



**INFORMATION TECHNOLOGY INFRASTRUCTURE CAPABILITY AND FINANCIAL
PERFORMANCE OF BARCLAYS BANK UGANDA LIMITED**

BY

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**A DISSERTATION SUBMITTED TO THE SCHOOL OF MANAGEMENT SCIENCE OF UGANDA
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MANAGEMENT INSTITUTE**

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DECLARATION

I, Samuel Nixon Munnet, declare that this my original research work and that it has never been submitted for any academic award. I wish to state that where I used other people's work, I have dully acknowledged them.

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APPROVAL

This is to certify that this dissertation has been submitted with our approval as University Supervisors.

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DEDICATION

Commitment, effort and dedication were fundamental elements in the completion of this research report, this piece of work is dedicated to my parents, brother, sister, wife and children

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ABBREVIATIONS/ACRONYMS

ATM	-	Automated Teller Machines
BOU	-	Bank of Uganda
CVI	-	Content Validity Index
ICTs	-	Information Communication Technologies
IT	-	Information Technology
ITI	-	Information Technology Infrastructure
ITICs	-	Information Technology Infrastructure Capabilities
NPL	-	Non Performing Loans
SPSS	-	Statistical Package for Social Sciences
UGX	-	Uganda Shillings

ABSTRACT

The purpose of the study was to investigate the influence that IT infrastructure has on financial performance at Barclays Bank. The study was guided by the following specific objectives; to establish the relationship between IT compatibility and financial performance; the relationship between IT connectivity and financial performance; and the relationship between IT application functionality and financial performance in Barclays Bank. Using a cross sectional study design, responses were collected from 134 respondents out a population of 179 respondents. Data on the sample characteristics and objectives were analyzed according to frequency tabulations and Pearson correlation matrix respectively and regression analysis was used to examine the predictive power of staff training on financial performance. From the findings: IT compatibility ($r=.582^{**}$), IT connectivity ($r =.469^{**}$) and IT application functionality ($r=.540^{**}$) had positive significant relationships with financial performance showing that IT infrastructure capability had a positive effect on financial performance at Barclays Bank. Results from regression analysis showed IT compatibility, IT application functionality and IT connectivity were strong predictors of financial performance (Adjusted R Square = .466). The study recommended that; the management of the bank should develop strategies inclined to IT compatibility, IT application functionality and IT connectivity so as to enhance the financial performance at Barclays Bank. The strategies will help foster the development and implementation of IT infrastructure capability which promote profitability, sales growth, liquidity and return on investment.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

All organizations whether public or private rely on some form of information technology communication to send their messages across to their target audience or to perform certain operations in their organizations (Bhatt and Emdad, 2010). Love, et. al., (2005) posit that ICTs are influential in enabling supportive employees. Effective ICTs ensure employees receive, respond, adjust and perform activities within an organization. Information and Communication Technology deals with the physical devices and software that link various computer hardware components and transfer data from one physical location to another (Bhatt and Grover, 2005). Therefore, the importance of information technology infrastructure can be considered as a key dimension to the kinds of capabilities of information technology in business organizations (Dai, Kauffman and March, 2007). As information technology infrastructure capabilities will be available to support new applications and initiatives in the organization (Mithas, et. al., 2007).

On the other hand, Love, et. al., (2005) noted that the infrastructure density of information technology could lead to improving the performance and make the organization more superior over its competitors from organizations that do not invest in information technology. The importance of information technology infrastructure can be considered as a key dimension to the kinds of capabilities of information technology in business organizations (Durmusoglu, 2009). This study will examine the effect of information technology infrastructure capability on financial performance in Barclays Bank Uganda Limited. Although financial performance is vital for organizations, not all organizations are inclined on ensuring its improvement. According to Bank of Uganda Stability Report (2016), most financial institutions in Uganda are still failing to strike a balance in financial performance. Much as several efforts by the

management of these institutions have been made to enhance financial performance through IT investment, the financial performance in financial institutions is still inadequate (Bank of Uganda, 2013). This chapter covered the background to the study, the statement of the problem, the general and the specific objectives of the study, the research questions, the hypotheses, the scope of the study, the significance, justification and operational definition of the terms and concepts used in the study. The operational terms and concepts were also covered in this chapter. According to the study, information technology infrastructure capability was the independent variable and financial performance the dependent variable.

1.1 Background of the Study

The background is presented under historical, theoretical, contextual, and conceptual perspectives as discussed below.

1.1.1 Historical Background

The value of information technology (IT) infrastructure in today's organizations is of growing importance. As the main component of the IT investment, the development of an effective IT infrastructure is placed among the top concerns of overall IT management. Firms spend a considerable amount of money and time to build IT infrastructure. From the 19th throughout the 20th centuries was a rise in banking services offered by banks increased (Bowden, 1989). Several clearing facilities, security investments and overdraft protections were introduced. The 21st century has seen most banks offer very similar services using with differing information communication infrastructure (Bowden, 1989). In the US, ICT banking evolved in the late 1960's with Chemical Bank taking the lead to install the ATM systems (Wetzel, 2011). Like in the US, the use of IT is widespread from the most developed countries through the developing countries to the least developed countries, although the extent of overall use is directly related to the level of development. Given that commercial banks highly information intensive, they have invested in IT extensively.

In the 1980s, IT was becoming known to help firms raise entry barriers, increase bargaining potential with suppliers and customers, and offer new products and services (Bhatt and Emdad, 2010). In the 1990s ITI was being defined as shared, tangible, technological resources including platform technologies (i.e., hardware and operating systems), networks and telecommunication technologies, data, and software applications (Xianfeng, Boxiong and Zhenwei, 2008). Since then the objective is to find the ways IT can help generate business advantages. Like in many developing countries, Uganda's financial sector has evolved in the area of ICT banking. In 1966, the Bank of Uganda was established with the responsibility of issuing currency and managing foreign exchange reserves (Bank of Uganda, 2012). It is during the 1970s and early 1980s that a number of commercial banks significantly started to realize an increase in banking services in Uganda much as the delivery of services depended on manual systems which were highly bureaucratic (Uganda Banks Association Records, 2007).

In early 1990s, the nature of banking started changing in Uganda's financial sector with much developments and integration of ICT banking which resulted into borderless banking where customers could make transactions across the world through different ICT enabled channels such as ATMs, call centres, online banking and mobile banking. ICT banking which involves relatively lower costs and allows customers to choose from alternate delivery channels has threatened traditional branch banking network (Darlington, 1999). During the late 1990s and early 2000s saw the emergence of electronic banking in most commercial banks. In the early 2000s, banks accelerated and continued to improve their branch network through mergers and acquisitions. By the end of 2009, total commercial bank assets value in Uganda was estimated at US\$4.6 billion and there were 22 licensed commercial banks with an estimated 400 bank branches and over 600 ATMs (Uganda Banks Association, 2009).

The growth in e-banking continues to grow with banks getting more equipped with latest technology (Bank of Uganda Report, 2014). The transformation implies that the Ugandan

banking industry, which is dominated by commercial banks, has continued to invest heavily in IT products and services such as hardware, software, telecommunication, training, consulting, and outsourcing. Commercial banks' investment in IT accounts for about 70% of the industry's total investment cost and 46% of the total organizational IT spending in Uganda (Bank of Uganda, 2012). In the past few years, banks in Uganda have increasingly depended on the deployment of (IT) infrastructure to drive their processes in order to deliver superior financial performance to meet and surpass customer expectations. Customer's insatiable appetite for efficient services has compelled financial institutions to make the transition from the traditional 'brick and mortar banking to the e-platform and in the process they have occasioned a more radical transformation of their business systems and models by embracing e-banking .With their transition to the e-business, e-commerce and e-banking platform, Ugandan banks are aggressively moving towards reduction of cash transactions (Ovia, 2007).

In Uganda, Barclays Bank has upgraded the capability of its IT infrastructure facilities with the establishment of a new banking system, internet banking, mobile banking and spread of the bank's service points across the country (Barclays Bank Annual Report, 2016). In Barclays Bank just like in other financial institutions the demand for e-banking services is growing and opportunities lie in IT infrastructure capabilities so as to meet the existing demand for the services. During the period 2011 to 2015, Barclays Bank undertook the implementation of performance improvement programs to obtain the required capacity. The programs included both strategic internal reforms and private sector participation in the operations of the bank (Barclay Bank Annual Report, 2012). In addition to core banking, the new system includes modules for various other banking and financial needs including e-banking, mobile banking, treasury, wealth management, customer relationship management, business analytics, operational data store and specialized core banking solution for regional rural banks (The Economic Times, 2011).

1.1.2 Theoretical Background

The study was guided by the “General System Theory” and “Transaction Cost Theory” that signify the relationship between the independent and dependent variables of this study as well as assisting to measuring the level of an organization’s performance against the organisational expectations. The “General System Theory “was propounded Ludwig von Bertalanffy (1974) in the early 1970's. Systems are required for results since these are interrelated components working together as a whole to accomplish a given purpose/cause (Von Bertalanffy, 1974). This means that in order for the bank to improve its financial position its IT infrastructure components of compatibility, connectivity, application functionality and IT knowledge should work as a whole that is a combination of all components are required to be in place in order to improve its operations hence lure more clients and maintain its performance. Therefore the General Systems theory will be used to explain the independent variable.

On the other hand, the “Transaction Cost Theory” will be used to explain financial performance of financial institutions which is the dependent variable. This theory was propounded by Ronald Coase in the later 1930s. Transaction cost theory supposes that companies try to minimize the costs of exchanging resources. In addition, the underlying assumption of “Transaction Cost Theory” is that as firms expand their businesses, they need to determine the allocation of resources to enhance financial performance. In relation to the study, Barclays Bank has tried to minimize costs of transaction and allocated most of its resources to IT infrastructure trends such as hardware, software and personnel trends in order to improve performance. Therefore, the transaction cost theory will guide the study to establish how allocation of resources to IT infrastructure trends to contribute to financial performance at Barclays Bank.

With reference to the above, the theories enabled the researcher to know whether IT infrastructure capability is adequate at Barclays Bank and whether IT infrastructure capability affects financial performance. The researcher also used the content in the theories to see how

IT infrastructure capability is being used to manage the organisational resources of the bank. The Transaction Cost theory may help explain the poor financial performance, when they emphasize the need for organizations to ensure proper organisational IT infrastructure capability so as to remain sustainable. This implies that if the bank is to comply with the suggestions of the theory then this would result in improved financial performance.

1.1.3 Conceptual Background

Two concepts constitute the major variables of this study namely; “IT Infrastructure capability” and “financial performance”. This section gives a brief overview of the conceptualization of those two variables for their understanding is important to their application in the study. Though regarded as the vital aspect of any successful organization, “IT Infrastructure capability” definitions vary depending on the researcher’s specific domain. Generally, the resources and capabilities are considered as two distinctive and tightly interrelated infrastructure components of a company. “IT infrastructure capability” has been defined as the integrated set of reliable IT infrastructure services available to support existing applications and new initiatives in firms (Weill, et. al., 2002). Traditionally, IT infrastructure has been viewed as the foundation of IT components that is hardware, software and networks, whereas more recent conceptualizations extend IT infrastructure as including shared services, such as data, information, and standardized applications.

Allamah, et. al., (2011), Laudon and Laudon (2012) and O'Brien and Marakas (2008) pointed out that the information technology means the development and management techniques used by the organization represented with instruments, software, networks, databases, communications and human skills programmers and end-user. While, Scott and Walczak (2009) confirmed that the tools of information technology infrastructure based on the computer, are including the collection, storage, processing and storage of data and information. On the other hand, Love, et. al., (2005) noted that the infrastructure density of information technology could

lead to improving the performance and make the organization more superior over its competitors from organizations that do not invest in information technology. The importance of information technology infrastructure can be considered as a key dimension to the kinds of capabilities of information technology in business organizations. As information technology infrastructure capabilities will be available to support new applications and initiatives in the organization (Mithas, et. al., 2007).

Key “financial performance” dimensions include “profitability”, “liquidity”, “growth” and “operational expenses”. Productive assets have fundamental role in obtaining profit, the more the assets are used with higher efficiency the business unit will have higher profitability. Regardless that the assets have been procured from borrowed funds or investment of the owners, perform the relevant duties in a similar way. Operating expenses in total refer to those expenses that are resulted from the company operations and operating incomes are also those incomes that are obtained through company’s operations, either capital operation or non-capital.

