ENTERPRISE RESOURCE PLANNING SYSTEMS IMPLEMENTATION STRATEGIES IN COMMERCIAL BANKS IN KENYA

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

NOVEMBER 2013

DECLARATION

This research project is my original work and has not been presented to any university for an award.

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ACKNOWLEDGEMENTS

I have taken efforts in this project. However, its successful completion would not have been possible without the grace and mercies of Almighty God.I am highly indebted to Mr. Joel Lelei for his guidance and constant supervision as well as for providing necessary information regarding the project & also for support in completing the project. I would like to express my gratitude towards my family and colleagues for the constant encouragement. I would like to express my special gratitude and thanks to industry persons for giving me attention and time.

DEDICATION

I dedicate my work to my Wife Kate, Daughter Neema and Son Alec who have supported me all the way and have been a great source of motivation and inspiration.

ABSTRACT

Enterprise resource planning systems integrate the organizations business functions allowing a smooth flow of information and interaction with all sections and by so doing allowing quick adjustments to opportunities and risks. This study focused on commercial banks in Kenya and its objectives were to establish the activities of ERP implementation in commercial banks in Kenya; determine implementation strategies for ERP systems by commercial banks in Kenya and determine factors influencing the choice of ERP implementation strategies in commercial banks in Kenya. The research was a census survey with the population being all commercial banks in Kenya. Data was collected by means of questionnaires and analysed using means, standard deviations, percentages and factor analysis on the various objectives. The findings were presented in form of charts and tables. The findings show that all the activities mentioned on implementation of Enterprise resource planning systems are important but to varying extents. Key activities are selection of a project leader, data migration, formation of an operational level project team, costs and benefits analysis, selection of a full time team to support the project leader, staff training, issuance of a request for proposal and cost analysis of different ERP systems. Implementation strategies most employed by most commercial banks are the Big-bang and parallel implementation strategies. Phased and pilot-study implementation strategies are only used to a small extent. Commercial banks in Kenya also consider majority of factors mentioned as essential to determine the choice of implementation strategy of Enterprise resource planning systems. These are summarized into clusters relating to the organization structure, training of stakeholders, vendor/ICT skill and support, time, financing and organizations offer of products. From the findings we can conclude that as far as ERP implementation activities are concerned, forming of project teams and having a project leader is essential to give the project its deserved focus; cost-benefit analysis is also essential as well as data migration in form of data integrity and availability. For ERP implementation strategies, the big-bang is the most preferred method largely due to its low cost of implementation. Organisation structure, training of various levels of stakeholders, vendor/ICT skill and support, time management, financing and the array of products that an organization has are the key drivers that influence the choice of ERP implementation strategy. For successful implementation of ERP systems, organisations should undertake all the activities mentioned within the process of implementation. They should also gauge what benefits they intend to derive from this. A cost-benefit analysis should be a critical part of gauging an ERP system to ensure maximum value for money. Organisations should also ensure that they gauge their organization strategy, organization structure and development/training as well as the vendors and ICT staff competencies before choosing an ERP implementation strategy. This will assist them in maximizing the implementation benefits.

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LIST OF ABBREVIATIONS

ERP…….Enterprise Resource Planning

SPSS……Statistical Package for Social Sciences

CHAPTER ONE: INTRODUCTION

1.1 Background

An organization that has an Enterprise resource planning (ERP) system can run on many kinds of software that interact and as such there will be flow of information when required. This will positively affect the optimum functioning of an organization's business activities. There is a benefit in integrating various business function activities to allow for smooth flow of information and interaction with sections such as marketing, sales, quality control, and many other areas and hence the need for an ERP system (Wainright, et al, 1999).

An ERP system is defined by Wallace and Kremzer (2001) as an enterprise-wide set of management tools that balances demand and supply, containing the ability to link customers and suppliers into a complete supply chain, employing proven business processes for decision-making, and providing high degrees of cross-functional integration among sales, marketing, manufacturing, operations, logistics, purchasing, finance, new product development, and human resources. This enables people to run their business with high levels of customer service and productivity, and simultaneously lower costs and inventories; and providing the foundation for effective e-commerce.

1.1.1 Enterprise Resource Planning Systems Processes, implementation Strategies and Drivers of Implementation Strategy Choice

Organizations want to improve their competitiveness by implementing and investing in high end information technology, such as Enterprise Resource Planning (ERP) Systems (Grabski and Leech, 2006). The goal of having an ERP system implemented

is that integrated data and business processes from different departments will be gathered in one single computer system (Coffin and Murray, 2001). The six most common reasons cited for ERP implementation were: (1) need for a common platform, (2) process improvement, (3) data visibility, (4) operating cost reductions, (5) increased customer responsiveness, and (6) improved strategic decision making (Graeme Shanks, et al, 2003).

