According to Williams (2006) black box testing is set of resources or inputs that completely maneuvers the system specifications of the company. Black box testing emphasizes on the software functionality and it is mainly used to enable the analyst of the ZB Financial Holdings to identify the system errors such as initialization and interface errors and incorrect functions. The system developer of the ZB Bank can implement this strategy on unit and acceptance testing.

Advantages of black-box testing

Since software tester and the designer are independent to each other, the testing process can yields unbiased test results. There is no need for the tester to have a detailed know-how of any programming language since tests carried out using the black- box technique are cheaper.

Disadvantages of black-box testing

It is very unrealistic to test each and every input stream and that the black-box testing technique requires a well-trained or experienced designer since the test cases are very difficult to design.

White-box testing

According to Patton (2003) white box testing is simply a thorough review of the interior logic and the system code of any project. Williams (2006) explained white box testing as a case design strategy on which the software test cases are obtained from the detailed knowledge of the project construction. White box testing is mainly used to carry out unit testing.

Advantages of white box testing

There is room for the software tester to effectively inspect the interior of the box after the test had been carried run. This can be important since the developer can be able to ensure that the interior information is either in correct state or not irrespective of correct or incorrect output.

Disadvantages of white box testing

Since a detailed knowledge of the code and the internal state of the system is a necessity there is need for a well skilled tester and this can make the testing process to be very expensive.

5.3.1 Unit test

According to Mishra(2004) unit testing as a test that is carried out to validate on what the unit does to meet its functional specifications and whether the units' implementation structure meet the specified design. Unit testings' main objective is to remove the system errors and to validate that the end users are well satisfied by the system outputs. White box testing was carried out by the system developers to identify whether the system has a capacity to enable the customers of

the ZB Bank to carry out the banking transactions such as cash transfers, withdrawals, deposits and loan applications. The tests results enable the developers to implement some improvements on the system and this shows that the test has been completed.

5.3.2 Integration test

According to Mishra (2004) integration testing is carried out by combing the user modules from both the module and integration stages into a group. Integration stage is carried out to integrate the modules together to eliminate errors or bugs that can occur on the system. Software testing can be carried out in two different ways which are the base up and the top to down strategies. The base up strategy testing commences with unit testing where system modules are continuously tested. The top-down strategy tests the system modules in descending order where the largest modules are tested first, followed by the lower level system modules. Therefore the base up or the top to down technique was employed because it commences with the smallest modules. This is important since there is less demand of ID slips from the modules.

5.3.3 System Test

According to Sommerville (2004) system testing is implemented to carry out an assessment on the company system to check whether it performs towards end user specifications. The system functionalities are tested towards the end to end point of view. To obtain effective system test results must be carried out by a free group that can give both neutral and unbiased data. System testing for the ZB Financial Holding Virtual banking and loan application system was carried out by the experienced team from TBN Software solutions from Harare. After carrying out the tests the system developers managed to make some updates on the two modules were malfunctioning in meeting the non-functional necessities of the end users.

5.3.4 Acceptance test

According to Luo (2001) acceptance testing process is carried out when the system developers hand over the system to the end users. Acceptance testing boost up end user confidence since they be deployed a system which has prerequisite features that are operating correctly. The system designers carried out acceptance testing to determine whether the end users are impressed with the system or not. End users can be able to make some recommendations which the system developers can incorporate in the final system.

5.3.5 Verification and validation

Verification is primarily concerned with the construction of the model right. Shelly (2001) argued that verification possesses the questions such as is the right program installed in the machine and that does the model effectively addresses the available problems. Tran (2009) explains that validation provides to the questions such as is the right software being constructed? Validation is mainly carried out to determine whether the software being developed meet the system and end user requirements and the objectives. Validation was carried out on the acceptance testing process and verification was done on both the unit and mix testing strategy. Both validation and verification where used in the system testing process. The following figure shows how data is validated when the end users input data into the system. The system rejects the entering the data with erroneous format and to alert the user where he or she has inputted wrong details a message is shown.

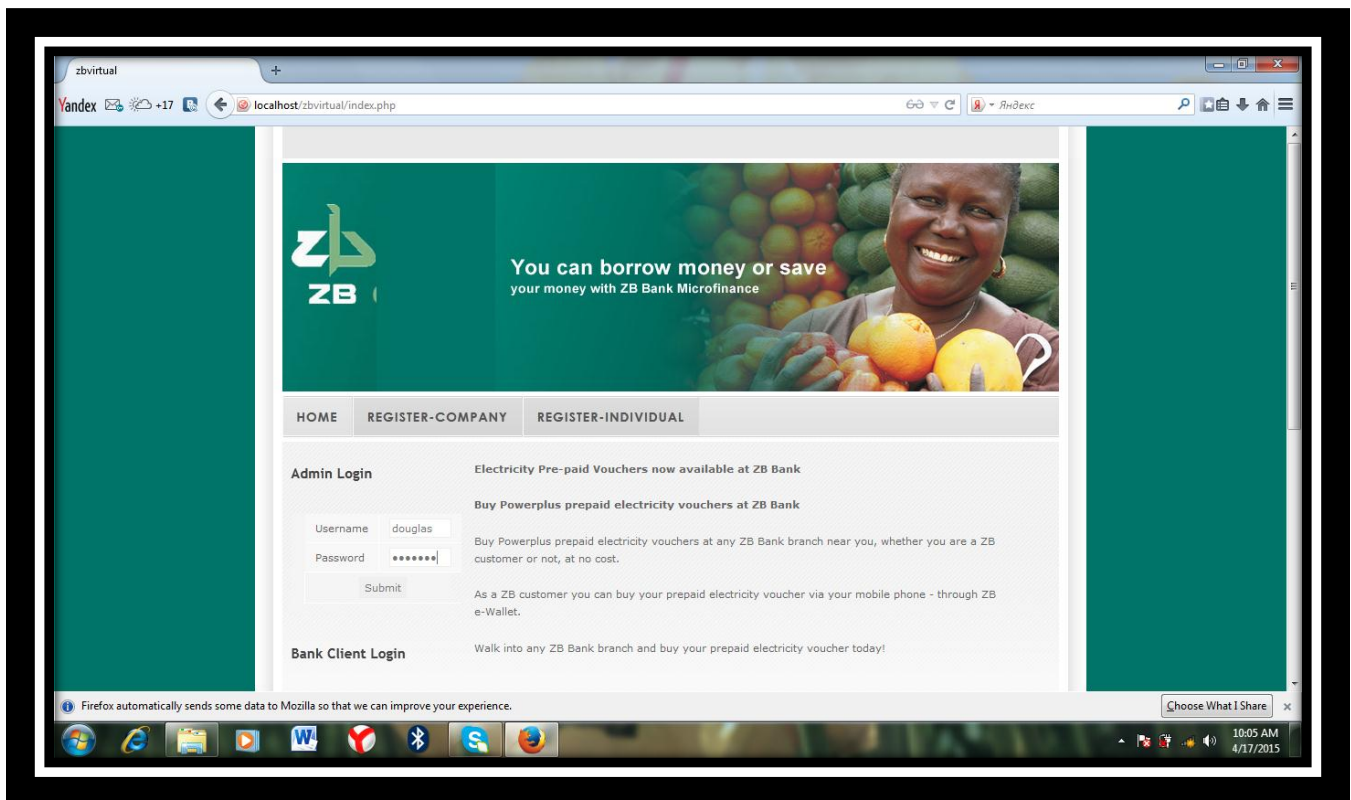
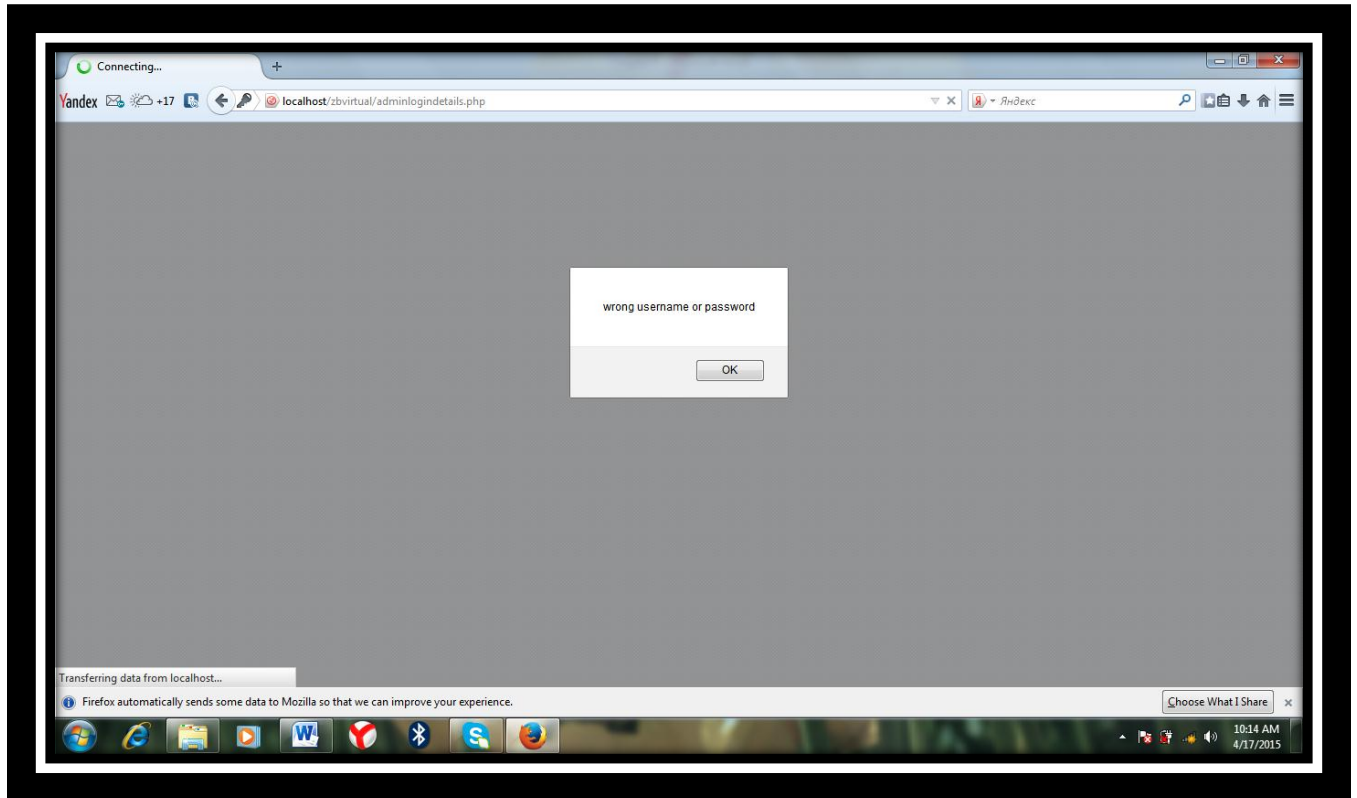


Figure 5.2 Customers and admin login form validation

When the company admin and the customers have logged into the system and input either wrong username or password and proceed to clicking the submit button. The following message is outputted by the system



When the customers want to register their details with the company so that they can be able to carry out their banking transactions the following form will be displayed for them to input their details.

The image shows a web form for account creation. It consists of several input fields and a submit button. The fields are arranged vertically and are as follows:

- Username:** A single-line text input field.
- Password:** A single-line text input field.
- Confirm Password:** A single-line text input field.
- Company Name:** A large multi-line text area.
- Account Number:** A single-line text input field.
- Country:** A single-line text input field.
- Address:** A large multi-line text area.
- Phone Number:** A single-line text input field.
- Security Code:** A single-line text input field.
- Picture:** A file upload field containing a "Browse..." button and the text "No file selected."

At the bottom right of the form is a "Submit" button.

Figure 5.3 Account creation form

The following figure shows the notifications of errors that the system users can preview when he or she doesn't enter any detail in the system fields whilst they wish to progress.

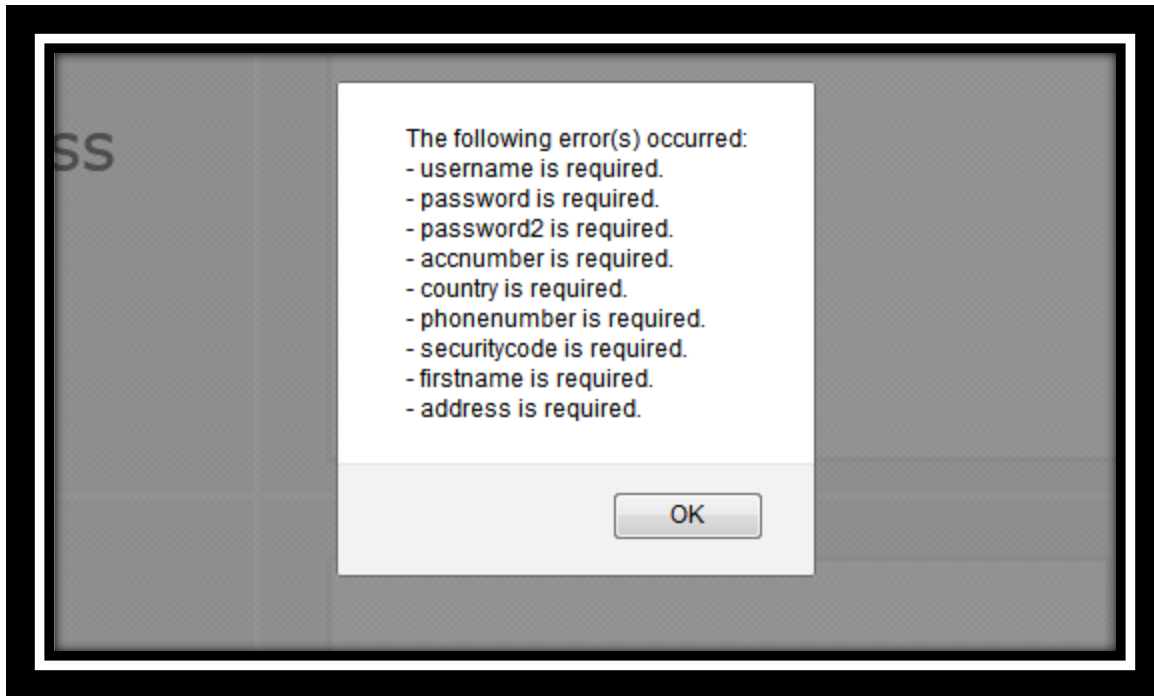


Figure 5.4 Missing data error notification

Conclusion on tests conducted

Software testing of the new system was an incredible move on the implementation of the new system to the end users. The system developer was able to identify all the system errors that the new system is experiencing and also considering the recommendations from acceptance testing strategy. The new system was concluded to be effective within the company and end user trainings were carried out to enable them to disseminate with the new system.