1.1.4 Contextual Background

In Ugandan, commercial banks are the predominant financial institutions and constitute about 80 percent of the financial system. These institutions are the primary mechanisms for the implementation of monetary policy, determine the supply of money within the economy and form the backbone of the payments system. Uganda’s banking industry is highly concentrated and many studies in the banking literature elsewhere suggest a positive statistical relationship between performances, measures of market structure-either concentration or market share as well as technologies (Meyer, et. al., 2004). For the case of Barclays Bank of Uganda (BBU), it opened its opens in the late 1920’s with two branches, one Kampala and another in Jinja. By 1971, the Barclays Bank acquired the business of the Commercial Bank of Africa (Barclays Bank of Uganda Historical Information, 2015). As of December 2014, BBU was ranked the

fifth-largest commercial bank in Uganda, with an estimated assets valued at about US\$504 million (UGX 1.4 trillion) (Bank of Uganda Sector Report, 2015).

Mwesigwa (2015) asserts that to compete favorably in the ever dynamic environment, innovations in information processing, telecommunications, and related technologies have to be adopted not forgetting management support. Finally as the bank provides a number of IT services for instance internet and electronic banking services which support the use of financial services by its customers. The customers have access to their accounts when they have internet access even while using their phones. The chargeable services are available 24/7 and have contributed to financial its objectives (Barclays Bank of Uganda Product and Service Catalogue, 2014). The year 2016 was greeted with paperless banking to enhance efficiency and also minimize any costs, all for the better performance position of the bank. The intended study will therefore be based upon this contextual background.

Despite the existence of a robust ICT framework, Barclays Bank has continued to record poor performance evidenced by growth in loan arrears, operational costs, bad loans against declining profitability and revenues. Most of these problems are linked to failure to realize projected profits which continues to affect the level of liquidity at the bank. This is also affected by unstable high inflation rates in the money markets, devaluation of the Shilling against foreign forex and increasing operational costs. According to the Bank of Uganda Financial Stability Report (2016), the total assets of the bank grew by 5.5% in 2016 which was lower than the growth rate of 15.9% in 2015. Customer deposits reduced to 7.5% in 2016, compared to 16.5% in 2015. The decline in deposits occurred amidst a rise in the cost of deposit funding which rose from 10.4% to 12.2% in 2016. On the other hand, the 2016 financial stability report showed that total interbank values traded and bank credit during 2016 continued to decline at the bank which was blamed on the slowdown in economic activity coupled with the bank's reduction in lending in light of rising non-performing loans. According to the Uganda Research Network

report of 2016, the aggregate industry NPL ratio increased to the highest recorded NPL ratio from 4% in 2015 to 8.3% in 2016 with bad loans increasing continuously. A survey by Bank of Uganda in 2016 indicated that the majority of bad loans were due to delayed government payments, insufficient cash flows and diversion of funds (BOU Financial Stability Report, 2016).

In 2015, a new version of the core banking platform was rolled out at the bank. This was to address many of the challenges experienced during the earlier rollout. The platform was an advanced technology banking system which provides customers with a superior experience through continuous innovation. Although the bank was able to implement the system to support its core activities, this has been challenged by low user acceptance due to the system being perceived not to be user friendly, uneasy to use and not being able addressing challenges faced with the previous system. Also pointed out was the high cost of implementation and the long time required to implement the system. The system also requires that there is continuous improvement, targeted intervention and transformational plan which are aimed at improving IT capabilities and bank flexibility to get the most out of the core system. On the other hand, user skepticism about the new system is mainly driven by lack of enough awareness about the system, security concerns and reliabilities (Annual Performance Reports, 2016). The Barclays Bank Strategic Report (2011-2016) showed that some of the factors affecting system's user acceptance were staff readiness, performance expectancy, productivity enhancement, time saving, degree of effort staff believe they need to spend on using the system and peer social influence. The report also pointed out that staff became anxious when it came to using the system, were not confident about their ability to use the system and they did not find joy in using the system. The above weaknesses may be responsible for the growing poor performance at the bank. It is upon this background that the study sought to examine the effect of Information Technology Infrastructure capability on the bank's financial performance.

1.2 Statement of Problem

Successful Information Technology Infrastructure utilization in the financial sector is increasingly becoming a central component for organizational performance globally. IT Infrastructure capability is believed to be a vital driver of financial performance in the financial sector. It has been extensively embraced by many financial organizations both in developed nations and developing countries (Love, et. al., 2005). Like many other developing countries, financial institutions in Uganda are attaching at most significance to Information Technology Infrastructure capability as a strategy for enhancing organizational performance and subsequent sustainability (Bank of Uganda Quarterly Report, 2015).

In Uganda, commercial banks such as Barclays Bank , one of the leading foreign bank offering financial services to the public have adopted strategies to improve IT infrastructure capability in their operations. In order to promote financial performance in Barclays Bank, management should support and encourage structural adjustments that promote IT infrastructure capability at the bank. For example, in the recent past, Barclays Bank has come up with ways of promoting IT infrastructure improvement among which include application functionality, communication connectivity, system and software compatibility and technical specialty all aimed at enhancing bank performance (Barclays Bank Annual Report, 2014). The user acceptance of the core banking system at the bank has been slow since its inauguration affecting the delivery of financial services.

According to the Barclays Bank Annual Performance Reports (2016), the new core banking system was failing to address the challenges experienced by users of the old system such as incompatibility and difficulty in system navigation in regard to design, content and speed. In addition, the Annual Report (2015) revealed that before the implementation of the system, little was done clearly identify the challenges of the old system for the new system to address these challenges. The Bank Annual Performance Report (2016) revealed that there is a general rise in

the number of system errors committed by users such as wrong entries, incomplete data which have caused customer complaints in the process undermining the image of the bank. For example, the number of customers reporting anomalies in their account balance rose from 5% to 9% during the period 2015 to 2016 and continues to grow. Likewise, there is inadequate monitoring of system operations, provision of enough awareness and training to users. If the management of the bank does not pay attention to the declining financial performance by ensuring that the bank's IT infrastructure is capable in promoting compatibility, connectivity and that applications used function well, this may endanger the financial performance of the bank and result into its collapse. This study therefore, investigated the effect of Information Technology Infrastructure capability on financial performance in commercial banks in Uganda, with a case analysis of Barclays Bank.

1.4 Purpose of the study

To establish the relationship between Information Technology Infrastructure capability and financial performance in financial institutions in Uganda using Barclays Bank Uganda as a case study.

1.5 Specific Objectives

- i) To establish the relationship between IT compatibility and financial performance in Barclays Bank.
- ii) To establish the relationship between IT connectivity and financial performance in Barclays Bank.
- iii) To establish the relationship between IT application functionality and financial performance in Barclays Bank.

1.6 Research Questions

- i) What is the relationship between IT compatibility and financial performance in Barclays Bank?

- ii) What is the relationship between IT connectivity and financial performance in Barclays Bank?
- iii) What is the relationship between IT application functionality and financial performance in Barclays Bank?

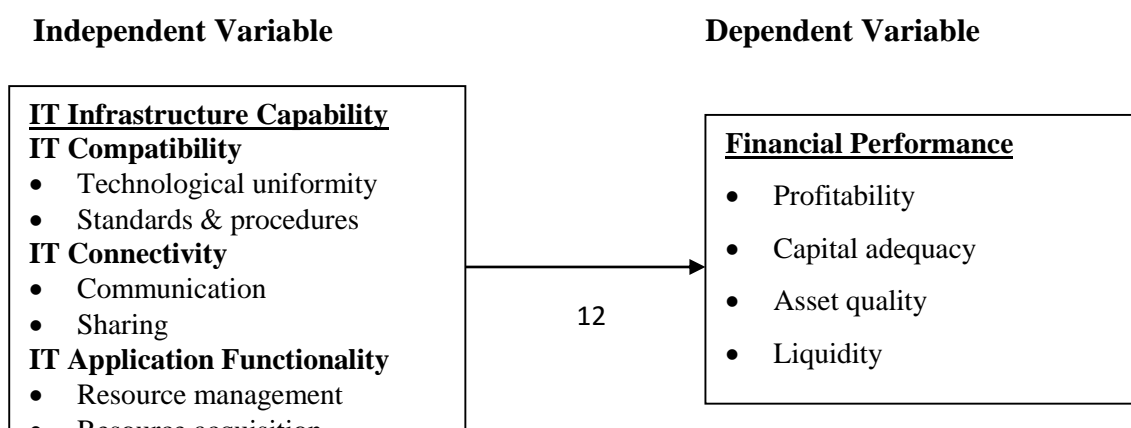
1.7 Hypotheses of the Study

- H₁: There is a significant relationship between compatibility and financial performance.
- H₂: There is a significant relationship between connectivity and financial performance.
- H₃: There is a significant relationship between application functionality and financial performance.

1.8 Conceptual framework

The framework shows the relationship between independent variable and dependent variable. According to Mugenda and Mugenda (2003), an independent variable is a variable that has an influence on the dependent variable. When the independent variable is present, the dependent variable is also present and with each unit of increase in the independent variable, there is an increase or decrease on the dependent variable as well. In other words, the variance in the dependent variable is accounted for by the independent variable. The conceptual framework shows the relationship between the study variables under investigation. The independent variable will be Information Technology Infrastructure capability with financial performance as the dependent variable. The model shows that Information Technology Infrastructure capability influence financial performance.

Figure 1: Conceptual Framework



Source: Adopted with modifications from the literature of Laudon and Laudon, Harvey, 2006; Schlichter 2007; Wendy, et. al., 2014; 2008; Joseph and Dai, 2009

Figure 1.1 above explains the interaction between the independent variable and the dependent variable and the expected outcome. The independent variable, Information Technology Infrastructure compatibility comprises of dimensions that include IT compatibility, IT connectivity and IT application functionality, which was used to guide the study. All these items above are the core areas of Information Technology Infrastructure capability. The dependent variable was financial performance which was measured according to profitability, capital adequacy, liquidity and asset quality. The framework explains the relationship between Information Technology Infrastructure capability and financial performance.

1.9 Significance of the Study

The study may inform a larger financial sector related purpose, such as benefiting practitioners in their respective roles in engaging the world. Scientific-based evidence, information, research and technical support to build knowledge and capacity are needed to help the financial sector support their companies, both in terms of efficiency and the services they provide.

It may be used for other research references; as it is with all research work, there are always gaps. So to academicians and researchers, the study should help to generate more intensive knowledge for further research on the response of the financial sector to other operational areas of service provision.

To the bank policy formulation and review, this study's findings on the effect of Information Technology Infrastructure capability and financial performance are expected to provide

guidelines. Within the different departments, the recommendations of this study can be translated to the rest of the organization for implementation to continuously improve on financial performance.

The findings of the study may also be vital to policy makers as it clearly points out the effect of Information Technology Infrastructure capability on financial performance in the financial sector as well as other factors which affect performance. The possible solutions to these causes may be used by policy makers since they are a point of reference while writing company and government policies.

1.10 Justification of the Study

The study was justified in such a way that Information Technology Infrastructure capability is paramount in determining financial performance in the financial sector. In regard to management's concern on the efficient and effective use of organisational resources, it then becomes a necessity to review the bank's current Information Technology Infrastructure capability in relation to financial performance. From the existing literature of (Laudon and Laudon, 2008; Joseph and Dai, 2009) among others, there has been extensive research carried out on Information Technology Infrastructure capability on business organizations but no study has been done to investigate the influence of Information Technology Infrastructure capability on financial performance in the financial sector. This creates a research gap in literature that was bridged by undertaking this study.

1.11 Scope of the Study

1.11.1 Subject Scope

The study focused on the relationship between Information Technology Infrastructure capability and financial performance at Barclays Bank. From the study, Information Technology Infrastructure capability was the independent variable and financial performance

as the dependent variable was conceptualized according to profitability, sales growth, liquidity and return on investment.

1.11.2 Geographical Scope

The study was conducted at Barclays Bank of Uganda, located at Plot 2 Hannington Road, on Nakasero Hill, Head office in Kampala covering corporate service centre, premier centre, collections department, treasury, finance. These areas are chosen because the researcher has access to them and can be guided properly given the availability of resource to guide the study.

