CORE BANKING SYSTEMS REPLACEMENT AND
PERFORMANCE IN COMMERCIAL BANKS IN KENYA

By

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DECLARATION

I declare that this is my original work and has not been presented for a degree in any other university.

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This project has been submitted for examination with my approval as university supervisor

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DEDICATION

To my wife Nelly, daughter Faith and sons Wallace and Ian; you have helped me realize my dreams and achieve them. Thank you for your unconditional love and support.
ABSTRACT

Financial services companies around the world are seeking to upgrade their core banking systems to improve competitiveness, operational efficiency, and regulatory compliance. However, such initiatives are especially challenging for most institutions. In a survey on the implementation of Basel II regulations, CBK (2008) found that some Kenyan banks had failed to implement the regulations due to challenges in their core banking systems.

The purpose of this study was to: determine factors leading to replacement of core banking systems in commercial banks in Kenya; establish the challenges that commercial banks in Kenya encounter in the process of core banking systems replacement; and determine the effect of core banking systems replacement on bank performance.

This research was carried out using a descriptive survey design. The target population of this study was all the 43 commercial banks in Kenya as at 31st December 2011. No sampling was done since the population was small (N=43). The research instrument for this study was a questionnaire. Data was collected from IT directors of the 43 operational commercial banks in Kenya. This data was manipulated through descriptive statistics such as percentages, range and mean scores and regression analysis. Presentation of data was through tables.

Study results indicate that there are various factors that lead banks to replace their cores. These include their technologies being outdated, to reduce cost and improve efficiency, to enable adoption of new customer centric strategies, to enhance business banking and personalized service and to incorporate new and increased business.
Challenges faced in the process of core banking system replacement include agreeing on what is actually necessary, security issues, empowering employees to use the new system, vendor capabilities and credentials, risk of the software capability to meet requirements and expectations, unavailability of the diverse skills required and data migration. Findings also indicated that replacing core systems has a significant positive effect on financial performance.

The following recommendations were made. First, banks need to be mindful of the challenges associated with core banking deployments. These challenges, once understood should be mitigated properly and perfectly managed. Secondly, the small and medium banks must appreciate that technology is an enabler and should adapt to change that make the technology transformation. Lastly, banks that have not replaced their core systems should have plans to do so and should learn from the leaders on the benefits and challenges.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>DECLARATION</td>
<td>1</td>
</tr>
<tr>
<td>DEDICATION</td>
<td>ii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>iii</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>iv</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>ix</td>
</tr>
<tr>
<td><strong>CHAPTER ONE: INTRODUCTION</strong></td>
<td>1</td>
</tr>
<tr>
<td>1.1 Background of Study</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Statement of the Problem</td>
<td>10</td>
</tr>
<tr>
<td>1.3 Objectives of the Study</td>
<td>12</td>
</tr>
<tr>
<td>1.4 Hypothesis</td>
<td>12</td>
</tr>
<tr>
<td>1.5 Value of the Study</td>
<td>12</td>
</tr>
<tr>
<td><strong>CHAPTER TWO: LITERATURE REVIEW</strong></td>
<td>14</td>
</tr>
<tr>
<td>2.1 Introduction</td>
<td>14</td>
</tr>
<tr>
<td>2.2 IT and the Banking Sector</td>
<td>14</td>
</tr>
<tr>
<td>2.3 Core Banking Systems</td>
<td>15</td>
</tr>
<tr>
<td>2.4 Core Banking System Replacement</td>
<td>17</td>
</tr>
<tr>
<td>2.5 Challenges of Core Banking System Replacement</td>
<td>21</td>
</tr>
<tr>
<td>2.6 Conceptual Framework</td>
<td>23</td>
</tr>
<tr>
<td>2.7 Summary</td>
<td>25</td>
</tr>
<tr>
<td><strong>CHAPTER THREE: RESEARCH METHODOLOGY</strong></td>
<td>26</td>
</tr>
<tr>
<td>3.1 Research Design</td>
<td>26</td>
</tr>
<tr>
<td>3.2 Target Population</td>
<td>26</td>
</tr>
<tr>
<td>3.3 Sample and Sampling Procedures</td>
<td>26</td>
</tr>
<tr>
<td>3.4 Research Instruments</td>
<td>27</td>
</tr>
<tr>
<td>3.5 Data Collection Procedures</td>
<td>27</td>
</tr>
<tr>
<td>3.6 Data Analysis Procedures</td>
<td>27</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 4.1: Gender of Respondents ..............................................................................29
Table 4.2: Age of Respondents ...................................................................................30
Table 4.3: Highest Education Level ............................................................................30
Table 4.4: Years of Experience ...................................................................................30
Table 4.5: Whether Core Has Been Replaced ............................................................31
Table 4.6: Year Core System was replaced ................................................................31
Table 4.7: Number of Branches ..................................................................................32
Table 4.8: Number of Employees ...............................................................................32
Table 4.9: Number of Customers in the Bank ............................................................33
Table 4.10: Factors Leading to Core Systems Replacement ......................................34
Table 4.11: Core Systems Used By Banks .................................................................35
Table 4.12: Challenges to Core Systems Replacement ..............................................36
Table 4.13: Regression Model Summary ....................................................................37
Table 4.14: Analysis of Variance ................................................................................37
Table 4.15: Significance of Predictors ........................................................................38
LIST OF FIGURES

Figure 2.1: Core banking System Levels ....................................................................16
Figure 2.2: Conceptual Framework ............................................................................24
CHAPTER ONE: INTRODUCTION

1.1 Background of Study

Technology has come into common use in the banking sector and has played an important role. Banks aim to reduce costs, enhance efficiencies and guarantee customer retention with use of technology (Turnbull et al., 2007). Financial institutions obtain considerable cost reductions at the same time as they reach new customer segments, identify potential customers and cover a global geographic field of action that no other distribution medium allows affordably.

The self-service technologies and e-banking also allow users to customize the service in a tailor-made fashion, which is often assessed by the customer as a gratifying experience. Zineldin (2009) propose that the use of new technologies is understood as a chain of virtual value used for the greater benefit of customers and banks. Despite these positive aspects, new technologies can be expensive, be negative for the customer and create problems related to the reliability and security of transactions, accessibility to the service and customer support.

Financial services and banking in particular are businesses in which the relationships between institutions and their customers are critical (Seybold, 2001). There is a great deal of interaction between the customer and the bank, and technology plays a major role in that interaction. For example, the self-service technologies such as ATMs introduced into the banking sector have become both well-known and popular, since they were readily accepted by customers, who recognize their advantages in terms of efficiency, convenience and cost reduction. However, there is some doubt as to
whether self-service technologies contribute favourably towards establishing lasting relationships between banks and their customers.

Several studies (e.g. Chairlone and Ghosh, 2009; Claessens and Luc, 2009; Boot, 2009) have suggested that technological advances and the tools of communication enable close and long-term relations to be created and developed with customers. However, there is no consensus as to whether these relationships are strengthened or, rather, weakened by the use of technology. If, on one hand, the potential exists for technology to improve communication and customization, on the other hand, increasing virtualization may translate into no direct personal interaction, diluting links between company and customers (Turnbull et al, 2007).

1.1.1 Core Banking Systems

Core banking system is the platform where communication technology and information technology are merged to suit core needs of banking such as handling deposits and lending (Chairlone and Ghosh, 2009). Abbate (1999) defined a core banking system as a back-end system that processes daily banking transactions, and posts updates to accounts and other financial records. Core banking systems typically include deposit, loan and credit-processing capabilities, with interfaces to general ledger systems and reporting tools. Strategic spending on these systems is based on a combination of service-oriented architecture and supporting technologies that create extensible and agile architectures (Chairlone and Ghosh, 2009).