5.4 Installation

After finishing the software testing of the new system the system developer had to implement the proposed system. The database of the new system was effectively installed on the web server and the system developers managed to organize server testing and all the communication channels that lie within it.

5.4.1 Change over strategies

According to Cotterell and Hughes (2004) change over strategy is the process of replacing the old system with the new system. The ZB Financial Holdings was previously implementing the

use of the manual system to carry out customer transactions as a result a new electronic system that replaces the new system was implemented. The new system was implemented using system change over strategies which are explained below:

Parallel operation

Both the new and old systems will be running together, that is the new proposed system will be introduced but the old system will remain in use. Information will be inputted in both system and the outputs will be compared. When the administration and Information Technology personnel are satisfied about the performance of the new system the old system will be stopped. Parallel operation has some advantages which are that it gives a room for the new system to prove itself before the old one is removed. Functionality of the new systems can be analyzed by comparing the data generated by the two systems.

Immediate changeover

This is complete change from the old system to the new system, thus after the completion of new system it gets into operation and the old one is stopped immediately. There are more dangers that can be encountered by implementing this strategy compared to other change over strategies.

Pilot operation

This is a process of executing the new system at different branches of the company. The system will be only be utilized at the chosen branches that the ZB Bank owns and the new system will be working in parallel with the currently existing system.

Conclusion on system changeover

The recommended changeover strategy is the implementation of the pilot changeover on which the end users will assess the system functionality at the site. Pilot changeover was chosen because it gives a clear room for the correction of flaws or errors without disturbing the whole company. The strategy allows the system designer to make some additions and improvements on the new system before it is totally in use.

5.4.2 User Training

According to Carpenter (2001) user training is the process whereby the prospective users of the new system are taught on how to operate the system. User training conducted at the ZB Bank was an in- house training which was conducted by the team. Workshops were arranged with the firstly with the managements and the general employees and lastly with the company employees. The employees were taught on how to generate reports on the banking transactions that are carried by the customers. The company management was taught ways of accepting customer requests and how to conduct a validation on the requests. The customers were also taught on how to send their requests to the company and where possible attaching their documents for verification. They were also on how to login into the system and on how to change their logging details when they want.

5.5 Maintenance

According to Hughes and Cotterel (2007) System maintenance is an important aspect that offers high degree of durability and long lasting system functionality. Maintenance is the change of a product item after use to address the errors or to make some adjustments on the items' state. There are different types of maintenance which are corrective, adaptive and perfective maintenance.

Corrective maintenance

According to Wolak (2001) corrective maintenance is the process of altering a software application to eliminate all the errors. Corrective maintenance is implemented after the occurrence of design, logic and coding errors and is aimed at correcting all the errors so that the system can operate without any hindering factors.

Adaptive maintenance

Wolak (2001) explained that adaptive maintenance as the effort that is put to make some alterations on the software environment. Adaptive maintenance is all about monitoring the environment thus all the conditions and processes that act on the system interior. Since the ZB Bank is increasing its scale of operation there is need of upgrading database sizes.

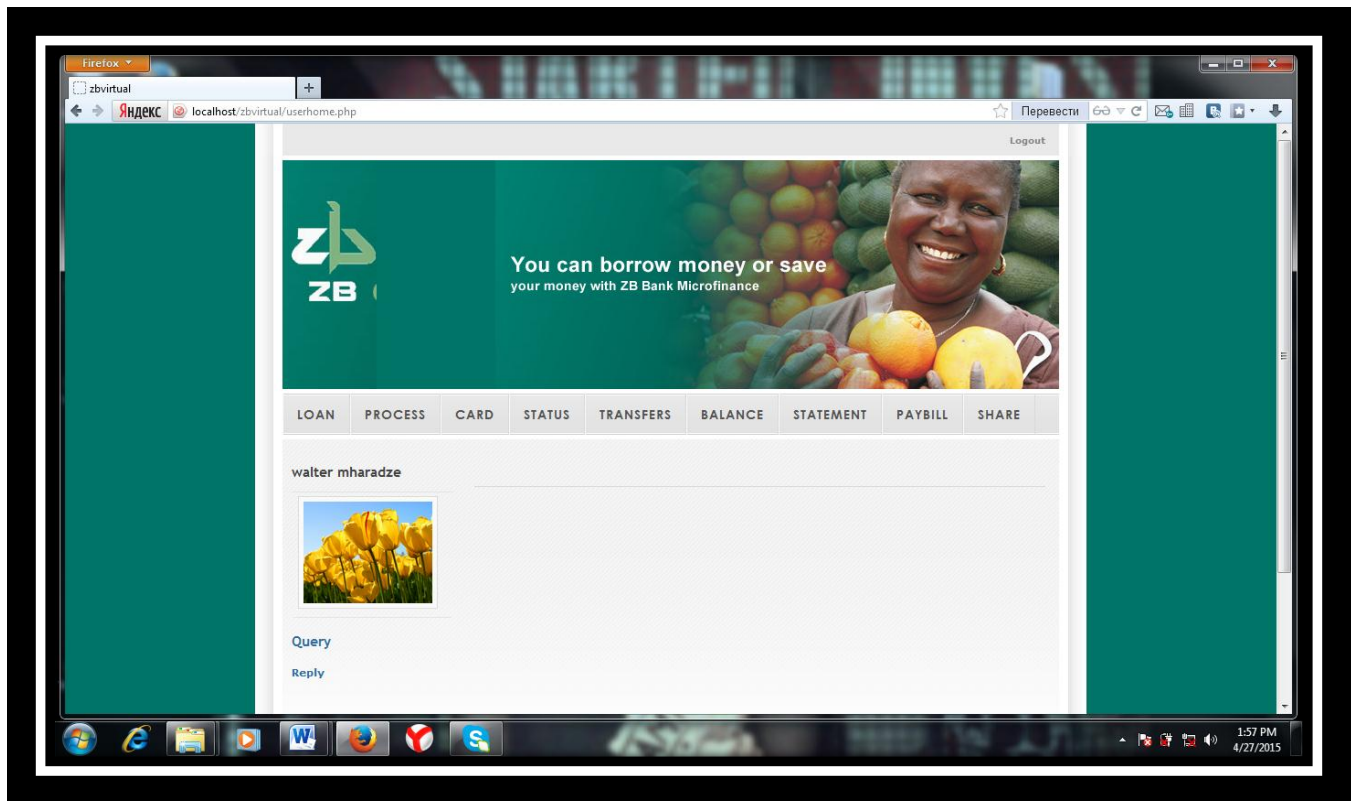
Perfective maintenance

According to Saleh (2009) perfective maintenance are the activities that involves changing the software with an objective of improving both the well-designed and non-functional aspects of the software. It is a software maintenance tool that is implemented to improve attributes of applications on the computer, maintainability and system performance. Perfective maintenance involves the implementation of changes such as inserting, deleting and modifying to make the system meet all the end user requirements.

5.6 Inter-system objectives to the actual system

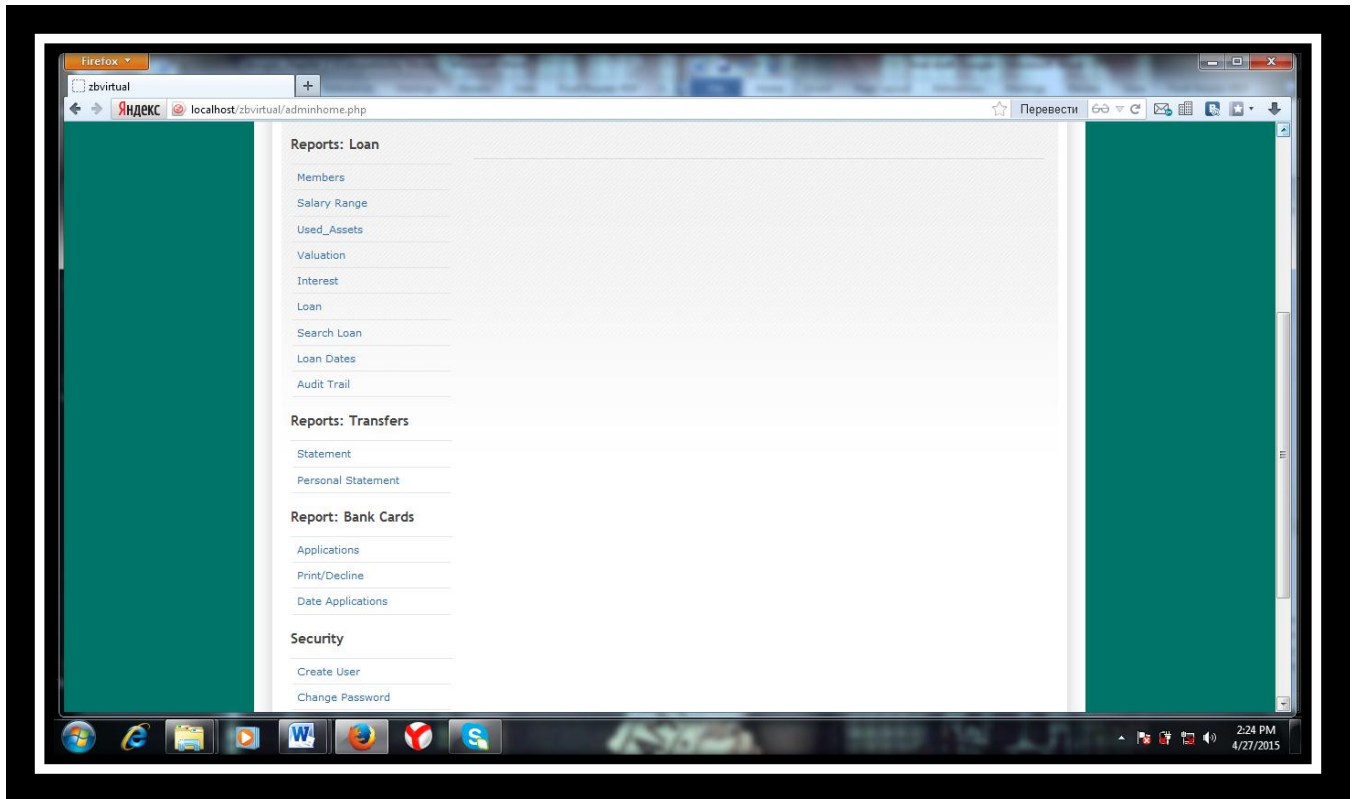
The new Virtual Banking and loan application system has a concrete objective of enabling the customers to carry out the transactions they deem necessary from their geographical locations without physically visiting the bank.

The first objective was to enables customers to view account balances, download bank statements in portable document format, viewing images of paid cheque and ordering of cheque books. The second objective wasto enables customers to transfer funds from one customer to another account, paying their bills and be able to check latest transactions from remote locations. The third objective was to enable customers apply for loans by uploading of all the necessary documents to the company and to enable them to follow up their application status. The proposed objectives of the system were effectively met by the system as shown on the following preview of the system snapshot.

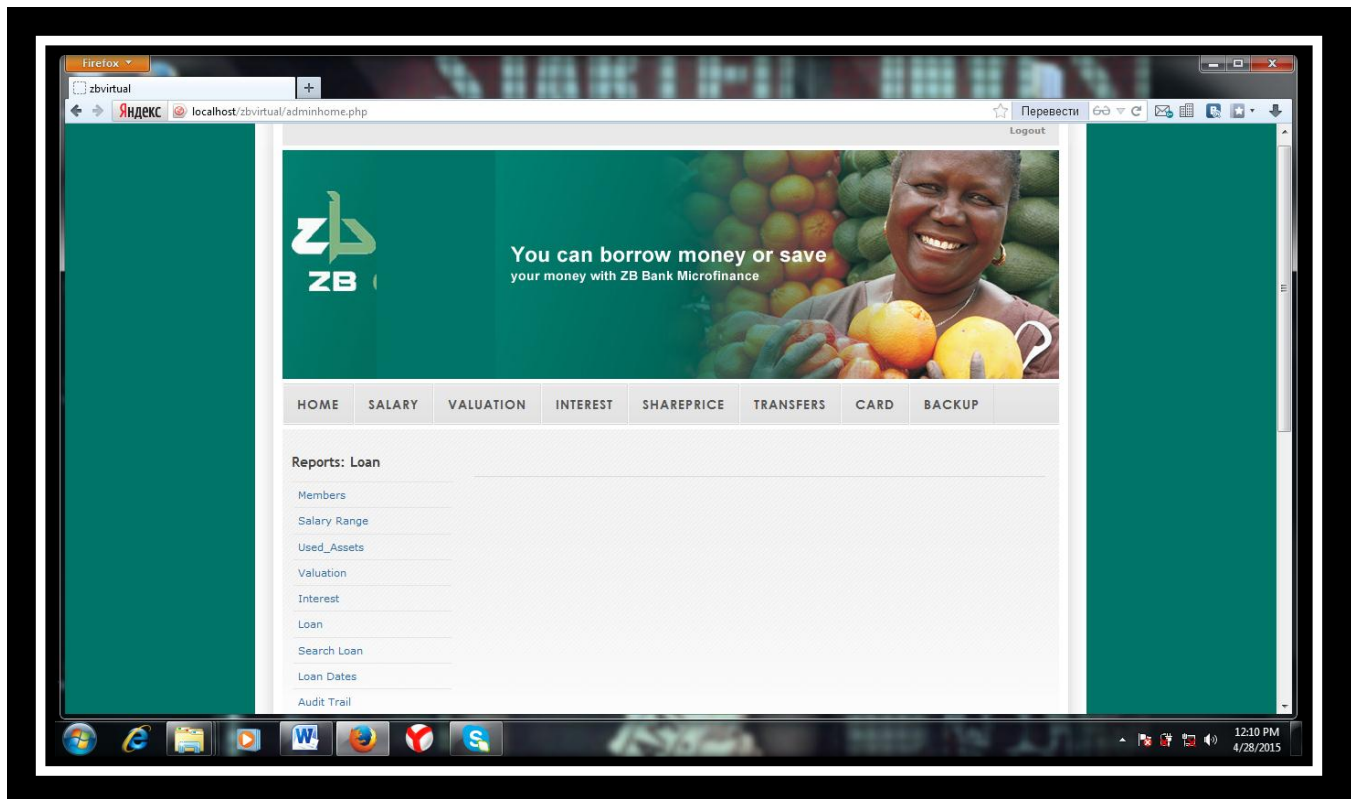


The system end users have to click on the button he or she deems necessary to execute within the banking environment.