1.11.3 Time Scope

The study covered the period starting 2012 to 2017 because the management embarked on the structuring process to improve the financial performance of the bank during this period (Barclays Bank Annual Report, 2015). Therefore, to study the bank's financial performance in relation to IT infrastructure capability, this needed to be done for at least a period of four consecutive financial years.

1.12 Operational Definitions of Terms and Concepts

- **IT infrastructure capability** has been defined as the integrated set of reliable IT infrastructure services available to support existing applications and new initiatives in firms.
- **IT infrastructure capabilities** is the ability to provide data and information to users with the appropriate levels of accuracy, timeliness, reliability, security, and confidentiality; the ability to provide universal connectivity and access with adequate reach and range; and, the ability to tailor the infrastructure to emerging business needs and directions.
- **IT Infrastructure** is the base upon which something else runs or operates, without which operations are not possible.
- **Financial performance** is the accomplishment of a given task that is measured using predetermined standards of accuracy, completeness, efficiency and effectiveness.

- **IT compatibility** is the ability to share any type of information across any technology component throughout the organization.
- **IT connectivity** is the ability of any technology components to communicate with any of the other components inside and outside of the organizational environment.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature on the dimension of Information Technology Infrastructure capability and how it relates to financial performance. The purpose of reviewing the literature is to bring out a relationship amongst the variables in this study, present what other researchers have written in connection to this dimension and to identify the gaps in their reviewed studies which were then closed by this study. The literature reviewed is from journal articles, research dissertations, books from the libraries and banking industry reports. The chapter was structured in four sections; the first is an introduction that gives general views of previous researchers, followed by the theoretical review; the third is an overview of literature of Information Technology Infrastructure capability followed by literature on financial performance and lastly the summary and conclusions.

2.2 Theoretical Review

The study was guided by two theories namely; “System Theory” and “Transaction Cost Theory”. According to Von Bertalanffy (1974) a system is a collection of parts (or subsystems) that interact to accomplish an overall goal. In line with IT infrastructure capability and financial performance, in order for Barclays bank to achieve improved financial performance, there is need for compatibility, connectivity, application functionality and IT knowledge. The systems theory further contends that if one part of the system is removed, the nature of the system is changed. Therefore, if compatibility, connectivity, application functionality and IT knowledge are removed from operations of Barclays bank, it cannot perform in any way because financial of the bank is dependent on the inter-relatedness of the identified IT infrastructure.

According to Hsiao (2007), operations of an organisation can be affected by a respond to circumstances that are external. The organization obtains the input resources from external circumstances; the obtained resources are processed within the boundary of the system in order to generate valuable output. In reference to this study, IT connectivity is used to process information in the financial system of financial institutions. With the aid of customized and general purpose IT software, the information is processed to obtain output in terms of return on equity, assets and sales volume. The products/output of the organization returns to and affects the external circumstance. However, effective operation of IT compatibility, IT connectivity, and IT application functionality depends on IT knowledge whereby staff members at the bank need to possess the required skills and abilities, job competencies and qualifications to effectively operate the infrastructure trends. Simultaneously, the external circumstances would respond to the products of the organization (Hsiao, 2007). These responses return to the system again through the procedure of feedback. The function of feedback, which allows external circumstances to recognize the operation of the system, can stimulate the system to adjust itself based on responses from the external circumstances (Barrien, 2008). In addition, the bank uses hardware trends to obtain feedback on its financial performance.

Therefore, with the aid of IT infrastructure capability, the bank can use the customised and general purpose software to control and detect regular or irregular operations that affect the bank's financial performance. The selector is defined by the rules that the system uses to make decisions, and the effector is the means by which transactions are made between systems. Basing on IT knowledge in terms of skills and abilities as well as competencies, communication and transaction are effected to ensure intersystem interactions and obtain information on financial performance in terms of return on equity, return on assets and sales volume.

Although the General Systems Theory clearly states how important it is for subsystems to interact and achieve overall organisational goal, the theory does not provide alternatives to a

situation where one of the subsystems is not operational. In addition, the theory assumes that subsystems function in equal measures, yet there can be overlapping one subsystem can provide the functions of the other (Barrien, 2008). While explaining performance of financial institutions, the transaction cost theory supposes that companies try to minimize the costs of exchanging resources. Therefore, the use of hardware trends, software trends and personnel trends should minimize the costs Barclays bank incurs during its operations to ensure improved financial performance. In addition, the underlying assumption of Transaction Cost Theory is that as firms expand their businesses, they need to determine the allocation of resources to enhance performance (Hsiao, 2007). Effective allocation of resources to the acquisition of infrastructure trends should aim at enhancing the banks' performance. Therefore, the transaction cost theory guides the study to establish how allocation of resources to IT infrastructure trends contributes to financial performance at Barclays bank.

The theory sees institutions and market as different possible forms of organizing and coordinating economic transactions. Using IT infrastructure capability, the bank can organise economic transactions with the aid of personnel who possess the requisite skills and abilities as well as job competencies and qualifications (Coase, 1937). The efficiency of the economic transactions will be reflected through return on equity, return on assets and sales volumes. When external transaction costs are higher than the company's internal bureaucratic costs, the company will grow, because the company is able to perform its activities more cheaply, than if the activities were performed in the market. However, if the bureaucratic costs for coordinating the activity are higher than the external transaction costs, the company will be downsized. Therefore, basing on the transaction cost theory, the bank should ensure that the costs of acquiring infrastructure trends is lower than the external transaction costs to ensure that the bank grows in terms of financial performance. This is in line with Coase (1937) who asserts that every company will expand as long as the company's activities can be performed cheaper

within the company, than by e.g. outsourcing the activities to external providers in the market. However, the transaction cost theory assumes that financial performance is only affected by internal costs of an institution yet other external factors such as competition from other financial institutions and the exchange rate among others can affect financial performance.

2.3 IT Infrastructure Capability and Financial Performance

Under this section a review of literature in relation to the influence of the dimensions identified to measure Information Technology Infrastructure capability on financial performance will be carried out. Furthermore, a review of literature on the objectives of the study will be carried out to ascertain the effect of the factor components used to measure Information Technology Infrastructure capability on financial performance according to previous studies.

2.3.1 IT Compatibility and Financial Performance

Compatibility is the ability to share any type of information across any technology component throughout the organization (Fink and Neumann, 2009). According to Mohammad and Kamaruzaman (2009), Information Technology compatibility help span organization boundaries, employee empowerment, make information and knowledge readily available in the organization. Patrakosol and Lee (2009) noted that compatibility addresses the need for uniformity in technology across the organization. Kamal (2006) in his study revealed a positive correlation between compatibility and reliability of service. Anand (2013) in his study revealed that compatibility is positively correlated with access to service, in that compatibility creates ease of use. Anand (2013) suggests that ITI configuration and compatibility standards and rules are central in managing the firm's sharing extent range-wise. IS standards and procedures also provide a foundation for ITI analysis, design and development, in other words, the architecture controlling a firm's IT operations. Therefore, IS standards and procedures together with IT services represent the level at which IS function meets a firm's need for IT-related services (Rasli, Huam, Mohd, Maseri and Asmi, 2011).

IT compatibility signify significant financial expenditures and have a significant effect on performance (Bagheri, Abdullah, Razaei and Maidani, 2012). At the same time, IT compatibility contributes significantly to the growth and productivity of the firm and the economy as a whole. IT is very significant to several business organizations because in today's environment, survival and ability to attain the goals of business strategy is difficult if the execution is not supported by an extensive use of IT (Anand, 2013). Due to that situation, several organizations decided to invest in IT since it may contribute a lot of benefits to the company in the long run. Krusinskas and Vasiliauskait (2005) have acknowledged that, among the major factors impacting economic progress in today's global business atmosphere is the transmission and application of latest compatible technologies in organizations (Ordanini and Rubera, 2010). The importance of IT compatibility can be seen as employing of latest technological equipment which lead to achieved higher productivity, higher profit, greater activity outcomes, reduced costs, improved quality, gaining competitive advantage, market share and improved firm financial performance at the same time (Zehir, Vilmaz and Velioglu, 2008).

Ismail and Mamat (2012) opine that IT compatibility helps organizations to modernize business operations, produce a modern business model and enhance their customer relationship management. In order to achieve a range of goals, managers make IT investments to positively influence performance by providing a competitive advantage, responding to rapidly changing market needs, providing resourceful information for better decision making, reducing business costs by automating some transactions, allowing competition in specific technology market areas (e.g. ATMs for banks), facilitating flexibility to fulfill more customers' needs without incurring extra cost, and providing technological platform for producing other business.

As observed from the assertions of the studies above, at Barclays Bank, IT compatibility has been adopted to promote financial performance and the management of the bank is focused on ensuring that IT compatibility is implemented well. Although, a lot has been done to ensure that there is adherence to proper procedures of IT compatibility, the bank still experiences financial performance challenges in its operations. To date, the bank has not realized the physical benefits of IT compatibility are anticipated as a growth strategy. From the reviewed literature on IT compatibility much of it is focused on its influence on firm performance and not providing adequate literature on how IT compatibility affects the financial performance in the banking sector in developing countries. The study revealed that financial institutions were less likely to select IT infrastructure that was not compatible to their operating systems but rather focused on IT infrastructure that promoted technological uniformity and standards & procedures set in the organization.

In the case of Uganda and more especially financial institutions, the idea of IT compatibility is practiced as a way of ensuring IT infrastructure capability in relation to set financial internal controls. However it should also be noted that the reviewed draws a lot of attention on IT compatibility and organizational performance in the financial sector leaving scanty literature on the effect of IT infrastructure compatibility on financial performance in the financial sector and more especially commercial banks. This provides a gap in literature which this study addressed by conducting a study on the effect of IT compatibility on financial performance in Barclays Bank.

2.3.2 IT Connectivity and Financial Performance

Aral and Weill (2007) observed that connectivity is the ability of any technology components to communicate with any of the other components inside and outside of the organizational environment. According to Campbell (2012), Information Technology connectivity enable

seamless and transparent organizations that are independent of time and space. Chanopas, Krairit and Khang (2006) described connectivity as the physical presence of information technology that binds the organization together. He further suggested the term reach, to address the issue of connectivity. He defined reach as the location that can be connected via the IT infrastructure. Keen (1991) also noted that reach is required to achieve an organization's desired level of data transparency. Ismail and Mamat (2012) noted that connectivity refers to the ability of any technology to attach to any of the other technology component. It also means that every person, every functional area, and every application in the organizations are linked to one another.

ITI sharing capability refers to how ITI can efficiently provide homogenous services to customers from within and outside the company. If data/applications are not shared, it is a business decision consequence rather than technological capability (Anand, 2013). Sharing capability can be described as reach and range with reach meaning individuals and places that ITI can connect (Anand, 2013). The way reach works to connect is that in some firms, employees only communicate within one unit, whereas in others interaction extends to customers and suppliers, no matter where the IT base is situated. Range determines the level of functionality that extends throughout any Reach level, and can tell what services can be offered (Durmusoglu, 2009). Higher reach and range show higher sharing capability, which also means more complex transactions across more business units a firm can handle. This portrays the potential to connect anything to anyone at any time (Xianfeng, et. al., 2008). If data or applications are not shared, it is a consequence of a business decision rather than the technological capability.

The sharing capability can be described in terms of reach and range. Reach refers to the locations that can be connected via the infrastructure from local workstations and computers within the same department to customers and suppliers domestically, to international locations,

or to anyone, anywhere. It answers the question of who can be connected. Range determines the level of functionality (i.e., information and/or transaction processing) that can be shared automatically and seamlessly across each level of reach and answers the question of what services can be offered. A higher reach and range indicates a higher level of sharing capability. The higher the extent of reach and range, the more complex transactions the firm can process across more business units and applications. This capacity suggests a connectivity capability for “anything to anyone at any time. In the case of Barclays Bank, the bank is still facing IT connectivity challenges which are related to delivery of homogeneous services across the bank’s branch network and the ability of the IT used by the bank to promote information sharing effectively.