Most financial institutions rely on some form of core banking systems to provide customers with retail and corporate banking products. In addition, core banking systems deliver enterprise-wide capabilities such as general customer information,
branch services, input for the general ledger, and data on credit limits, payments, and transfers (Claessens and Luc, 2009). Like the institutions that depend on them, core banking systems are feeling the pressures of an increasingly global financial marketplace. Institutions face growing competition from new market entrants and established players. At the same time, these aging legacy systems are by and large unable to fulfill customer demands for a better financial services experience that includes competitively priced products, more attentive and faster service, and lower cost.

As regulatory demands grow in intensity and financial institutions face a competitive and challenging environment, running a modern and efficient core banking system has become essential to continued success (Chairlone and Ghosh, 2009). Furthermore, as the number of core system replacements by commercial increases, banks are demonstrating not only an increased need but also a desire to replace antiquated systems. Unfortunately, the costs and time associated with taking on such a project have forced many institutions to fail to move forward with these projects or, if doing so, to proceed with caution.

New core banking systems are helping a growing number of banks achieve a longtime goal which is a comprehensive view of their customers. The credit crisis, new regulatory requirements and increasing demand for higher cross-sale revenue have all renewed banks' interest in improving their ability not only to see but also to have and use customer information in real time (Abbate, 1999). Developing these capabilities has challenged all but the most technologically adept banks. Most banks use separate software programs from multiple vendors to manage their varied operations, creating a patchwork of disparate systems through which data doesn't easily flow. Various
studies (e.g. Adamson et al. 2003; Boot, 2009; Zincildin, 2009) and experts say the new generation of core processing applications can resolve these issues, but many banks remain reluctant to take on core replacement projects.

It's becoming more imperative for them to really understand who their profitable customers are, or at least be able to see the entire relationship the customers have with them, to be able to make sure they're taking care of their customer and making sure they're successfully acquiring new customers they want (Turnbull et al. 2007). The core processing systems have a lot of information on them but there are many, many bank systems that are not necessarily on the core platform. The end goal for many banks is being able to see at once the status of their customers' deposit accounts, loans, credit card transactions, brokerage accounts and other details so they can get a more accurate view of just how profitable their patrons are, design for them the products that make the most sense and spot potential problem areas.

1.1.2 Core Banking Systems Replacement

Core banking systems replacement involves an overhaul of the existing core system and putting in its place a newer and better system to handle the core functions (Boot, 2009). Banks' core systems can prove to be inadequate for today's business needs. They're focused on product-oriented back-office processes instead of customer-oriented processes; perform batch processing instead of online, real-time, STP (straight through) processing; and are IT driven and reactive instead of business driven and proactive. Older core systems are fragmented and don't present an integrated global view (Forgia et al. 2008). System replacement with a modern core banking solution includes such benefits as greater efficiency, easier access to information, and the ability to add new applications without fear of system crashes.
Among other benefits, developments in packaged solutions include a move away from dependencies on hardware platforms and operating systems (Boot, 2009).

A core system replacement is likely to be the largest information technology (IT) investment an institution will take on. Depending on the size of the institution, such an initiative could cost several hundred thousand to several million Kenya shillings and take three to five years to complete. Most banks have instead opted for middleware layers to quickly improve integration, with less risk and in less time. The financial crisis, however, brought to light the more urgent need for institutions to replace their cores and move beyond the "quick-fix strategies" of the past. In fact, Turnbull et al. (2007) found that the key difference between those institutions that are less able and better able to withstand challenges is ease of access to data being requested by regulators and customers.

Those institutions with outdated, siloed systems are not able to access the necessary information requested by regulators and, as a result, are forced to readjust their IT priorities and absorb additional costs due to additional man-hours and manual data entry—often at the expense of customer service. These banks are feeling the repercussions of past decisions to implement quick fixes to overcome technology challenges that only masked underlying problems that grew worse with time. In addition, several saw their corporate customers grow increasingly frustrated and, in some cases, form new banking relationships with competitors better able to provide information on exposures and real-time cash positions which are critical information in the current environment (Boot, 2009).
1.1.3 Factors Leading To Core Banking System Replacement

The reasons for core system replacement vary by financial institution. There are seven key drivers, according to Zinceldin, (2009). First are phased-out vendor technologies. Vendor mergers often lead to overlaps in technologies or acquisitions of more advanced solutions. Some vendors discontinue upgrades to some products, leaving institutions unsure about the future of their existing solutions.

Secondly are outdated technologies such as outmoded platforms and integration architectures that don't permit financial institutions to leverage advances in technology, such as web services. Implementing newer, more efficient technologies with open architectures hastens transaction speeds and speed to market with new products and capabilities (Ritter, 2003).

Thirdly, is greater focus on business banking. Thin net interest margins and the increasingly competitive retail space are causing greater focus on business services, with their greater potential for cross-selling and fee-based income. Another reason is new member-centric strategies. As banks increasingly adopt member-centric strategies, they need their core banking solutions to provide enterprise-wide member data.

Another major reason is cost reduction. Besides reducing complexity and speed to market with new products, some institutions are running multiple solutions simultaneously due to mergers and acquisitions, and are paying multiple license and maintenance fees. Another major reason driving need for core replacement is organic growth. New solutions enable financial institutions to launch new products quickly without involving vendors for customization or altering sophisticated code. Lastly is
better risk management and compliance. Regulators expect to see uniform and integrated management of risk, data, and processes throughout an organization. This is often a daunting task for older, less user-friendly core systems (Blanchard, 2008).

A core banking solution, once implemented, should be robust, scalable and future-proof and serve the business interest for at least 10 years. Banks need to focus on key factors, which make the core banking transformation a successful experience (Adamson et al, 2003). The key challenges in core banking transformation are vendor capabilities and credentials, dependence on legacy or vendor applications and impact on envisioned technology architecture and bank’s business goals and alignment to leverage the new technology.

Vendor capabilities and credentials entail vendor’s financial stability, vendor’s commitment to the business, domain and technology competence of the vendor and deployment capabilities of the vendor. If the vendor is challenged in one of these areas, the implementation of the core system transformation can be affected. Another challenge is dependence on legacy/vendor applications.

The key challenges to be understood and overcome are data migration, understanding the prevalent systems and interfaces deployed, understanding the functioning of the legacy environment and configuring the new architecture (Moriarty et al, 2003). Another challenge is the bank’s business goals and alignment to leverage the new technology. Critical considerations include expectations management, finalization of the scope and the timelines, empowerment, change management and ownership issues, midway changes through the project and resource availability.
Core replacement involves a series of launches and migrations. The last thing any bank would want is to build a new core that will make the bank look just like the old one (Adamson et al, 2003). The bank should therefore launch the new capability, prove it works and then migrate old to that. This way it will be building the new bank and taking the old one to it. Studies (e.g. Zineldin, 2009; Boot, 2009) have indicated that core banking system replacement is quite challenging and this study seeks to assess the situation within the Kenyan banking industry.

As Kenyan banks explore their network expansion strategies by adding new channels, new products and new segments, the result has been a dramatic increase in back office and IT complexity, with the consequent stagnating efficiency metrics. Additionally, as the banks continue to face more competitive pressure and in order that they ensure long-term competitiveness, these companies must focus increasingly on their core competences. Most core systems of Kenyan banks are old and outdated which do serve the increasing business well. Examples include CBA which has changed to T24, KCB bank Ltd has also changed to Temenos T24 and the deal between Hewlett-Packard (HP) and Chase Bank for a converged hardware infrastructure to accommodate its new software platform that runs core banking operations. Other Kenyan banks such as Credit Bank, Co-operative Bank, Family Bank, National Bank of Kenya and National Industrial Credit Bank have entered into agreements with IBM to advance their core systems (http://aitecafria.com).

1.1.4 Firm Performance

Firm performance is a multidimensional construct that consists of four elements (Alam et al. 2011): (i) customer-focused performance, including customer satisfaction, and product or service performance; (ii) financial and market performance, including
revenue, profits, market position, cash-to-cash cycle time, and earnings per share; (iii) human resource performance, including employee satisfaction; and (iv) organizational effectiveness, including time to market, level of innovation, and production and supply chain flexibility.