The proposed fourth and fifth objectives were to enable the financial administrator to manage multiple users and to compute all the revenue reports. The objectives were met by the actual system as shown on the following system snapshot.



The administrator and the company staff or employees can be able to compute all the reports of the transactions such as loan reports, cash transfers reports and bank cards reports. The ZB Bank staff can be able to manage multiple users' accounts as shown on the following preview of the management snapshot.



5.7 System backup

The Virtual Banking and Loan Application System must have its own independent backup to enable reinstalling of the system when there is need. The system must be backed up on an offline server or a server that is located on a different location from where the company is located. This can reduce the loss of data in case of natural disasters or fire out break the system can also be backed up using cloud drive or online servers.

5.8 Recommendations

Basing on the analysis carried out the project researcher suggested that a user manual must be provided to the end users so that they can refer to when they do not understand. The end users must attend some training workshop periodically so that all areas of confusion can make clear. The system need to be updated to avoid it from being outdated due to evolving technological changes. Furthermore, the analysis carried out motivated the company shareholders and the management to implement the electronic system that will enable the end users to make some requisitions in computerized form there by saving a lot of time. The system provides a dashboard

to the customers, management and the employees and this can maximize end user satisfaction due to the new systems' end user friendliness hence building stakeholder confidence.

5.10 Conclusion

Implementation stage shed light to the implementation techniques that can be employed by the company. Implementing the Virtual Banking and Loan Application System at the ZB Bank will be capable of revitalizing the customers and the employees. The completion of the implementation stage will give a green light for the system maintenance to commence in a continuous process. End users must each have copies of user manual of the system so that they can be able to refer to when they are in the process of navigating the system. The researcher gained a lot of experience that can be used in the future when researching other projects. Therefore, overcoming all the hindering factors that can be faced when proposing the projects in the future up to its completion can be made possible since the implementation of the Virtual banking and Loan Application System for the ZB Bank left the researcher with highest levels of project management knowledge and skills.

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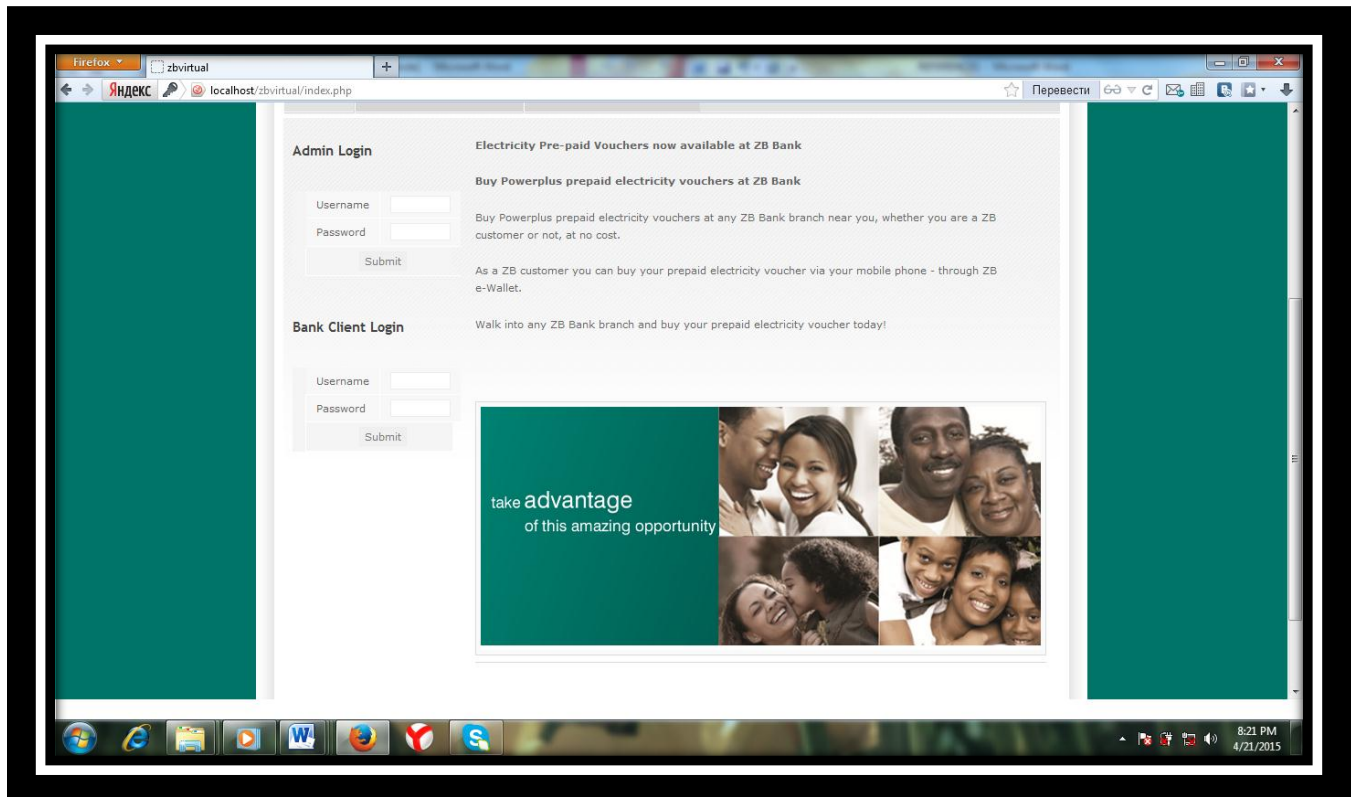
Sommerville, T. (2008). Systems Analysis and Design, Harlow: Edinburgh

Tidwell, J. (2010). Designing Interfaces, O'Reilly Media, Inc.APPENDICES

APPENDIX A: USER MANUAL

How to login

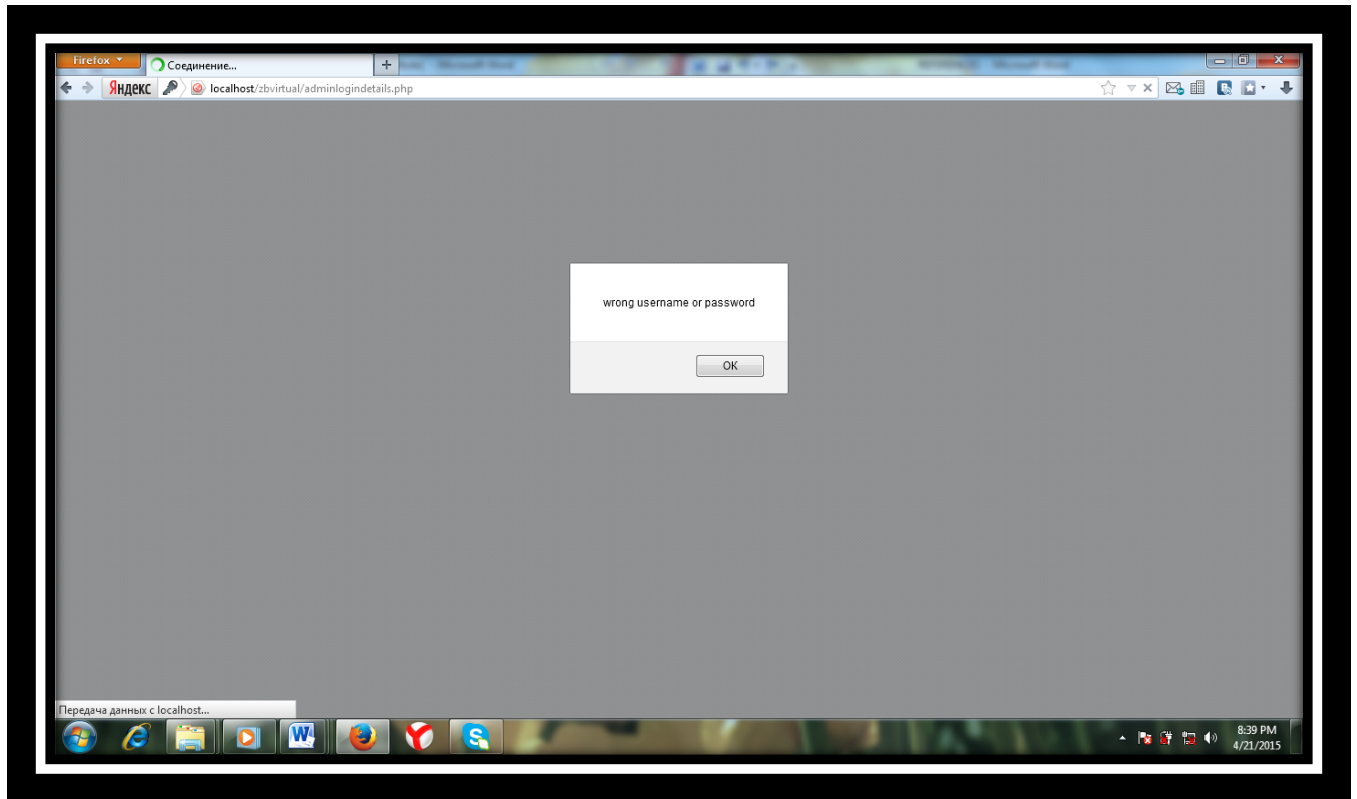
In order to gain access of the system the ZB Bank end users must login first. The processes that the end user is entitled to will be determined by his or her access levels assigned to them. The following preview shows what the end user login page looks like for both the customers and the staff employees.



1. Enter username and password as shown above
2. Then click or press enter on the submit button.

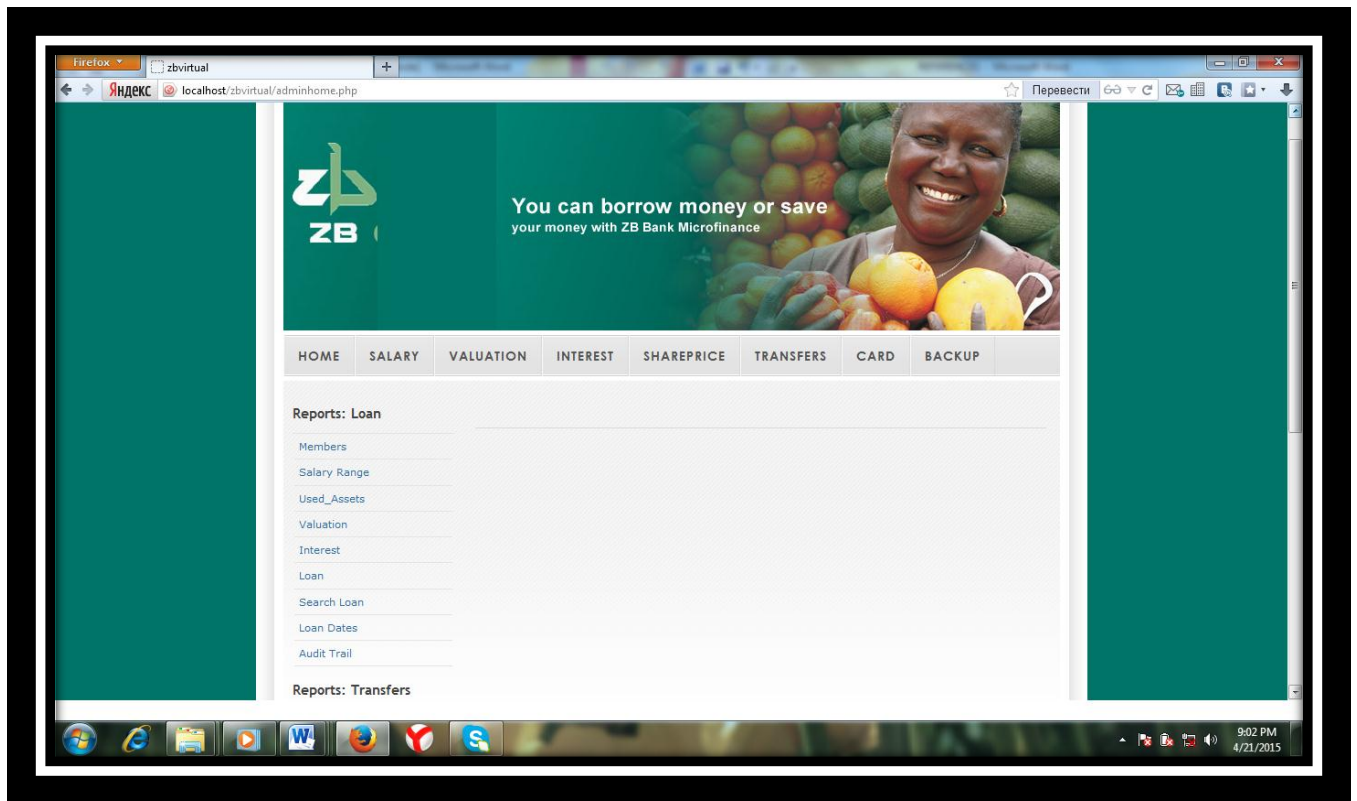
End users must enter valid username and password for them to gain access into the system.