One of the main benefits associated with ERP systems is access to integrated and real-time data for better decision making (Wainright, et al, 2009). The philosophy behind a corporate wide ERP is to use IT to break down organization silos, replacing them with a seamlessly connected and integrated horizontal structure to allow business strategy, organization structure and technologies to work together (Mcnurlin,et al, 2009).

ERP is a relatively new phenomenon within the software industry and its implementation methodologies are still developing. By following an ERP process, the organization increases the chances of successful implementation (Cornelius, 2007). The implementation of an ERP software package involves a mix of business process change and software configuration to align the software with the business processes (Davenport, 2000; Holland and Light, 1999; Gibson, et al., 1999). In addition, implementing ERP systems is not as much a technological exercise as it is an organisational revolution (West and Shields, 1998; Bingi, et al. 1999; Davenport, 2000).

Several approaches and methodologies have been introduced by a number of authors and practitioners. Harwood (2003) presents a methodology where the implementation

cycle starts at the point when the need for a new ERP system is recognized and documented followed by the following: market awareness of what is available, vendor selection, implementation, go-live and review. Anderson (2008) in a study of how to secure an ERP implementation for Ericson Mobile platforms noted that the process should flow as follows; Need defined, Pre-study, Vendor selection, implementation, Training and Education, Go-live and review and improvement.

The success of implementation can be affected by availability of: top management support, user involvement, Clear goals and objectives, ERP implementation strategy, ERP implementation methodology, project plan, communication, training, proper data analysis and migration, good infrastructure and a risk management plan (Hasibuan and Dantes, 2012). The importance of implementation strategy is because it determines the overall cost of the project (different strategies will have different costs), the timing required for the project is different for different strategies and the resources required may vary. The most important reason for Implementation strategy is cost (Khanna and Arneja, 2012; Neal, 2010).

Every situation is unique and therefore an organization does not need to only choose a single approach. They can use an existing approach as support when they work out their own specific model (Harwood, 2003). An organization must decide which strategy suits their implementation project (Welti, 1999). It is important for the organization to have a clear strategy to increase the chance of succeeding and minimizing cost (Khanna and Arneja, 2012; Neal, 2010).

Four Implementation strategies that can be employed are the phased approach; the direct approach; parallel and pilot study strategy (Laudon and Laudon, 2006; Neal, 2010; Wallace, et al 2001). The phased strategy implements in small steps (Welti, 1999); the direct approach changes from old to new system in one swoop (Shelly et al, 2010); Parallel runs the legacy and new system simultaneously until there is assurance that the new one works well (Laudon and Laudon, 2006; Neal, 2010) and the pilot study isolates different parts of an organization for implementation then moves to the rest based on success (Laudon and Laudon, 2006; Wallace, et al 2001). Parallel is the most expensive and resource consuming implementation method (Neal, 2010).

The choice of implementation will depend on a number of factors. According to O'Leary (2005) the choice of implementation depends on factors such as Organization Size, structure, complexity and controls. According to Welti (1999), the choice should be on the basis of available People, expertise, financing and time. Johansson and Sudzina (2008) in an investigation into factors influencing ERP implementation strategies in three countries with over 200 companies saw some indication that the following factors influence the choice of implementation strategy: Chief information officer; Country; IS/IT Strategy; Organization Size and Growth.

1.1.2 Commercial Banks in Kenya

Commercial banks are primarily financial intermediaries which deal with transfer of funds from the excess to the deficit sectors of an economy through conversion of liabilities (deposits) into assets (lending). This is what largely spurs economic growth within the private sector. The organization structures in the commercial banking sector take on a more functional approach with a leaning towards a flat structure. This

is because of the highly specialized nature of banking operations and the need to deal quickly with competitive pressures. The environment where banks operate is highly restricted through regulation and is capital intensive. The players in the sector are thus few and in effect competition is very stiff. To succeed, commercial banks need to attract deposits and as such have to fulfill customer expectations through giving value added services.

Commercial Banks are licensed and regulated pursuant to the provisions of the Banking Act (Cap 488) and the Regulations and Prudential Guidelines issued there under. Currently there are **43** licensed commercial banks of which 27 are locally owned, 13 are foreign owned and 3 are public finance institutions (majority shareholding held by the government) (http://www.centralbank.go.ke/financialsystem/banks/Introduction.aspx).