Much as the idea of IT connectivity is been extensively studies in the financial sector, little attention has been focused on the banking sector in developing countries such as Uganda. Similarly, much of the existing literature focuses on IT connectivity and firm performance causing gaps in the literature on IT connectivity and financial performance in the banking sector and more especially in developing countries where the structures of IT connectivity are still under developed to support the financial performance of commercial banks. The little or no decentralized systems in these organizations is the major challenge affecting IT connectivity and has in turn affected their financial performance. This explains why in the bank there are still performance challenges in regard to profitability, liquidity, growth and operational costs. This literature deficiency provides a research gap which will be bridged by this study.

In general, the available literature suggests that for any financial institution, the state of its IT connectivity can be established through assessing the conditions defining the following indicators: communication and sharing. The literature is however not very articulate on how each of these: indicators relates to the financial performance of commercial banks generally and

the performance of Barclays Bank in particular. In the case of Uganda and more especially commercial banks, the idea of IT connectivity is practiced as a way of improving IT infrastructure capability. However it should also be noted that the reviewed literature draws a lot of attention on IT connectivity and service delivery of financial institutions in the financial sector leaving scanty literature on the effect of IT connectivity on commercial banks in the financial sector and more especially Barclays VBank. This is hence the gap that this study was intended to fill.

2.3.3 IT Application Functionality and Financial Performance

IT physical assets are fundamental technical fundamentals shared across organizational units, such as organization-wide technical platforms, architectures, networks and databases. IT intellectual assets are IT-related knowledge, expertise and management of technology within a firm. IT related procedural assets are regulations that specify how other IT assets are evaluated, acquired, built, implemented, used, improved and replaced (Ordanini and Rubera, 2010). IT standards are an example of procedural assets since they make rules for system design and development. The service capability of the IT infrastructure is the capability to meet the firm business demands, which focuses on the efficiency of the existing functions. The service capacity can be identified from the range and kinds of IT services. According to Chanopas, Krairit and Khang (2006), there are nine kinds of IT services in the e-business circumstances: application infrastructure, communication, data management, IT management, security, architecture and standards, channel management, IT research and development, and IT education. However, not all services should be provided for one firm.

A firm can provide some necessary services due to its unique e-business model. The range of the IT services can be classified into three layers: the whole organization, business unit, and a geographical area (Fink and Neumann, 2009). Depending on the standardization, the shared services across the whole organization can provide uniform services for all business units by

lower cost and higher quality. Corresponding to the range of sharing capability, the higher the extent of the sharing capability is, the wider the range of IT service is. ITI Service Capability is the capacity to meet a firm's business demands, while focusing on current functions' effectiveness, and can be identified from the different kinds of IT services (Ismail and Mamat, 2012). A business has the choice to provide the desirable services, not necessarily all, according to its unique setup. Technical ITIC is an organizational ITIC facet defined as functions that the technical ITI provides, or the choices related to IT components like applications, data, and system and technology configurations. Technical ITICs are acquired from the ITI analysis grid and can function in two dimensions: functional efficiency and flexibility of technical ITI elements (Anand, 2013).

Human ITIC means the functions made available by human ITI, including choices on IT staff requisite knowledge and management skills needed for effective IT resource handling within an organization. Byrd and Turner (2000) underline that elements of human infrastructure are experience, capability, commitment, values and norms of IT staff who provide IT products and services. Human ITIC can also operate at two levels: Functional efficiency and flexibility of human ITI components (Ordanini and Rubera, 2010). The flexibility of ITI refers to ITI's ability to help a firm adjust in its changing environment. Flexibility is the firm's ability to utilize ITI for dealing with fluctuations in business and technology. ITI flexibility can be separated into technical and managerial flexibility. Technical flexibility focuses on software and hardware platform components, while managerial flexibility pertains to human and society elements, such as cooperation, relationships among employees and the organization's norms. These two flexibilities react to each other to fulfill demands, since ITI is an intricate human-machine system. Between the two, managerial flexibility is more crucial than the technical aspects, because management can deal with issues due to frequent and elaborate changes (Xianfeng, et. al., 2008). A flexible firm has the ability to efficiently adapt its IT to the many changes in

strategy direction. This agility and versatility are necessity to survive in the present competitive environment. Therefore, a firm should invest in both IT technical and human capabilities, to use IT to its full potential to attain business goals (Xianfeng, et. al., 2008).

As observed from the assertions of the studies above, at the bank, IT application functionality as a measure of IT infrastructure capability has been adopted to promote organisational growth and efforts by management are still underway to ensure that IT application functionality is implemented well. Although, a lot has been done to ensure that the bank operates more effectively, the company continues to face financial performance challenges. To this end, the bank has not realized the tangible benefits of IT application functionality as a growth strategy. From the literature on IT application functionality much of it is centered on it influence of firm performance among others and not providing adequate literature on how IT application functionality affects the financial performance of commercial banks in developing countries. For this reason, the study focused on establishing the effect of IT application functionality on financial performance in commercial banks such as Barclays Bank so as to close the literature gap that is existing on the subject.

Much as the idea of IT application functionality is been extensively studies in the private sector, little attention has been focused on the financial sector. Similarly, much of the existing literature focuses on IT application functionality and organisational performance or service delivery causing gaps on the literature on IT application functionality and financial performance in the financial sector and more especially commercial banks in developing countries where the structures of IT application functionality are still under developed to support the financial performance of organisations. The little or no decentralized systems in these organisations is the major challenge affecting IT application functionality and has in turn affected their financial performance. This explains why in Barclays Bank there are still lapses in profitability, liquidity, growth and cost reduction. This literature deficiency provides a research gap which was bridged

by the findings of the study which revealed that resource management and resource acquisition helped enhance IT application functionality at the bank and in the process improved the financial performance of the bank.

2.4 Summary of the Literature Review

In this chapter, the researcher gives a review of the existing literature on the dependent and independent variables. During the review of literature, the researcher has carried out a literature survey on the existing research and is able to link the literature reviewed to the problem under study which helps to give an in-depth understanding of both the dependent and independent variables as stated in Chapter one. A review of literature on the various Information Technology Infrastructure capability reveals that among these comprise IT compatibility, IT connectivity and IT application functionality. These practices if managed properly are responsible for the proper management of an organization's IT infrastructural capability. A review of literature on Information Technology Infrastructure capability and financial performance reveals that where there is absence of proper Information Technology Infrastructure capability, profitability, return on investment, liquidity and sales growth are negatively impacted. Several factors responsible for financial performance have also been identified from existing literature.

Under literature review, a review of literature was carried out in relation to the study objectives. Literature on IT infrastructure capability was reviewed and established that the world over there has been reformation of administration and management systems in the banking sector in a variety of countries including developing countries like Uganda. However, the developed countries had made much progress in this area justifying why delivery of banking services was more effective and efficient compared to developing countries. In regard to the effect of IT infrastructure capability on financial performance, the literature revealed that there was a significant relationship between the variables justifying that IT infrastructure capability were

paramount in steering financial performance of financial institutions in both developing and developed countries. Among the factors affecting IT infrastructure capability were; institutional capacity, multiple accountability, declining service ethics, declining social values and civil service morale and corruption.

However much as the previous studies revealed that there was a relationship between IT infrastructure capability and the general organisational financial performance, these studies seem to have concentrated more on organisations telecom sector and less on the financial sector where e-banking is just taking root in developing economies. Therefore the studies seem to offer limited solutions to the problems in Uganda's commercial banks such as Barclays bank since the IT problems at hand required a study to be conducted to establish how IT infrastructure capability can be effectively implemented in order to bring about sustained financial performance. From the findings of the study, it was clear that ensuring IT infrastructure capability at Barclays Bank in regard to IT compatibility, IT connectivity and IT application functionality, determined the bank's financial performance through a reduction in profitability, return on investment, liquidity and sales growth res.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter describes how the study was conducted. It focuses on the research design and approaches that were adopted, the study area, target population, sampled population, sample size and selection. The chapter examines data collection instruments, sampling techniques and procedures, pre-testing of instruments, methods and procedures for data collection and analysis.

3.2 Research Design

This study adopted a cross-sectional design which employed both qualitative and quantitative approaches. A cross-sectional design was used because it gave an in-depth investigation of institution, group, individual or phenomenon. Amin (2005) asserts that a cross-sectional design provides an in-depth study of the problem within limited time scale perceived as the most holistic way of obtaining insights, while correlation design was used to establish the magnitude of the relationship between the variables and strength and direction of their relationship and regression to find out the extent to which the independent variable affects the dependent variable. According to Mugenda and Mugenda (1999), the notion combining qualitative and quantitative approaches offers the promise of getting closer to the whole case in a way that a cross-sectional study cannot achieve. Qualitative methods provided in-depth account while the quantitative approaches provided the data needed to meet required objectives. The design was descriptive and analytical in nature. For qualitative and quantitative data, the study adopted the field research method where the researcher went to the field took extensive field notes which were subsequently coded and analyzed in a variety of ways.

3.3 Study Population

Population refers to an entire group of individuals, events or objects having a common observable characteristic as Kothari (2003) posit. The population of the study was 179 comprising of 8 ICT personnel, 6 Heads of Departments, 7 senior managers, 13 supervisors, 29 banking officers and 116 corporate customers as stated in the Barclays Bank Annual Report of 2016.

3.4 Sample Size

A sample is a proportion of the population whose results can be generalized to the entire population as defined by Kothari (2003). The sample size of the study was 134. The sample size was derived using the (Krejcie and Morgan, 1970) statistical table adopted from.

Table 3.1: Sample Size Determination

Respondents	Study Population	Sample Size	Sampling Techniques
ICT personnel	8	5	Purposive Sampling
Heads of Department	6	4	Purposive Sampling
Senior Managers	7	5	Purposive Sampling
Supervisors	13	10	Simple Random sampling
Banking Officers	29	24	Simple Random sampling
Bank Customers	116	86	Simple Random sampling
Total	179	134	

Source: Barclays Banks of Uganda HR Report (2014).

3.5 Sampling Technique and Procedure

According to Sekaran (2003), sampling is the process of choosing the research units of the target population, which are to be included in the study. This study adopted both probability and non-probability sampling techniques.

Probability Sampling Techniques

A probability sampling method is where all elements have an equal chance of being selected (Kothari, 2003). This entailed simple random sampling. The simple random sampling method selects a sample without bias from the target/accessible population. The method was used to select random samples from the customers, bank officers and supervisors. This method was justified for the study because it ensured that all subjects of the sub groups were given an equal chance of being selected. This minimized bias and simplified analysis of results.

Non-Probability Sampling Techniques

Non-probability sampling is a sampling technique where the samples are gathered in a process that does not give all the individuals in the population equal chances of being selected. Under this category, the purposive sampling method was used. This is a method used by the researcher to decide who to include in the sample based on their relevance. Purposive sampling technique was used to collect focused information from particular respondents which included ICT

personnel, heads of departments and senior managers. The technique was used because the focus of the researcher was to get in-depth information and not simply making generalizations.

3.6 Data Collection Methods

This study adopted questionnaire survey, interviews and documentary analysis methods of data collection. Both qualitative and quantitative approaches were considered as this was an integral part of research strategy.

3.6.1 Questionnaire Survey

Data was collected through a survey study. The researcher developed a questionnaire that was used to answer specific objectives of the study for respondents to complete in writing. The questionnaire was structured (close ended) to elicit specific responses which are easy to analyze, compare among different groups and are economical in terms of time and energy as per (Kothari, 2003). The participants' literacy levels too favored the self-administration approach, which gave an accurate profile of the situation and the data provided describes who, what, how, when and where of the variables in the study. The questionnaire survey was used to collect data from the operations staff.

3.6.2 Interview

An interview guide is a fixed format in which all questions are prepared beforehand and are put in the same order to each interviewee (Kothari, 2003). Face to face interviews were conducted and during the course of the interviews, notes were taken and audio recording of the two directors. To obtain accurate information through these interviews, the researcher needed to obtain maximum co-operation from respondents. Interviews were advantageous in that they provided in depth information using a guide and the interactive nature of this approach scores highly on not only flexibility and adaptiveness but also heuristic, depth, and realism (Mugenda and Mugenda, 2003). This is a method that was used to collect data from top executives.