If incorrect login credentials are used the system will automatically give an error message as shown below.



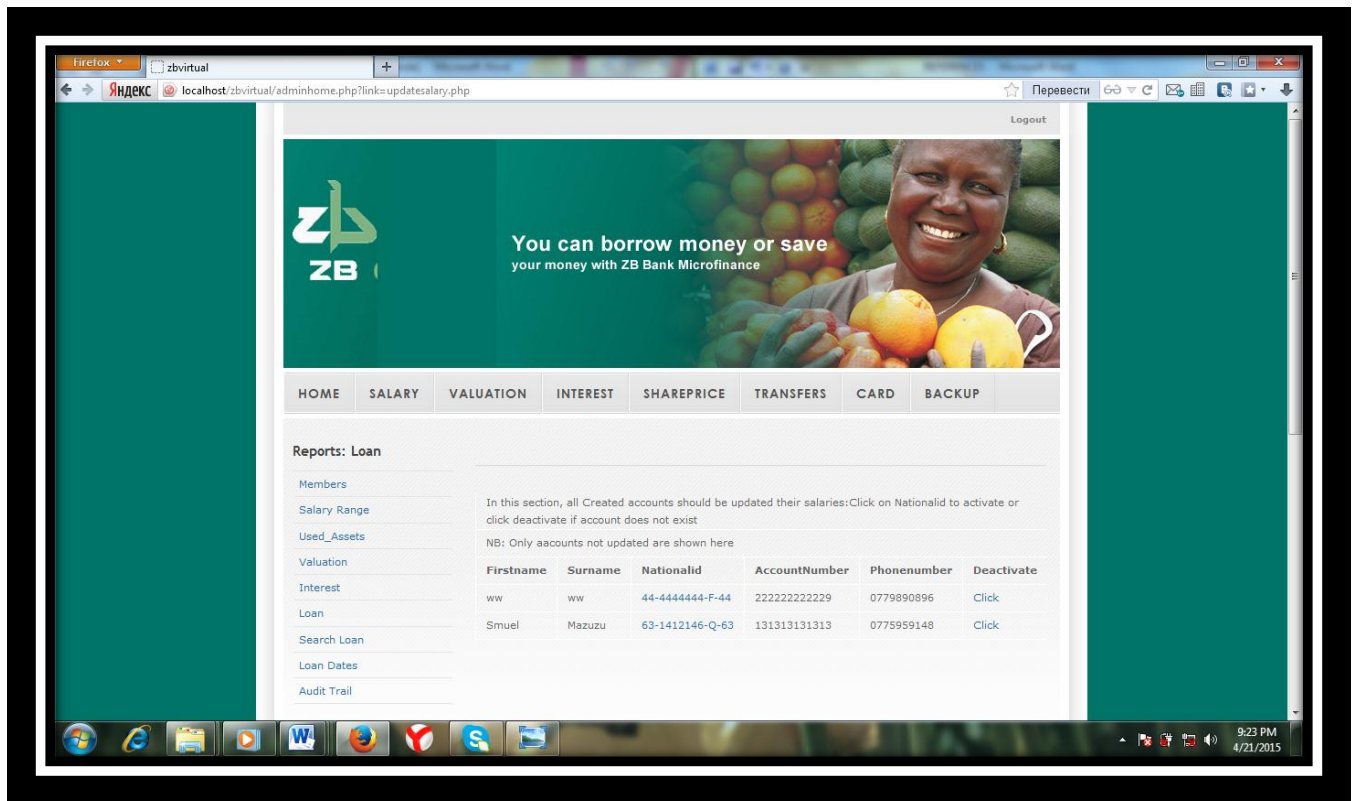
Staffs' guide (Administrator, Management and Other Staff)

If the end user with privileges of accessing the system he or she logs into the system and directed to home page which contains unique tabs that the end users can navigate through. The following figure shows a home page which is previewed when the administrator had logged in. The tabs are the same as those the management and other company can preview after successfully log in the system.



Salary Button

The can administrators click on the salary button to activate the salaries of all the created accounts. To activate the salary the he or she click on the National ID and click deactivate if the account does not exist as shown on the following diagram



Valuation button

Enables the staff members or the administrator to make a valuation of the customers' assets so that the loan ranges that suit him or he can be decided.

Interest button

The administrator can be able to adjust the interest rates that are charged on loans by clicking this button, the interests rates are adjusted basing on the amount of the loan that the customer is given.

Share price button

The administrator can be able to update share prices and to add new shares so that potential buyers can view by clicking on the share price button.

Transfer button

The company staff can click on the transfer button to transfer from the bank accounts to personal accounts

Card button

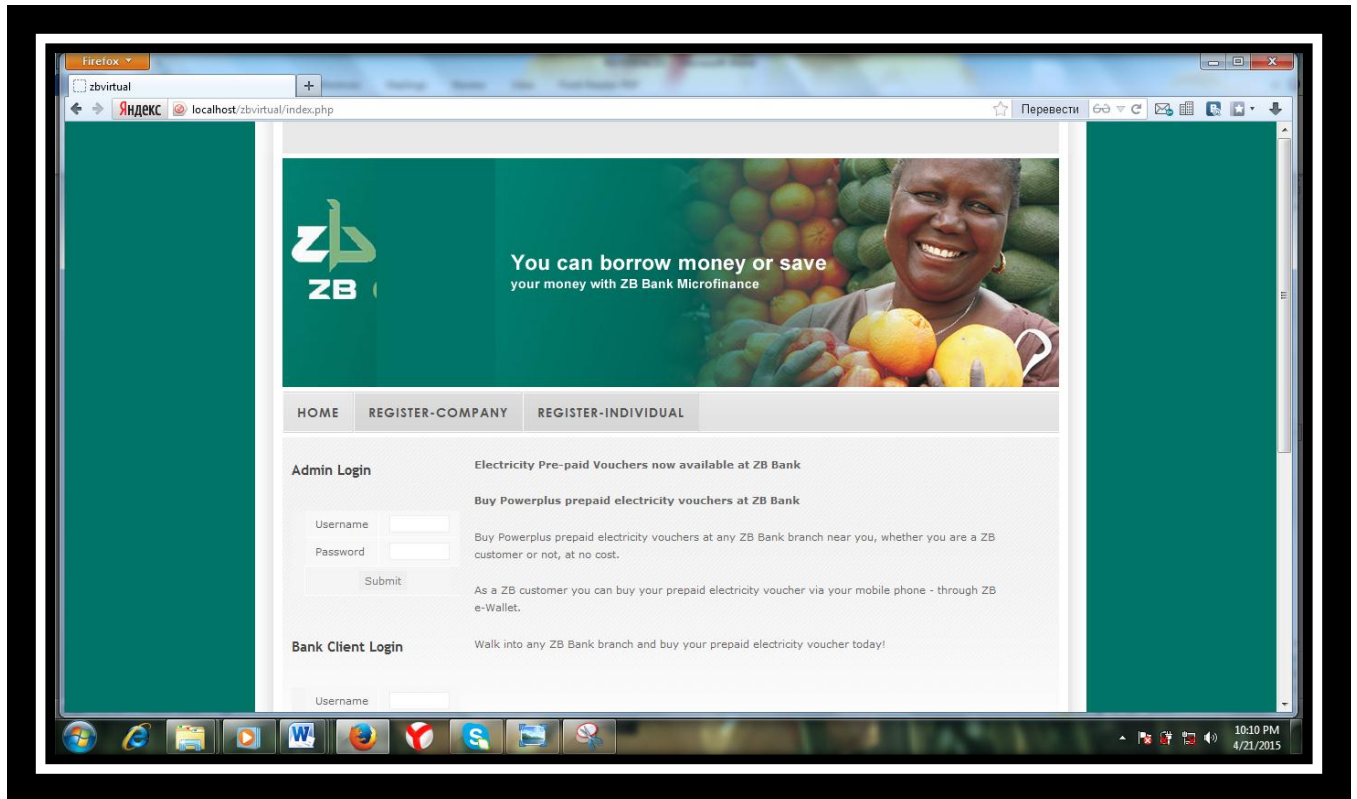
Clicking on the card button the ZB Bank staff can be able to either accept or decline the bank cards applications that the customers have applied for.

Backup button

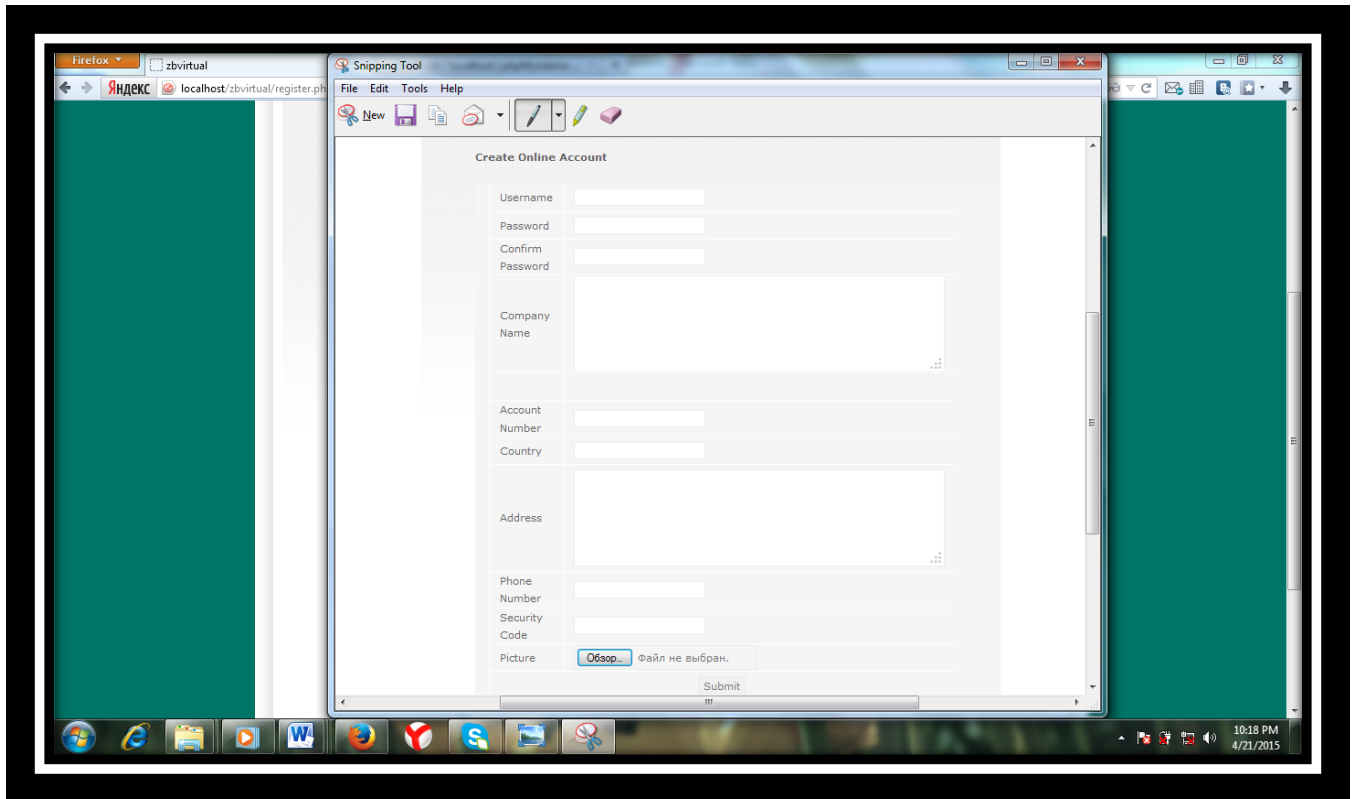
Enables the administrator to back up the system data so that lost data lost due to natural disasters or fires can be recovered.

Customer guide (Company or Individual customer)

The customer has to register first so that he or she can have the privilege of navigating on the system. The ZB Bank has two types of customers the individual customers and the company customer and both customers have to register their details so that they can access the system. The following preview shows the buttons the two types of customers have to click to register their details.

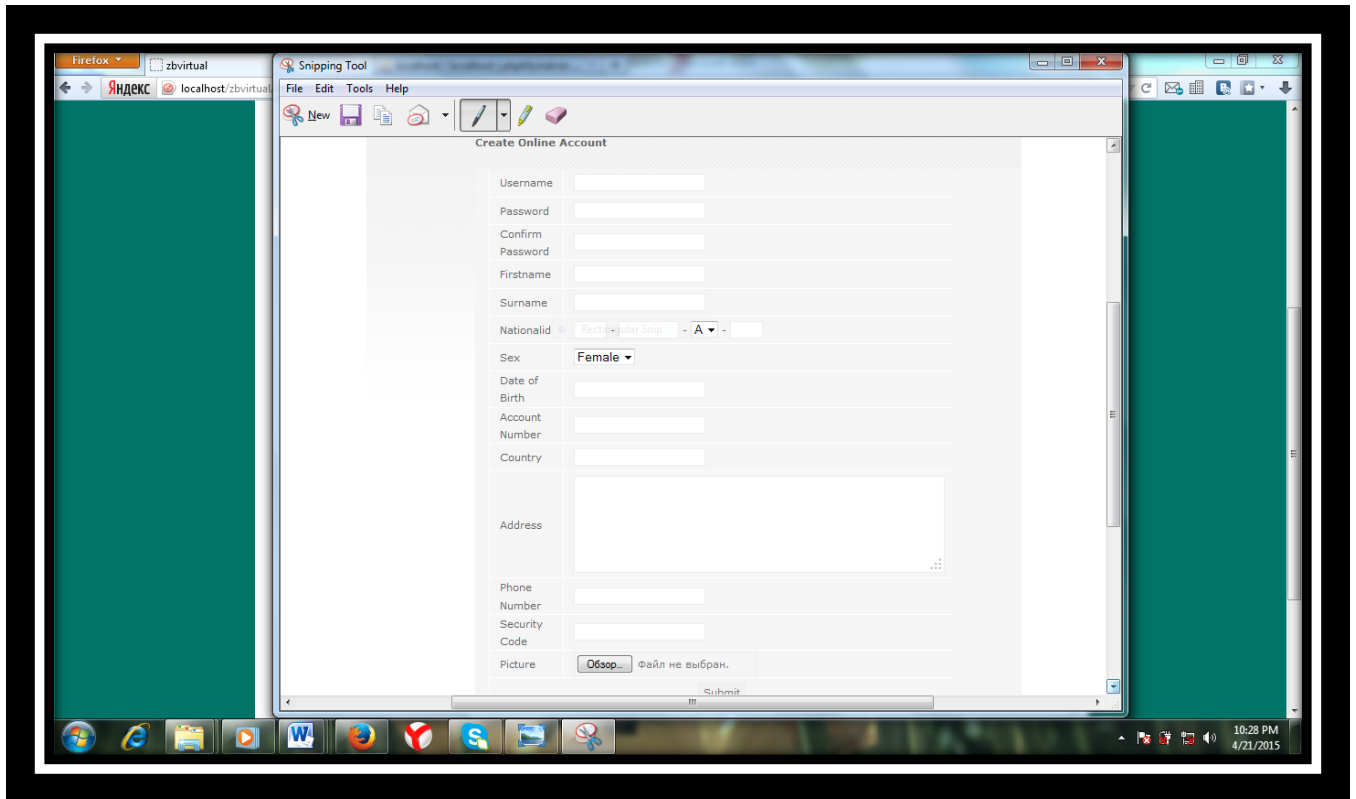


By clicking on the register- company button the company customer can view the following preview where they can input their registration details.