Banks have a number of functions namely Deposits, Lending, Trade finance services, Electronic funds transfer, Money market investment, Foreign exchange trading, Asset and liability management, Account maintenance, Human resource management, Finance, Cards management and Cheque clearing. For all the functions to work seamlessly, an ERP system is required. Without an ERP system, banks would otherwise be unable to effectively compete and stay relevant in the provision of services and products. With the 2012 deposit accountholders at 15.8 million persons, turnaround time and products that provide convenience to the customer are pushing banks to employ technological value adding channels to retain customers. These are products such as Mobile banking, internet banking as well as automated clearing allowing for 2 day clearance of cheques. Banks have had to further integrate their

processes by use of robust and stable enterprise systems to maintain their relevance, competitive advantage and reduce costs of service delivery so as to keep healthy profitability margins (Bank Annual Supervision Report 2012, Central Bank of Kenya). By using ERP's banks can successfully achieve the objectives of customer acquisition, customer retention, profitability as well as shareholder value addition.

ERP software is database and resource intensive thus cost and quality are key items banks would be looking at during implementation. The infrastructure in terms of Hardware, software, databases and skills are available in Kenya for implementation.

1.2 Problem Statement

Research relating to the ERP has been done internationally by Anderson (2008); Hoon, et al (2006); Abdelghaffar et al (2010); Hawking (2007); Neal (2010), Hustad and Bechina (2011) and Hasibuan and Dantes (2012). These investigations look at Benefits and Critical success factors for implementation of ERP's; Challenges of implementing ERP's as well as factors that influence implementation of ERP's. In Kenya, Nyandiere (2002) investigated challenges facing ERP systems implementation in Kenya. Nyaga (2006) investigated critical success factors for successful implementation of ERP systems in Kenya. Kangethe (2007) evaluated successful implementation of ERP at HACO industries. Thathi (2008) looked at Human Resource management challenges in Implementation of ERP's. Gatimu (2009) looked into implementation of ERP in the education sector in KCA university and Rono (2012) looked at core banking systems replacement and performance. These studies have largely focused on success factors of implementation.

Anderson (2008) studies how to secure an ERP implementation in Ericson Mobile Platform and covers some implementation strategies as well as the process of implementing ERP's. Harwood (2003) contends that there has not yet been a common comprehensive or holistic approach to ERP implementation. Zafeiropoulos, et al (2009) researched on the use of a goal directed project methodology and concluded that following a definite process was very important as far as control of cost, resources and time is concerned. Organisations can use existing approaches as support when they work out their own specific model (Welti, 1999). The researches mentioned point to the fact that the process is not fixed and there is room for further research. The perspective of the above studies was from the fast moving consumer goods companies and Small and Medium Enterprises in Europe. No work has been done in Kenya on the process of ERP implementation.

An organization must decide which strategy suits their implementation project (Welti, 1999). Implementation strategy is very important because it determines what the cost of the project shall be (Khanna and Arneja, 2012). A study conducted by Palanisamy (2007) on organizational culture and knowledge management in ERP implementation shows that 61.5% of organizations used phased approach, 28.6% used big-bang approach, 5.5% used pilot and 1.7% used parallel. In Kenya, investigation by Nyaga (2006) into critical success factors for successful implementation of ERP's, revealed that the strategy most used was Parallel big bang strategy at 56 % of the sample and the least used was the Direct approach (Big Bang). Other investigations by Gatimu (2009) and Nyandieri (2002) indicated that firms investigated used the Parallel approach. The research done both internationally and in Kenya show that the

implementation strategies are more or less standard. The perspective used in these studies was from a manufacturing, small and medium enterprises and education angle.

Johansson and Sudzina (2008) in his study of factors influencing selection of specific ERP implementation approaches concludes that there is no significant relationship between the suggested factors namely geographic location, Chief information officer influence, Organization size, IS/IT strategy and growth and the selection of implementation approach but there is some indication that the factors influence selection. This point to the fact that some factors can be considered in the choice of implementation strategies. No work has been done on the factors that influence the choice of ERP implementation strategies in Kenya.

Based on the above researches done internationally and in Kenya, no substantive research has been geared towards the ERP implementation process; implementation strategies as well as factors for choosing an ERP implementation strategy in commercial banks and more so, in Kenya. So, this research addresses the following questions: What implementation strategies do commercial banks use for their ERP systems? : How do commercial banks choose what ERP implementation strategies to adopt? : What processes and activities do commercial banks go through to execute the chosen ERP implementation?.