3.6.3 Document Review

A documentary analysis is the process whereby each party to a case sorts through and analyzes the documents and data they possess to determine which are relevant to the case (Mugenda and Mugenda, 2003). As yet another qualitative focus tool, information on the study topic was collected from already existing archived documents, and this allowed the researcher to examine the organization's performance. Documentary analysis was the main source of secondary data from text books, internet, media, journals, articles, bulletins, reports, policies, minutes, newspapers, magazines and other researches.

3.7 Data collection Instruments

The tools that the researcher used for collecting data included the following; self-administered questionnaire, interview guide and document review list.

3.7.1 Structured Questionnaire

The study adopted a self-administered questionnaire to collect self-reported data from the respondents in order to establish how IT infrastructure capability affects financial performance. A self-administered questionnaire is a carefully designed instrument for collection of data in accordance with the research questions. The justification for using this instrument is that it is less expensive and does not require the researcher to be present for the respondent to complete. The attitude scale (interval Likert Scale) was used to enable the respondents to select a statement that best described his or her reaction to the statement in the question. The interval Likert scale questionnaire was designed on values assigned and ranked 5 to 1 in order of; 5-Strongly Agree, 4-Agree, 3- Neither Agree nor Disagree, 2-Disagree and 1-Strongly Disagree. The interval scale measurement of variables was adapted because it was recommended for measurement of variables of a study that were seeking to draw conclusions based on percentages of respondents' response as opposed to the nominal scale which was recommended for mutually exclusive and

interval variables (Sekaran, 2003). This scale was used to determine what an individual believes, perceives or feels about self, others, activities, institution or situation (Amin, 2005).

3.7.2 Interview Guide

An interview guide was used to collect data from key informants who included top management staff. Interviews are a good tool as they enable the researcher gather in-depth information around the topic to meet specific needs. This data assisted in clarifying information collected by the structured questionnaires since it involved a face to face interaction and it also provided a wide range of views.

3.7.3 Documentary Review Check list

The documentary review checklist was used for purposes of reviewing documentary data. Documentary data was obtained through the use of published and unpublished documents. A document review list was used to collect secondary information archived in the company's repository. This enabled the researcher to access historical information from the bank's annual reports, strategic plans, minutes, website, operations manuals, IT manuals among others.

3.8 Data Quality Control (Validity and Reliability)

In order to make sure that quality and relevant data is collected, the research instruments were tested for validity and reliability as follows;

3.8.1 Validity of Instruments

According to Kothari (2003), validity refers to the degree to which results obtained from data analysis actually represent the phenomenon under study. Validity being how data obtained in the study accurately represents the variables; it is the accuracy and meaningfulness of inferences that are based on research results. For purposes of producing a quality research study, the study focused on external validity to ensure that research findings of this study are highly generalized to other organisations and the environment outside the study setting. In this case, the researcher

carried out a pre-testing method of piloting the same research instruments on a different but homogeneous sample of ten respondents before going to the field. This pre-testing was done to ensure content and construct validity of the instrument by improving on the questions, the format and scales of measurement. The researcher also incorporated responses and comments of the pilot study into the final improved instrument. The content validity index (CVI) was computed using the formula below;

$$CIV (CVI) = \frac{K}{N}$$

Where;

CVI = Content Validity Index

K = Total number of items rated as relevant

N = Total number of items in the questionnaire

Validity of the instrument was obtained using the Content Validity Index (CVI) as presented in the table below.

Table 3.2: Validity

Variable	Anchor	Content Validity Index
IT compatibility	5 Point	.879
IT connectivity	5 Point	.877
IT application functionality	5 Point	.808
Financial performance	5 Point	.798

Source: Primary data, 2017

3.8.2 Reliability of Instruments

This is the measure of the degree to which a research instrument yields consistent results after repeated trials (Kothari, 2003). Random error being the deviation from the true measurement, it influences the instrument's reliability by reducing on it whenever it is high. Reliability threats always exist in research studies and do arise from inaccurate data coding; ambiguous instructions; interviewer/interviewee fatigue and bias. In this study, the researcher addressed reliability by reducing on the inaccuracy of both the instrument and the researcher's scoring

thus reducing on the inconsistencies in the measurements that would affect the reliability of the collected data. Reliability of instruments in this study was attained through employing the internal consistency method of assessment using the Cronbach's coefficient Alpha computation to determine the items' correlation among themselves. In this method, scores of a single test were done on a sample subject, where a score on 1 item is correlated with those from other items in the instrument. According to Kothari (2003), an alpha of 0.7 or higher is sufficient to show reliability; implying that the closer the alpha to 1, the higher the internal consistency reliability. Below, is the expression of the Cronbach's coefficient Alpha or Kuder-Richardson (K-R) 20 formula;

$$KR20 = \frac{(K) (s^2 - \sum s^2)}{(S^2) (K-1)}$$

Where;

KR20= Reliability coefficient of internal consistency

K = Number of items used to measure concept

S² = Variance of all scores

s² = Variance of individual items

From the researcher's computation results that were obtained above, the higher the coefficient the higher the item correlation among themselves.

Table 3.3: Reliability

Variable	Anchor	Cronbach Alpha Value
IT compatibility	5 Point	.758
IT connectivity	5 Point	.857
IT application functionality	5 Point	.859
Financial performance	5 Point	.847

Source: Primary data, 2017

According to Cronbach (1950), coefficient alpha of 0.7 and above is considered adequate. From the results all the Cronbach alpha coefficients ranged from .758 to .859, therefore meeting the acceptable standards. For the qualitative data, in order to enhance reliability refutational analysis, constant data comparison, comprehensive data use, inclusive of the deviant case and use of tables were used. As data were extracted from the original sources, the researcher verified

their accuracy in terms of form and context with constant comparison. The scope and analysis of data included was as comprehensive and inclusive with reference to quantitative aspects where possible.

3.9 Data Collection Procedure

The researcher submitted his proposal to University for approval. Upon successful defense of the proposal, the researcher obtained a cover letter from UMI authoring him to conduct the research. Questionnaires were hand delivered to the respondents assuring them of voluntary, confidentiality and anonymity, completed questionnaires were collected after 5 days. The researcher contacted key informants and provided them with the necessary details of the study seeking their consent to participate in the study and requesting for a date on which the interview could be conducted.

3.10 Data Analysis

After participants responding to the questionnaires and interviews, raw data were cleaned, sorted and entered using statistical data entry form designed in Statistical Package for Social Sciences (SPSS) software for analysis according to the objectives of the study. Data was organized and analyzed using a 5 Likert scale.

3.10.1 Quantitative Data Analysis

The researcher collected data, cleaned, coded and classified them into categories. The data was edited and entered into the data editor of Statistical Package for Social Scientists (SPSS) software for analysis according to the objectives of the study. Then, data was organized and analyzed. Questionnaire data was obtained from questionnaires each questionnaire was given a unique serial number extracting of inertial summaries by data reduction using soft numbers coding by categorizing data, sorting and filling were carried out. Statistical package for the social sciences (SPSS) student version of 20 was used to aid the processing and summarizing

of information got from the questionnaires. The researcher presented data using descriptive and inferential statistics where frequency tabulations were used to present the data on demographic characteristics whereas, for the research objectives, the Pearson Correlation analysis was used to present the correlation results of the study objectives. The researcher used a correlation analysis to test the relationships between the independent and dependent variables whereas, regression analysis was used to study the combined effect of the independent variables on the dependent variable.

3.10.2 Qualitative Data Analysis

Qualitative data collection was sorted out and interpreted manually from respondents each interview was analyzed and interpreted using content analysis to appropriate the nature of the collected data before emerging themes are identified using “Template analysis” approach analysis of qualitative data was done to identify similarities across several accounts as well as direction. Data was categorized into recurrent themes that seem relevant to answer the research question, descriptive analysis was made from information obtained from the questionnaires and interviews key categorical variables such as gender, education of respondents was presented in a table form. Triangulation is one of the several rationales for multi-method research and also offered the prospect of enhanced confidence. The researcher used data triangulation, which entailed gathering data through several sampling strategies, so that segments of data at different times, as well as on a variety of people were gathered. This provided invaluable information and gave the evaluation heightened status within the area of study.

3.11 Measurement of Variables

The variables were measured by defining concepts. For instance the questionnaire was designed to ask for responses about information technology infrastructure trends and organisational performance. Information technology infrastructure trends was measured according to the scales adopted from Laudon and Laudon (2008) whereas, financial performance was measured

basing on the items adopted from Joseph and Dai (2009). The items were altered according to the study and anchored on a 5 point Likert Scale ranging from 1-strongly disagree to 5-strongly agree. These were translated into observable and measurable elements so as to develop index of the concepts. The researcher categorized the data collected in an orderly form using the 5 Likert scale used on the questionnaire as indicated below where; 1= Strongly agree, 2= Agree, 3= Undecided, 4= Strongly disagree, 5= Disagree. Socio economic attributes like age, sex, employment period/duration of service, academic levels were measured at nominal and ordinal scales depending on the variables.

3.12 Ethical Consideration

The researcher considered the conduct of the research and gave attention to the ethical issues associated with carrying out the study by adhering to the following procedures. Permission of the respondents was sought to conduct research involving them. This was done by seeking permission from the management of the bank through an introductory letter from the University and allowing the respondents to be chosen to be part of the study or not.

Written or verbal informed consent from all respondents was sought before interviews were conducted and the purpose and objectives of the study was carefully explained to the respondents.

The researcher took into consideration the privacy and confidentiality of the respondents by safe guarding the information of the respondents and providing explanation for the relevance of the information they provided as well as who it was shared with.

The researcher ensured that there was anonymity of the respondents by requesting the respondents not to provide their names, designations and contacts. Here the researcher designed the tools in such a manner that the respondent was not required to provide personal details.

The major ethical problem in this study was privacy and confidentiality of the respondents. This is because the researcher had to gain access to staff lists and files which were an infringement on the privacy of the respondents. This however was the only way of constructing a sampling frame and generating a representative sample.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND PRESENTATION OF FINDINGS

4.0 Introduction

This chapter covered the presentation, analysis and interpretation of the research findings in regard to the study objectives. The chapter addressed the following areas which included; the introduction, section two represents the response rate, section three dealt with the sample characteristics which included; gender, age group, tenure of employment, level of education and position held using frequency tabulations and figures. Section four, dealt with empirical findings on the study objectives using item mean analysis and correlations. Section five dealt with multiple regressions which presented the results on the combined effect of the dimensions of IT infrastructure on financial performance using regression analysis.

4.1 Response Rate

Response rate in survey research refers to the number of people who answered the survey divided by the number of people in the sample. It is usually expressed in the form of a percentage. Therefore, response rate is viewed as an important indicator of survey quality. Amin (2005), higher response rates assure more accurate survey results. Questionnaires were distributed to employees of the bank and customers. The study targeted 134 respondents to provide the information of the study and 134 questionnaires were distributed to the respondents who composed the sample size of the study. Out of the 134 distributed questionnaires, 115 usable questionnaires were returned giving a response rate of 85.8% which was acceptable for the study according to Sekaran (2003).

4.2 Demographic Characteristics

This section of the study discusses the characteristics of the respondents at the bank such as gender, age group, tenure of employment, nature of employment, level of education and position held. The researcher adopted frequency tabulations and figures to present and discuss the results of the sample characteristics below. The rationale of using frequency tabulation and figures was to ascertain the categories of the different characteristics in relation to the responses of the respondents. In order to summarize the results, figures were used by the researcher because it was another way of presenting the results in a summarized manner.

4.2.1 Respondent Category by Gender

Data was analyzed according to gender in order to ascertain the distribution of the responses among the female and the male. This information was obtained using a questionnaire administered to the respondents and the results are presented in the table below. To present the results on the gender distribution, frequency tabulation was used. The results are presented in table 4.1 below.

Table 4.1: Gender Distribution

Gender	Frequency	Percentage
Male	67	58.3
Female	48	41.7
Total	115	100.0

Source: Primary data, 2017

The results from Table 4.1 above show that 58.3% of the respondents were male whereas 41.7% were female. From the results, the male respondents were more responsive compared to their female counterparts implying that, there were more male staff at the bank compared to the female staff. The high composition of male respondents is a justification that the bank recruited more male employees compared to the female. The reason for this is that the roles that are performed at the bank require a lot of flexibility where by staff have to work long hours of

different shifts, which was unfavourable for the married female staff who have to also take care of the children and the family at large.