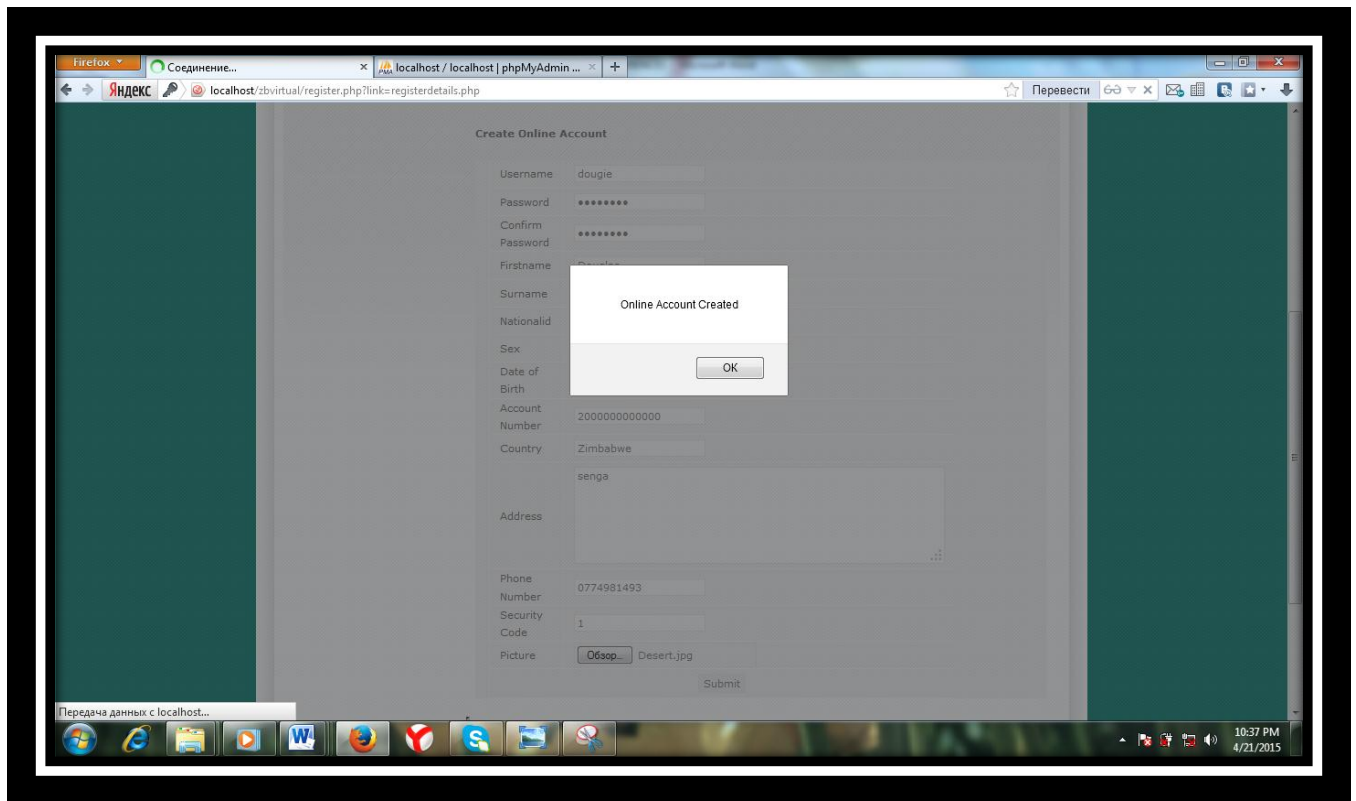


After inputting all the details the company customer can then click on the submit button to send into the system.

The individual customer can also click on the register-individual button and view the following preview.

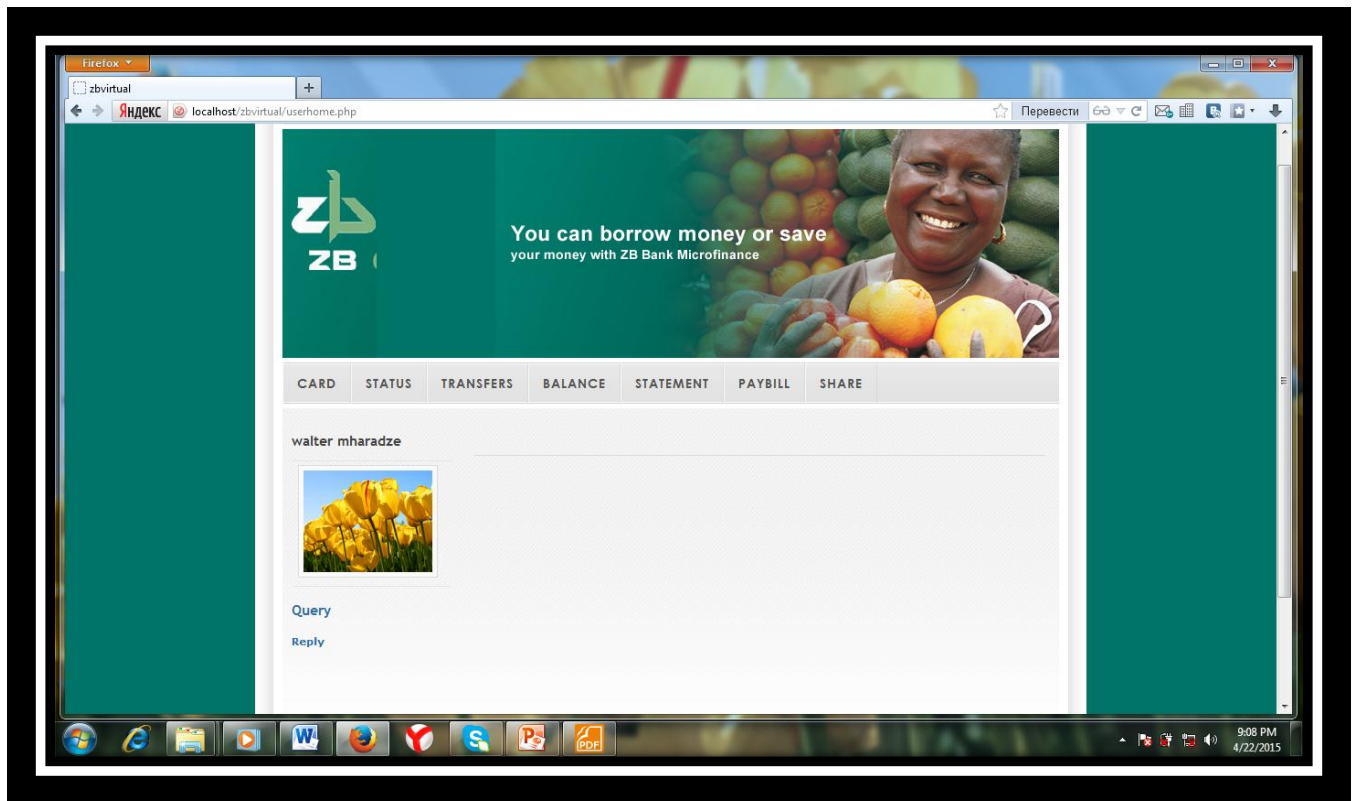


After inputting the details the customer can as well click on the submit button to proceed. If the details are entered correctly the customers the following message is shown



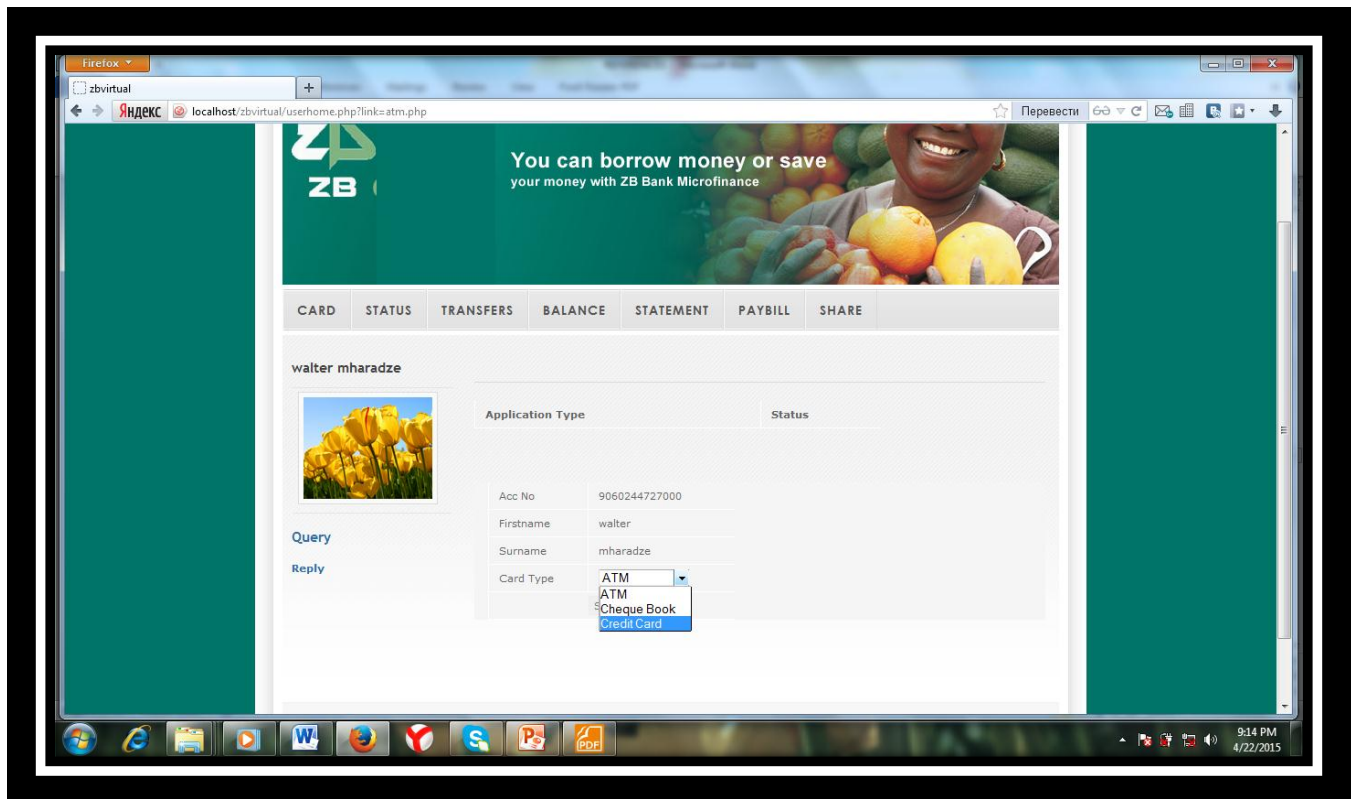
When a customer had made an error when inputting his or her details the system automatically alert the customer where he or she had made an error so that corrections can be done to proceed.

After registering the customers can then log in the system and have the privilege of navigating with the system. After logging in successfully the customers can view the following preview where they can choose the transactions they deem necessary to carry out.