This study used financial performance measures which indicate how well a firm is generating value for the owners. Measures of financial performance include return on assets (ROA), return on equity (ROE), earnings per share and any market value ration that is generally accepted. Generally, the financial performance of banks and other financial institutions has been measured using a combination of financial ratios analysis, benchmarking, measuring performance against budget or a mix of these methodologies (Ahmad et al, 2011). This study used return on assets.

1.1.5 Kenyan Banking Sector

The Banking sector in Kenya is governed by multiple rules such as the Companies Act, the Banking Act, the Central Bank of Kenya Act and various prudential guidelines and policies issued by the Central Bank of Kenya (CBK) (CBK, 2009). Reforms in the banking sector started in 1994 with failure of several banks in Kenya. The financial sector in Kenya was finally liberalized in 1995 where exchange controls and other control regimes were lifted.

As at 31st December 2011, the banking sector comprised of the Central Bank of Kenya, as the regulatory authority, 44 banking institutions (43 commercial banks and 1 mortgage finance company), 2 representative offices of foreign banks, 5 Deposit-Taking Microfinance Institutions (DTMs) and 126 Foreign exchange Bureaus. Thirty one of the banking institutions are locally owned while 13 are foreign owned.
locally owned financial institutions comprise of 3 banks with public shareholding, 27 privately owned commercial banks, 1 mortgage finance company (MFC) while 5 Deposit taking Microfinance Institutions and 126 foreign exchange bureaus are privately owned.

The banking sector has reported massive growth and development in recent years. Much of the growth in the banking sector has been witnessed in branch network expansion, growth in capitalization and asset base and the expansion of some of the banks regionally. The banks have also been in the frontline of automating their functions to give their customers good service. Kenyan banks have engaged in product innovation where internet banking and mobile banking have taken root in various local banks. As the Kenyan financial market is expanding, banks have realized that they are facing more and more competition from others thus forcing them to increase their marketing spend, lower charges such as lending rates and increase their presence.

1.2 Statement of the Problem

Financial services companies around the world are seeking to upgrade their core banking systems to improve competitiveness, operational efficiency, and regulatory compliance. However, such initiatives are especially challenging for most institutions. Most of today’s core banking systems were originally built in the 1970s and 1980s and after countless modifications and add-ons have become so complex and convoluted that it may be difficult to fully understand them (Adamson et al. 2003). This can make it hard for banks to comply with regulations and determine adequate controls.
In a survey on the implementation of Basel II regulations, CBK (2008) found that some Kenyan banks had failed to implement the regulations due to challenges in their core banking systems. This is an indication that these systems require a change. Financial services companies have undertaken core system replacement initiatives, often with less-than-hoped-for results and major challenges such as high capital investment requirements. Such initiatives can be particularly challenging for small and midsized banks for a variety of reasons. The impact of a core banking replacement is much more complex and pervasive across an organization than typical banking IT projects undertaken year after year, such as customer relationship management or branch teller implementations (Rakesh, 2004).

Various studies have been carried out in Kenya in the area of IT in the banking industry. Ochieng (1998) did an analysis of factors considered important in the successful implementation of information systems and found that commitment from top management, vendor capabilities and adequate training and change management are critical. Ngure (2004) researched on the factors influencing the Choice of Information Systems Changeover Approaches Used by ICT Consulting Firms in Kenya. Findings from this study indicated that there are firm specific and environmental factors that influence choice of changeover approach including size, financial capabilities, technology and product range. Musyoka (2006) did a survey of factors influencing choice of ICT systems for core banking activities in Kenya. His findings indicated that reliability, scalability and flexibility were the major factors. Kiemo (2009) evaluated security of information systems in the Kenyan banking industry and established that security of information systems in banks is an overriding concern which is stressed. There is no known study to the researcher which has studied core banking systems replacement in Kenya.
This study therefore aimed to fill this gap by answering the following research questions; i) What are the factors leading to replacement of core banking systems, ii) What challenges do banks in Kenya face in the process of core banking systems replacement? and iii) What influence does the core banking systems replacement have on the performance of banks?

1.3 Objectives of the Study

The objective of the study was to investigate core banking system replacement in commercial banks in Kenya by specifically to;

i) Determine factors leading to replacement of core banking systems in commercial banks in Kenya

ii) Establish the challenges that commercial banks in Kenya encounter in the process of core banking systems replacement

iii) Determine the effect of core banking systems replacement on bank performance.

1.4 Hypothesis

The study was aimed at testing the hypothesis that core banking system replacement has no effect on the performance of commercial banks.

1.5 Value of the Study

This study's findings will prove to be important to commercial banks in Kenya, other organizations in the country and even policy makers in area of ICT. The study will also add more knowledge on the concept of core banking systems thus making it of value to scholars, students and researchers. Core banking systems are known to be the backbone of any bank.
Companies who are seeking to replace their cores must make the right decisions about the need, implementation of the replacement and managing the changes that emanate from the replacement.

This study will give an analysis of the replacement success factors, and challenges which banks need to consider in changing their core banking systems. The findings can further be applied by scholars in the area of IT and banking. This study can be used as a basis of further research and also in academics in the area of core systems replacement in Kenya.

Findings also can be applied as input to policy measures by the government and the central bank of Kenya. This will be in the area of regulation and security where core systems are crucial.
CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The review of literature in this section covers the application of IT in the banking industry, the use of core banking systems and core banking system replacement. The study delves onto the drivers to core banking system replacement, factors to be considered in the replacement and challenges that are encountered by banks who are replacing their core systems. The empirical findings from various studies are also provided.

2.2 IT and the Banking Sector

Strides in the field of technology have redefined the role and structure of an IT department in a bank (Seybold, 2001). Rapid strides in the field of technology redefined the use of technology in banking. The fact that using better technology and systems, banks can garner more customers, retain existing ones and channel more of the customers’ business to its counters has forced business department to now look at IT as an effective operational and marketing tool. On the operational side, the power of IT in reducing transaction costs, providing better customer service and offering an over-all customer convenience has basically made this a win-win situation for both banks as well as its clients (Moriarty et al, 2003). These have become the main drivers for getting IT the importance it has got in banks in recent times.

The nerve centre of technology in a bank’s IT department is the Core Banking System. This paper aims at understanding the role of core systems, the scope of core systems, evaluation methodologies adopted by banks in selecting core systems, typical pitfalls in implementations, and recent and future trends in the core systems.
2.3 Core Banking Systems

Core banking systems are basically the heart of all systems running in a bank and it forms the core of the bank’s IT platform (Turnbull et al, 2007). Amongst other functionalities, it provides the customer information management, central accounting and the transaction-processing functions, which by far are the most fundamental processes in a bank. With the advancement in technology and with passage of time, core systems nowadays tend to cover more and more functionality giving the bank an integrated solution for most of its operations in different business lines. Alongside, it also provides a central operational database of customers' assets and liabilities giving facility to generate a 360 degree view of the customer's relationship with the bank, which is fundamental for the customer relationship management strategy of the bank (Kumba and Okoth, 2010). Core banking systems reside either in the heart of a bank’s data center or can be termed as the heart of the data-centre itself.

Zineldin (2009) classified core banking systems available in the market into five levels, primarily on the basis of the functionality offered with level one being the most traditional system offering basic functionality and level 5 being the latest state of the art systems with advanced features. Systems have been classified on the basis of functionality available for addressing needs of various business lines. Most systems from level 3 onwards can be classified as mature systems, which offer a moderate spread of functionality required to run a medium sized bank efficiently. Systems falling in level 4 and beyond can be classified as more advanced systems primarily aimed at large banks operating in multiple business-lines and offering a large array of products and services to its customers. These banks would typically be amongst the larger banks in the country or the sector they operate in. The levels are presented in Figure 2.1.
With development in the field of IT, viable and demonstrated solutions to these challenges have started to emerge. Many modern core banking platforms are flexible and scalable which are designed to adapt to a bank’s changing needs (Mohan, 2004). Also, many of these platforms are designed to provide real-time capabilities to improve the customer experience and help banks manage risk more effectively. These solutions are already being adopted in Europe and Asia and are gaining traction in Canada. Now, major banks in the U.S. are giving them a look as well. The emerging economies of the developing world are lagging behind but are also looking at applying the solutions to their core system problems.