1.3 Objectives of the Study

(a) To establish the Process/Activities of ERP implementation in commercial banks in Kenya.

(b) Determine implementation strategies for ERP systems by commercial banks in Kenya.

(c) Determine factors influencing the choice of ERP implementation strategies in commercial banks in Kenya.

1.4 Value of Study

The study will be useful in a number of ways. In particular, the study will assist various sectors such as financial institutions, consultants and academics. The findings would benefit as follows:

The financial institutions namely microfinance, insurance, Sacco's and financial regulators would be interested in findings on the process of implementation, Implementation strategies and Factors considered for choice of implementation strategy. This would enhance their implementation process of ERP's whenever they want to carry out implementations due to the similar nature of business to Commercial Banks.

ICT consultants would be interested in the results of all research objectives because they advise a lot of organisations on implementation of ERP's and would now have some concrete research to back and/or discard the advice they give their clients.

Academics (Students and instructors alike) would be interested in the results of all research objectives so that they can be able to determine further research to carry out on the area of ERP's to deepen knowledge in those areas.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

This chapter looks at the texts as well as studies conducted by various local (Kenyan) and international authors and researchers. The structure of the literature review shall be a brief review on ERP history; the process/activities relating to ERP implementation, the various implementation strategies used for ERP implementation as well as factors that influence the choice of ERP implementation strategy. The purpose of the literature review is to establish an outline with which to build the research structure.

2.2. Background

The acronym ERP (Enterprise Resource Planning) system was coined by the Gartner group in 1990 as an extension on the Material Requirements planning (MRP) in the 1960's, later Material resource planning and computer-integrated manufacturing in the 1970's and the 1980's. The Material resource planning was a system that covered scheduling production processes, inventory control as well as other manufacturing processes. By the 1990's this extended into other 'back-office' functions such as Human resources and accounting and as such the ERP term (Jacob and Weston, 2006) Currently, ERP has extended to encompass 'front office' functions such as sales, marketing, ecommerce as well as Business intelligence (BI).

Within the past two decades, there has been an increase in companies around the world implementing Enterprise resource Planning (ERP) Systems. ERP systems enable companies to integrate their business processes and the information relevant to their organization (Hoon Nah, et al, 2006). The installation process for an ERP is

difficult and time sensitive due to the dynamics of every organization as well as the form of the ERP and the coding required. It makes it more challenging due to the fact that there may be modeling and adjustment of existing systems and structures (Markus et al., 2000). It is therefore important to look at the activities of implementation, the strategies of implementation and the factors to choosing those strategies.

2.3. Enterprise Resource Planning

Klaus, Rosemann and Gable (2000) states that ERP systems are a commodity, in other words a product in form of computer software. The package software seeks to fulfill integration of the complete range of business processes and all the functions, to be able to present a holistic view from a single information and IT architecture. O'Leary (2005) states that an ERP system has the purpose of facilitating integration and real-time planning, production and also customer support. Klaus et al. (2000) defines the purpose of ERP systems as: "…to support all business functions of an enterprise." O'Leary (2005) states that an ERP system includes different modules, which are components containing different functionality. ERP software is application software and the applications modules of ERP are integrated across the supporting functions and across the involved data.

An ERP system differs from earlier approaches to developing or purchasing business applications in at least two ways; First, ERP modules are integrated through a common set of definitions and a common database (one transaction is immediately reflected in other related areas) and second, they are designed to reflect a particular

way of doing business (Wainright, et al, 2009). The procedures used in ERP implementation affect project success explicitly and implicitly of it.

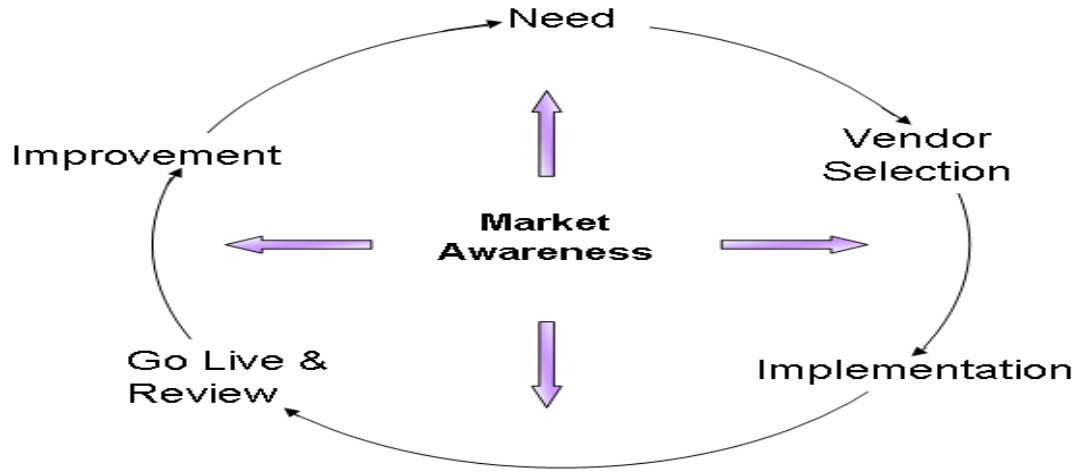
2.4. Enterprise Resource Planning Implementation Activities

