

**AN EVALUATION OF THE IMPACT OF BANKING TECHNOLOGY ON THE
PERFORMANCE OF COMMERCIAL BANKS: THE CASE OF NATIONAL
BANK OF MALAWI**

Masters in Business Administration

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A dissertation submitted to the faculty of Commerce, The Malawi Polytechnic, University of Malawi, in partial fulfilment of the requirements for the degree of Masters in Business Administration.

August 2008

DECLARATION BY CANDIDATE

I here by declare that this dissertation is my own unaided work. It is being submitted in partial fulfilment of the requirements for the degree of MBA in the University of Malawi and it has not been submitted before for any degree or examination in any other university.

Signed_____ **Date**_____

Thelma Saiwa

DECLARATION BY SUPERVISORS

We declare that this dissertation is from the candidate's own work and effort. Where she has used other sources of information, it has been acknowledged. This dissertation is submitted with our approval.

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DEDICATION

To my parents Edgar and Catherine, You have always been a source of inspiration to my life.

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ABSTRACT

The financial reforms initiated in 1987 have changed the operations of commercial banks in the industry. Malawi has seen the influx of commercial banks in the banking sector namely INDEBank, NedBank, MSB, OIBM, NBS Bank, First Merchant Bank and Loita Bank. The establishment of the new banks has changed the monopoly of two banks, Standard Bank previously known as Commercial Bank and National Bank of Malawi. Amongst several strategies that banks have implemented, there has been a lot of technological investment in the banking sector. The technological innovation in the banking sector has created a lot of competition and it is assumed that it contributed to customer satisfaction, productivity and profitability. This study sought to find out the impact of banking technology on the performance of commercial banks.

This study adopted an integrated model. This model was derived from Balanced Score Card Model (BSCM) and Technological Acceptance Model (TAM). BSCM concentrates on organizational value whilst TAM bases its attributes on personal values that stimulate an individual to adopt technological innovations. The study used profits and productivity to measure banking technological contribution to commercial banks' performance. Using linear regression analysis and significance hypothesis testing, it was found that banking technology investment contributes to the profitability whilst the productivity remains constant. The study also revealed that customers are satisfied with the current banking technology performance though there is in need for improvement in certain areas. Employees also agreed that banking technology innovations contribute in aiding fast delivery of services. In this way employees believed that productivity of commercial banks has been enhanced.

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ABBREVIATIONS AND ACRONYMS

ATM	Auto Teller Machine
BSCM	Balanced Score Card Model
CBM	Commercial Bank of Malawi
CSM	Customer Services Management
FMB	First Merchant Bank
GDP	Gross Domestic Product
ICT	Information Communication Technology
ESCOM	Electricity Supply Commission of Malawi
IT	Information Technology
JCE	Junior Certificate of Education
LAN	Local Area Network
MK	Malawi Kwacha
MALSWITCH	Malawi Switch Centre
MSB	Malawi Savings Bank
MSCE	Malawi School Certificate of Education
MSE	Malawi Stock Exchange
NBM	National Bank of Malawi
OIBM	Opportunity International Bank of Malawi
PEOU	Perceived Ease of Use
POS	Point of Sale
PU	Personal Usefulness
RO Bank Assets	Return on Bank Technological Assets
ROE	Return on Equity
ROI	Return on Investment
RSA	Republic of South Africa
SAPS	Structural Adjustment Policies
SE	Standard Error
SPSS	Statistical Package for Social Science
SST	Self Service Technologies
TAM	Technology Acceptance Model

USA	United States of America
WAN	Wide Area Network
VSAT	Video Satellite

CHAPTER 1

1.1 INTRODUCTION

Technological innovations have been the hub of development in the world. Companies that have invested in technology have realized several benefits. Technology unites systems and processes under one infrastructure allowing companies to make leaps in growth and profits (Gates and Hemmingway, 1999). This paper focuses its study on technological innovation in the banking sector because it is a centre of economic processes. The banking sector serves as focal point of financial transactions as such convenience and productivity have become of paramount importance.

1.2 BACKGROUND TO COMMERCIAL BANKING IN MALAWI

Commercial banks are one of the most critical economic entities in most developing countries where financial markets are not well developed. Just like in most developing countries, Commercial banks in Malawi channel funds from surplus economic units to deficit units in order to facilitate trade and capital formation. These banks have operated manually from inception. During the commercial banking infancy, most bank transactions were hugely manual resulting in excessive paper work for both employees and customers. The 1990's brought a lot of changes. Notably, commercial banks have adopted technological banking systems which, among other things were one of the key factors that helped the banks to move away from manual era. Resultantly, the banking hours which were previously limited to morning hours (08:00 Hrs to 12:00Hrs) Monday through Friday were later extended to 15:00 Hrs (with a further introduction of 3.5 hours of business on Saturday morning).

1.3 FINANCIAL REFORMS IN MALAWI

The first realistic financial reforms in Malawi were undertaken between 1966 and 1980. This period is called the post independence period. Reforms made during this period were meant to increase the level of structural adjustment. As such, they affected the banking sector including the commercial banks. The commercial

banks as a consequence of these reforms, began to concentrate on both institutional buildings and review of policies aimed at channelling credit to deprived sectors.

In early eighties, Malawi implemented Structural Adjustment Policies (SAPS). The SAPS affected the banking sector by the consequential liberalisation of the lending rate in 1987 and strengthening of supervision which was facilitated by revision of Banking Act 1989.

These changes ushered in the emergence of new commercial banks to add up to the existing National Bank of Malawi and Standard Bank (Malawi) formerly Commercial Bank of Malawi (CBM). National Bank of Malawi was incorporated in 1971 while Commercial Bank of Malawi was established in 1970. Since 1991, Reserve Bank has issued other licences to First Merchant Bank (FMB) in 1994, Finance Bank in 1995, Malawi Savings Bank (MSB) in 1995, Loita Investment Bank in 1998, NedBank 2001 previously called Fincom Bank, INDEBank in 2001, Opportunity International Bank of Malawi (OIBM) in 2002, NBS Bank in 2004, previously called New Building Society.

1.4 BANKING TECHNOLOGY IN MALAWI'S COMMERCIAL BANKS

Apart from growth, commercial banks have invested in various technologies aimed at enhancing their operations, provision of convenient and fast financial services to customers. The licensing of new commercial banks has stimulated the introduction of technological services to maintain and improve commercial bank services. Whilst this paper centres on evaluating the impact of technological innovations to performance in the banking sector, our emphasis is on customer assessment as well as bank staff self assessments. Within these context, accounting measures done in most previous studies in this area form part of study approach. This is in line with Technological Acceptance Model (TAM) and Balance Scorecard Model (BSCM). The former focuses on individual opinions whilst BSCM centres on the whole organisation performance. Annual reports,

internal reports, interviews as well as questionnaires have been used to generate information for this study.

Of the numerous technological instruments used in commercial banks in Malawi, below are notable pieces of technology which have hugely impacted on the commercial bank's clientele. We descriptively, albeit briefly, name and present technological purpose as below:-

- ATMS- equipment used to withdrawal cash, transfer cash between accounts and printing of mini statements.
- Internet Banking- With the aid of computer, the customer is assisted in account transactions for example checking balance whilst away from the bank.
- Electronic banking- Using the computer, corporate institutions conduct and check account transactions.
- Smartcash-Chip debit cards used for purchasing in main outlets shops in Malawi and withdrawal of cash.
- Computers- machine which facilitates speed in employee transactions and assist customers to conduct electronic banking.
- Electronic bill payment and purchase of airtime- electronic payment of bills using ATMs.
- Mobile phone banking allows customers to check balance on their accounts using mobile phones.

1.5 BANKING TECHNOLOGY: THE CASE OF NATIONAL BANK OF MALAWI (NBM)

This study selected National Bank of Malawi as a case study because it is locally owned bank and has been incorporated for over thirty-six years. It is geographically spread out than other local banks, true to its adage - 'Bank of the Nation'. National Bank of Malawi has made several developments to attract and retain customers. The bank uses its technological advances to make public appeal to its clientele base. Technological innovation is one of the NBM's strategies in

providing satisfactory service. (Annual Report (NBM), 1996-2006). From 1996, National Bank of Malawi has installed the following technological services:- Bankmaster/ power system to enhance automation of accounting procedures, to incorporate gateways for on-line ATMs which allow customers to transact at any National Bank of Malawi branch. Point of Sale (POS) machines allow customers to purchase items using a smartcash. The installation of branch network at National Bank of Malawi has led to influx of technological services to ease banking transactions.

The technological services have been implemented for the benefit of retail and corporate customers. Through electronic banking, corporate customers are able to conduct banking transactions from their offices there by saving time spent on travelling to and from the bank. In case of retail offers, customers have the convenience of making ordinary withdraws and pay utility bills electronically. The introduction of several technological innovations requires an evaluation to direct NBM management's decisions on further investments.

1.6 STATEMENT OF THE PROBLEM

The implementation of structural reforms has resulted in the influx of commercial banks and technological advances in the banking industry. Technology is one of growing tools that commercial banks are using to deliver services and products. However little is known about banking technology on the performance of commercial banks in Malawi. It is also clear that the survival of the banks depends on their performance in the market. This paper discusses whether introduction of banking technology is followed by better performance. Performance can be determined by various factors including increase in market share and reduction in labour costs. Technology is one of the tools that commercial banks are using to deliver their services and products. However little is known about the impact of banking technology on the performance of commercial banks in Malawi. The banking industry is a major component of economy and banking technology has a great influence on the shape of banking

industry. It is therefore imperative to reveal the effect of banking technology on the performance of commercial banks in Malawi.

1.7 OBJECTIVES OF THE STUDY

1.7.1 General Objective of the Study

This study intends to achieve the following objective:-

- To determine the relationship between the introduction of banking technology and the performance of banks

1.7.2 Specific Objectives

Apart from the general objective, the study has the following specific objectives:-

- To ascertain if banking technology improves customer satisfaction.
- To determine relationship between banking technology investment and productivity.
- To determine the relationship between banking technology investment and profitability.

1.8 HYPOTHESES

In order to address the above objectives, the following **null** hypotheses are tested:-

- Banking technology does not contribute to profitability of the commercial banks.
- Banking technology does not contribute to higher productivity/efficiency.

1.9 SIGNIFICANCE OF RESEARCH

There has been an influx of electronic services that various banks are offering to their customers, it is therefore in the interest of this study to investigate if technological products and services contribute to positive performance of the commercial banks. This study provides empirical evidence on measures that can be adopted to improve shortfalls in the current innovations in order to attain efficiency.

There is a discrepancy that exists on the impact of banking technological innovations on the performance of commercial banks in other countries. In other circles it is believed that banking technology adds value to bank operations whilst to others it is a cost. From previous research in developed and developing countries, the reaction has been mixed. Other researchers have found that banking technological investment leads to better performance whilst others have found that banking technology leads to poor performance. It is therefore beneficial to conduct the study on the evaluation of the impact of banking technology on the performance of commercial banks because most Malawian studies on commercial banks have dwelt on the effect of regulation on the performance of commercial banks (Gondwe, 2001) and on the determinants of profits only (Kachingwe, 2004). This study fills the gap by assessing if banking technology contributes to performance of the commercial banks.