New laws and market requirements are forcing banks to modernize their core systems. Regulators and investors are demanding improved data and transparency. Customers are looking for integrated service across a growing range of channels. And
competitive pressure is driving a constant stream of new products and services (Abbate, 1999). Banks have invested a lot of time and money in their core technology platforms and those systems have served them well. But now, after decades of quick fixes and workarounds, those same systems are holding them back. This calls for a core banking system replacement.

2.4 Core Banking System Replacement

Core banking systems replacement is the overhaul of the existing core system and putting in its place a newer and better system to handle the core functions (Boot, 2009). Marketplace, operational, and regulatory developments are driving financial services organizations to enhance technology resources, including core systems (Zineldin, 2009). Customers are more sophisticated and better able to compare organizations based on the value, quality, and level of service they deliver. They are demanding more flexible access to banking services, whether face-to-face or self-service, depending on their preferences.

Financial institutions are also under pressure to create new, innovative products and reduce the time it takes to bring those products to market (Forgia and Revetria, 2008). A highly competitive financial services market is requiring institutions to stay constantly focused on protecting profitable customers from competitors. Meanwhile, the sharp reductions in financial services company market valuations are increasing institutions' focus on achieving consistent and reliable profitability. Operationally, many institutions are facing high fixed IT costs relative to total spending, along with increasing complexity and inflexibility. Finding skilled staff is a growing problem as the IT workforce ages. And often, new initiatives take too long and are too expensive.
Several factors can compel financial institutions to undertake core banking replacements. The motive for core-system replacement differs by bank. However, two primary objectives today are improving outdated architecture to allow better interfacing with ancillary products and systems, and the ability to pump up commercial services offerings (Zineldin, 2009). Many banks want to respond more rapidly and economically to changing market conditions. They need to support both organic growth plans and acquisitions. Improved core banking systems can help empower customers, increase product innovation, and accelerate speed to market. They can facilitate more flexible and adaptive customer sales and service offerings that contribute to customer acquisition and retention efforts. They can help address increasingly complex regulatory requirements and mitigate the potential impact of financial penalties or business impediments resulting from noncompliance.

Institutions also want to move away from legacy systems that are increasingly expensive and risky to support (Rakesh, 2004). Such a transition will help them enhance and automate back-office functions, scale operations more efficiently to support higher volumes, reduce costs, and make the transition from emphasizing products to emphasizing customers. Institutions are interested in solutions that will enable them to manage all core bank processing and related services, including secured and unsecured lending, term deposits, demand deposits, and investments, in an integrated manner across the enterprise. Along with supporting product-specific activities, core banking also provides enterprise-wide functions such as customer information; branch services; customer credit data such as limits, collaterals, and liabilities; payments; transfers; and the general ledger.
There are various strategies that have been put forward for core banking replacement success. Any core banking replacement initiative is challenging. However, financial institutions can take steps to make the process easier. The first strategy is to understand at the outset why a core banking initiative is needed. It is important to explore this question from the business and IT perspectives and understand how the initiative will link back to the organization's business goals and objectives (Holland, 2007). After clear drivers have been established and their rationale is understood, the plan must be communicated widely across the organization, and the stated replacement aspirations must be adhered to rigorously, as even small variations can have big impacts.

The second important element is to identify a business sponsor (Rakesh, 2004). This person needs to stay at the helm until the program is completed. The sponsor and the rest of the business community must agree on clear responsibilities, accountabilities, and authority. A key to success is ensuring that the resources doing the work are completely under the control of the core banking management team and not distracted by other projects or initiatives. The team should incorporate support for as many business functions as possible into the new core system. The more functions the bank includes as part of the new core banking system, the fewer it has to integrate from existing systems; however, it is important to be mindful that support for various functions can differ (Bout, 2009).

Another important element is to develop a common, business-understandable language for integration requirements. One of the biggest challenges in implementing a new system is gaining agreement on the business language to be used for interactions between systems. For example, when does someone become a customer?
Is it when she was first contacted? When she came into a channel? Or when she first used a product? It is critical to clearly define the meaning of “business information,” map the core banking system and legacy systems to it and then make sure information is used consistently across systems. Organizations with an already-existing middleware environment in which information is uniformly described and shared will have major advantages in implementation. The bank should use a set of predefined business processes (Adamson et al. 2003). These processes should be consistent and fit the core banking solution.

The other important element is to develop detailed end-state architecture and adhere to it as closely as possible. The end-state architecture defines the scope of the core banking replacement (Adamson et al. 2003). Often, diverging from the original architecture results in addressing one technical issue but creating others and risks diluting long-term value. Confidence in the long-term architectural vision provides a clear framework for preparing the existing IT environment for the transition. If legacy applications are going to stay but need to change in some way, such as through system simplification or “rewiring”, changes should be made before commencing the core banking program.

Further the bank should accept that some activities will not be at today’s level of functionality. Moving to a new core banking system is a significant change. Sometimes it does not appear good. Overall it should be a significantly better experience. Even if some things are not as expected, the bank should accept and live with these conditions for a while if they remain a concern, they should be addressed in a later phase of work after the replacement has stabilized. This should be facilitated by bringing an effective business change manager into the program (Rakesh, 2004).
Change is inevitable, so it should be embraced. The bank should choose a change manager as early as possible and make the business transformation this person's responsibility.

Lastly, the bank should execute the initial implementation as quickly as possible. It should get the system up and running even if it does not address 100% of the issues. An organization must implement something before it can see benefits, and the longer the program takes, the more likely drivers will change (Adamson et al., 2003). Changes can be assessed and prioritized against the initial base program when the technology and operations reach a stable, steady state.

2.5 Challenges of Core Banking Systems Replacement

Although the drivers for core banking system replacement are clear and compelling, such initiatives present unique challenges and have long-term organizational implications. The first challenge is overestimating the capability of software to meet requirements. Business users often assess requirements fit by directly comparing how business needs are supported today. This form of assessment inevitably drives up the degree of customization and pushes out timetables. To avoid falling into this trap, it is important to ask two key questions when assessing software capabilities. First is to ask whether the existing business work is effectively based upon the software's structure and processes.

Secondly is the question of whether the software will enable new ways of working, resulting in additional value to the organization (Blanchard, 2008). Many organizations believe the way they do things today is both unique and a major factor in the successful execution of their business. However, certain capabilities existing
today do not mean they are required or are the only way to do business in the future (Adamson et al., 2003). Therefore, reaching agreement within the organization on what is actually necessary is difficult but essential. Core banking packages available in the market today are internally focused, but they have to be “wired into” the existing mechanisms of the organization (Bogoslaw, 2009). Modern core banking packages expose their services in different ways and to different degrees, and not always in structures that make sense to a financial services organization.

Another challenge is overestimating the ability of the business to change (Adamson et al., 2003). Too often, organizations implementing a new core system do not consider the impact the project will have on business processes early enough in the estimation, planning, and initiation phases. They also underestimate the amount of communication required to achieve the necessary behavioral and attitudinal change across the organization and its extended network. Executive and middle management can have conflicting viewpoints on a core banking initiative. Executives look for significant benefits and capability, while middle management must deal with the difficulties of realizing the benefits. Both views are important, but the interaction can create dysfunction and pressure to change the program, potentially diminishing its impact and value to the organization.

Another important challenge is underestimating the complexity of legacy integration (Blanchard, 2008). Interaction between a new core banking system and legacy applications will have interlinking impacts on the structure, location, and maintenance of business information. It will affect business process steps and organizational structures. Also, if the legacy environment is old, there will undoubtedly be gaps in knowledge about the existing systems. Institutions may need to adjust their
replacement programs to align with shifts in the business environment. They will be challenged to adapt to the dynamics of day-to-day business without continually restructuring the program.