4.2.2 Respondent Category by Age Group

Frequency tabulation was used by the researcher to present the age distribution of the respondents. Table 4.2 below presents the results:

Table 4.2: Age of Respondent Distribution

Age Group	Frequency	Percentage (%)
20-30yrs	25	21.7
31-40 yrs	63	54.8
41-50 yrs	21	18.3
Over 50 yrs	6	5.2
Total	115	100.0

Source: Field data, 2017

According to the results in table 4.2 above, the majority of the respondents were in the in the age brackets of 20-30 years and 31-40 years with percentages of 21.7% and 54.8% respectively, followed by those in the 41-50 years age group with a percentage of 18.3% and then those in the over 50 years age group accounted for 5.2%. The results implied that the composition of the respondents was made up of staff who were mature enough to understand issues attributed to IT infrastructure capability.

4.2.3 Tenure of Employment

In order to ascertain the duration spent by the respondents as employed by the organisation, the researcher developed four employment tenure categories. While using frequency tabulation, the researcher sought to find out the distribution of the respondents according to the different tenure periods. This information was obtained by way of a self-administered questionnaire to the respondents. Table 4.3 below presents the results:

Table 4.3: Tenure of Employment

Tenure of Employment	Frequency	Percent
1-5 years	23	20
6-10 years	44	38.3
11-15 years	27	23.5
16-20 years	14	12.2
Above 20 years	7	6.1
Total	115	100.0

Source: Field data, 2017

The results from table 4.3 above shows that 38.3% of the respondents had worked for the bank for 6 to 10 years this implies that the majority of the staff at the organisation had worked for more than 6 years for the organization and 23.5% of the respondents had served the bank for a period of 11 to 15 years, 20% had been employed for 1-5 years, 12.2% had been at the bank for 16-20 years and 6.1% of the respondents had worked for over 20 year. Overall, the results showed that more than 80% of the respondents had worked for the bank for 6 years or more. The high percentage for respondents under the 6-10 years tenure of service is due to the fact that the bank has been existence for a long period of time which justifies why the majority of the respondents had tenure of 6-10 years. For the category of respondents who had tenure of employment of 1-5 years, these accounted for the new staff that had just been recruited. This is justification that the respondents possessed the required information on IT infrastructure capability at the bank and were therefore, able to provide the required formation for the study.

4.3.4 Level of Education

In order to find out the level of education of the respondents, the researcher categorized this from diplomas degrees and any other types of qualifications. This was done in order to find out the ability of respondents provide the required information on IT infrastructure capability and financial performance. Using frequency tabulation, the researcher presented the level of education distribution categories of the respondents. Table 4.4 below presented the results.

Table 4.4: Level of Education

	Frequency	Valid Percent
Diploma	13	11.3
Degree	62	53.9
Postgraduate	8	7.0
Masters	32	27.8
Total	115	100.0

Source: Field data, 2017

The results from table 4.4 above showed that the majority of the respondents (53.9%) possessed bachelors degree level of education, 27.8% were masters degree holders, 11.3% held diploma qualifications whereas, 7% were postgraduate holders. The high number of degrees and masters holders is due to the fact these are the minimum requirement for supervisory employees in both private and public organisations such as banks. The results show that the respondents possessed the required qualifications for their roles at the bank which was justification that the staff and customers possessed the required competences to be able to provide the required information about the study. This is justification that they were able to provide the right information for the study.

4.3.5 Position held by the Respondent

To understudy the different positions held by the respondents the researcher developed five positions ranging from top executives to junior officers. Using frequency tabulation, the researcher presented the position held distribution categories of the respondents. Table 4.5 below presented the results.

Table 4.5: Position held in the Organization

Position held		Frequency	Percent
	Top Executive	2	1.7
	Senior Manager	4	3.5
	Operations officer	38	33.0
	Customer	71	61.7
	Total	115	100.0

Source: Field data, 2017

From the results in table 4.5 above, the majority of the responses were acquired from customers (61.7%) followed by operations officers (33%) and then the senior managers (3.5%) and then top executives (1.7%). From the results it's clear that responses were acquired from all the stakeholders that affect or are affected by IT infrastructure capability at the bank. The horizontal nature of the organisational structure of the bank is evidence that there are more operational staff than senior management staff. This provides evidence that data was collected from the respondents who possessed the required information for the study and were therefore knowledgeable about the IT infrastructure capability and its resultant effect on financial performance at the bank.

4.4 Empirical Findings

The findings in this study are based on the specific objectives which included the effect of IT compatibility on financial performance; the effect of IT connectivity on financial performance; and, the effect of IT application functionality on financial performance. The variables are measured using a five point Likert scale and the results are presented in descriptive tables, showing item means of responses under each variable. The results are further explained using the Pearson correlation matrix in order to show relationships between the study variables whereas, to study the predictive power of the dimensions of IT infrastructure capability (IT compatibility, IT connectivity and IT application functionality) on financial performance, a

regression analysis was carried out. The results from the quantitative source are compared with qualitative ones. Statistical tables were used for easier understanding and interpretations.

4.5 IT Compatibility and Financial Performance

4.5.1 IT Compatibility

In order to assess the level of agreement and disagreement by the respondents regarding IT compatibility for the items used to explain IT compatibility in the questionnaire, item mean analysis was carried out. The researcher anchored the responses of the respondents on five Likert scale ranging from strongly disagree to strongly agree and the results are presented in table 4.5 below.

Table 4.6: IT Compatibility

Item scale	Min	Max	Mean	SD
Our Information Systems are subject to modification and adjustment	1	5	3.67	.689
Our bank seeks to examine and adjust the infrastructure of IT in proportion with the areas of marketing	1	5	3.70	.684
Infrastructure of IT can create new strategic assets	1	5	3.04	.789
The bank uses online analytical processes	1	5	3.74	.756
User interfaces provide transparent access to all platforms and applications	1	5	3.65	.652
End users throughout the bank use a common operating system	1	5	3.62	.752
Remote, branch and mobile offices do not perform any additional steps to access data from the head office	1	5	3.66	.789

Source: Primary data, 2017

Using item mean analysis on IT compatibility as a component of IT infrastructure capability, from the results the respondents revealed that information systems were subject to modification and adjustment (mean=3.67), the bank sought to examine and adjust the infrastructure of IT in proportion with operations (mean=3.70), the bank used online analytical processes (mean=3.74), user interfaces provided transparent access to all platforms and applications (mean=3.65), end users throughout the bank used a common operating system (mean= 3.62) and remote, branch and mobile offices did not perform any additional steps to access data from the head office (mean=3.66). The mean results show that much as the bank had done much in promoting IT infrastructure capability through IT compatibility, there were still gaps that

affected the effective performance of the bank. This could be attributed to none adherence to operations procedures and guidelines as stipulated by the policies. This implies that for the financial performance of the bank to be improve, IT compatibility was paramount in promoting IT infrastructure capability at the bank.

The results are also supported by the Head IT who revealed that;

“IT compatibility affected the IT infrastructure of the bank in such a way that if there was IT incompatibility in regard to operating systems used at the bank, this would cause disruptions in operations and thus affecting operations (Interview with the Head IT; October 2017).

Likewise, the Director Finance in support of the assertions of the Head IT, he revealed that;

“the bank’s operations were largely dependent on IT compatibility. Without IT compatibility or breakdowns in IT compatibility would render the bank non-functional (Interview with the Director Finance; October 2017).

This is corroboration that in order for the bank to achieve desirable IT infrastructure capability, it was of importance that the available IT infrastructure promote technological uniformity and standards & procedures were adhered to as this made the operating systems used by the bank more compatible to be able to deliver financial services offered by the bank. The results on the contribution of IT compatibility towards IT infrastructure capability imply that IT compatibility was paramount in fostering IT infrastructure capability at the bank.

4.5.2 IT Compatibility and Financial Performance

In order to understudy the association between IT compatibility and financial performance, the researchers unpacked the factor components of IT compatibility and examined the effect of IT compatibility on the financial performance of the bank. Using the, Pearson’s correlation test, the researcher analyzed the association between IT compatibility and financial performance to establish the contribution IT compatibility on financial performance at the bank. The Pearson

correlation coefficient was used because it presents data in a numerical way to quantify the relationship between two variables where the correlation coefficient is determined. Where the correlation coefficient, is positive, then an increase in the independent variable would result in a increase in dependent variable, however if it was negative, a decrease in independent variable would result in a decrease in the dependent variable. Larger correlation coefficients would suggest a stronger relationship between the variables and vice versa. The results are presented in table 4.7 below.

Table 4.7: IT Compatibility and Financial Performance

		IT Compatibility	Financial Performance
IT Compatibility	Pearson Correlation	1	.582(**)
	Sig. (2-tailed)		.007
Financial Performance	Pearson Correlation	.582(**)	1
	Sig. (2-tailed)	.007	
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Field data, 2017

The correlation results in Table 4.7 above indicated a significant and positive relationship between IT compatibility and financial performance ($r = 0.582^{**}$, $p < .01$) which confirms hypothesis one which states that there is a significant relationship between IT compatibility and financial performance. This implies that when the IT infrastructure of the bank is supported by IT compatibility, there would be effective, efficient, economical and timely service delivery at the bank. This was shared by some of the senior managers who stated that;

“to ensure the sustainability of the bank, there was need to ensure that IT that supported the operating systems of the bank was compatibility as this promoted IT infrastructure capability at the bank”.

From the results, it's clear that if there was clear that IT compatibility as a key driver of IT infrastructure capability at the bank, this would enhance the financial performance of the bank. This position was also shared by top executives such as the heads of departments who revealed

that IT compatibility at the bank was paramount in promoting bank profitability, liquidity, growth and return on investment. This implies that when there is commitment by management to ensure that the IT infrastructure is compatible and performing as required, this will enhance the financial performance of the bank.

4.6 IT Connectivity and Financial Performance

4.6.1 IT Connectivity

Item mean analysis was used to assess the respondents' level of agreement and disagreement in regard to the items used to measure IT connectivity. The item means showed the average response from the respondents for each item in relation to IT connectivity. The items were rated on the 5 point Likert Scale ranging between strongly disagree, disagree, not sure, agree and strongly agree. The findings are shown in table 4.8 below:

Table 4.8: IT Connectivity

Items	Min	Max	Mean	SD
The speed of our communication infrastructure contributes to meet current needs	1	5	3.69	.757
Bank data are a flexible and sharable with business units	1	5	2.77	.869
The uses open system network mechanisms to boost connectivity	1	5	3.89	.646
The bank does not experience communication bottlenecks	1	5	2.47	.737
The bank uses virtual networks to connect end users	1	5	3.68	.736
The bank offers a wide range of types of information to end users	1	5	3.53	.837

Source: Field Data, 2017

According to the results in table 4.8 above, the respondents revealed that the speed of the bank's communication infrastructure contributed to meet current needs (mean=3.69), the bank used open system network mechanisms to boost connectivity (mean=3.89), used virtual networks to connect end users (mean=3.68) and offered a wide range of types of information to end users (mean=3.53). On the contrary, bank data was not flexible and sharable with business units (mean=2.77) and the bank experienced communication bottlenecks (mean=2.47). In line with the quantitative results above, some of the senior managers revealed that;

“the major role IT connectivity was to promote easy communication within the bank and linking branches to the head office as a way of enhancing information sharing among the different sections and departments (Interviews with the Senior managers; October 2017)”.

From the results, the standard deviation result of less than 1 is proof that IT connectivity determined the financial performance of the bank. Likewise, the standard deviation results provided evidence that the results obtained on IT connectivity could be applied to the bank and therefore could be generalized on banks in the country. The general view from the results is that the results on IT connectivity as a means of promoting IT infrastructure capability at the bank provided confirmation that improvements had been done in regard to IT connectivity as a strategy of enhancing IT infrastructure capability and this was benefiting the bank in delivering financial services. This implies that continued IT connectivity will go a long way in helping the bank improve information flow from one level to another and also promote effective communication at the bank.

4.6.2 IT Connectivity and Financial Performance

To investigate the connection between IT connectivity and financial performance, a Zero-order correlation table was generated. To study the relationship between IT connectivity and financial performance, Pearson’s correlation test was used and the results are presented in table 4.9 below.