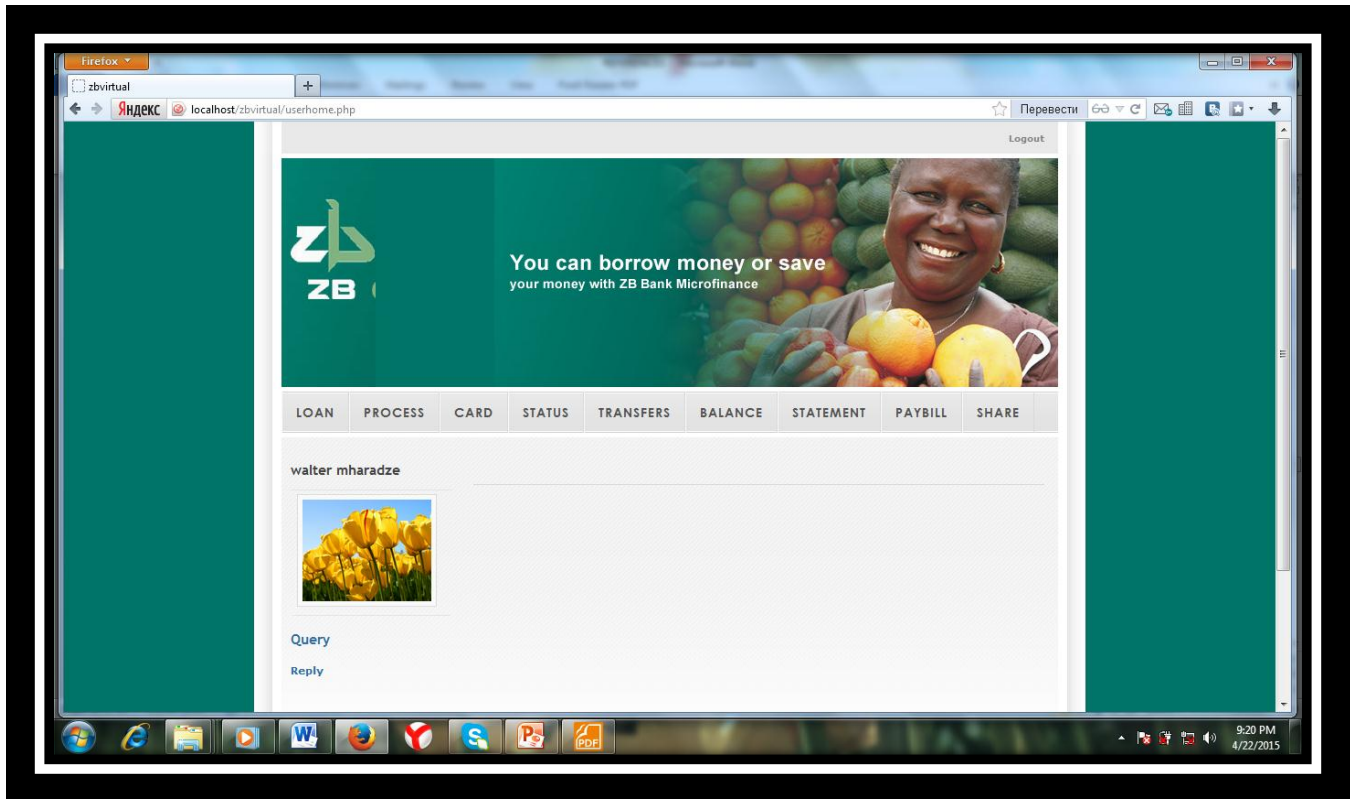
Card button

The customers can click on the card button to a request for ATM card, credit card and for a cheque book and then click the submit button to send the request as shown on the following preview

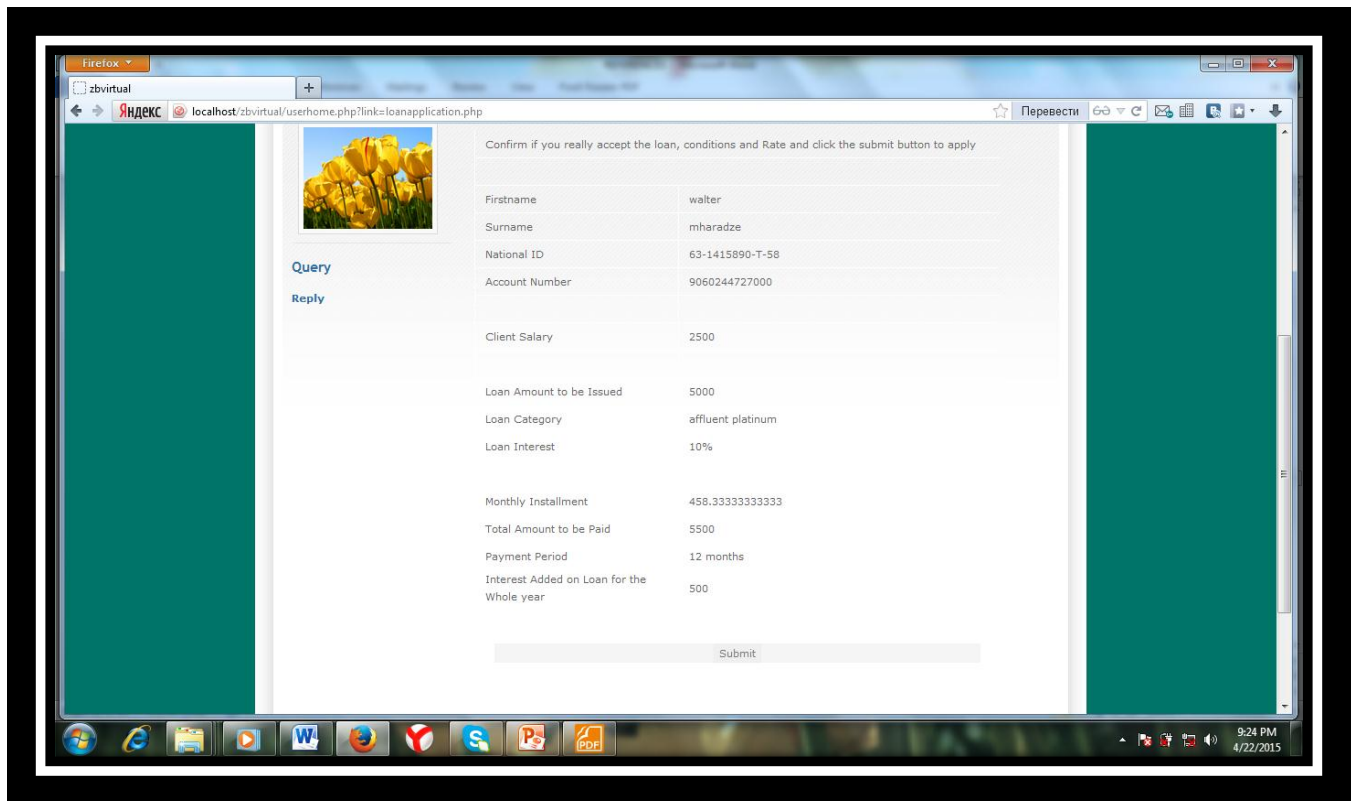


Status button

Upon clicking the button the customers can able to preview the loan status that is after the administrator have updated the salary and valued the assets of the customer. After the update and valuation of the assets the following preview will be shown

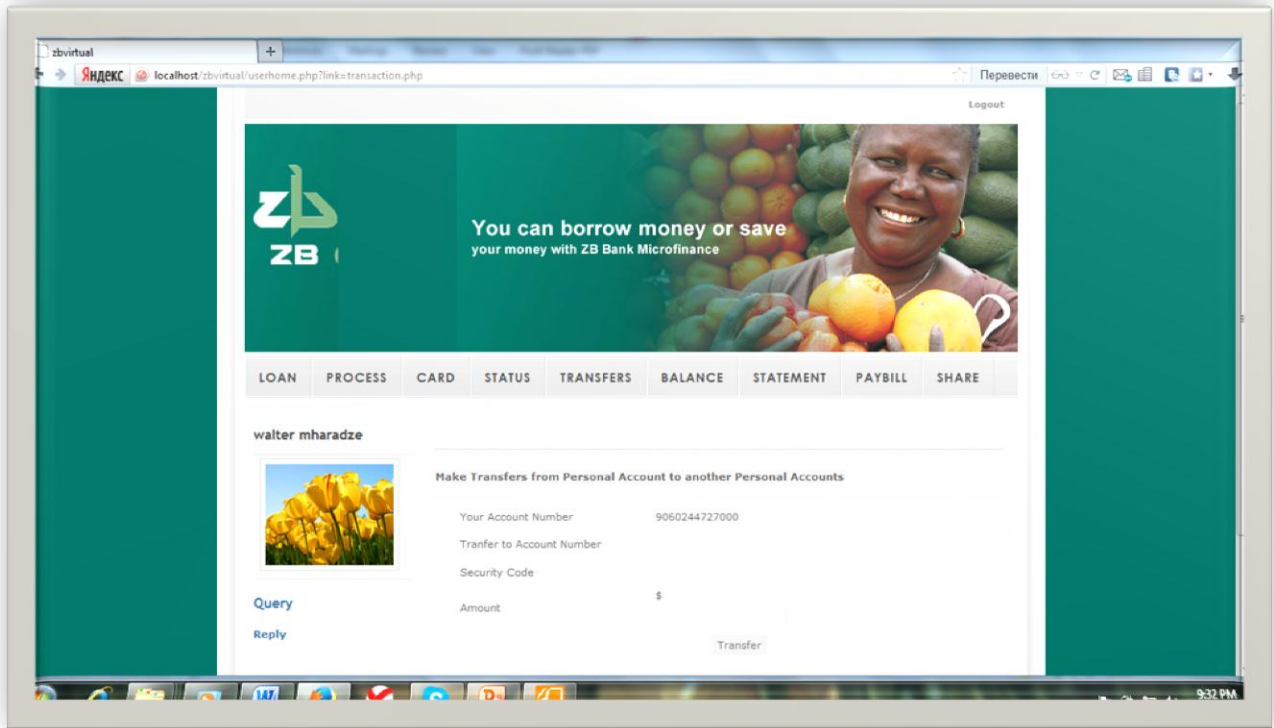


The customer will then click on the process button to either accept or reject the loan terms and conditions. When he or she accepts the loan then click the submit button to proceed with the loan application as shown on the following preview



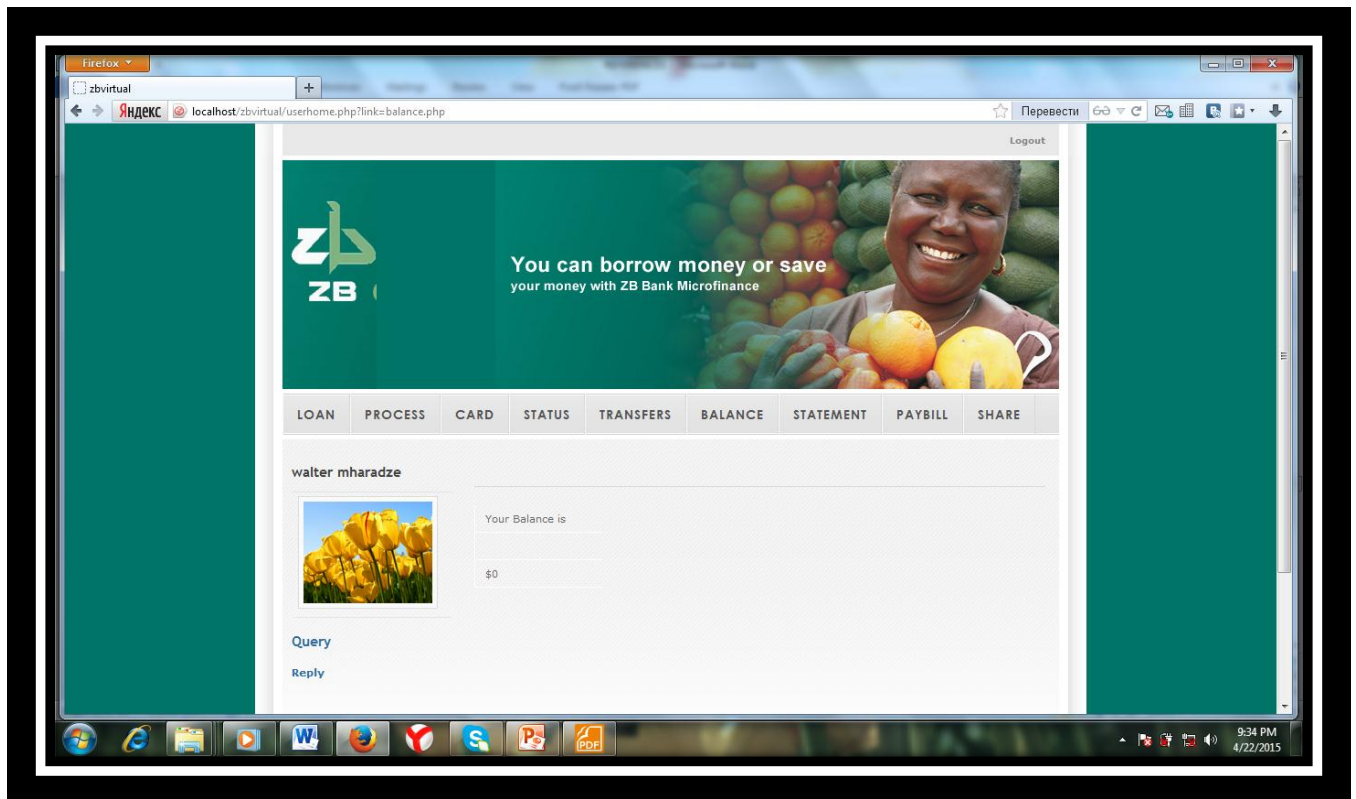
Transfer button

The customer can click on this button to make a cash transfer from his or her account to another account by entering the account number or the account to be transferred to, security code of the account and the amount to be transferred and then click the transfer button to proceed. The following preview shows the cash transfer process.