Another challenge is underestimating the skills required (Rakesh, 2004). A broad spectrum of skills is needed to meet the project commitments and unexpected issues of core system replacement. Given the complexity and importance, core banking programs need access to some of the best talent in the organization. However, these people often are already swamped by daily business needs. Financial institutions may bring in outside resources to help. Typically these resources are focused on product implementation and program management. It is critical, as well, for external resources to participate in and adequately address the architecture, integration, and change management dimensions of the project.

It is therefore imperative that if a bank requires an effective replacement of a core banking system, it should address these challenges above ensuring that implementation is efficient and focused on objectives.

2.6 Conceptual Framework

The conceptual framework for this study was derived from the new technology adoption model. New technology adoption model was developed by Davis (1979) to provide a model on how and why organizations adopt new technology. DeSanctis and Poole (1994) later developed the theory to include considerations that firms looked into before adopting any technological system. Technology adoption model is based on the fact that organizations and individuals consider the benefits of a system and its shortcomings before adopting it into their operations.
For a technological system to be acceptable, it must have benefits which outweigh the costs (Zineldin, 2009). Benefits can be measured in terms of efficiency and better quality and service while costs can be measured in terms of purchase price and learning required. Groups and organizations using information technology for their work dynamically create perceptions about the role and utility of the technology, and how it can be applied to their activities. These perceptions can vary widely across groups. These perceptions influence the way technology is used and hence mediate its impact on organizational outcomes. This theory assisted in directing the study towards finding out core systems replacement in banks and the effect of such on performance.

The conceptual framework that guided the study is presented in Figure 2.2 below.
In the conceptual framework presented in figure 2.2, the independent variable is core systems replacement and the dependent variable is performance. Core systems replacement is conceptualized to influence the performance of the bank that replaces its core systems. Factors contributing to performance are intervening variables that come to play when the bank replaces its core systems. These are the ones that intervene and are expected to cause core banking system replacement to have an effect on performance. These include bank characteristics and personal characteristics of senior bank employees. Bank characteristics include factors such as number of branches the bank has, whether the bank engages in international business and number of employees. Personal characteristics include work experience of the leaders and level of education.

2.7 Summary of the literature review

Literature review on core banking systems replacement, factors leading to core banking systems replacement and challenges encountered by banks in replacing their cores have been reviewed in this section. The review had indicated that many commercial banks are replacing their cores due to various factors ranging from competition to customer service. There are a myriad of challenges that banks are facing in replacing their core systems which include financial resources and vendor capabilities. The next section presents methodology that was used in carrying out the study.
CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

This research was carried out using a descriptive survey design. The survey research design was applied to obtain the relevant data which was used to determine the drivers behind core banking system replacement, challenges that are encountered thereto and the effect of such replacement on performance. A cross section of the banks in the banking industry was surveyed. A cross sectional survey research design is valuable in this study since it gave information about different banks and how they have dealt with their core systems.

3.2 Target Population

The target population of this study was all the 43 commercial banks in Kenya as at 31st December 2011. The banking sector was selected as the target of this study due to its strategic location as the driver and financier of economic development and growth in Kenya and the way the buzz of core system replacement has gained momentum following the financial crisis of 2008/09.

3.3 Sample and Sampling Procedures

No sampling was done since the population was small (N=43). The survey was therefore a census of all the 43 commercial banks. According to Mugenda and Mugenda (2003), sampling is not necessary when the population is small. Sampling in a small population increases the risk of sampling errors which can distort the reliability of the sample in relation to its representativeness to the population.
3.4 Research Instruments

The research instrument for this study was a questionnaire. The questionnaire was designed after a critical analysis of literature on core banking systems replacement to arrive at the constructs of the data collection instrument. The questionnaire will be used to collect data from the 43 commercial banks. Questionnaire was applied as a survey instrument due to its economy, standard responses and ease of analysis (Ghauri and Gronhaug 2003).

3.5 Data Collection Procedures

Data was collected from IT directors of the 43 operational commercial banks in Kenya. The developed questionnaire was administered to the selected subjects in the commercial banks at their places of work through hand delivery. The researcher requested to collect the duly filled questionnaire from the respondents' work stations after they were filled.

3.6 Data Analysis Procedures

Data which was collected included extent of replacement, important factors considered in replacement, challenges involved and measures taken to deal with those challenges. Also collected was performance information about the banks. Data collected was quantitative in nature which was collected through closed questions and responses from the respondents that was in figures. This data was manipulated through descriptive statistics such as percentages, range and mean scores.

Likert type questions were used to determine factors leading to replacement of core banking systems in commercial banks in Kenya. Those factors with a mean factor of
3.5 and above were considered important. To establish the challenges that commercial banks in Kenya encountered in the process of core banking systems replacement, likert type questions were used. Those challenges with a mean score of 3.5 and above were considered important. To determine the effect of core banking systems replacement on bank performance, a multiple linear regression was conducted to establish the effect of core banking system replacement on performance. The following model was applied:

\[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + E \]

Where, 
- \( Y \) = Performance of Commercial banks as measured by after tax net profit
- \( \beta_0 \) = Constant
- \( \beta_i \) = coefficients of the independent variables
- \( X_1 \) = Core system replacement
- \( X_2 \) = Personal Characteristics
- \( X_3 \) = Firm Characteristics
- \( E \) = Error term

Analyzed data was presented in tables and graphs.
CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter presents results and findings from the questionnaire survey. The findings of the study are presented according to the research questions. There were 43 questionnaires distributed to the selected IT directors in commercial banks in Kenya. Thirty-four questionnaires were returned which indicated a response rate of 79%. All the returned questionnaires were found to be correctly filled and fit for analysis.

Section 4.2 presents data on the general information, section 4.3 presents data on factors influencing the decision by banks to replace their core banking systems while section 4.4 presents data on challenges to core banking system replacement. Section 4.5 presents data on the relationship between core system replacement and bank performance.

4.2 General Information

The study sought to establish gender of the respondents in the questionnaire survey. Findings are presented in Table 4.1 and they indicate that 22 (65%) of the respondents were male while 12 (35%) were female.

Table 4.1: Gender of Respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>22</td>
<td>65</td>
</tr>
<tr>
<td>Female</td>
<td>12</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>100</td>
</tr>
</tbody>
</table>

Age was also a factor that was investigated. Results are presented in Table 4.2. Findings indicate that 19 (64%) of the respondents were aged between 40 and 50
years while 6 (20%) indicated to be between 30 and 40 years. Others are as indicated in table 4.2. These results indicate that most IT managers were in their mid-ages.

<table>
<thead>
<tr>
<th>Table 4.2: Age of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Below 30</td>
</tr>
<tr>
<td>30 - 40</td>
</tr>
<tr>
<td>40 - 50</td>
</tr>
<tr>
<td>Above 50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

Respondents were also required to indicate their highest education level. Results indicate that 11 (38%) were undergraduates while 18 (62%) were post graduates.

<table>
<thead>
<tr>
<th>Table 4.3: Highest Education Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education level</td>
</tr>
<tr>
<td>Undergraduate</td>
</tr>
<tr>
<td>Postgraduate</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

Further, the number of years respondents had worked in the respective banks was investigated. Results which are presented in Table 4.4 indicate that 12 (37%) had between 10 and 20 years of experience, 8 (25%) had between 5 and 10 years of experience while 6 (19%) had more than 20 years of experience and the same number had below 5 years of experience in the respective banks.

<table>
<thead>
<tr>
<th>Table 4.4: Years of Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Below 5</td>
</tr>
<tr>
<td>5 - 10</td>
</tr>
<tr>
<td>10 - 20</td>
</tr>
<tr>
<td>Above 20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>
The study sought to establish whether the bank had replaced its core. Results indicate that 24 (73%) of the banks had replaced their cores while 9 (27%) had not replaced their cores. This indicates a good number of banks in Kenya had upgraded their cores.