1.10 STRUCTURE OF THESIS

The thesis is divided into five chapters and summarised as follows:-.

Chapter one- Introduction

This chapter illustrates the importance of the study and defines objectives. It further describes the hypotheses to be tested and gives overview of the methodology that will be employed. Finally the chapter outlines chapters included in the thesis.

Chapter Two-Literature Review

This chapter reviews at some work that has been done in the past on the impact of information technology on the performance of commercial banks. It explores models of adopting banking technology, empirical evidences in individual countries in order to gain insight on the effect of information technology on the performance of commercial banks.

Chapter Three-Methodology

This chapter describes the methods that have been employed to attain the objectives and prove the hypotheses.

Chapter Four -Findings and Discussion of Results

This chapter describes findings, opinions and results expressed by customers and employees on the performance of information technology in terms of profitability, customer satisfaction and productivity. It further discusses regression findings between banking technology investment as an independent variable whilst productivity and profitability as dependent variables.

Chapter five-Conclusion and Recommendations

This chapter summarises the findings of the study and recommends areas for further study.

1.11 LIMITATIONS TO THE STUDY

This study is limited to the experience of National Bank of Malawi with regard to the kind of technological innovations introduced and applied. Therefore the conclusions drawn are lessons of experience. Nevertheless, despite the lack of use of comprehensive approach, based on representative sample of the commercial banking sector as a whole, the study assumes that the findings would not deviate significantly from the possible results with the use of the latter research approach. National Bank of Malawi operates under the same environmental conditions as the rest of the commercial banks that have joined the bandwagon, albeit at various speeds and scale. Further, in its attempt to provide a picture of technology –linked banking performance, the study is limited to consideration of only a few variables, being customer satisfaction, productivity and profitability.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter provides an overview of literature related to banking technology and commercial banks performance. The discussion is divided into four main parts comprising:- concepts related to banking technology, models of banking technology, country experiences, and constraints associated with banking technology and banking experiences in Malawi

2.2 CONCEPTS RELATED TO BANKING TECHNOLOGY

There are various concepts that are associated with banking technology and the performance of commercial banks. In the context of the objectives of this study, the critical concepts are customer satisfaction, productivity and profitability

2.2.1 Banking Technology

Ige (1995), Sathye (1999), Ogwu (1999), Meuter and Bitner (1998) and Alu (2000) have defined various concepts that are associated with banking technology. This study has selected customer satisfaction, productivity and profitability as concepts to attain this study's objectives because they determine the survival of commercial banks.

According to Ige (1995) technology in the banking sector entails modern way of handling information by electronic means which involves access, storage, processing, transportation, transfer of information and delivery. Sathye (1999) and Alu (2000) agree that banking technology has influence on financial institutions in terms of nature of core products and services by easing enquiry, saving time and improving service delivery. Ogwu (1999) lists computer systems, ATMs, debit cards, electronic banking, Video Satellite (VSAT) and Local Area Network as examples of banking technology. Meuter and Bitner (1998) add that

accuracy, support and performance are factors that induce adoption of banking technology.

2.2.2 Productivity and Profitability

Productivity and profitability constitutes some of the major factors that contribute to survival of an organisation. Ittner and Lacker (1998), Duke and Brand (1982), Nevens (2002) and Mtholyoke (2005) highlight the importance of productivity and profitability.

Mtholyoke (2005) states that increase in output per employee result in increased productivity. Nevens (2002) adds that an increase in banking productivity is mainly associated with improved competition and innovation, when capital is invested in technological equipments. However Duke and Brand (1982) found that heavy technological investment in USA banking sector does not always result in productivity when labour costs are reduced and revenue remains constant. The findings further showed that product customization resulted in complexity and high cost of technology from customer perspective and failure to attain profits by banks. Further, customers were often frustrated with the problems incurred when doing banking transactions.

Measuring profitability accurately has been the critical aspect of performance and remains the basis for evaluating most of the organizations including the banking sector. Profit measurement systems provide the foundation for the development of organizational strategic plans, assessment pertaining to the attainment of objectives and the remuneration of employees. According to Ittner and Larcker (1998), McLannery and Atrill (2001) financial performance is deemed important in facilitating management's decision making. The only challenge with financial performance is that it represents history to predict the future.

2.2.3 Customer Satisfaction

According to Liljander and Strandvik (1994), customer satisfaction can be measured by opinions, attitudes and motivations of customers and could be attained if the opinions are incorporated in the organisation plan.

2.3 BANKING TECHNOLOGY MODELS

Particularly relevant to this study are two models, the Technological Acceptance Model (TAM) and Balanced Scorecard Model (BSCM), because they contain pertinent attributes that facilitate adoption of banking technology. TAM concentrates on personal factors that influence an individual to use various forms of banking technology. The factors that characterize TAM are Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). The Balanced Scorecard Model (BSCM) on the other hand focuses on customer value, business processes, financial performance, learning and growth as factors that facilitate the adoption of technology models. Together BSCM and TAM address the issues of impact on customer satisfaction, productivity and financial performance of an organization.

2.3.1 Technology Acceptance Model (TAM)

Davis et al. (1989) and Adams et al. (1992) advanced the Technology Acceptance Model (TAM) as the foundation of research in accepting technological diffusion in the banking sector. TAM works within the context of two variables, namely:

- Perceived Ease of Use (PEOU) defined as the degree to which a person believes that using a particular system would be free of effort.
- Perceived Usefulness (PU) defined as the degree to which a person believes that using a particular system would enhance performance.

In addition to personal variables that induce adoption of technological usage, external variables such as culture and technical quality have been incorporated to enhance the model. Though the TAM has been successful in assessing reasons for adopting banking technology in industrialized countries, Ibrahim (1985), Atiyyah

(1989), Goodman and Green (1992) have all criticized TAM for having several shortfalls. For instance, despite the widespread use TAM in various studies, it is not universally applicable due to the assertion that users have a choice to either accept or reject technology. This entails problems of applicability of TAM because management mostly imposes technology perceived to be relevant to the success of the organization. TAM substantially ignores external and situational influences particular to a given circumstances or culture which is quite diverse in developing countries. Nevertheless, modifications could be made to TAM to fit developing settings in order to assess technological impact on the performance of banking industry. For instance, a study by Krishnan et al. (2005) investigated effects of technological investments on customer satisfaction. Based on more qualitative measures namely improved customisation, product variety and customer convenience on 50 USA firms for the period 1994-2000, the findings revealed that satisfaction defined from customers' perspective brings value to the service firms.

2.3.2 Balanced Score Card Model (BSCM)

In addition to the TAM which centers on personal evaluation on the need to use banking technology, Balanced Scorecard Model (BSCM) focuses on non-financial and financial measures. The measures that make up Balanced Scorecard are market share, productivity, financial performance and customer satisfaction. According to Kaplan and Norton (2001), the BSCM factors accommodate most of the aspects that define performance of the organization. However, the use of TAM cannot be underestimated. The use of BSCM on the other hand was tested in Korean banking industry by Thatcher and Oliver (2001) and Alpar and Kim (1990). They found that information technology investment in the Korean banking sector has a positive impact on labour productivity, market share and profitability when microeconomic variables are used. The results further suggested that economic benefits of banking technology could be realized if perceived as an integral part of management strategy.

2.4 COUNTRY EXPERIENCES

Several studies have been conducted in USA, France, Korea, Malaysia, Australia, Nigeria, Tunisia and South Africa to assess the impact of banking technology on the performance of commercial banks. Such literature suggests that the impact of technological investment has been insignificant, negative or positive in selected countries with respect to customer satisfaction, productivity and financial performance.

2.4.1 Banking Technology and Customer Satisfaction

There has been some confusion regarding differences between service quality and customer satisfaction. Conceptual and empirical overlap between these two concepts has been widely debated in the service industry among service quality researchers (Rust and Oliver, 1994), however literature is consistent with unique nature of each concept. Jamal and Naser (2003) have associated customer satisfaction as a feeling towards service or products and have approached it as a function of perception. This concept was based on attitudes and opinions of Pakistan retails bankers.

Following the dilemma of what constitutes customer satisfaction, Langeard et al. (1981), Meuter et al. (2000) and Ricard et al. (2001) agreed that ATMs, Debit cards and internet banking facilities constitutes Self Service Technologies (SSTs). Further, it was advanced that customers accept technologies if individual perceived benefits and concerns are addressed for example, convenient banking hours, speed of transactions, security and cost of service.

In contrast to SST acceptance school of thought, Dabholkar (1994), Meuter and Bitner (1998) and Parasuraman (2000) rejected the use of SSTs due to lack of human interaction, unreliability of technology, poor performance and inconveniences facilitated by delays in recovery from technical errors. The two schools of thought based their results from opinions and attitudes of French students and North- east USA customers. In addition to these studies, Barns and

Glynn (1993) suggested that service quality and speed of transactions in banks enhances customer satisfaction.

On a wider perspective, studies have indicated that banks technological innovations focus beyond individual satisfaction. Customer satisfaction and profitability are some of the factors that induce technological adoption. Walker and Cheung (1998) found that banks concentrated on banking technology that result in customer satisfaction and return on investment. The results were based on opinions of customers and employees of Australian banks. Simpson (2002) identified risk, efficiency and growth as variables for investigating impact of electronic banking in emerging markets. Using the risk based model, the results revealed that cost minimisation, increase in number of customers and high revenue drives the adoption of banking technology. Pikkarainen et al. (2006) investigated online customer satisfaction in Finland. The results showed that incorporation of customers' divergent needs in banking technology contributes to customer satisfaction and profitability. Reichheld (1996) and Yeung et al. (2002) concurred that there is a positive relationship between customer satisfaction and profitability if technology incorporates customer needs. The results were not particular to financial institutions but the whole service sector.

In Africa, banking technology is not used to its full potential. Studies by Hickman (2000), Goldfinger (2001) and Webchek (2002) found that South Africans generally fear to use banking technology due to unsafe transactions, lack of knowledge of online information. Further studies by Singh (2004) investigated online banking trends in South Africa .He found that though the ATM is the main banking technology in South Africa, it is mainly used for basic transactions for example withdrawals, balance enquiries than third party deductions.

Other studies in Australian and Malaysian banking sector have indicated that despite high customer transactions and freedom to conduct banking transactions anytime, customers prefer traditional banking style (presence of banking

officials). Sandlant (2001) found that 9 percent of the sampled electronic banking users in Australia were not satisfied with the technological service. Another contribution by Sulaiman and Lim (2005) indicated that traditional banking set up is important for successful banking operations in Malaysia. The study based its findings on opinions of users and non users of electronic banking. As discovered by Singh (2004), only a small percentage of respondents used the technological facilities for payment of personal investment and housing mortgage other than the withdrawals. The few users for extra service could be explained by lack of face to face interaction and information to make rational decision.