Table 4.9: IT Connectivity and Financial Performance

Variable		IT Connectivity	Financial Performance
IT Connectivity	Pearson Correlation	1	.469(**)
	Sig. (2-tailed)		.000
Financial Performance	Pearson Correlation	.469(**)	1
	Sig. (2-tailed)	.000	
**.			<i>Correlation is significant at the 0.01 level (2-tailed).</i>

Source: Field data, 2017

Correlation results indicated a significant association between IT connectivity and financial performance ($r = 0.469^{**}$, $p < .01$). From the results of the respondents, it was revealed that through bank's ability to use virtual networks, flexible data sharing and availability of communication infrastructure, this supported the capability of the bank's IT infrastructure. This was supported by the results from the interviews which revealed that IT connectivity was paramount in enhancing the financial performance of the bank. The results confirm that for the bank attain required profit levels, liquidity levels, growth and managing operational costs, there was need to ensure effective IT connectivity that supported IT infrastructure capability as this would enhance the financial performance of the bank. Various studies have shown that IT connectivity influences IT infrastructure capability in organization. This view was also collaborated by the results of the study.

From both the qualitative and quantitative results of the study there was consensus that IT connectivity determined IT infrastructure capability. It can therefore be deduced that IT connectivity was paramount in promoting IT infrastructure capability at the bank. Therefore, the management of the bank should put emphasis on ensuring that effective communication in the operations of the bank and that information is shared among staff as this enhance connectivity between different operations at the bank which will in turn boost the bank's IT infrastructure capability. Moreover, the enhancement of IT connectivity should be related to the overall adequacy of IT infrastructure capability because it provides the mechanism whereby the

questions central to proper functioning of IT infrastructure can be answered. The findings justify that IT connectivity in terms of communication and information sharing among others were paramount in determining bank's profitability, capital adequacy, asset quality and liquidity which would promote financial performance.

4.7 IT Application Functionality and Financial Performance

4.7.1 IT Application Functionality

Using item mean analysis and percentages, the researcher determined the level of IT application functionality in regard to the ability of the operating systems to function properly when being used to carry out bank activities are dependent on the IT infrastructure of the bank. The items were rated on the 5 point Likert scales ranging from strongly disagree, disagree, not sure, agree and strongly agree. The findings are shown in table 4.10 below:

Table 4.10: IT Application Functionality

Items	Min	Max	Mean	SD
IT assist the bank to monitor the use of resources	1	5	3.75	.834
IT assist the bank to upgrade outdated systems	1	5	3.66	.716
IT assist the bank to dispose-off outdated data/equipments	1	5	2.62	.745
IT assist the bank to evaluate the effectiveness of operations	1	5	3.62	.616
IT applications assist in the ordering process of required resources	1	5	3.82	.691
IT applications assist in the physical acquisition of resources	1	5	3.18	.692
IT applications assist in the verifying resources according to specifications	1	5	4.00	.663

Source: Field data, 2017

From the results on the level of IT application functionality in regard to IT infrastructure at the bank in table 4.10 above, the respondents revealed that ITs assisted the bank to monitor the use of resources (mean=3.75), upgrade outdated systems (mean=3.66) and evaluate the effectiveness of operations (mean=3.62). On the other hand, IT applications assisted in the ordering process of required resources (mean=3.82), in the physical acquisition of resources (mean=3.18) and in the verification of resources according to specifications (mean=4.00), whereas, there was disagreement that IT assisted the bank to dispose-off outdated

data/equipments (mean=2.62). From the results, the standard deviation results of less than 1 provided evidence that the results obtained on IT application functionality applied to the bank and therefore could be generalized on other financial institutions that offer financial services.

In support of the above results, the Head finance and Head Operations revealed that;

“during IT infrastructure implementation, a lot of emphasis was put making sure that IT applications function as required for the bank to be able to meet customer expectations (Interviews with the Head Finance and Head Operations; October 2017)”.

The Head Finance also revealed that;

“inadequacies in IT applications functionality would mean that the bank’s IT infrastructure was incapable of delivering quality financial services which would make it less competitive in the sector (Interviews with the Head Finance, October 2017)”.

From the qualitative and quantitative results, it was clear that strides had been in promoting IT application functionality through resource management and resource acquisition as a way of ensuring that the bank’s capability in its IT infrastructure is improved so as to remain competitive in the delivery of financial services to the public. However, more needed to be done to promote continuous improvement in IT application functionality because of the continuous developments in information technology that require regular update of IT infrastructure to suit new inventions in information technology.

4.7.2 IT Application Functionality and Financial Performance

To present the results on the relationship between IT application functionality and financial performance, correlation was done where by all responses for each variable; IT application functionality and financial performance were aggregated and then Pearson’s correlation Coefficient (r) technique was used to assess the nature and magnitude of the relationship. Table 4.11 gives Pearson’s correlation Coefficient for the two variables which include; IT application functionality and financial performance.

Table 4.11: IT Application Functionality and Financial Performance

		IT Application Functionality	Financial Performance
IT Application Functionality	Pearson Correlation	1	.540**
	Sig. (2-tailed)		.000
Financial Performance	Pearson Correlation	.540**	1
	Sig. (2-tailed)	.000	
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Field data, 2017

According to table 4.11 above, the correlation results showed a strong significant relationship between IT application functionality and financial performance ($r=0.540^{**}$, $p<.01$). Therefore, the management of the bank should pay a lot of attention to the effect of IT application functionality on financial performance at the bank. From the results the respondents revealed that there was some level of IT application functionality at the bank much as more needed to be done by management so as enhance the functioning of IT applications. This is supported by the results from the interviews which revealed that enhancing the proper functionality of IT applications resulted in the bank's ability to deliver quality financial service making in more competitive and thus more financially sustainable.

The study findings show that the manner in which IT application functionality was conducted had a resultant effect on the financial performance of the bank. This is because issues such as resource management and resource acquisition influenced the bank's IT infrastructure capability which in turn either had a positive effect on the financial performance of the bank. Therefore, the management of the bank needed to make sure that the functionality of IT applications is implemented in an efficient manner so as to achieve its intended goals of enhancing the bank's profitability, capital adequacy, asset quality and liquidity. This is because as the bank becomes more versatile in information technology emphasis should be put on ensuring that the IT infrastructure used by the bank is functioning well when delivering financial services as this will contribute to the bank's sustainability in the long run.

4.8 Regression Model

Multiple regression analysis was used to establish how the combined effect of the independent variable that is IT infrastructure capability affects financial performance at the bank. The overall potential of IT compatibility, IT connectivity and IT application functionality to explain the financial performance of the bank, were presented using the regression model in the table below.

The results are presented in table 4.12 below.

Table 4.12: Prediction Model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.593	.449		1.321	.195
	IT compatibility	.724	.221	.539	3.275	.001
	IT application functionality	.416	.150	.390	2.782	.002
	IT connectivity	.187	.137	.226	1.368	.010
Dependent Variable: Financial Performance R Square = .474 Adjusted R Square = .466						

Source: Field data, 2017

According to table 4.12, IT compatibility, IT connectivity and IT application functionality predict 46.6% of the financial performance of the bank (Adjusted R Square = .466). The regression model was significant and thus reliable for making conclusions and recommendations. The most significant predictor of the bank's financial performance was IT compatibility (Beta= 0.539, Sig. = 0.002) followed by IT connectivity (Beta= 0.390, Sig. = 0.008) and then followed by IT application functionality (Beta= .226, Sig. = 0.010). The findings revealed IT compatibility, IT connectivity and IT application functionality were strong predictors of financial performance. Providing evidence that for the bank to realize the required profitability, liquidity, growth and ensure beneficiary satisfaction there was need to ensure that

IT infrastructure used by the bank was compatible, compatibility, effectively connected and that the applications function in the required manner when delivering financial services.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the discussion of results presented in chapters four and conclusions drawn from the presentation. The chapter presents a short summary of the purpose of the study and the research findings, followed by the set of recommendations, limitations of the study and areas of further research.

5.1 Summary of the Study Findings

The study sought to examine the extent to which IT infrastructure capability affected financial performance at Barclays Bank. This was carried out by unpacking the dimensions of IT infrastructure capability which are: IT compatibility, IT connectivity and IT application functionality. These were related with financial performance when developing the study objectives. Data was collected using self-administered questionnaires and an interview guide and it was analyzed using the Statistical Package for Social Scientists (V20) which was used to generate tabulations of frequencies, item means, correlations and regression analysis.

5.1.2 IT Compatibility and Financial Performance

The study findings validate that IT compatibility was significant in determining financial performance. The findings authenticated that IT compatibility was an integral part in promoting the financial performance of the bank. This implied that emphasis on ensuring that ICTs used by IT infrastructures was compatible would result into increase in the bank's profitability, liquidity, growth and cost reduction.

5.1.3 IT Connectivity and Financial Performance

According to the findings, there was a positive significant relationship between IT connectivity and financial performance. The positive significant relationship between IT connectivity and financial performance was verification that in order to enhance the financial position of the bank, there was need for the bank to ensure adequate IT connectivity in the bank's ICT infrastructure.

5.1.4 IT Application Functionality and Financial Performance

The study findings established that IT application functionality had a positive influence on the financial performance of the bank which was implication that if the bank's IT applications functioned as required, this would enhance the capability of the bank in relation to IT infrastructure which in the process would enhance the financial position of the bank.

5.2 Discussion of the Findings

A discussion of the findings was carried out following the study objectives. Here the researcher assessed how the findings of the study were in agreement or disagreement with extant literature that was reviewed.

5.2.1 IT Compatibility and Financial Performance

The findings indicated a significant and positive relationship between IT compatibility and financial performance. This was also supported by regression results which revealed that IT compatibility was a significant predictor of financial performance. In line with the findings Mohammad and Kamaruzaman (2009), Information Technology compatibility help span organization boundaries, employee empowerment, make information and knowledge readily available in the organization. Anand (2013) suggests that ITI configuration and compatibility standards and rules are central in managing the firm's sharing extent range-wise. IS standards and procedures also provide a foundation for ITI analysis, design and development, in other

words, the architecture controlling a firm's IT operations. Therefore, IS standards and procedures together with IT services represent the level at which IS function meets a firm's need for IT-related services (Rasli, Huam, Mohd, Maseri and Asmi, 2011). Ismail and Mamat (2012) opine that IT compatibility helps organizations to modernize business operations, produce a modern business model and enhance their customer relationship management. In order to achieve a range of goals, managers make IT investments to positively influence performance by providing a competitive advantage, responding to rapidly changing market needs, providing resourceful information for better decision making, reducing business costs by automating some transactions, allowing competition in specific technology market areas, facilitating flexibility to fulfill more customers' needs without incurring extra cost, and providing technological platform for producing other business.

5.2.2 IT Connectivity and Financial Performance

The findings revealed a significant and positive relationship between IT connectivity and financial performance. These results were in line with the regression findings which revealed that IT connectivity predicted financial performance. This is in agreement with Campbell (2012), Information Technology connectivity enable seamless and transparent organizations that are independent of time and space. Keen (1991) also noted that reach is required to achieve an organization's desired level of data transparency. ITI sharing capability refers to how ITI can efficiently provide homogenous services to customers from within and outside the company. If data/applications are not shared, it is a business decision consequence rather than technological capability (Anand, 2013). The way reach works to connect is that in some firms, employees only communicate within one unit, whereas in others interaction extends to customers and suppliers, no matter where the IT base is situated. Higher reach and range show higher sharing capability, which also means more complex transactions across more business units a firm can handle. This portrays the potential to connect anything to anyone at any time

(Xianfeng, et. al., 2008). If data or applications are not shared, it is a consequence of a business decision rather than the technological capability.

5.2.3 IT Application Functionality and Financial Performance

From the findings, a significant and positive relationship between IT application functionality and financial performance was observed. This confirms that IT application functionality determined the financial performance of the bank. IT physical assets are fundamental technical fundamentals shared across organizational units, such as organization-wide technical platforms, architectures, networks and databases. Corresponding to the range of sharing capability, the higher the extent of the sharing capability is, the wider the range of IT service is. Flexibility is the firm's ability to utilize ITI for dealing with fluctuations in business and technology (Xianfeng, et. al., 2008). A flexible firm has the ability to efficiently adapt its IT to the many changes in strategy direction. This agility and versatility are necessity to survive in the present competitive environment. From the discussion of the findings, it was revealed that the findings on the associations between IT compatibility, IT connectivity, IT application functionality and financial performance were significant and support by earlier studies conducted by other researchers on the variables under study. Therefore, the findings of the study were in line with the findings of the studies conducted in the past.