<table>
<thead>
<tr>
<th>Core replacement</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>24</td>
<td>73</td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>100</td>
</tr>
</tbody>
</table>

Those respondents who indicated that the banks had replaced their cores were required to indicate the year that replacement had been effected. Results indicate that 6 (27%) had replaced their cores in 2010, 5 (23%) in 2009, 4 (18) each in 2008 and 2011. Three (14%) had replaced their core systems in 2006. The findings indicate that banks in Kenya have replaced their cores just recently.

<table>
<thead>
<tr>
<th>Year</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>2008</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>2009</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>2010</td>
<td>6</td>
<td>27</td>
</tr>
<tr>
<td>2011</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>100</td>
</tr>
</tbody>
</table>

The study also sought to find out the number of branches that the surveyed banks had. Results indicate that those who had less than 10 branches were 10 (33%), those with between 10 and 20 branches were 9 (30%), those with between 20 and 50 branches were 6 (20%) while those with above 50 branches were 5 (17%).
The study sought to establish the number of employees that these banks had. Results indicate that those with between 100 and 500 employees were 9 (36%), those with below 100 employees were 8 (32%), those with between 500 and 1000 employees were 3 (12%) while those with over 1000 employees were 5 (20%).

The number of customers that these banks had was investigated in the study. Findings indicate that 13 (41%) had between 10,000 and 100,000 customers while 10 (31%) had less than 10,000 customers each. Results also indicate that 4 (13%) had more than 1 million customers. This indicates the distribution of banks in Kenya where there are few large banks, with majority being small while the rest are regarded as medium.
Table 4.9: Number of Customers in the Bank

<table>
<thead>
<tr>
<th>Customers</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10,000</td>
<td>10</td>
<td>31</td>
</tr>
<tr>
<td>10,001–100,000</td>
<td>13</td>
<td>41</td>
</tr>
<tr>
<td>100,001–500,000</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>500,001–1 million</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Above 1 million</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

4.3 Core System Replacement

4.3.1 Factors Leading to Core System Replacement

The study had an objective of establishing the factors that lead to core banking system replacement. Respondents were required to rate the provided specific factors on the extent they had influenced the replacement of core systems. Rating was on a scale of 1 - 5 where 1 represented 'No extent' while 5 represented 'Very great extent'. Data was analyzed using mean scores and standard deviations. Mean scores of below 2.5 were interpreted to indicate that the factor affected replacement on a small extent, those between 2.5 and 3.5 were interpreted to be moderate extent while those above 3.5 were interpreted to affect on a great extent. The higher the mean score, the higher the extent the factor led to replacement of core systems in the banks.

Findings on factors leading to core banking systems replacement indicate that factors which greatly led to replacement included having outdated platforms and technologies that restricted adoption of new technologies and systems (4.22), cost reduction and focus on efficiency (4.21). Another factors leading to replacement of core banking systems were new customer centric strategies requiring new technologies (3.97) and greater focus on business banking and personalized service (3.91). Another factor that greatly led to replacement of core systems was to incorporate new and increased
business (3.86). Other factors which had affected the core replacement decision to a moderate extent and those which had little effect are shown in Table 4.10.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Mean score</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phased out technology</td>
<td>2.72</td>
<td>1.32</td>
</tr>
<tr>
<td>Outdated platforms and technologies that restricted adoption of new technologies and systems</td>
<td>4.22</td>
<td>1.87</td>
</tr>
<tr>
<td>Greater focus on business banking and personalized service</td>
<td>3.91</td>
<td>1.88</td>
</tr>
<tr>
<td>New customer centric strategies requiring new technologies</td>
<td>3.97</td>
<td>1.12</td>
</tr>
<tr>
<td>Cost reduction and focus on efficiency</td>
<td>4.21</td>
<td>1.71</td>
</tr>
<tr>
<td>Organic growth in customer numbers and product range</td>
<td>3.17</td>
<td>1.64</td>
</tr>
<tr>
<td>Better risk management and compliance</td>
<td>3.32</td>
<td>1.26</td>
</tr>
<tr>
<td>Need for personalized service</td>
<td>3.16</td>
<td>1.04</td>
</tr>
<tr>
<td>To cope with Competition</td>
<td>2.97</td>
<td>1.97</td>
</tr>
<tr>
<td>To incorporate new and increased business</td>
<td>3.86</td>
<td>1.34</td>
</tr>
<tr>
<td>Merger/acquisition</td>
<td>1.71</td>
<td>1.32</td>
</tr>
</tbody>
</table>

This result agrees with findings from a study by Turnbull et al (2007) which indicated that banks aim to reduce costs, enhance efficiencies and guarantee customer retention with use of technology and current core systems. Turnbull et al (2007) established that financial institutions obtain considerable cost reductions at the same time as they reach new customer segments, identify potential customers and cover a global geographic field of action that no other distribution medium allows affordably than new core systems.

The findings also concur with findings from a study done by Zineldin (2009). This study established that replacement of core systems was understood as a chain of virtual value used for the greater benefit of customers and banks. Another study by Chairlone and Ghosh (2009) had similar findings that technological advances and the
tools of communication in new core systems enable close and long-term relations to be created and developed with customers.

4.3.2 Core System Used

The study sought to establish the core system the banks surveyed used. Results presented in Table 4.11 indicate that 18 (58%) of the surveyed banks had level IV and level V of core systems, 8 (26%) level 3 while 5 (16%) had level II. No bank had level I of core systems.

Table 4.11: Core Systems Used By Banks

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level II: Level I, loans systems and deposit system</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Level III: Level II, report writers and trade finance</td>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td>Level IV &amp; V: Level III, internet banking, CRM and services based architecture</td>
<td>18</td>
<td>58</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>100</td>
</tr>
</tbody>
</table>

4.4 Challenges to Core Systems Replacement

The study had an objective of determining the challenges faced by commercial banks in replacing their core systems. Some listed challenges from reviewed literature were listed and respondents were required to indicate the extent the bank faced the challenge. Rating was on a scale of 1 - 5 where 1 represented 'No extent' while 5 represented 'Very great extent'. Data was analyzed using mean scores and standard deviations. Mean scores of below 2.5 were interpreted to indicate that the banks faced the challenge on a small extent, those between 2.5 and 3.5 were interpreted to be challenges on a moderate extent while those above 3.5 were interpreted to affect the banks on a great extent.
### Table 4.12: Challenges to Core Systems Replacement

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Mean score</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capability of software to meet requirements and expectations</td>
<td>3.78</td>
<td>1.32</td>
</tr>
<tr>
<td>Reaching agreement within the organization on what is actually necessary</td>
<td>4.28</td>
<td>1.87</td>
</tr>
<tr>
<td>Ability of the business to change to fit the new system</td>
<td>2.54</td>
<td>1.88</td>
</tr>
<tr>
<td>Complexity of legacy integration</td>
<td>3.35</td>
<td>1.12</td>
</tr>
<tr>
<td>Unavailability of the diverse skills required</td>
<td>3.84</td>
<td>1.71</td>
</tr>
<tr>
<td>Vendor capabilities and credentials</td>
<td>4.46</td>
<td>1.64</td>
</tr>
<tr>
<td>Bank’s business goals and alignment</td>
<td>1.84</td>
<td>2.26</td>
</tr>
<tr>
<td>Data migration</td>
<td>3.95</td>
<td>2.04</td>
</tr>
<tr>
<td>Understanding the functioning of the new core system environment</td>
<td>3.87</td>
<td>1.46</td>
</tr>
<tr>
<td>Expectations management</td>
<td>2.28</td>
<td>1.90</td>
</tr>
<tr>
<td>Resource availability</td>
<td>3.34</td>
<td>2.32</td>
</tr>
<tr>
<td>Change management</td>
<td>2.35</td>
<td>1.69</td>
</tr>
<tr>
<td>Empowering employees to use the new system</td>
<td>4.27</td>
<td>1.77</td>
</tr>
<tr>
<td>Customer Acceptance</td>
<td>2.16</td>
<td>1.62</td>
</tr>
<tr>
<td>Reliability</td>
<td>4.06</td>
<td>1.93</td>
</tr>
<tr>
<td>Security</td>
<td>4.28</td>
<td>1.74</td>
</tr>
<tr>
<td>Weakening relationship with customers</td>
<td>2.44</td>
<td>2.44</td>
</tr>
</tbody>
</table>

Results presented in Table 4.12 indicate that the challenges that were encountered by most of the banks included reaching agreement within the organization on what is actually necessary (4.28), security (4.28), empowering employees to use the new system (4.27) and vendor capabilities and credentials (4.46). Other major challenges include capability of software to meet requirements and expectations (3.78), unavailability of the diverse skills required (3.84), data migration (3.95) and understanding the functioning of the new core system environment (3.87). Other challenges which were reported on a small or moderate extent are as indicated in Table 4.12. The findings from this study agree with those from Rakesh (2004) which
established that underestimating the skills required was a big challenge. This study established that a broad spectrum of skills is needed to meet the project commitments and unexpected issues of core system replacement. Given the complexity and importance, core banking programs need access to some of the best talent in the organization. Another study that concurs with the findings from this study was by Blanchard (2008) which had indicated that data migration, security and empowering employees about the new systems were major challenges faced by banks replacing their core systems or having any major IT project.