Customer Service Management (CSM) is the new tool that enhances customer satisfaction and profitability. Jones and Sasser (1995); Wei and Nair (2006) discovered that technology expenses could be reduced and less marketing expenses incurred with high profitability and customer satisfaction if CSM is adopted. CSM incorporates customer needs, customer service and market research.

2.4.2 Banking Technology and Productivity/ Efficiency

Banking technology has shifted the role of traditional brick and mortar banks through reduction of number of branches and employees by substituting them with technological devices that aid employees and customers' transactions. Some technological improvements in the banking sector have however been associated with increase in number of employees and branches.

Technology investment could result in both staff reduction and enhancement of staff skills. Contributions by Flannery (1996); Lunt, Crane and Bodie (1996); Hoffman (1996) found that introduction of banking technology led to a reduction in number of branches and increase in ATM and online transactions. The growth of ATMs in USA escalated from 13800 in 1979 to 110000 in 1995. During this period, branches experienced slightly slower growth in number from 51236 to 65610. The banks experienced a lot profits which led to experimenting various

technological services and reduction of staff expenditure. Apart from reducing staff costs and increasing online transactions, other studies place the importance of human resource and other factors to attain productivity. Powell and Dent – Micallef (1997), Castel and Go'rriz (2007) argued that the use of technology in addition to human resources with other organisational structure such as flexible culture contributes to productivity. Skills of workers and enabling government policies facilitate productivity. Idowu et al. (2002) researched on the effects of banking technology on growth of Nigerian banks. The results revealed that banking technology investment facilitates speed of transactions and quality service. However the study could not ascertain if technological investment increases staff levels or not.

Other studies have investigated the relationship between banking technology and productivity using quantitative measures. Kang and Song (1999) proved that banking technology investment of domestic banks in Korea contributed to twice as much productivity than non-technological investment when an empirical model was used. Kraemer and Dedrick (1999) and Min and Dewan (2000) concur on their findings that technological investment enhances growth apart from productivity and that it is vibrant during periods of greater economic activity. In construction industry, Park and Kim (2003) found that technological investment has also positive relationship with the productivity. Another study on Indian banks by Meenakshi and Sweta (2004) revealed that technological investment has a positive correlation with productivity. The results of the study showed that private banks had high labour productivity than state banks due to late adoption of technology and failure to substitute employees with technology. Lee and Kim (1999) agreed that banks with high labour productivity showed positive effects of technological investment. However Roach (1996) cautioned that banking technology that ignores customer satisfaction and concentrates on productivity and cost reduction only does not add firm value. Recently, Ziadi and Kuofie (2006) explained that technological investment should encourage human resource development especially in developing countries to yield productivity.

Despite methodological differences that are associated with assessing banking technology investment on productivity, Houghton (2001) has noted that ICT development is felt in developed countries for example USA whilst in developing countries positive effects of technological investment are noted. Mahmood and Mann (2000) suggested incorporation of qualitative measures when assessing the impact of technological investment on service firms to have balanced results.

2.4.3 Banking Technology and Profitability

Various studies have been conducted on the relationship between banking technology and profitability.

Financial performance can be measured using various methods. Bharadwaj and Konsynski (1999) investigated financial performance using Tobin q measure. This measure was used to cater for strategic flexibility and intangible value in order to assess performance. The results indicated a positive relationship between technological investment and financial performance. However Duncan and Elliot (2002) added that ratio analysis has been the widely adopted measure of performance in financial institutions. This entails that despite using different methods when assessing the impact of technology on profitability, the results could be the same

Despite various methods of assessing profitability, certain studies have indicated that there is no relationship between banking technology and profitability. A study by Zhiwei et al. (2004) found that Return on Assets (ROA) and networking amongst branches through Wide Area Network (WAN) behaved statistically independent against USA bank characteristics. The results did not show any significant relationship between banking technology and profitability. As a result it was concluded that overall profitability may be impossible to measure using WAN as a variable. In that case, the study suggested the inclusion of customer satisfaction, and product differentiation as factors that enhance profitability. Shin (2004) explored the relationship between technological investment, profitability

and market valuation for Korean domestic firms whilst employing a number of profitability measures. Though using ROE and ROA as profitability measures, the relationship was insignificant. Further the results showed that capital investment on technology and management style affected the firm's future returns and stock market valuation. Lubbe (2002) also failed to find a significant relationship between technological investment and profitability on South African firms. The study found that integrated technology and e-commerce investment decisions provide a chance for full alignment with overall strategy in South African firms. It further found that technological intensity facilitates the financial performance of the organisation.

Nevertheless to the conclusion that there was an insignificant relationship between technology and profitability, An and Choi (2004) found that banking technology has a positive impact on profitability using the Pooled Ordinary Least Squares method. Data to this effect collected from a panel of twenty six domestic banks suggested that the GDP growth rate of the local banks facilitated by technological investment lead to an improvement in the bank's profitability. Jun (2006) agreed with the findings that banking technology has a positive impact on profitability. Using an empirical analysis on annual financial statements and IT investment measures, the results indicated that both low and high technological banks had a positive effect on profitability because they all recorded profits. The only difference is that banks with low technological infrastructure have stronger influence on bank returns. This is because the marginal productivity of banks with lower level of technological investment as a factor of input is relatively higher by the law of diminishing marginal product, thereby leading to higher effects on profitability increase. Prior to these studies, Kim (2000) investigated the effect of banking technology investment and financial performance using a wide range of measures such as cost reduction, profit increase and market share expansion. The results showed heavy investment of technology reduced labour costs whilst incurring more material costs. However banks had positive effects on market share and profit. Large banks were found to have a greater positive effect on

banking technology expenditure than small banks. Mwamba (2006) concurred that large banks in Zambia maintained customer loyalty and high profits due to technological advancements, such as ATMs, Local Area Network among branches and internet banking.

2.5 CONSTRAINTS ASSOCIATED WITH BANKING TECHNOLOGY

There are many general issues which stand as obstacles to adopting banking technology. Several authors have highlighted general and specific problems associated with technological investment.

Li and Laforet (2005) identified security, perceived risk, the computer illiteracy, new technological risk and habit to carry cash as some of the barriers to acceptance of banking technology by customers in China. They also found that gender is a critical factor because most of the banking technology is used predominantly by male managers, salaried employees and business owners. Walker and Cheung (1998) concluded that reduction of employees caused by the merging of branches contributed to poor customer service. Similarly Bednar et al. (1996) found that Australian customers did not regard banking technology as a major determinant of performance. In that context they recommended that specific needs for the customers should be met by targeting technological investments in areas that bring customer satisfaction. Walker and Cheung (1998) found that Australian customers preferred employee assistance in all banking transactions including the use of banking technology. Instead a significant number of customers preferred to use banking technology for basic transactions such as withdrawals and checking of balance only. The results revealed that younger generation is interested in the technological facilities than older generation because 53 percent of the respondents under the age of 35 preferred to use technological equipments for banking transactions rather than queuing in the banking hall.

Some problems are specific to developed and developing countries. Studies carried out by Foster and Cornford (1992), Odedra et al. (1993) found that technology in developing countries is generally underutilized hence technological investment made insignificant contribution to improving financial performance of organizations. However, Stumpf et al. (1987) argued that generalizations of findings of USA based studies and Sub Saharan African countries settings lack validity because factors such as national culture influence technological usage. The contributions by Deans et al. (1991), Palvia and Sarawat (1992) are that individualism and power distance are some of the drivers of technology in developed countries rather than in Sub-Saharan countries. In addition to factors that affect acceptance of technology in developed countries, there are individual factors that affect adoption of banking technology namely:- communication, compatibility to individual needs, complexity and risk of technology. On the other hand, Ogwu (2000), Idowu et al. (2002) and Singh (2004) added that erratic power supply, slow dial up connections and cost of network provisions hinder smooth operation of banking technology in developing countries. The hindrances affect customer satisfaction, promptness, efficiency and competitive advantage. Despite the constraints, banking technology could result in improved performance if loyalty rewards, training of customers on the use of technology and effectiveness are guaranteed. Webchek (2002) suggested that safety assurance, formal tutorials to customers and cooperation amongst stakeholders should be emphasized to alleviate the existing problems.

2.6 EXPERIENCES IN MALAWI

The banking sector in Malawi has introduced various technological innovations since the implementation of major reforms in 1987. The reforms led to the birth of new commercial banks adding up to the existing commercial banks namely National Bank of Malawi and Commercial Bank of Malawi. The Reserve Bank of Malawi in line with Malawi Switch Centre (MALSWITCH) has facilitated technological development in the financial sector to promote payment and settlement systems to match the global standard. On their part, commercial banks

have made significant investment in upgrading banking operations, acquiring new programs and software, introducing new products and training staff on new technologies in order to improve competence and quality service. Some of the technological products introduced are ATM, networking among branches, Visa branded facilities, cheque guarantee card, smartcash, internet, email and electronic banking (Payment Systems, 2002).

A study by Nzima (2004), investigated on customer care and service quality of commercial banks, he concluded that though customers have indicated that service quality and customer care have improved, it could be enhanced if the bank could have provided fast accurate quotes and bank statements with reliable and technological aided devices like ATMs, electronic banking to personalize service and attain zero defect quest. The study was based on opinions from employees, customers and management from all commercial banks in Malawi. Several studies have been carried out on the determinants of profits in Malawian banking sector. Kachingwe (2004) researched on the determinants of profits on Malawian banking Sector. She concurred with Chirwa (2003) that profitability is shaped by market share, bank specific factors and macroeconomic variables. However, the study was not exhaustive on factors that affect profitability of banks. There is need for further studies especially focusing on banking technology and profitability Recently Kanyoma (2005) investigated the financial performance on privatised banks in Malawi. He concluded that there are various factors including technological innovations that affect profitability apart from privatization of banks. The study considered profitability, operating efficiency and employment levels as some of the variables

The banking sector in Malawi is going through various transformation and studies in the sector attracts a lot of interest. Currently there are few studies that have been carried out in Malawian banking sector leaving a knowledge gap that needs further research especially on the impact of banking technology on the profitability, productivity and customer satisfaction.

2.7 SUMMARY

Following the TAM and the BSCM approaches, this study took an integrated approach with some modifications incorporating qualitative and quantitative measures in order to assess the impact of banking technology investment on the performance of commercial banks in Malawi. The integrated approach based its findings from customer and employee opinions to incorporate TAM whilst the BSCM is incorporated in terms of productivity and profitability. Mahmood and Mann (2000) supported the idea by indicating that qualitative measures should be considered when studying the impact of banking technology on service firms. A study by Mistry (2006) used both qualitative and quantitative measures on technological impact on cost and revenue driver relations study.

Literature has shown that banking technology innovations generally enhances banks performance in terms of customer satisfaction, productivity and profitability. However in some instances, the relationship has either been insignificant or negative. Other country studies further revealed that issues of management style, capital and technological intensity affect customer satisfaction, productivity and profitability. The positive results could be attained if divergent needs of customers are incorporated in the technological development.