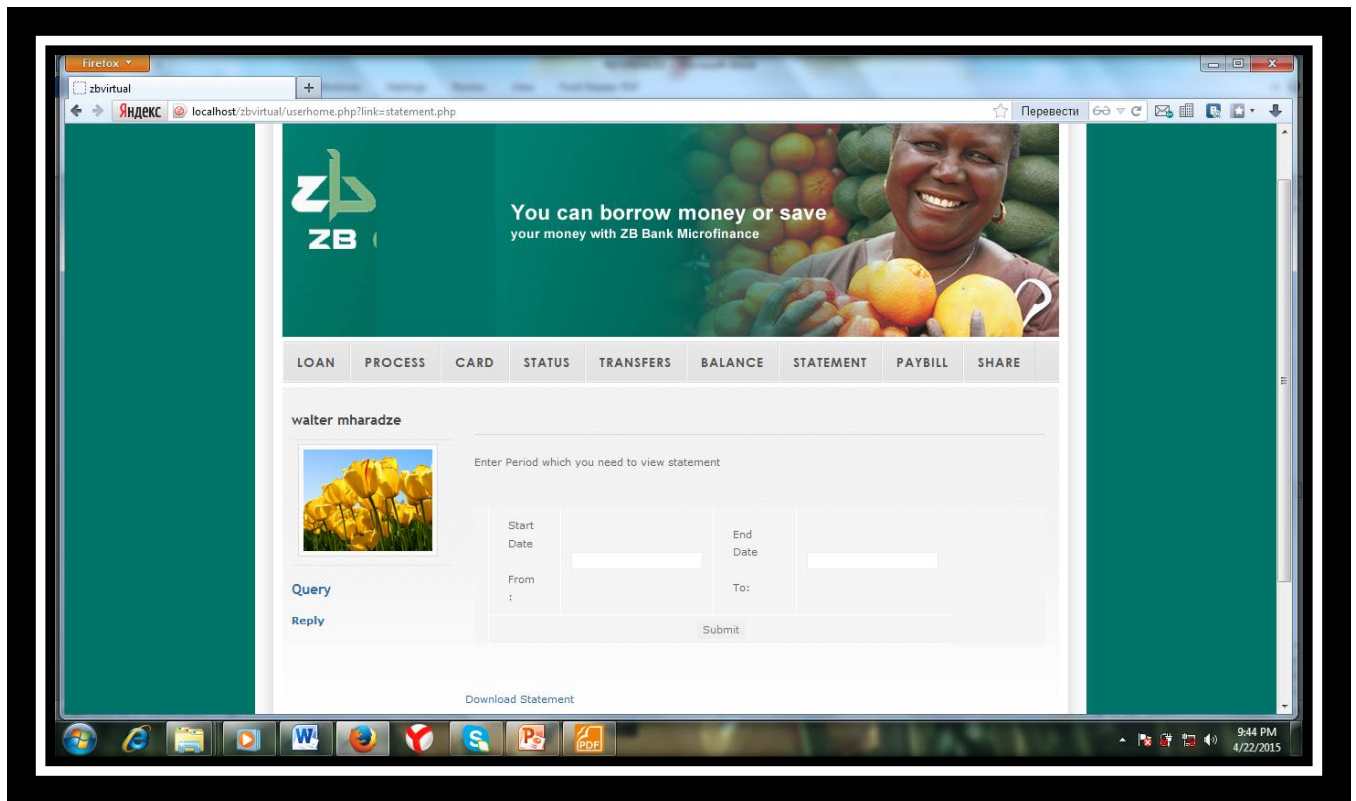
Balance button

Clicking the button enables the customers to make a balance enquiry of their accounts. After clicking the account balance will be shown as highlighted on the following preview



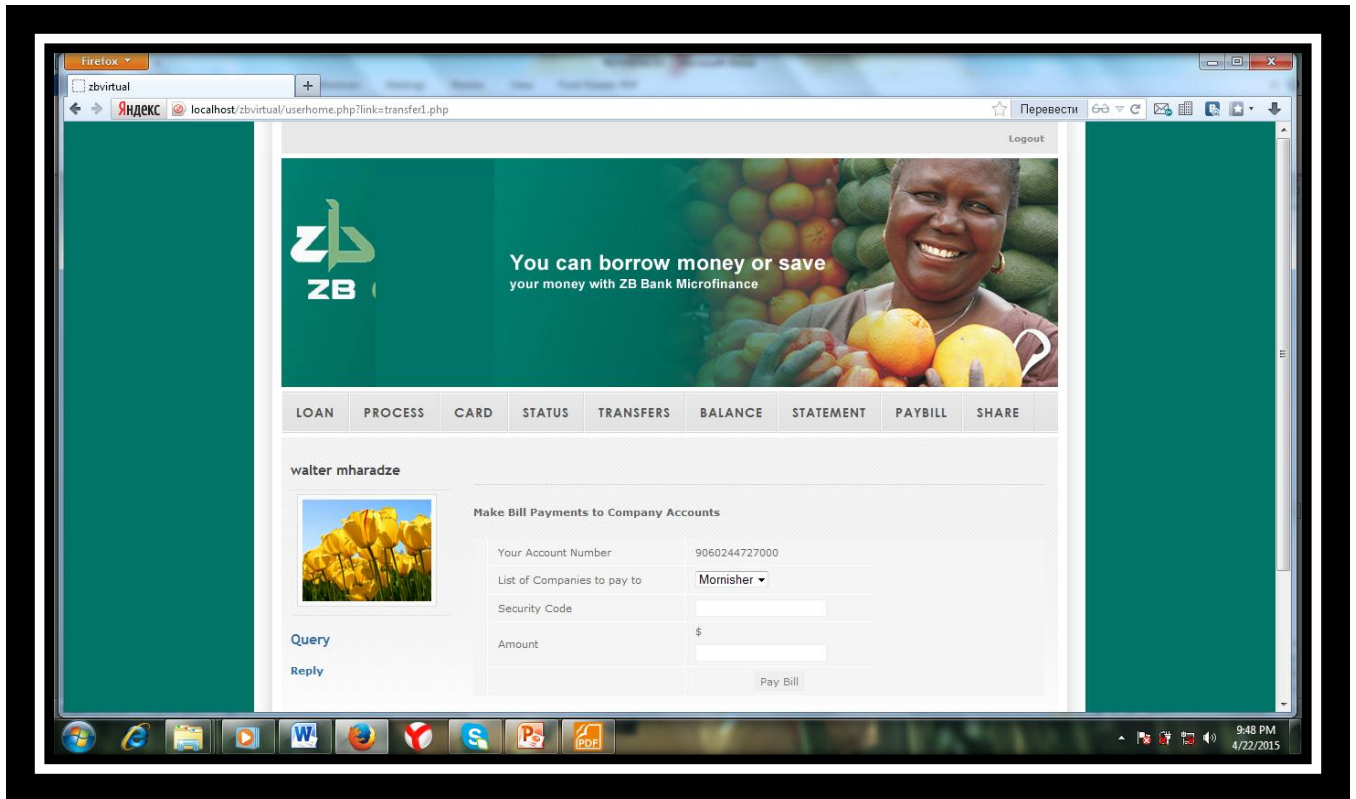
Statement button

Clicking the statement button enable the customers to down load a bank statement in portable document format by inputting the start date from and the end date to which they want to download the statement. The customer can then proceed by simply clicking the submit button to send the request. Then the downloading process can commence after the customer has click the download statement icon.



Pay bill button

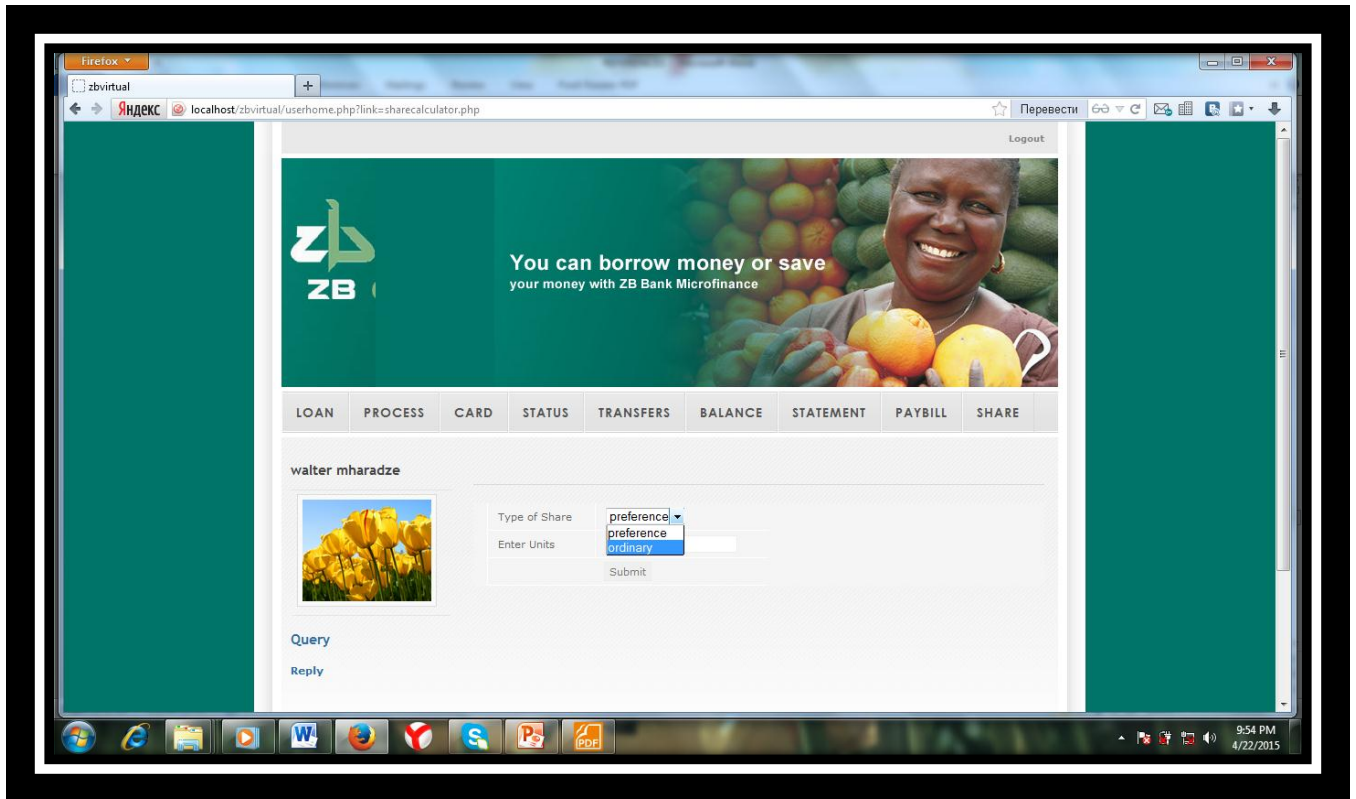
Enables the customer to make payments of their bills either to the companies or other merchants they owe. The bills can be utility bills or other bills that customers can owe.



After inputting the name of the company or the organization they wish to pay to, the security code and the amount the customers then proceed to make payment by simply clicking on the pay bill button to conclude the payment.

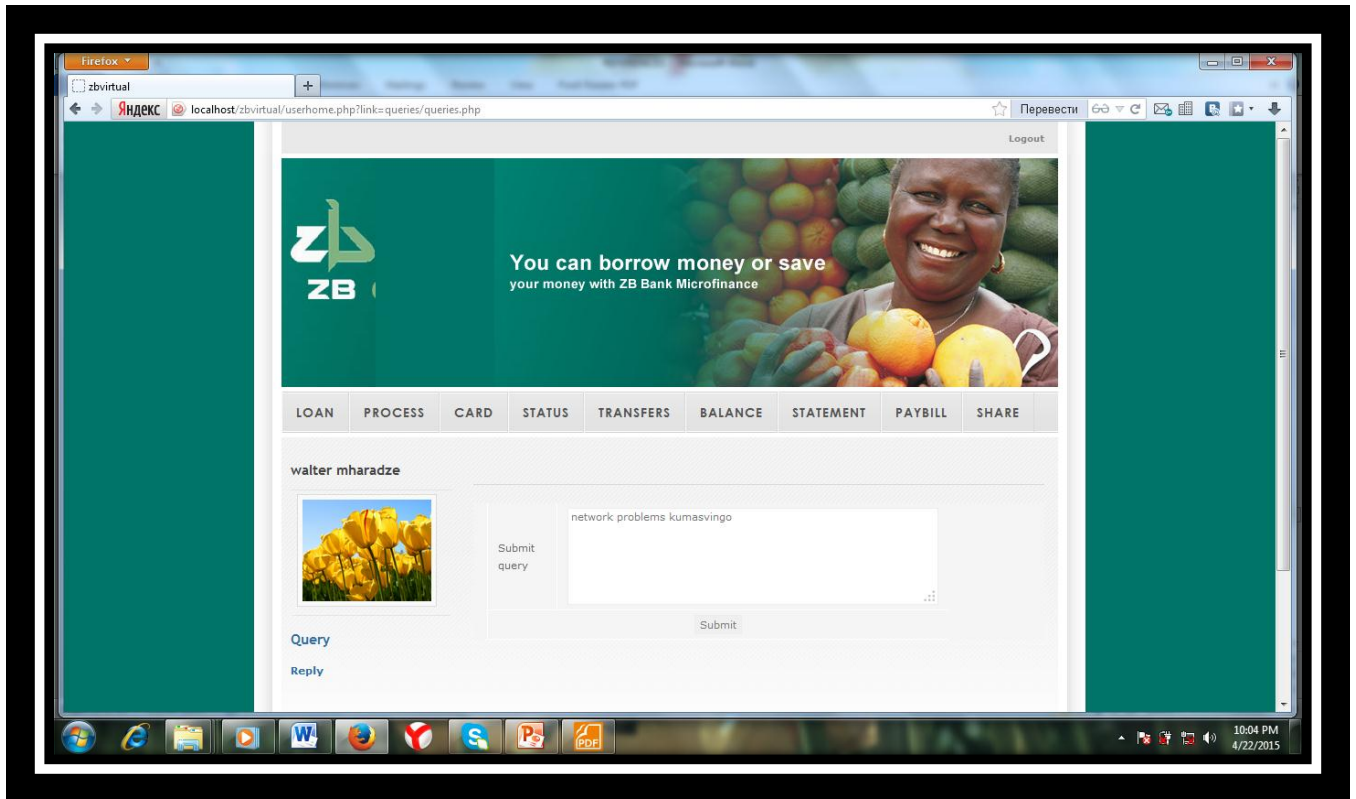
Share button

The customers who wish to purchase shares from the company can click this button and choose the type of the share they deem necessary to purchase thus either preference or ordinary shares as shown on the following preview