4.5 Effect of Core System Replacement on Bank Performance

The study had an objective of establishing the effect of core banking system replacement on bank performance. This was achieved through a multiple linear regression. In the model, the dependent variable was profit after tax. The independent variables were core systems level, personal characteristics of employees (experience in years) and bank characteristics (number of customers). Results of the regression analysis are presented in Table 4.13 - 4.15.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.863(a)</td>
<td>.745</td>
<td>.703</td>
<td>11.219</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>2028.324</td>
<td>4</td>
<td>507.081</td>
<td>5.4071</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>2625.892</td>
<td>28</td>
<td>93.7819</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4654.216</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4.15: Significance of Predictors

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>0.947</td>
<td>1.067</td>
<td>0.8875</td>
<td>0.247</td>
</tr>
<tr>
<td>Core system replacement</td>
<td>12.601</td>
<td>4.015</td>
<td>11.018</td>
<td>3.1385</td>
</tr>
<tr>
<td>Firm Characteristics</td>
<td>1.846</td>
<td>0.494</td>
<td>2.394</td>
<td>3.7368</td>
</tr>
<tr>
<td>Personal Characteristics</td>
<td>96.168</td>
<td>22.922</td>
<td>8.130</td>
<td>4.1955</td>
</tr>
</tbody>
</table>

The resultant regression model is of the form:

\[ Y = 0.947 + 12.601X_1 + 1.846X_2 + 96.168X_3 \]

Where: 
- \( Y \) = Performance of Commercial banks as measured by after tax net profit
- \( X_1 \) = Core system replacement (measured by levels)
- \( X_2 \) = Firm Characteristics (number of customers)
- \( X_3 \) = Personal Characteristics (experience of employees)

Table 4.13, Table 4.14 and Table 4.15 showed the results of the regression analysis have some explanatory value and it is significant at 1% significance level. To predict the goodness-of-fit of the regression model, the multiple correlation coefficient (R), coefficient of determination (R square), and F ratio were examined. First, the R of the independent variables (three factors, \( X_1 \) to \( X_3 \)) on the dependent variable (performance of commercial banks) is 0.863, which showed that the banks had positive and high overall performance with the three dimensions. Second, the R square is 0.745, suggesting that more than 74.5% of the variation of commercial bank overall performance was explained by the three factors. Last, the F ratio, which explained whether the results of the regression model could have occurred by chance, had a value of 5.4071 and was considered significant. The regression model achieved
a satisfactory level of goodness-of-fit in predicting the variance of banks' performance in relation to the three factors, as measured by the above-mentioned $R^2$, $R$ squared and $F$ ratio. In other words, at least one of the three factors was important in contributing to performance of commercial banks.

In the regression analysis, the beta coefficients could be used to explain the relative importance of the three dimensions (independent variables) in contributing to the variance in performance of commercial banks (dependent variable). As far as the relative importance of the three dimensions, personal characteristic ($\text{Beta} = 96.168$, significance $= 0.003$) carried the heaviest weight for performance of commercial banks, followed by core banking replacement measured by levels ($\text{Beta} = 12.601$, significance $= 0.001$) and firm characteristics ($\text{Beta} = 1.846$, significance $= 0.012$). The results showed that a one level change with the core system replacement would lead to a 12.601 shilling increase in performance of commercial banks as measured by after tax net profit, other variables being held constant. A one year change of experience of employee will lead to a 1.846 shilling increase in performance of commercial banks as measured by after tax net profit, other variables being held constant. An additional increase of one customer in the bank will lead to a 96.168 shilling increase in performance of commercial banks as measured by after tax net profit, other variables being held constant.

Furthermore, it was also noted that the independent variables in the model are all significant predictors of bank performance as indicated in Table 4.15. The parameters are significance at 5% significance level. Personal characteristics had significant predictor of performance ($t = 4.1955$), firm characteristics ($t = 3.7368$) and then core systems ($t = 3.1385$). These results indicate that replacing core systems to a higher level core is expected to improve financial performance for a bank. These results concur with results from a study by Zineldin (2009) which indicated that for a core system
replacement to be acceptable, it must have benefits which outweigh the costs.

Zineldin (2009) listed the benefits which are claimed by banks which have replaced their cores as efficiency, better quality service and improved productivity and performance of the bank as a whole.

In conclusion, all underlying dimensions are significant. Thus, the results of multiple regression analysis reject hypothesis that there is no relationship that core banking system replacement has no effect on the performance of commercial banks.
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The objective of the study was to investigate core banking system replacement in commercial banks in Kenya. The study had three objectives. First was to determine factors leading to replacement of core banking systems in commercial banks in Kenya. Second was to establish the challenges that commercial banks in Kenya encounter in the process of core banking systems replacement and lastly was to determine the effect of core banking systems replacement on bank performance. This section provides the summary of findings in 5.2, conclusion in 5.3 and recommendations in 5.4.

5.2 Summary

The study established that 22 (65%) of the respondents were male while 12 (35%) were female. On age of the respondents, survey results indicate that 19 (64%) of the respondents were aged between 40 and 50 years while 6 (20%) indicated to be between 30 and 40 years. On education, 11 (38%) were undergraduates while 18 (62%) were post graduates. On experience in the bank, 12 (37%) had between 10 and 20 years of experience, 8 (25%) had between 5 and 10 years of experience while 6 (19%) had more than 20 years of experience and the same number had below 5 years of experience in the respective banks. On core systems replacement, 24 (73%) of the banks had replaced their cores while 9 (27%) had not replaced their cores.

Factors that had led to Core System Replacement were established as having outdated platforms and technologies that restricted adoption of new technologies and systems (4.22), cost reduction and focus on efficiency (4.21), new customer centric strategies
requiring new technologies (3.97) and Greater focus on business banking and personalized service (3.91). Another factor that greatly led to replacement of core systems was to incorporate new and increased business (3.86).

On the core systems used by banks, 18 (58%) of the surveyed banks had level IV and level V of core systems. 8 (26%) level 3 while 5 (16%) had level II. No bank had level I of core systems.

Challenges to Core Systems Replacement were established as reaching agreement within the organization on what is actually necessary (4.28), security (4.28), empowering employees to use the new system (4.27) and vendor capabilities and credentials (4.46). Other major challenges include capability of software to meet requirements and expectations (3.78), unavailability of the diverse skills required (3.84), data migration (3.95) and understanding the functioning of the new core system environment (3.87).

Study findings revealed that replacing core systems had a significant effect on financial performance. Core systems replacement was found to have a significant positive effect on financial performance (3.1385) at 5% significance level.

5.2 Conclusions

The following conclusions are made from the study findings. First, there are various reasons that make banks make the decision to replace their core systems. These include their technologies being outdated, to reduce cost and improve efficiency, to enable adoption of new customer centric strategies requiring new technologies and to enhance business banking and personalized service. Other factors included need to
incorporate new and increased business and the need to remain competitive and relevant in today’s banking.