Despite the positive correlation between banking technology and performance, there are inherent constraints to the applicability of banking technology to achieve the performance goal. The literature has identified problems of security and poor service due to replacement of staff with technology. Some of the external problems that have been identified are erratic power failure and slow dial up connection.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This Chapter outlines methods used in carrying out this study. Areas that this chapter shall emphasize are the research strategy, sources of data, and sampling technique, and data analysis, limitations of study and reliability of methods used.

3.2 RESEARCH STRATEGY

This study has adopted an integrated approach because it encompasses qualitative measures as defined by TAM and quantitative measures as stipulated by BSCM with some modifications to fit this study. Opinions have been sourced from employees and customers on banking technology investment and performance whilst productivity and profitability have been adopted as quantitative measures. This approach has been adopted because most of the related studies have either taken a qualitative or quantitative approach. In order to address flaws associated with qualitative and quantitative research, this study has used both approaches. Biasness on the part of qualitative research and cost of obtaining quantitative information are some of the flaws associated with both methods (Saunders et al., 2000).

This research took a descriptive style because it aimed to establish a causal relationship between variables. In trying to understand the effect of banking technology investment on the performance of commercial banks, it targeted National Bank of Malawi because it is locally owned and registered on Malawi Stock Exchange (MSE). The listing on MSE entails availability of information. Accessibility to National Bank of Malawi is easy because its head office is in Blantyre where the researcher is based. This research further focused on the impact of banking technology on the performance of one company as a result research objectives have been achieved through National Bank of Malawi.

3.3 DATA SOURCES

Sources of data are critical to success of any research. This study has sourced its data from primary and secondary sources.

3.3.1 Primary Data

Primary data was collected from interviews and retained questionnaires from respondents. This portrayed opinions, attitudes and perceptions of customers, management and employees.

3.3.2 Secondary Data

Secondary data was sourced from annual reports, bank's documents, books and internet in order to enhance the study.

3.4 METHODS OF DATA COLLECTION

Several methods were used to collect data for this study. Face- to-face interviews, questionnaires and internal documentation. These methods have provided both primary and secondary data. Primary data was collected from interviews and questionnaires. Questionnaire pre- testing was done before the actual survey to allow for relevant corrections to the questionnaire. Prior to interviews and distribution of questionnaire, respondents were notified of the objectives of study and participation was voluntary. In departments of Information Technology and Retail at National Bank of Malawi, interviews were conducted with key informants and a checklist was used to collect more information on issues regarding technological services available to National Bank of Malawi customers and employees, advantages, achievements, constraints and extent of problems.

3.4.1 Face to Face Interview

In order to collect valid and reliable data which would achieve research objectives, face to face interviews were used. Ten managers were interviewed whilst the remaining 7 managers who were busy with other assignment opted for a questionnaire. Most of the questions used were open-ended as such respondents

were free to express their views and experiences. This method assisted the interviewer to collect pertinent information important to this study. Most of the managers preferred the face to face interview because they were assured that the information was intended for academic purpose only. The face to face interviews resulted in high response rate because in Malawian culture, the interviews show respect than the use of telephone, mail surveys and questionnaires.

3.4.2 Questionnaire Administration

Questionnaires were chosen as one way of collecting data because the research required large number of closed questions and small number of open- ended questions. According to Saunders et al. (2000) though questionnaires are not good for exploratory and other research that require large number of open-ended questions, this research is descriptive and explanatory therefore the use of questionnaires. According to Bynard et al. (1999) questionnaires provide time for respondents to think about answers.

Three questionnaires administered on employees and customers were structured with standardized list of answer options to choose from. (Appendix 1, 2, 3) In the case of managers, semi-structured questionnaire was administered to obtain their views and opinions. The important attributes that were included in the questionnaire comprised of personal data, technology available to customers and employees, importance of using banking technology, constraints associated with banking technology and improvements to enhance the technology. The researcher used a ‘drop and pick up’ later approach to administer the questionnaires for employees and management. In case of the customers, the two enumerators distributed the questionnaires using a “grab sampling” technique to select customers from the bank during working hours as the customers visited the bank. The questionnaires were accompanied by a covering letter which explained the purpose of the research.

3.4.3 Documentary

Secondary sources just like primary sources are important in research because they provide valid and reliable information which strengthen the findings. According to Churchill (1995), secondary data offer low cost and time economies to the researcher. Denscombe (1998) adds that secondary data is permanent and could be easily verified by others.

Secondary data was obtained from books, annual reports, research papers, electronic journals and National Bank publications. Electronic journals were obtained from the following websites, Emerald, JSTOR, and African Journals Online. The Reserve Bank of Malawi and University of Malawi libraries (Polytechnic and Chancellor College) provided books and access to internet sources. Saunders et al. (2002) states that secondary data assist in generalization of findings and lead to unforeseen discoveries however access may be difficult at times if information is categorized.

3.5 SAMPLING TECHNIQUES

The study used a stratified random sampling technique to select employee respondents in order to have representation of all grades and years of service.

The respondents included members of staff, customers and management from 5 branches of National Bank of Malawi, Information Technology Department and Retail Division. There were 450 employees from the sampled NBM branches. Using Decision Analyst Tool Appendix 4, a sample of 217 was calculated from the sampled branches and 145 responded to the study through questionnaires. 110 customers were randomly chosen whilst being served in the bank. The time incorporated busy period (month end) and free period (mid month) in order to identify banking trends at different periods. Management was also not left out in the study. A total of 20 managers from the sampled branches and Head office (IT department and Retail Division) were chosen to participate in the study. The total sample for this study was 275. In case of branches, five out of twelve branches of the National Bank of Malawi were randomly selected. These branches are

Henderson, Victoria, Customs, Zomba and Capital City which represented both urban and semi- urban areas.

3.6 DATA ANALYSIS

The analysis of data involved quantitative and qualitative approaches because it incorporated attitudes, perceptions and motivations from employees, customers and quantitative data for productivity and profitability. All qualitative data collected through face to face interviews and questionnaires was numerically coded to reduce errors when entering into the computer. Using Statistical Package for Social Science (SPSS) descriptive analysis such as frequencies and percentages, opinions and attitudes were categorized into themes such as definitions of banking technology, importance of banking technology, achievements of banking technology and problems associated with using banking technology.

On the other hand, quantitative data was categorized in form of total banking technology investment, productivity and profits sourced from annual reports and bank documentation. With the available information, relevant ratios were calculated as defined in table 3.1:-

Table 3.1 Definition of Variables

ITEM	DEFINITION
Total Banking Technological Investment (Banking Tech. Inve.)	New Equipment costs + Licensing costs
Net Profits	Profit after Tax
Productivity/ Efficiency	Net interest expense ÷ Total Income

Using banking technology investment as independent variable, regression analysis was conducted against profits and productivity to establish causal effect between variables. Profits and productivity have been selected as dependent variables because the performance of commercial bank is mainly determined by profits and productivity. The regression analysis is an appropriate method when measuring causal effect between variables. The validation of the regression model was

conducted by F test whilst the *t* test and P values were used to test the hypotheses. These tests were chosen because they determine the strength of the variables and significance of hypotheses. These tests have also been reliable for a long period of time.

3.7 RELIABILITY OF RESULTS

The research focused on technological experience i.e views, opinions and motivations applying to National Bank of Malawi only. However this is of little significance considering that NBM environment applies to the whole commercial banking industry. The research focuses on 5 of the 12 National Bank of Malawi branches and the head office. Further the branches were selected from major urban centres of Blantyre, Lilongwe and municipality of Zomba. This means that the research is limited by its exclusion of more rural environments for example Karonga, Kasungu, Mangochi, Mzuzu and Machinga. The results from the selected branches are however significant and representative because most of National Bank of Malawi services are uniform in all the branches and all the staff are adequately trained to deliver excellent service. Some employee and customer respondents who were uncooperative due to busy schedules were replaced with an alternative person holding a similar position. Management approval also facilitated employees cooperation. The customers were guided by the introductory letter and face to face interaction in the banking hall.

3.8 ETHICAL CONSIDERATION

The study adhered to ethical rules because it did not force the respondents to participate in the study. The confidentiality of the respondents was also maintained during the study. NBM management was convinced that the results of the study would improve the service delivery, customer satisfaction and profitability as such management interest was enhanced. Employees and customers of the participating branches were also briefed by branch manager to encourage participation.

CHAPTER 4

RESULTS AND DISCUSSION OF FINDINGS

4.1 INTRODUCTION

This Chapter discusses results and findings from interviews and questionnaires about the effect of banking technology on customer satisfaction, productivity, and profitability. The users of banking technology are the best assessors of technological performance as such their input is important in this study. The input was sourced from the responded questionnaires and interviews. The attributes included are the understanding banking technology, the importance of banking technology, problems with the current banking technological services. Further, demographic characteristics have been defined in terms of gender, age and education. The findings in this study are presented in form of tables and figures.

4.2 CHARACTERISTICS OF RESPONDENTS

The respondents have been characterised in terms of gender, age and level of education.

4.2.1 Gender

This study involved a total sample of 275 respondents of which 60 percent were males and 40 percent were females. The higher percentage of males is due to interest that male employees portrayed by filling in the questionnaires.

The distribution of questionnaire depended on the number of staff at the branch however the response from employees was coincidentally equal as shown in Table 4.1.

Table 4.1: Gender Distribution of Respondents by Percentage

Gender	Overall Sample	Customers %	Employees %	Bank Managers %
Male	60	64	50	65
Female	40	36	50	35
Total %	100	100	100	100
N=	275	145	110	20

Customers and managers also portray a higher percentage of male participation in the study. This trend could entail that NBM has more male employees than females.

4.2.2 Age Distribution of Respondents

The age distribution of respondents is important in this study because it generally provides an insight to NBM on the type of technological products that would meet the needs of different age groups. Table 4.2 shows age distribution of all respondents.

Table 4.2: Age Distribution of Respondents

Age Band	Total Sample %	Customers %	Employees %	Bank Managers %
Below 20	3	6	0	0
21-30	32	39	27	15
31-40	38	30	46	40
41-50	20	17	22	40
Over 50	7	8	5	5
Total %	100	100	100	100
N=	275	145	110	20

Table 4.2 portrays the age distribution of the respondents for this study. 70 percent of the respondents are between 21 and 40 years. 20 percent of the respondents are between 41 and 50 years whilst only 7 percent represents respondents are over 50 years. The pattern of the age distribution indicates that the age gap amongst the respondents is not wide. The significance of the age

distribution is that it assists NBM to understand technological needs of the customers. The results further portray that 69 percent of bank customers are between the age of 21 and 40 as such technological innovations could target this higher percentage. The minority age group needs should also be satisfied. The age group of respondents over 50 years is only 8 percent. If National Bank of Malawi could satisfy technological needs of all age categories, then it could be assured of customer satisfaction.

4.2.3 Level of Education

The level of education is important in this study because understanding of technological issues requires a certain level of education especially when using technological equipment. The trend of qualification in this study is quite good because the minimum level of education is JCE. Most of the respondents have either MSCE or Diploma. This could suggest easy following of instructions associated with banking technology usage as outlined in table 4.3.