5.3 Conclusions

Based on the study findings a number conclusions were made;

5.3.1 IT Compatibility and Financial Performance

The study findings substantiate that IT compatibility was important in determining the financial performance of the bank. This implies that focus on ensuring IT compatibility in the bank's IT infrastructure would enhance the financial performance of the bank. This is confirmation that IT compatibility was paramount in determining the financial performance of the bank.

Therefore, it is concluded that IT compatibility affected the financial performance of Barclays Bank.

5.3.2 IT Connectivity and Financial Performance

Generally, the study findings on objective two revealed that IT connectivity was still inadequate which affected the financial position of the bank. The positive significant relationship between IT connectivity and the financial performance of the bank is justification that to ensure the capability of the IT infrastructure of the bank, there was need for the bank to promote IT connectivity as this would enhance the financial position of the bank. Accordingly, it is concluded that IT compatibility was paramount in determining the financial performance of Barclays Bank.

5.3.3 IT Application Functionality and Financial Performance

The study findings substantiate that IT application functionality was paramount in promoting the financial performance of the bank. This is corroboration that a positive change in IT application functionality would translate into an improvement in the financial position of the bank. This is justification that IT application functionality was vital in improving the financial performance of the bank. In light of the above, it is concluded that IT application functionality was a strong determinant of the financial performance at Barclays Bank

5.4 Recommendations

IT Compatibility and Financial Performance

The bank should improve upon its IT flexibility, by regularly training and retraining its IT personnel with the aim of being responsive to customer's complaints as they arise from time to time. Likewise, the bank should overhaul their IT facilities from time to time so as to meet current trends of information technology as to deliver quality and accessible service to

customers. In other words, there should be timely innovations and improvements of ITI facilities.

The management of the bank should put a lot of emphasis on ICT capacity building (training) of both senior and operations staff for them to appreciate the relevance of IT infrastructure capability at the bank. Likewise, the bank should involve key stakeholders in all critical IT infrastructure activities at both the strategic and operational levels of service delivery.

IT Connectivity and Financial Performance

The bank should venture into digital technologies because they increase a bank's connectivity not just with customers but also with employees and suppliers. This will help the bank have access to online interactivity and payment solutions to mobile functionality and opportunities to boost bank brands which in process will result in improved financial suitability. Likewise, through IT connectivity the bank will be able to draw on big data and advanced analytics to extend and refine decision making.

IT Application Functionality and Financial Performance

For the bank to enhance its IT infrastructure capabilities, management should develop, assess, implement and evaluate policies that support user acceptance of IT infrastructure.

The management of the bank should hire an IT infrastructure consultant to understudy the ICT challenges facing the bank and come up with recommendations of improving the IT infrastructure capability of the bank. Similarly, the consultant should be involved in the implementation process of the proposed changes.

In order for the bank to promote IT infrastructure capability, management should work towards making sure that the systems and procedures are perceived to be credible, promote positive social influence to users, ensure that the facilitating conditions that support the system are put

in place, promote effort and performance expectance for the system while at the same time ensuring self-efficacy and positive attitudes towards the system.

5.5 Contributions of the study

The study was able to contribute to knowledge by proving a clear understanding about the effect of IT infrastructure capability in regard to IT compatibility, IT connectivity and IT application functionality, on the financial performance of financial institutions focusing on Barclays Bank. From the findings, it was evident that IT compatibility, IT connectivity and IT application functionality were key components that determined the financial performance of financial institutions. These findings enhance policy makers', academicians', managers and other stakeholders' understanding of the extent to which IT compatibility, IT connectivity and IT application functionality affect the financial performance of financial institutions in Uganda. From the findings of the study, the information can influence policy formulation and strategies that are intended to enhance the financial performance of financial institutions.

5.6 Implications for Theory

In line with the "General System Theory" and "Transaction Cost Theory", IT compatibility such as technological uniformity and standards & procedures promoted the financial performance of the bank. Likewise, IT connectivity factors such as communication, reach and sharing if addressed by the bank, would enhance the financial performance of the bank in regard to profitability, liquidity, capital adequacy and asset quality. In addition, IT application functionality factors such as resource management and resource acquisition were key in determining the profitability, liquidity, capital adequacy and asset quality of the bank hence improving the financial performance of the bank. Therefore, the study confirms the theories since IT compatibility, IT connectivity and IT application functionality were found to influence the profitability, liquidity, capital adequacy and asset quality of the bank.

5.7 Implication for Policy and Practice

The study revealed that IT compatibility, IT connectivity and IT application functionality determined the financial performance of the bank. This implies that policy makers such as the Bank of Uganda, Ministry of Finance, Planning and Economic Development among others put more emphasis on IT infrastructure capabilities in the financial sector that encourage IT compatibility, IT connectivity and IT application functionality to ensure that the organisations deliver quality financial services in an effective manner.

5.8 Limitations of the study

- i) The cross sectional research design used by the study undermined the quality of information that was collected to represent the views of the staff and customers at the bank. In order to enhance the representation of the views of the respondents on the financial performance of the bank, a longitudinal study design should be adopted in future studies.
- ii) The time horizon used (cross sectional) in the study only collected data at a point in time, therefore providing views as of when the study was carried out. However, the research encouraged respondents to provide as much information as possible and to bridge this gap, he pointed out that a longitudinal study was more appropriate for the study so as to gain a clear understanding about financial institutions regarding their financial performance.
- iii) The scales in the questionnaire were adopted from other studies conducted in different environments from that of Uganda, which is likely to cause bias. The research indulged experts in the field of finance and accounting to moderate the scales adapted to fit the local environment.
- iv) The study used a closed ended questionnaire which required the respondents to provide responses on the items contained in the tool. This did not give a chance to the

respondents to provide more information beyond what was contained in the questionnaire which limited the respondents' ability to provide more information about the study. To address this, the researcher carried in depth interviews with senior staff who had a long tenure at the bank so as to have an in-depth understanding of how IT infrastructure capability affected the financial performance of the bank.

5.9 Areas for Further Study

This study focused on IT infrastructure capability and financial performance in Barclays Bank. Future research should focus on the following:

- i) IT infrastructure capability and financial performance in other commercial banks in Uganda.
- ii) IT infrastructure capability and financial performance in Microfinance institutions in Uganda
- iii) IT infrastructure capability and financial performance in the private sector.

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APPENDICES

Appendix i: Questionnaire

Dear Sir/Madam,

I am Samuel Nixon Munnet, a student at Uganda management Institute. I am carrying out a research study on “Information Technological capability and Financial Performance in Commercial Bank in Uganda: A Case of Barclays Bank”. The study is being conducted in fulfillment of the requirement for the award of a degree of Master of Business Administration. This questionnaire is seeking information on the study. The information provided in this questionnaire will be used for academic purposes only and shall be accorded utmost confidentiality. Therefore, your contribution towards filling in this questionnaire will be a great contribution to my academic endeavor.

Thank you.

Section I: Bio Data

Kindly tick (√) the appropriate option.

1. Sex of Respondent

Male

Female

2. Age group:(Tick appropriately)

200 years	31-40 years	41-50 years	> 51 years

3. Highest Level of Education:(Tick appropriately)

Diploma	Bachelor degree	Postgraduate	Masters

Others please specify:

4. Period Staff has been with the company

1-5 years	6-10 years	11-15 years	16-20 years	Above 20 years

5. Position at the company

Top Executive	Senior Manager	Operations officer	Support staff

Section II: IT Compatibility

Please tick the option showing the extent to which you agree or disagree with the statement. 5- Strongly Agree (SA), 3 – Not Sure (NS), 2 – Disagree (D) and 1 – strongly Disagree (SD)

Items	SD	D	N	A	SA
Our Information Systems are subject to modification and adjustment.	1	2	3	4	5
Our bank seeks to examine and adjust the infrastructure of IT in proportion with the areas of marketing.	1	2	3	4	5
Infrastructure of IT can create new strategic assets.	1	2	3	4	5
The bank uses online analytical processes	1	2	3	4	5
User interfaces provide transparent access to all platforms and applications	1	2	3	4	5
End users throughout the bank use a common operating system	1	2	3	4	5
Remote, branch and mobile offices do not perform any additional steps to access data from the head office	1	2	3	4	5

Section III: IT Connectivity

Please tick the option showing the extent to which you agree or disagree with the statement. 5- Strongly Agree (SA), 3 – Not Sure (NS), 2 – Disagree (D) and 1 – strongly Disagree (SD)

Items	SD	D	N	A	SA
The speed of our communication infrastructure contributes to meet current needs.	1	2	3	4	5
Bank data are a flexible and sharable with business units.	1	2	3	4	5
The uses open system network mechanisms to boost connectivity	1	2	3	4	5
The bank does not experience communication bottlenecks	1	2	3	4	5
The bank uses virtual networks to connect end users	1	2	3	4	5
The bank offers a wide range of types of information to end users	1	2	3	4	5

Section IV: IT Application Functionality

Please tick the option showing the extent to which you agree or disagree with the statement. 5- Strongly Agree (SA), 3 – Not Sure (NS), 2 – Disagree (D) and 1 – strongly Disagree (SD)

Items	SD	D	N	A	SA
IT assist the bank to monitor the use of resources	1	2	3	4	5

IT assist the bank to upgrade outdated systems	1	2	3	4	5
IT assist the bank to dispose-off outdated data/equipments	1	2	3	4	5
IT assist the bank to evaluate the effectiveness of operations	1	2	3	4	5
IT applications assist in the ordering process of required resources	1	2	3	4	5
IT applications assist in the physical acquisition of resources	1	2	3	4	5
IT applications assist in the verifying resources according to specifications	1	2	3	4	5

Section V: Financial Performance

Please tick the option showing the extent to which you agree or disagree with the statement. 1-Strongly Disagree (SD), 2-Disagree (D), 3-Not Sure (NS), 4-Agree (A), 5-Strongly Agree (SA)

Items	SD	D	N	A	SA
Our bank achieves an increase in total assets	1	2	3	4	5
Our bank achieves yield on investment higher than that of our competitors	1	2	3	4	5
The bank's return on investment has overridden that of our competitors.	1	2	3	4	5
Our account sales have steadily increased	1	2	3	4	5
The financial position of the bank has improved	1	2	3	4	5
Over the last 3 years the profits of the bank have been steadily increasing	1	2	3	4	5
Over the last 3 years the profit margins of the bank have increased	1	2	3	4	5
The return on investment has increased over the last three years.	1	2	3	4	5

Thank You

Appendix II: Interview guide for Senior Officers

IT Infrastructure Capability

1. Is the bank's IT Infrastructure capable to support bank operations? If so how?
2. In your view, is the bank's IT compatibility adequate enough?
3. Is there enough IT connectivity at the bank?
4. Does the bank put emphasis on ensuring that system applications function well?
5. What are some of the strategies put in place to improve IT Infrastructure capability at the bank?

Financial Performance

6. What is your assessment of the company's profits?
7. Would you agree that the company is liquid enough?
8. In your view, have the portfolio of the bank improved?
9. Is the bank realizing return on investment?
10. Has the bank's capability of the IT Infrastructure improved the financial performance of bank?

Thank You

Appendix III: Table for determining sample size from a given Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Appendix IV: Documentary Review Checklist

Key: A- Always, F=Frequently, O=Occasionally, R=Really, N=Never

General's Policy and Reports	A	F	O	R	N
Documented ICT policies					
Bank Annual Reports					
Bank Strategic Plans					
Bank of Uganda Performance Reports					
Bank of Uganda Financial Sector Reports					
Meeting minutes	A	F	O	R	N
Is there a policy on IT hardware?					
Is there a policy on IT software?					
Is there a policy on personnel IT skills?					
Is business on IT infrastructure trends discussed by management?					
Journal articles	A	F	O	R	N
Is there discussion on IT infrastructure trends?					
Is there a relationship between IT infrastructure trends and organisational commitment?					

Appendix IV: Introductory Letter

Appendix V: Field Research Letter

Appendix VI: Anti plagiarism Report