Secondly, there are various challenges that banks replacing their core systems face. These include agreeing inside the bank on what are actually necessary, security issues due to privacy concerns, empowering employees to use the new system and questionable vendor capabilities and credentials. Other major challenges include risk of the software capability to meet requirements and expectations, unavailability of the diverse skills required to make the replacement a success and data migration. Another major challenge was making the organization and more so the employees to understand the functioning of the new core system environment.

Lastly, replacing core systems is a way to improve efficiency and competitiveness of the bank since it improves financial performance. This is accomplished through better customer service, ability to incorporate more business and good integration among the banks many operations.

5.3 Recommendations

While the advent of state-of-the-art technologies and global best practices undoubtedly offer improved agility, efficiency, CRM capability and faster implementation cycles, banks need to be mindful of the challenges associated with core banking deployments. These challenges, once understood should be mitigated and properly and perfectly managed.

Secondly, the small and medium banks must appreciate that technology is an enabler and not a panacea. As history indicates, successful banks are those that have understood the potential of new technologies and aligned themselves to fully leverage
its power. These are banks that have focused on the adaptive change that made the technology transformation process successful.

Lastly, banks that have not replaced their core systems should have plans to do so and should learn from the leaders. They should understand the challenges that those which have replaced their core systems have faced and be in a better position to roll out the replacement without many risks. Replacement of core systems to the latest level has been established to improve the bottom line: financial performance.

5.4 Recommendations for Future Studies

For future studies on use of IT in banking and core systems, it is recommended that an intensive study should be carried out to find out which mode of dealing with core system is most effective: to replace or renew/update. This is because in today’s business and economic environment, banks are under pressure to cut costs aggressively while preparing to emerge with a competitive advantage. Many banks, however, have reached the limits of their ability to realize either of these goals, burdened by multiple, disparate, aging legacy systems that are expensive to run and inhibit the timely launch of new products. Core systems replacement has become an increasingly powerful option for helping banks achieve that goal. However, determining whether, when and how to replace a core system is arguably one of the biggest decisions a bank will ever make. A survey of banks that have done the replacement should be done to establish the answer to the question of whether, when and how.
References


Zineldin, M., (2009), "Core banking system replacement as competitive strategy in the Swedish banking industry", The TQM magazine, Vol 17, pp 329-34.
APPENDICES

Appendix I: Commercial Banks in Kenya

1. African Banking Corporation
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank of Kenya
6. CFC Bank
7. Charterhouse Bank
8. Chase Bank
9. Citibank
10. City Finance Bank
11. Co-operative Bank of Kenya
12. Commercial Bank of Africa
13. Consolidated Bank
14. Daima Bank (Statutory)
15. Development Bank of Kenya
16. Diamond Trust Bank
17. Dubai Bank
18. EABS Bank
19. Euro Bank
20. Equatorial Commercial Bank
21. Equity Bank
22. Family Bank
23. Fidelity Commercial
24. Fina Bank
25. Giro Commercial Bank
26. Guardian Bank
27. Habib A.G.Zurich
28. Habib Bank
29. Imperial Bank
30. Investment and Mortgages Bank
31. K-Rep bank
32. Kenya Commercial bank
33. Kenya Post Office Savings Bank
34. Middle East bank
35. National bank of Kenya
36. National Industrial Credit bank
37. Oriental Commercial bank
38. Paramount Universal bank
39. Prime Bank
40. Southern Credit bank
41. Stanbic bank
42. Standard Chartered bank
43. Trans-National bank

Source: Central Bank of Kenya
Appendix II: Questionnaire to IT Directors

William Kipngenno Rono,
University of Nairobi,
P.O.Box 30197 -00100,
Nairobi.

To whom it may concern,

I am a postgraduate student in the School of Business, University of Nairobi, in a Master of Business Administration degree program. I’m currently doing a research titled Core Banking Systems Replacement and Performance in Commercial Banks in Kenya.

In this regard, you have been selected to take part in this study as a respondent. Kindly respond to all items to reflect your opinion and experience. Please answer all the questions freely. You will not be identified from the information you provide and no information about individuals will be given to any organizations. The data collected will be used for this academic research only.

Kindly therefore, fill the questionnaire submitted within five days after receipt to enable me complete my research.

Yours Sincerely,

William Kipngenno Rono
MBA Student
SECTION A: GENERAL INFORMATION

1. What is your gender?
   [ ] Female  [ ] Male

2. What is your age in years? .................................

3. What is your highest educational level?
   Diploma [ ]
   Undergraduate Degree [ ]
   Postgraduate Degree [ ]

4. How long in years have you worked in this Bank? ..........................

6. Has your organization effected a core systems replacement?
   [ ] Yes
   [ ] No

7. If Yes to question 6 above, which year..........................

8. How many branches does the bank have currently? ......................

9. How many employees does the bank have currently? .....................

10. How many customers does the bank have currently? .......................

11. What profit after tax did the bank have immediately before the replacement?
    Ksh ............

12. What profit after tax did the bank have immediately after the replacement?
    Ksh ............
SECTION B: FACTORS LEADING TO CORE SYSTEM REPLACEMENT

1. According to your experience in this bank, what drives the bank to effect core systems replacement? Rate the extent that the stated factors contribute to the decision to replace cores using the following scale:

1) No extent  2) Little extent  3) Moderate extent  4) Great extent  5) Very great extent

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Phased out technology</td>
<td></td>
</tr>
<tr>
<td>2. Outdated platforms and technologies that restricted adoption of new technologies and systems</td>
<td></td>
</tr>
<tr>
<td>3. Greater focus on business banking and personalized service</td>
<td></td>
</tr>
<tr>
<td>4. New customer centric strategies requiring new technologies</td>
<td></td>
</tr>
<tr>
<td>5. Cost reduction and focus on efficiency</td>
<td></td>
</tr>
<tr>
<td>6. Organic growth in customer numbers and product range</td>
<td></td>
</tr>
<tr>
<td>7. Better risk management and compliance</td>
<td></td>
</tr>
<tr>
<td>8. Need for personalized service</td>
<td></td>
</tr>
<tr>
<td>9. To cope with Competition</td>
<td></td>
</tr>
<tr>
<td>10. To incorporate new and increased business</td>
<td></td>
</tr>
<tr>
<td>11. Merger/acquisition</td>
<td></td>
</tr>
</tbody>
</table>

2. With the levels indicated below, what level is the core system used by the bank?

Level I: Basic functionality e.g. transaction processing, customer information file, general ledger system

Level II: Level I, loans systems and deposit system

Level III: Level II, report writers and trade finance

Level IV & V: Level III, internet banking, CRM and services based architecture
## SECTION C: CHALLENGES TO CORE SYSTEMS REPLACEMENT

1. What challenges among the ones listed below, has the bank faced in its implementation of core system replacement? Tick whichever is applicable.


### Challenge | Rating
--- | ---
1. Capability of software to meet requirements and expectations | 1 2 3 4 5
2. Reaching agreement within the organization on what is actually necessary | 1 2 3 4 5
3. Ability of the business to change to fit the new system | 1 2 3 4 5
4. Complexity of legacy integration | 1 2 3 4 5
5. Unavailability of the diverse skills required | 1 2 3 4 5
6. Vendor capabilities and credentials | 1 2 3 4 5
7. Bank's business goals and alignment | 1 2 3 4 5
8. Data migration | 1 2 3 4 5
9. Understanding the functioning of the new core system environment | 1 2 3 4 5
10. Expectations management | 1 2 3 4 5
11. Resource availability | 1 2 3 4 5
12. Change management | 1 2 3 4 5
13. Empowering employees to use the new system | 1 2 3 4 5
14. Customer Acceptance | 1 2 3 4 5
15. Reliability | 1 2 3 4 5
16. Security | 1 2 3 4 5
17. Weakening relationship with customers | 1 2 3 4 5

*Thank you for taking your time to fill in this questionnaire*