Table 4.3 Level of Education

Level of Education	Overall Sample	Customers %	Employees %	Managers %
Passed JCE	7	13	0	0
Passed MSCE	37	30	46	35
Undergraduate Diploma	39	37	43	25
1 st , 2 nd and 3 rd Degree	15	17	11	30
Professional qualification	2	3	0	10
Total N=	100 275	100 145	100 110	100 20

Table 4.3 indicates that the level of education for respondents is generally good for both customers and employees. 67 percent of the customers and 89 percent of employees possess either MSCE or undergraduate Diploma. With this level of education the results suggest that understanding of banking technology issues could be simplified.

4.3 UNDERSTANDING OF BANKING TECHNOLOGY

The understanding of banking technology has been based on the available technological facilities that the banks offer to its employees.

4.3.1 Employee Perception

Employees understand banking technology in various ways. Table 4.4 defines banking technology from various perspectives

Table 4.4 Understanding of Banking Technology

Understanding of banking technology	Strongly Agree %	Agree %	Not sure %	Disagree %	Strongly Disagree %
Technology at my branch involves use of computers in fulfilling my tasks	39	57	2	1	1
Technology is the networking between branches that helps to serve customers of National bank regardless of their branch.	48	39	7	3	3
Technology involves use of scanners that help to pick important details on customer cheques for record purposes.	21	45	17	12	5
Technology involves use of Auto teller machines and debit cards when doing bank transactions	35	57	2	5	1

Table 4.4 shows that majority of employee respondents understand the definition of banking technology in the banking sector. The definitions have been derived from the technological facilities offered by National Bank of Malawi over the past ten years. The results show high percentages of respondents agree with the definitions of banking technology. 57 percent of the respondents agree that banking technology involves the use of Auto Teller Machines (ATM) whilst 48 percent of the respondents strongly agree that banking technology involves networking amongst National Bank branches. However the results also suggest that some employees are not sure of the attributes that constitute banking

technology. The results reveal that 2 percent of the respondents are not sure that computer constitutes banking technology and 3 percent of the respondents disagree that networking amongst branches is part of banking technology. These results suggest that there are few employees who do not understand technological facilities.

4.3.2 Customer Perception

Customers on the other hand indicate that ATM facilities constitute the main banking technology. In addition to ATMs, customers understand internet banking, electronic banking and smartcash as some of the technological facilities that customers use. ATM is the one of the highly used technological facilities because its usage is rated at 98 percent in Table 4.5.

Table 4.5 Technological Facilities

Banking Facilities	Users of technological facilities		Non users of technological facilities	
	Frequency	Percentage	Frequency	Percentage
ATM	143	98	2	2
Smartcash	10	7	135	93
Internet Banking	13	8	132	92
Withdrawal Slips	122	84	23	15
Cheque books	84	58	61	42

The results further indicate that 7 percent of the customer respondents use smartcash whilst internet banking is patronised by 8 percent. Electronic banking is one of the technological facilities used by corporate customers. The results further indicate manual instruments are equally important as technological facilities. Table 4.5 portrays that 84 percent of customer respondents use withdrawal slips whilst 58 percent use cheque books. These results suggest that though technological facilities have been introduced, manual instruments are also highly used by customers.

4.4 PERCEPTIONS ABOUT BANKING TECHNOLOGY

Managers were asked to indicate their perceptions about banking technology. This category was selected because managers are policy makers when it comes to huge investment like banking technological innovations. Their perceptions suggest some of the advantages of introducing banking technology as outlined in table 4.6.

Table 4.6 Managers Perceptions about Advantages Banking Technology

Attributes for Introducing Banking Technology	Frequency	Percentage
Easy, fast and convenient banking processes	2	10
Serve customers better	2	10
Improvement of employees performance	3	15
Reduction of manual processes	1	5
Realignment with current banking innovations	3	15
Efficiency	5	25
Increased profits	5	25
Total	20	100

Table 4.6 indicates that managers strongly agree with the objectives of this study. The trend indicates that managers want to serve customers better by making banking convenient and simple with technological facilities. The managers perception also indicates need to improve employees efficiency. 25 percent of the sampled managers suggest that efficiency is one of the reasons for introducing banking technology. 15 percent of the manager respondents perceive that technological innovations help National Bank of Malawi to attain international standards applicable to other commercial banks. Enhancement of profits is one the reasons for introducing technological facilities. 15 percent of the managers indicate that introduction of technological facilities induce profits. Table 4.6 suggests and accommodates the interests of both employees and customers when introducing technological innovations.

4.5 ACHIEVEMENTS MADE BY CURRENT TECHNOLOGICAL INNOVATIONS

The current banking technology has attained several achievements as stipulated in table 4.7.

Table 4.7 Achievements Attained by Technological Innovations

Achievements	Acceptance to Achievements		Disagreement to Achievements	
	Frequency	percentage	Frequency	Percentage
Increase in profits	91	82	19	18
Increase in number of customers	100	91	10	9
Prompt service to customers	105	96	5	5
Convenient service to customers	105	96	5	5
Professionalism of serving staff	102	93	8	7
Incorporation of customer ideas	96	87	14	13
Individualized customer attention	95	86	15	14

Table 4.7 indicates that 82 percent of employee respondents believe that technological innovations have contributed to profits. 93 percent of employees indicate that professionalism of staff has been enhanced by technological innovations. 91 percent believe that customers have increased in number due to technological innovations currently available. 96 percent of employee respondents indicate that the service to customers is prompt and convenient. The results in table 4.7 suggest that there have been considerable benefits attained by employees and customers. On the other hand some employee respondents have differed with the majority. 18 percent of the employee respondents indicate that profits have not increased with technological innovations. 13 percent of employee respondents believe that there is little incorporation of customers and 14 percent of employee respondents do not support the idea that there is individualised customer attention. The results suggest that though some employee respondents believe that profits

have improved, the perception by the minority should be scrutinised to provide basis for further improvement.

4.6 COMPARISON BETWEEN TECHNOLOGICAL AND MANUAL FACILITIES

In addition to the importance of technological services, comparison of technological and manual facilities has been made and the results portray that technological services are preferred by customer as indicated in Table 4.8.

Table 4.8 Comparison of Technological and Manual facilities

Advantages of using banking technology	Technological Instruments percent		Manual Instruments percent	
	Frequency	Percentage	Frequency	Percentage
Reliability	104	72	41	28
Ease of use	112	77	33	22
Convenience	133	92	12	8
Lacks Security	53	37	92	63
Costs are high	57	40	88	60
Reduction of long queues	123	85	22	15
Free account transactions	124	86	14	21
Utility bill payment	114	86	21	14

Table 4.8 indicates that overwhelming majority of customers find technological instruments as advantageous to their banking transactions. 86 percent of respondents find technological instruments to have greater advantages. Greatest advantage is convenience (92 percent of respondents) followed by free account transactions (86 percent) and reduction in long queues (85 percent). However 28 percent of the respondents find the manual instruments reliable, 22 percent indicate that manual instruments are easy to use whilst 63 percent of respondents find manual instruments costs high and 60 percent admits that they lack security. The trend of the results suggests that manual instruments are supported by few individuals compared to technological instruments due to the risk of security and high costs.

4.7 CONSTRAINTS ASSOCIATED WITH BANKING TECHNOLOGY

Introduction of technological innovations at National Bank of Malawi has not been smooth. There are constraints from customer and employee perspectives as indicated by the table 4.9.

Table 4.9 Constraints Indicated by Employees

Constraints	Agreement to Constraints		Disagreements to constraints	
	Frequency	Percentage	Frequency	Percentage
Lack of training	79	72	31	28
Retrenchment	65	59	45	41
Customer inconveniences	95	86	15	14
Cost of Purchasing technology	76	69	34	31
High maintenance and upgrading costs	75	68	35	32
Lack of Social interaction	62	56	48	44
Delayed support when machine breaks down	57	52	53	48

Table 4.9 indicates that 72 percent of respondents indicate that employees lack of both formal banking training and the mere on-the-job orientation. 86 percent of employees feel that there are constraints of customer inconveniences when using technological facilities. 76 percent of respondents believe that cost of purchasing technology is high whilst 75 percent of respondents suggest that maintenance costs are high. 56 percent of respondents indicate that there is lack of social interaction because technological facilities allow customers to individually transact with their account. 52 percent of respondents indicate that support is delayed when machines breakdown. Results in table 4.9 indicate that technological costs are high and that customers are inconvenienced by delays in rectification process of technological facilities breakdowns. The results further indicate that employees are constrained by retrenchment and lack of training.

4.7.1 Constraints Indicated by Customers

Respondents have indicated various situations as problems depending on their banking experience with National Bank of Malawi. Most of the problems indicated by customer respondents have also been expressed by employee respondents. Table 4.10 summarises the constraints.

Table 4.10 Constraints Indicated by Customers

Constraints	Very often %	Often %	Rarely %	Very Rarely %	Never %
Slowness operation of ATM	13	24	31	23	9
Unavailability of Support staff	15	21	34	20	10
Lack of awareness on use of technological facilities	11	26	24	18	21
Long Queues when using technological facilities (ATM)	30	33	20	10	7
Inconveniences due to breakdown of technological facilities for example (ATM)	6	15	30	31	18

Table 4.10 indicates that 24 percent of respondents indicate that constraints of slowness operation of the ATMs happen often whilst 23 percent of respondents indicate that constraints rarely occur. 21 percent of respondents indicate that unavailability of support staff is often whilst the same percentage of respondents indicate respondents rarely experience unavailability of support staff. The results further suggest that long queues are inevitable when using technological facilities especially the ATM because it is the main banking technology. 30 percent of respondents indicate that long queues are experienced very often when using technological facilities. These results suggest that long queues constitute the main constraint to customers when transacting with the ATM.

4.7.2 Constraints Associated with Auto Teller Machine (ATM)

In addition to constraints noted by customer respondents, they also rated constraints associated with using the ATM because it widely used technology. Table 4.11 describes the extent of technological problems.

Table 4.11 Extent of the Problems

Problems	Very serious Problems%	Serious Problem %	Limited Problem %	Very Limited Problem%	Not a Problem %
High Cost of technological Services	16	17	22	16	29
Few Machines per branch	31	32	14	12	11
Problems when using secret code	8	11	11	19	51
Unfamiliar language on ATMs	10	3	6	13	68

Table 4.11 indicates that 32 percent of customers feel that there are insufficient ATM machines at the branches to cater for customers within a shortest period of time. 29 percent of respondents indicate that cost of technological services is not considered as a problem. 51 percent of the respondents indicate that the use of the secret code is not a problem to them whilst 68 percent of the respondents find that language for ATM instructions is easy to follow and use.

4.8 DISCUSSION OF OPINIONS FROM EMPLOYEES AND CUSTOMERS

This study revealed that 73 percent of the employee respondents and 69 percent of customer respondents are aged between 21 and 40. This entails that employees could be easily understand technological needs of customers because large percentage of customers and employees falls in the same age group.