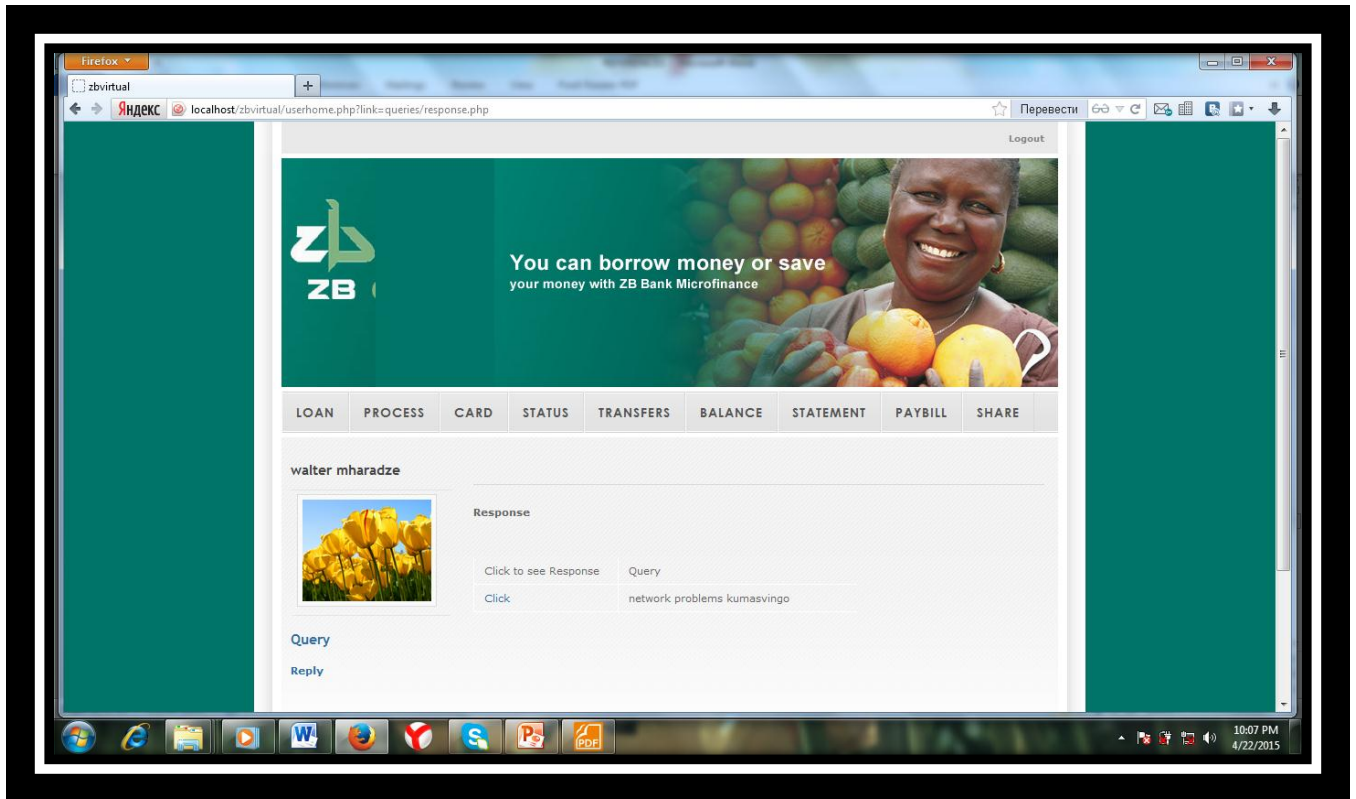


After choosing the type of share the customer can click the submit button and wait for the response from the management.

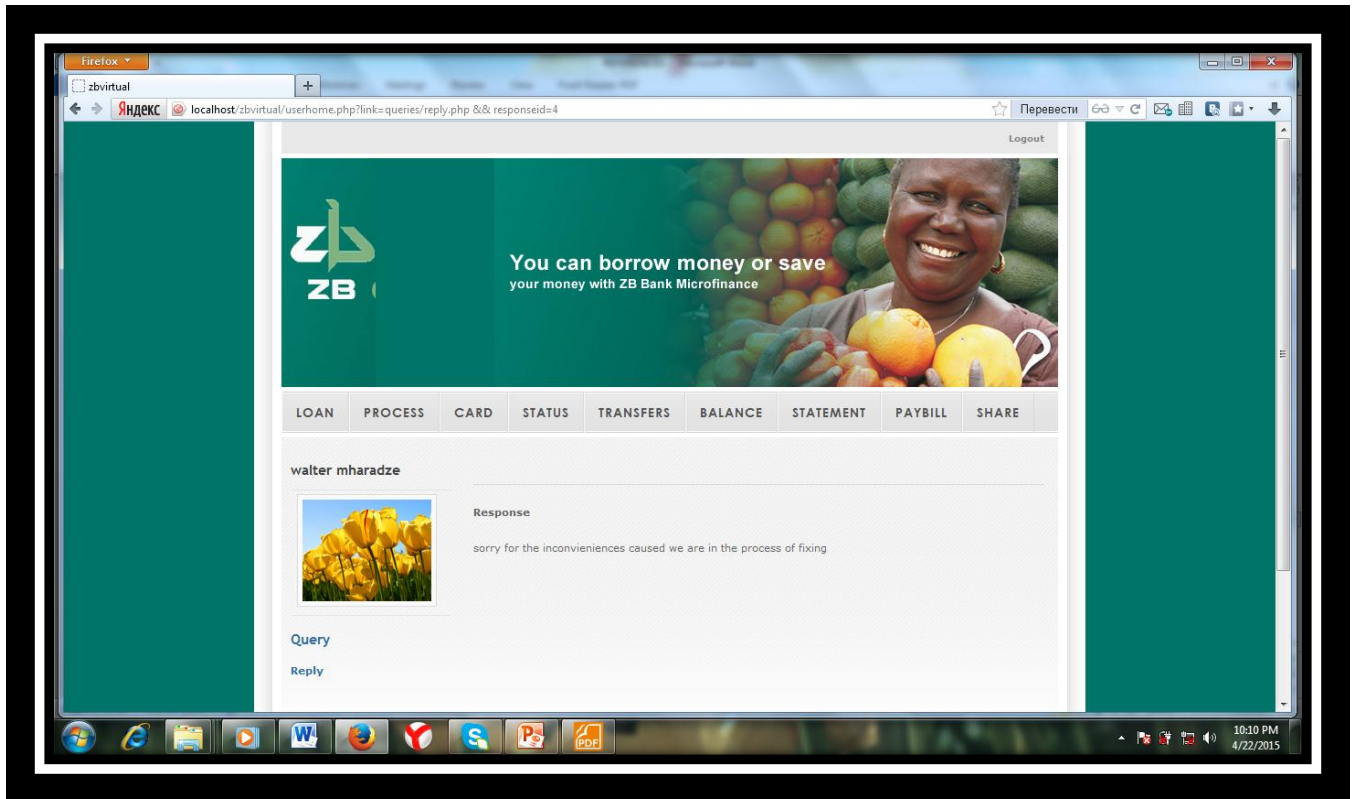
When the customer wants to send a query to the company they simply click on the Query highlight and the following preview of where they can input their query is shown



After inputting the query then the customer can send it by simply clicking on the submit button and then wait for the reply. When they want to follow up the response of their queries then they can click on the reply highlight and the following preview can appear



The customer he or she can now view the reply or the response from the company by simply click on the click highlight as shown above. After clicking they can be able to view the reply as shown on the following preview



APPENDIX B: INTERVIEWS

Stakeholder Interview questions

In your opinion, how important is the Virtual Banking and Loan Application System at your company?

May you briefly explain how the existing system works?

Are you facing any problems along the way of using the existing system?

Roughly how long does it take for a customer to process all the transactions they deem necessary?

How do you rate the existing system?

Do you think a web-based cooperated database will recover effectiveness and efficiency of currently existing operations?

Let's say a new system is to be established to counter the problems you are currently fronting are there any areas you think necessitate exceptional consideration?

APPENDIX C: QUESTIONNAIRES

Questionnaire guide for ZB Financial Holdings Virtual Banking and Loan Application System

I am **Mlambo Douglas**, a student at the Midlands State University in Zimbabwe following a Degree in Information Systems. One of the necessities for this award is a task report with an effectively debugging system. This questionnaire is intended to find out the necessities for the above stated system.

I consequently request you to assist me with the obligatory information in this questionnaire. I promise to keep all the given information confidential and highly guard due rights. Thank you for your cooperation.

NB: Please answer this questionnaire anonymously and feel free to answer every question.

Please tick where appropriate and fill in spaces provided

Job title.....

Sex Male Female

Level of education Degree Diploma Certificate

Other specify

Qn1: How do you degree the existing system? **Poor** **Average** **Good**

Qn2: Are you pleased with the existing system? **Yes** **No**

Qn3: Do you think the existing system has adequate security? **Yes** **No**

Qn4: Do you have internet access? **Yes** **No**

Qn5: What are the hindering factors or stumbling blocks are you facing with the existing system?

Cost Time Communication Security

Additional (please specify)

.....
.....

Commendations.....

.....
.....

APPENDIX: D OBSERVATION SHEET

Observation guide page

Date:

Time:

Opinion.....
.....
.....
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.....
.....

Decision.....
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.....
.....

CODE SNIPPETS

```
<?php
session_start();

include "includes/opendb.php";

$rs= mysql_query("SELECT * FROM admin WHERE username='$_POST[username]' and
password='$_POST[password]'");

if($row=mysql_fetch_array($rs))
    {

$time=strtotime("now");

$username=$row["username"];

$_SESSION['username']=$username;

$_SESSION['logged'] = true ;

$_SESSION['id']=$row["id"];

$_SESSION['level']=$row["level"];

//$_SESSION['accountnumber']=$row["accountnumber"];

mysql_query("INSERT INTO audittrail VALUES(NULL,$row[id],$time)") or
die(mysql_error());

?>

<script language="javascript">
window.location="adminhome.php";

</script>

<?php
```



```

    }
    else
    {
        echo "<script language='javascript'> alert('wrong username or password');
window.location='index.php'; </script>";

    }

?>

<?php
include "includes/opendb.php";

?>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml">

<head>

<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />

<title>Bancabc</title>

<script type="text/javascript">

<!--

functionMM_validateForm() { //v4.0

if (document.getElementById){

var i,p,q,nm,test,num,min,max,errors=",args=MM_validateForm.arguments;

for (i=0; i<(args.length-2); i+=3) { test=args[i+2]; val=document.getElementById(args[i]);

if (val) { nm=val.name; if ((val=val.value)!="") {

```

```

if (test.indexOf('isEmail')!=-1) { p=val.indexOf('@');
if (p<1 || p==(val.length-1)) errors+="- "+nm+" must contain an e-mail address.\n";
    } else if (test!='R') { num = parseFloat(val);
if (isNaN(val)) errors+="- "+nm+" must contain a number.\n";
if (test.indexOf('inRange') != -1) { p=test.indexOf(':');
min=test.substring(8,p); max=test.substring(p+1);
if (num<min || max<num) errors+="- "+nm+" must contain a number between '+min+' and
'+max+'.\n";
} } } else if (test.charAt(0) == 'R') errors += '- '+nm+' is required.\n'; }
    } if (errors) alert('The following error(s) occurred:\n'+errors);
document.MM_returnValue = (errors == "");
} }
//-->
</script>
</head>
<!-- Include Core DatepickerStylesheet -->
<link rel="stylesheet" href="ui.datepicker.css" type="text/css" media="screen" title="core css
file" charset="utf-8" />
    <!-- Include jQuery -->
    <script src="jquery.js" type="text/javascript" charset="utf-8"></script>
    <!-- Include Core Datepicker JavaScript -->
    <script src="ui.datepicker.js" type="text/javascript" charset="utf-8"></script>
    <!-- Attach the datepicker to dateinput after document is ready -->

```

```

<script type="text/javascript" charset="utf-8">
    jQuery(function($){
        $("#dateofbirth").datepicker();
    });
</script>

```

```
<body>
```

```
<p><span class="heading"><strong>Create Online Account</strong></span></p>
```

```

<form action="" method="post" enctype="multipart/form-data" name="form1"
target="laststage" id="form1"
onsubmit="MM_validateForm('username','R','password','R','password2','R','firstname','R','s
urname','R','id1','RisNum','id2','RisNum','id4','RisNum','dateofbirth','R','accnumber','Ris
Num','country','R','phonenumber','RisNum','securitycode','R','address','R');return
document.MM_returnValue">

```

```
<table width="82%" border="0" cellpadding="2" class="td1">
```

```
<tr>
```

```
<td width="55%">Username</td>
```

```
<td width="45%"><label>
```

```
<input type="text" name="username" id="username" />
```

```
</label></td>
```

```
</tr>
```

```
<tr>
```

```
<td>Password</td>
```

```
<td><label>
```

```
<input type="password" name="password" id="password" />
```

```
</label></td>
```

```

</tr>
<tr>
<td>Confirm Password</td>
<td><label>
<input name="password2" type="password" id="password2" maxlength="12" />
</label></td>
</tr>
<tr>
<td>Firstname</td>
<td><label>
<input type="text" name="firstname" id="firstname" onkeypress="lettersOnly(event)"/>
</label></td>
</tr>
<tr>
<td>Surname</td>
<td><label>
<input type="text" name="surname" id="surname" onkeypress="lettersOnly(event)"/>
</label></td>
</tr>
<tr>
<td>Nationalid</td>
<td colspan="3"><input name="id1" type="text" id="id1" size="2" maxlength="2" />
-
<input name="id2" type="text" id="id2" size="7" maxlength="7" />

```

```

-
<
-

<input name="id4" type="text" id="id4" size="2" maxlength="2" /></td>

</tr>

<tr>

<td>Sex</td>

<td><label>

<select name="sex" id="sex">

<option>Female</option>

<option>Male</option>

</select>

</label></td>

</tr>

<tr>

<td>Date of Birth</td>

<td><label>

<input type="text" name="dateofbirth" id="dateofbirth" />

</label></td>

</tr>

<tr>

<td>Account Number</td>

<td><label>

<input name="accnumber" type="text" id="accnumber" onkeypress="isNumberKey(event)"
maxlength="13"/>

```

```
</label></td>
</tr>
<tr>
<td>Country</td>
<td><label>
<input type="text" name="country" id="country" />
</label></td>
</tr>
<tr>
<td>Address</td>
<td><label>
<textarea name="address" id="address" cols="45" rows="5"></textarea>
</label></td>
</tr>
<tr>
<td>Phone Number</td>
<td><label>
<input type="text" name="phonenummer" id="phonenummer"
onkeypress="isNumberKey(event)"/>
</label></td>
</tr>
<tr>
<td>Security Code</td>
<td><label>
<input type="text" name="securitycode" id="securitycode"
```