The use of computers, networking amongst branches, the use of ATMs, electronic banking and internet banking has been incorporated in the definition of banking technology. The results have revealed that 57 percent of the respondents

understand banking technology. Nevertheless, there are also indications that 18 percent of the respondents do not understand attributes that constitute banking technology. This entails that orientation and formal development of human resources on banking technology issues is important to enhance service delivery which could lead to customer satisfaction and later contribute to higher returns. Adequate knowledge of the available banking technology investment stimulates usage.

The study has revealed that work has been simplified since the introduction of technological innovations at National Bank of Malawi. Tasks are done with increased speed with banking technology. Over 85 percent of the customer respondents have indicated that technological facilities are reliable, convenient and contribute to reduction of queues in the banking hall. This is a positive development to National Bank of Malawi as it could encourage potential customers to open accounts with the bank.

Customers are also able to conduct extra transactions such as electronic payment of utility bills and purchase of air time apart from withdrawals and balance enquiry. Further, employee respondents have indicated that current technological innovations have resulted in; increase in profits, professionalism of staff, increase in number of customers, promptness when serving customers, individualized customer service and customer satisfaction.

Customers have also indicated satisfaction with the achievements and improvement of service. The results indicate that 98 percent of the customers use Auto Teller Machine (ATM) when doing banking transactions. This could be explained by simple instructions associated with the usage of ATM. NBM also provides ATM card to all account holders as such all customers are encouraged to use the ATM. In addition to ATM facilities, smartcash, electronic banking, bank-net online are some of the technological services that assist in meeting customer

needs. The results further indicate that only 15 percent of customers use internet and electronic banking facilities.

On the other hand, results indicate that 84 percent of the respondents use withdrawal slips whilst 58 percent of respondents use cheque books. These results entails that though banking technological facilities have been introduced, manual instruments are used concurrently. This entails that traditional banking operations could not be completely ignored with the introduction of banking technology because some customers prefer manual system compared to technological innovations. National Bank of Malawi has also opened branches and agencies across the country to cater for traditional banking operations and meeting of all customer needs.

There are some constraints which have been highlighted by employee and customer respondents though banking technological innovations have improved customers satisfaction. Employee respondents indicate that customers are inconvenienced when technological breakdowns occur. Retrenchment, high purchasing and maintenance costs of banking technological innovations are major problems that employee respondents at National Bank of Malawi noted. 33 percent of customer respondents indicated that long queues emanating from slowness of ATM and technological faults inconvenience customers when doing banking transactions. 32 percent of the respondents have further rated the availability of few machines as a serious problem because it contributes to inefficiency of technological equipment. The use of secret code and unfamiliar language are considered as minor problems. All the problems represent challenges associated with banking technology.

4.9 EFFECT OF BANKING TECHNOLOGY INVESTMENT ON PROFITS AND PRODUCTIVITY

This section portrays the impact of banking technology investment on productivity and profits. Though opinions have been sourced from the customers

and employees in the preceding section, data for this section has been sourced from annual reports and other bank documents ranging from 1996 to 2006 to substantiate the findings from customers and employees opinions.

4.9.1 Staff Levels at NBM from 1996 to 2006

National Bank of Malawi Staff levels have been declining since the implementation of various banking technological investments. Figure 4.9.1 indicates that staff levels have been decreasing from 1996 to 2006. (NBM, Human Resources reports, 2006).

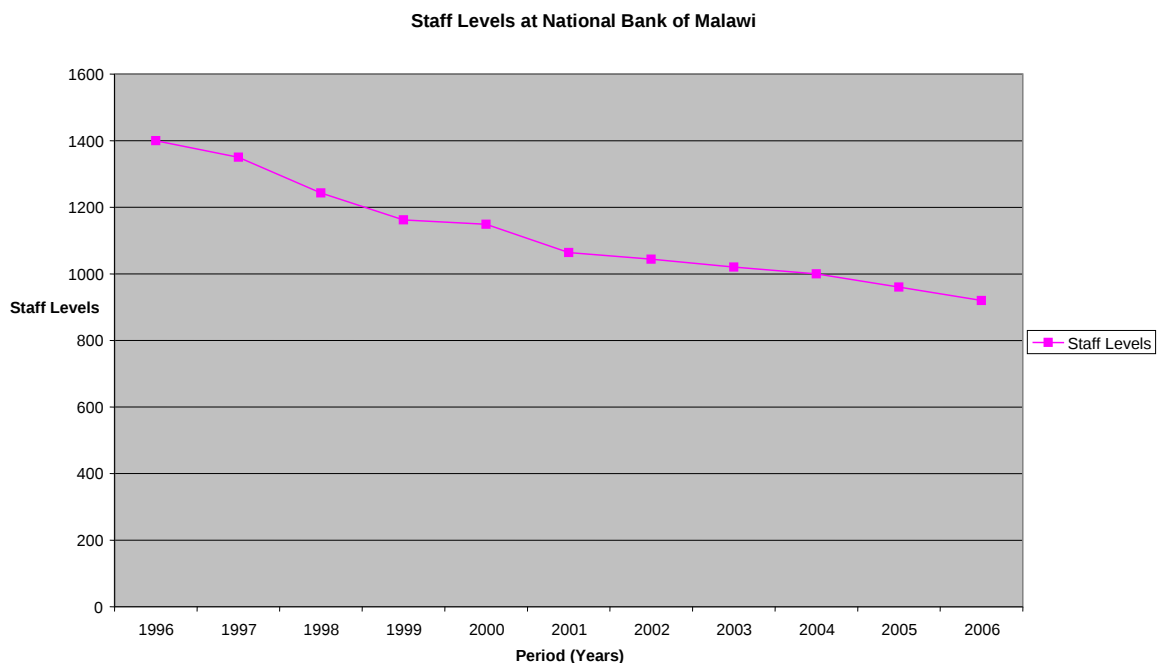


Figure 4.9.1 Staff Levels at National Bank of Malawi

Figure 4.9 indicates a decreasing trend of staff levels. The introduction of various technological innovations coincided with staff level reduction (NBM Annual Report, 2002). The National Bank of Malawi encouraged members who could not fit with banking technological innovations to access benefits of voluntary redundancy scheme.

4.9.2 Productivity/ Efficiency

Productivity is one of the important measures of bank performance. Regression test between banking technology and productivity was done to establish relationship.

Table 4.12 presents summary of the regression results between banking technology investments and efficiency.

Table 4.12 Regression Results - Banking Technology Investment and Productivity

Regression Statistics	
Multiple R	0.493326836
R Square	0.243371367
Adjusted R Square	0.159301519
Standard Error	7.845418592
Observations	11

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	178.1810276	178.1810276	2.89487102	0.12307
Residual	9	553.955336	61.55059289		
Total	10	732.1363636			

Coefficients Summary						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	34.9145167	3.060342266	11.4086967	1.1828E-06	27.9915	41.837
Banking Tech Inve	2.45865E-05	1.44505E-05	1.70143205	0.12307178	-8E-06	6E-055

The following regression equation has been established from the regression results:-

$$Y = a + b(X) \quad a = 34.91 \quad b = 0.000025$$

$$Y = 0.000025X + 34.91$$

The calculated a and b are coefficients which are used to make a forecast. The regression equation identifies the nature of the relationship between dependent and independent variables. It uses the information to estimate dependent variable (productivity/efficiency), based on some known or expected value of independent

variables (Banking Technology Investment). The value of b determines the slope of the relationship. In this case, the value of b is 0.000025. This is very close to zero and entails that no slope exists. These results predict that little change is experienced in productivity when banking technology investment is increased.

The R square is 0.24 which entails that 24 percent of productivity values are associated with changes in banking technology investments. The regression equation of banking technology investment and productivity has computed F of 2.89. It also indicates that the probability of getting an F value of that size is 0.12. These results indicate that the ratio of explained variance to unexplained variance is not large enough to be viewed significant.

The hypothesis about the slope would take this form:-

$$H_0: b = 0$$

$$H_1: b \neq 0$$

In determining whether b values differ from 0, a comparison is made between two values of standard errors. The computed standard error for b (SE_b) is 0.000014. A t test shows that b coefficient (0.000025) differs from 0 by 1.70 SE_b (Standard Error). This value is compared to tabulated t from tables, at 0.05 level of significance and nine degrees of freedom ($n-2$). The tabulated value is 2.3 and since computed t (1.70) is smaller than tabulated t (2.3), this indicates that b values do not differ significantly from 0, there is no slope in the data, therefore this evidence suggest the acceptance of hypothesis that $b = 0$. The P value of 0.123 as computed in coefficient summary schedule falls within the accepted region of the confidence level (95%) as such null hypothesis is accepted.

4.9.3 Banking Technology Investment and Profitability

Apart from productivity, performance of commercial banks is measured by profits. Banking technology investments and profits were therefore regressed to establish if any significant relationship exists between the variables. The

computed results as shown in Table 4.13 indicate the results of regression conducted on banking technology investment and profits.

Table 4.13 Regression Results - Banking Technological Investment and Profitability

Regression Statistics						
Multiple R	0.652264758					
R Square	0.425449315					
Adjusted R Square	0.36161035					
Standard Error	525040874.2					
Observations	11					
ANOVA						
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	1.837E+18	1.837E+18	6.664414	0.029621079	
Residual	9	2.481E+18	2.757E+17	4		
Total	10	4.318E+18				
Coefficients	Summary					
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-106755670.3	406488185	-0.2626292	0.798749	-1026295828	81278448
Banking				3		8
Tech Inve	5.306743521	2.0556402	2.5815527	0.029621	0.656562322	9.9569247
				1		

$$a = -106755670.3$$

$$b = 5.31$$

$$Y = a + b(X)$$

$$Y = 5.31 X. - 106755670.3$$

The a value is an intercept. It is a point where regression line crosses Y axis. Thus, it identifies value of Y when X equals 0. The b value identifies the slope of the line. It indicates that changes that occur in the dependent variable (Y) for each unit change in the independent variable (X). The regression equation therefore identifies the nature of the relationship between dependent and independent variables. The equation uses the information to estimate dependent variable (profitability), based on some known or expected value of independent variables

(Banking Technology Investment). In this case, b is positive and sloping upward to the right. This entails that increase in banking technology investment leads to increase in profits.

The regression results indicate that R square is 0.425, this entails that 43 percent of profit values are associated with changes in banking technology investment. The regression equation of banking technology investment and profits has also computed F of 6.66 and the probability of getting F of that size is very minimal (0.03). This test result is evidence that there is a linear correlation existing between banking technological investment and profits.

The calculation of the equation indicates that National Bank of Malawi needs to invest MK20,116,983.21 in banking technology to breakeven. Banking technology investment below MK20 million would result in a loss whilst higher banking technology investment would result in higher profits.

The coefficients have produced the following equation:-

$$H_0: b = 0$$

$$H_1: b \neq 0$$

In determining whether b values differ from 0, a comparison is made between two values of standard errors. The computed standard error for b (SE_b) is 2.0556402. A t test shows that b coefficient (5.31) differs from 0 by 2.58 SE_b (Standard Error). This value is compared to tabulated t from tables, at 0.05 level of significance and nine degrees of freedom ($n-2$). The tabulated value is 2.3 and since computed t (2.58) is larger than tabulated t (2.3), this indicates that b values differ significantly from 0, there is a slope in the data, therefore this evidence suggest the rejection of hypothesis that $b = 0$. The computed P value of 0.03 falls within the rejection region (95% confidence level) as such the null hypothesis is rejected.

4.9.4 Discussion on Productivity and Profitability.

The results of regression between banking technological investment and productivity indicate that banking technology investment result in constant productivity. In addition, staff levels have been reducing since the introduction of technological innovations as shown in figure 4.9.1. Staff levels reductions have not however contributed to productivity or efficiency. Further, the hypothesis significance test proves that productivity is constant when banking technology investment is increased. National Bank of Malawi productivity has remained constant even though there has been a reduction in staff levels. The productivity has not been changing though employees feel that customers are being served faster with the introduction of technological innovation. This might be explained by lack of training to use technological equipment as such usage capacity is low as such National Bank of Malawi incur increasing costs compared to total income made. The other problem could be lack of morale to work harder by the remaining staff.

The coefficient of correlation results between banking technology investment and profits is strong and positive. The hypothesis test shows that the relationship between banking technology investment and profits is significant and the null hypothesis is therefore rejected, banking technology therefore contributes to profitability of National Bank of Malawi. These results are important because performance of commercial banks is measured by profitability and these results assist the commercial banks to invest in areas that result in profit enhancement. Though there are other factors that contribute to profitability at National Bank of Malawi, 42 percent of the profits are a result of technological investment. This encourages National Bank of Malawi to introduce more technological facilities and differentiate the existing products and services to add variety.

4.10 SUMMARY

This chapter has discussed the opinions sourced from employees and customers through interviews and questionnaires. The introduction of technological instruments to improve the performance of the bank has contributed to positive results because the respondents have indicated that customer satisfaction, productivity and profits have improved. 60 percent of the respondents indicated that services are faster compared to the period when banking transactions were all manual. The study has also noted that ATM is the main banking technology because 98 percent of respondents use it for its banking transactions. The results also noted other technological instruments like internet banking and electronic banking are used by a small customer percentage of 7 to 8 respectively. The results have also revealed that there are constraints that need the attention of the Bank officials for the technological investment to be termed perfect. Amongst the constraints that have been highlighted are long queues in banking hall and on ATMs, slowness of ATMs and lack of urgent assistance by support staff that inconveniences customers.

The significance test proves that the relationship between banking technological investment and productivity is constant. This entails that banking technological investment does not result productivity. The relationship between banking technological investments and profit is significant and has resulted in rejecting the null hypothesis, therefore accepting the alternative hypothesis which states that banking technology contributes to profitability. The results ably achieved the objective of the study because the relationship between banking technology and performance of banks has been determined.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This segment concludes the study by presenting a summary of the findings, recommendations based on such findings as well as further research based on the research gap.

5.2 SUMMARY OF FINDINGS

The study revealed that banking technology describes computers, networking among branches, internet banking, fake notes detectors, scanners, money counting machines electronic banking, smartcash and use of Auto Teller Machine(ATM). The results from table 4.4 indicate that the majority of employees understand banking technology. On the part of the customer, results from table 4.5 have clearly shown that banking technology enhances speed when transacting with personal account whilst for employees better service is rendered to customers. The study has termed banking technology to be convenient and flexible because banking hours are not limited to normal working hours and extra services like utility bill payment and purchase of air time are incorporated. The results from table 4.8 have clearly shown that technological instruments have more advantages than manual instruments. It can therefore be concluded that banking technology facilitates customer individualised service. Further, it has been perceived through this study that the technological facilities have contributed to increased profits.

Despite the introduction of various banking technological facilities, results indicated in table 4.5 have revealed that some manual facilities like cheque and deposit slips are inevitable for banking operations as such they have been used concurrently with technological facilities. The study has revealed that some customers have preferred to use manual facilities because they are considered to have survived the test of time than modern banking facilities. The comparison of the manual facilities and technological facilities revealed that manual processes

are costly due to a lot of paper work and require long waiting period in the banking hall. The manual facilities were deemed to lack security if the paper is lost because it is difficult to trace transactions.

Apart from the achievements that banking technology has attained, the study has revealed some inconveniences to both employees and customers as depicted in table 4.9. It was observed that lack of proper training retards proper understanding of customer queries as such customers are referred from one officer to another. Retrenchment was perceived to be another major problem to employees because most of the manual routine tasks were being substituted by technological facilities. The cost of purchasing and maintaining banking technology was observed to be one of the problems because it hinders progress. Banking technology is dynamic and keeps on improving as such frequent upgrades of banking technology are costly. On the other hand, table 4.10 has highlighted constraints noted by customers. The customer respondents indicated that ATM failure, lack of awareness to use electronic equipment, long queues, inconveniences due to external problems for example network error and power failure are the main problems that the respondents experience when using technological facilities. The results as shown in table 4.11 have revealed that there are few Auto Teller Machines (ATMs) at National Bank of Malawi branches to cater for customers especially during busy periods.

Apart from the opinions from respondents, a statistical analysis using linear regression model was done to assess the relationship between banking technology investment as an independent variable whilst net profits and productivity as dependent variables. The results as shown in table 4.12 have indicated that there is no relationship between banking technology investment and productivity. The bank has been able to achieve its goal of substituting staff with technology unfortunately it has not contributed to productivity. The results also indicated a strong positive relationship of 0.652 between banking technology investment and profits as shown in table 4.13. The hypothesis test has rejected null hypothesis

there by accepting the alternative hypothesis that banking technology investment contributes to profits (An and Choi, 2004; Jun, 2006).

5.3 RECOMMENDATIONS

This study recommends the following suggestions to improve on the shortfalls that have emerged from the study associated with the technological services.

5.3.1 Need Based Banking Innovation

The results in table 4.2 have shown that 73 percent of employee respondents and 69 percent of customer respondents are between 21- 40. This trend should therefore influence National Bank of Malawi to incorporate the need and interest of young users because they command large clientele and could be used to attain competitive advantage against other commercial banks. The needs of minority should also be incorporated to develop a market niche that could enhance competitive advantage.

5.3.2 Training and Awareness Campaigns

The results in table 4.9 have shown that training is one of the constraints that hinder success of banking technology at National Bank of Malawi. It is therefore recommended that formal and on-the- job training should be routinely provided to employees to improve service delivery because the success of any technological investment depends on well trained human resources. Apart from specialised trained personnel required to manage banking technology, general awareness to the rest of employees instil confidence to attend to minor queries from customers. Customers would also be satisfied if their queries attended with promptness.

Results in table 4.5 indicate that ATM is the highly used technological instrument by NBM customers. However the bank has other technological facilities which are not commonly used due to lack of awareness. Pre –awareness campaigns before the launch of technological facilities would therefore initiate interest to use the coming banking technology whilst post awareness campaigns equip customers with knowledge on the usage of banking technology. NBM could also consider

promotion campaigns to encourage interest of customers. Considering that awareness could limit the number of attendants and could not be on going, it would be recommended to introduce a Customer Service Helpdesk which should be operational 24hours to assist customers on technological queries. In addition to orientation of front line staff on banking technological issues, all members of staff should be oriented on all technological innovations that the bank has installed to own the facilities and ably assist the customers.

5.3.3 Enhancement of Available Banking technology

Table 4.11 has indicated problems associated with banking technology at NBM. Amongst the problems is lack of ATMs to cater for growing number of customers in the various branches of NBM. The bank should make sure that every branch has adequate number of ATMs to cater for the growing number of customers. Security could also be improved by the use of Biometric scanners to identify a customer finger at the ATM machine to overcome pin code fraud.

NBM could also install cash dispensers at strategic locations and shopping malls where cash is highly required for shopping. NBM could further minimise the use of cash by enhancing the use of Smart cash chip card and the Point of Sale (POS) equipment to make direct payment of goods at the main shopping centres.

The results in table 4.5 have revealed that internet/ bank net online receive minimal participation of customers. National Bank of Malawi could encourage participation of these technological facilities by instituting banking cafe points at strategic places to encourage customers to transact with their account without travelling to their branch. NBM could even consider having the computers for internet and electronic banking within the banking hall to encourage usage of the technological facilities.

5.3.3.1 Language on ATMs

All the ATMs available at the branches have their instructions in simple English. National Bank of Malawi should recognise that the majority of Malawians are illiterate and some are only familiar with their vernacular language. The bank could therefore ease the problems of using ATMs by incorporating main local languages like Chichewa, Tumbuka, Yao and Lomwe.

5.4 NETWORKING AMONG BRANCHES AND AVAILABILITY OF CONTINUOUS POWER

The networking among the branches is supplied by third party subscriber through leased lines which are prone to vandalism. To ensure reliable connectivity among branches, National Bank of Malawi should consider installing wireless connection facility called VSAT which should facilitate the networking amongst the branches. Malawi in general experiences erratic power failures as such powerful stand by generators are inevitable to supply electricity when ESCOM fails to supply for all the NBM branches.

5.5 RECTIFICATION OF BANKING TECHNOLOGY ERRORS

Results in Table 4.10 have shown problems identified by customers. Fast rectification of problems brings satisfaction, confidence and loyalty to customers as a result customers are easily retained with little marketing expenses. Benchmarking of technology with other financial institutions is advantageous to the performance of commercial banks because the banks gain fees through services it renders to customers from other commercial banks. Technology cannot contribute to customer satisfaction, productivity and profit except when it adds value to customers and employees.

5.6 BANKING TECHNOLOGICAL SUGGESTIONS

The bank should encourage its customers to suggest and at least conduct open days to hear the needs for the customers for their incorporation in their strategic

banking plans. Employees should be motivated to suggest improved ways of providing services to their customers.

5.7 RECOMMENDATIONS FOR FURTHER RESEARCH

As this study is based on the experience of one commercial bank, it is recommended that for a more representative picture, further studies be undertaken for larger groups of commercial banks and other financial institutions.

Secondly it is recommended to extend variables beyond the three covered in this study namely customer satisfaction, productivity and profitability. Additional variables would include benchmarking of technology within banking industry and quality service. Another study could emphasize on factors that enhance productivity. This will help to assess the banking technology beyond cost issue. It would therefore generate the importance of banking technology in the whole banking sector.

Lastly, it is recommended that further studies should be on valuation of specific banking technology products like mobile banking. This would help to assess the performance of individual banking technology facilities.

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APPENDICES

APPENDIX 1: Questionnaire for Employees CODE NO: QEMP 1

AN EVALUATION OF THE IMPACT OF BANKING TECHNOLOGY ON PERFORMANCE OF COMMERCIAL BANKS: THE CASE OF NATIONAL BANK OF MALAWI

1 Please indicate the following:

A Your gender

(i) Male (M)..... ☐

(ii) Female (F)..... ☐

B Your age

(i) Below 20 years..... ☐

(ii) 21- 30..... ☐

(iii) 31-40..... ☐

(iv) 41- 50..... ☐

(v) Over 50 years..... ☐

C Your level of education

(i) JCE..... ☐

(ii) MSCE..... ☐

(iii) Diploma ☐

(iv) Degree..... ☐

(v) Other, please specify..... ☐

D Name of your branch

2. For how long have you worked for National Bank of Malawi?

(i) Less than 1-5 years..... ☐

(ii) 6-10 years..... ☐

(iii) 11-15 years..... ☐

(iv) 16- 20 years..... ☐

(v) Over 20 years ☐

3. Below are statements on how technology is defined in banking. Please circle the number that corresponds to your level of agreement or disagreement to each statement. (For Example: If you strongly agree with the statement, circle 5).

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Technology at my branch involves use of computers in fulfilling my tasks.	5	4	3	2	1
Technology is the computer networking that helps to serve all customers of National Bank regardless of their branch	5	4	3	2	1
Technology involves use of scanners that help to pick important details on customer cheques for records purposes.	5	4	3	2	1
Technology involves use of Auto Teller Machines and debit cards by customers when doing bank transactions	5	4	3	2	1
Technology means the use of electronic banking when doing banking transactions	5	4	3	2	1

4. Technology assists me in fulfilling my duties in the following way: please circle the number that corresponds to your level of agreement or disagreement on each statement. (For Example: If you strongly agree with the statement, circle 5).

	Strongly agree	Agree	Not Sure	Disagree	strongly disagree
(i) Work is made simple	5	4	3	2	1
(ii) Knowledge is increased due to the use of technology	5	4	3	2	1
(iii) Customers are satisfied with branch's services	5	4	3	2	1
(iv) New customers are attracted to	5	4	3	2	1

		Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
	technological services					
(v)	Saves transactions time	5	4	3	2	1
(vi)	Administrative costs are reduced	5	4	3	2	1
(vii)	Productivity increases	5	4	3	2	1
(viii)	Helps in instant accessing of Inter-bank deposits	5	4	3	2	1
(ix)	Information is obtained instantly	5	4	3	2	1

Others, please specify

.....

.....

.....

5. Apart from advantages of technological uses, what challenges do you face at your branch?

Please tick all statements that apply appropriately

- (i) Lack of training..... ☐
- (ii) There are few employees to complete a task..... ☐
- (iii) Technological faults leading to customer inconveniences..... ☐
- (iv) Cost of buying technology is high..... ☐
- (v) High maintenance and upgrading costs..... ☐
- (vi) Lack of social interaction between employees and customers..... ☐
- (vii) Delayed support when Auto Teller machines breaks down..... ☐
- (viii) Inadequate staff to provide support services ☐
- (ix) Outside organization provide delayed support services..... ☐

6. How do you rate technological performance at you branch?

Please tick one

- (i) Excellent..... ☐
- (ii) Very good..... ☐
- (iii) Good..... ☐
- (iv) Poor..... ☐
- (v) Worse..... ☐

8. What changes in technology can improve speed and make work easier?
Please tick appropriately.
- (i) Computers..... ☐
- (ii) Scanners..... ☐
- (iii) Money counting Machines..... ☐
- (iv) Fake currency detectors..... ☐
- (v) Calculators..... ☐
9. Which of the following do you think could be used as a measure of good performance at your branch? Please tick as many factors as you believe are applicable.
- (i) Increase in number of customers..... ☐
- (ii) Meeting agreed-upon targets..... ☐
- (iii) Increase in profits..... ☐
- (iv) Being first in introducing new products and services..... ☐
- (v) Prompt service to customers..... ☐
- (vi) Convenient opening hours..... ☐
- (vii) Professionalism in serving staff..... ☐
- (viii) Incorporating customer suggestions..... ☐
- (ix) Individualized attention to customers.....
- Other, please
specify.....
10. What steps could be taken in order to improve the current banking technology for
better performance and productivity
.....
.....

Thank you for filling this questionnaire

**AN EVALUATION OF THE IMPACT OF BANKING TECHNOLOGY ON THE
PERFORMANCE OF COMMERCIAL BANKS: THE CASE OF NATIONAL
BANK OF MALAWI**

1 Please Indicate the following:

A. Your Gender

(i) Male..... ☐

(ii) Female..... ☐

B. Your age

(i) Below 20 years..... ☐

(ii) 21- 30..... ☐

(iii) 31-40..... ☐

(iv) 41- 50..... ☐

(v) Over 50 years..... ☐

C. Your level of education

i. JCE..... ☐

ii. MSCE..... ☐

iii. Diploma..... ☐

iv. Degree..... ☐

v. Other, Please specify.....

D. Name of your branch

E. For how long have you been customer at National Bank of Malawi?

(i) Less than 1-5 years..... ☐

(ii) 6- 10 years..... ☐

(iii) 11-15 years..... ☐

(v) 16-20 years..... ☐

(vi) 21+ years..... ☐

- 2 Which of the following services do you use for banking transactions? Please tick all that apply from the list below.

- | | | |
|-------|----------------------------|--------------------------|
| (i) | Smartcards..... | ☐ |
| (ii) | Cheque guarantee card..... | ☐ |
| (iii) | ATM machines..... | ☐ |
| (iv) | Savings card..... | ☐ |
| (v) | Current account card..... | ☐ |
| (vi) | Saver plus card..... | ☐ |
| (vii) | Internet banking..... | ☐ |

- 3 What manual services do you use for banking transactions?

- | | | |
|-------|-----------------------|--------------------------|
| (i) | Withdrawal slips..... | ☐ |
| (ii) | Cheque book..... | ☐ |
| (iii) | Card..... | ☐ |

- 4 Compared to technological services, how do you find the use of manual instruments in terms of serving your needs? Please write MI (if you believe that manual instruments are better and TI if technology instruments are better for each criteria indicated below:

- | | TI | MI |
|---|--------------------------|--------------------------|
| (i) Reliability | ☐ | ☐ |
| (ii) Easy to use | ☐ | ☐ |
| (iii) Convenience to use after workings hours | ☐ | ☐ |
| (iv) Lacks security | ☐ | ☐ |
| (v) Costs are high | ☐ | ☐ |

- 5 Are you satisfied with the banking technology services of National Bank because of the following reasons?

Please indicate your reasons by ticking appropriately

- | | | |
|--------|---|--------------------------|
| (i) | Services are fast..... | ☐ |
| (ii) | Long queues are reduced in banking halls..... | ☐ |
| (iii) | Able to access my account after working hours..... | ☐ |
| (iv) | It gives me high status..... | ☐ |
| (v) | It increases knowledge..... | ☐ |
| (vi) | It enables me to pay my bills directly..... | ☐ |
| (vii) | It enables me to purchase cell phone units..... | ☐ |
| (viii) | It enables me to personally check account balance..... | ☐ |
| (ix) | It enables me to transfer money between accounts..... | ☐ |
| (x) | It enables me to get printed mini statement from my account | ☐ |

- 6 How often do you face the following problems when you do business at National Bank branches? Please circle the number that applies to your choice.

	Very Often	Often	Rarely	Very Rarely	Never
(i) Slowness of Auto Teller Machines due to network failure	5	4	3	2	1
(ii) Unavailability of support Staff when machines Break down	5	4	3	2	1
(iii) Lack of awareness on the use of technology	5	4	3	2	1
(iv) Long queues in the bank and on Auto Teller Machines	5	4	3	2	1
(v) Inconveniences due to unavailability of cash in Auto Teller Machines after working hours	5	4	3	2	1

- 7 To what extent do you consider the following as problems while conducting business with National Bank? Please circle the number that corresponds to your level of agreement.

- (i) Cost of obtaining the services are high

Very serious problem	Serious problem	Limited Problem	Very limited problem	Not a problem
5	4	3	2	1

- (ii) Few machines to serve many customers

Very serious problem	Serious problem	Limited Problem	Very limited problem	Not a problem
5	4	3	2	1

- (iii) Uses secret code which can easily be forgotten

Very serious problem	Serious problem	Limited Problem	Very limited problem	Not a problem
5	4	3	2	1

(iv) Uses difficult/ unfamiliar language when transacting with Auto Teller Machines.

Very serious problem Serious problem Limited Problem Very limited problem Not a problem

5

4

3

2

1

- 8 Please write suggestions on how you would like to improve in areas such as reliability, cost reductions, user friendliness, security, e.t.c. while using the following technological instruments:

ATM Machines

ATM language

Internet Banking

User training

Other, please specify

Thank you for filling this questionnaire

APPENDIX 3: Questionnaire for Managers

CODE NO: QMNG 3

**AN EVALUATION OF THE IMPACT OF BANKING TECHNOLOGY ON THE
PERFORMANCE OF COMMERCIAL BANKS: THE CASE OF NATIONAL
BANK OF MALAWI**

Please indicate the following:

- B. Your Sex
- (i) Male (M)..... ☐
- (ii) Female (F)..... ☐
- B. Your age
- (i) Below 20 years..... ☐
- (ii) 21- 30..... ☐
- (iii) 31-40..... ☐
- (iv) 41- 50..... ☐
- (v) Over 50 years..... ☐
- C. Your level of education
- (i) JCE..... ☐
- (ii) MSCE..... ☐
- (iii) Diploma..... ☐
- (iv) Degree..... ☐
- (v) Other, please specify.....
- D. Name of your branch
- _____

3 For how long have you been an employee at National Bank of Malawi?

- (i) Less than a year ☐
- (ii) 1-5 years..... ☐
- (iii) 6- 10 years..... ☐
- (iv) 11-15 years..... ☐
- (v) 16-20 years..... ☐
- (vi) 21+ years..... ☐

4 What technology has National Bank of Malawi introduced to its customers?

- 4 What technology has National Bank of Malawi introduced to aid employees' tasks?

- 5 Why has National Bank of Malawi introduced technological instruments to aid employees' tasks?

- 6 Why has National Bank of Malawi introduced technological services to its customers?

- 7 How has the technology introduced by National Bank of Malawi improved the performance of the Bank?

- 8 What improvements have been made to existing technology in order to enhance performance of National Bank of Malawi?
-
-
-
-
-
-
- 9 What problems does National Bank of Malawi face with its technology that has been introduced?
-
-
-
-
-
-
- 10 What improvements could be made to technological instruments used by employees in order to enhance performance?
-
-
-
-
-
-
- 11 What improvements could be done to technological instruments being used by customers in order to enhance performance?
-
-
-
-

Thank you for filling this questionnaire

APPENDIX 4: Decision Analyst Tool

STATS - [Sample Size]

File Window Help

10:24 AM STATS™

Sample Size

Size of Universe? (Maximum 99999) 450	The Sample Size Should Be: 207.2408	Calculate Print Help Reset Exit
Maximum Acceptable Error (+-) %? 5%		
Estimated Percentage Level? 50%		
Desired Confidence Level? 95%		

Start | STATS - [Sample Size] | 10:24 AM