A number of implementation techniques have been created in the search of the most effective model with minimal risks. For instance, a model presented by O'Leary (2005), includes different activities like: deciding to go with an ERP, choosing an ERP system, designing, implementing, Post go live and training.

An additional strategy for ERP implementation is design, implementation, stabilization, continuous improvement and transformation (Ross, Vitale and Willcocks, represented in Shanks et al. 2003). Wallace and Kremzer (2001) recommend the process flow as follows Audit/Assessment 1, First-cut education, cost/benefit analysis, Go/No-go decision, Vision statement, performance goals, project organization, Initial education and training, planning, software selection and installation, Data integrity, Audit/Assessment II and Ongoing education. Harwood (2003) presents a model which includes the stages of market awareness, requirements/ needs definition, select vendor, implement the project and the Post-Go Live improvements. Harwood's (2003) model is illustrated in Figure 1.

The common themes in the models provided are Need and Requirements definitions, software/vendor selection, training, Data set-up and integrity, implementation, post implementation review and improvements.

Figure 1 *ERP Execution Life Cycle*



Harwood (2003).

As mentioned earlier the implementation cycle starts with a need. The need can be divided into two categories, initial need and requirements definition (Harwood, 2003). Initial need involves an analysis of the company's current situation, opportunities, threats, strategies and whether the potential change shall give the firm a competitive advantage (Wallace and Kremzer, 2001).

Regarding the costs there are one-off costs and on-going costs. The one-off costs consist of direct costs, like hardware, consultancy and training. Indirect costs and on-going costs are those which are mostly internal and include time and consequent cost of employees involved in the project, costs that are related to off-site travel, costs related to internal resources (Harwood, 2003). A total cost of ownership (TCO) is a methodology that shows how important it is to analyze all indirect and direct costs. The methodology's purpose systematically analyzes both the costs and performance issues (Heilala, et al, 2007).

A group of executives and managers should also learn how an ERP works, what it consists of ,how it operates and what it requires to implement and use it properly (first cut education).It is at this point that the organization should also form an executive steering committee; an operational-level project team, consisting mainly of the managers of operating departments throughout the company; and the selection of the fulltime project leader and other people who will work full time on the project. An education of ideally 100% of all staff needs to be done to sensitize them on the changes and how these will affect them (Wallace and Kremzer, 2001).

Harwood (2003) claims that it is time-consuming to make a requirement definition because all details must be captured and presented in voluminous documents. There are different ways of establishing requirements; identify the business process and define key issues that need to be addressed in order to make a list of all the needs.
The requirement definition should answer the question of what the company should look like and how it should operate after the implementation (Wallace T. et al, 2001).

Once the requirements are defined a way to meet them must be identified and the following statements should be considered: Choose well established vendors, Choose modules or components to deal with and Choose "best-of-breed" (take the best parts from different vendors).The final decision is the direction to be taken (Harwood, 2003). Zafeiropoulos, et al (2009) in a study of 2 firms in the installation of an ERP system with a Goal directed project management principal's notes that the requirement definition creates the necessary requirements for a stable transition of the corporation to the new organizational and managerial system.

The chosen vendor shall provide the application software and the skill in how to use the application. The vendor will also provide expertise in implementing the application (Harwood, 2003). There are four stages to consider when choosing vendors, namely: Find out who is on the market which generates the first vendor list, Generate a short-list of suppliers who offer the potential for meeting requirements, reduce the short-list to the most suitable and make the final selection. Hustad and Bechina (2011) in a study of Project life cycles in four Small and Medium Enterprises referred to this as part of the pre-implementation phase. All four companies wanted vendors who were accepted in the market, would solve critical business case scenarios, and with good reputation. Once the vendor is selected contract negotiations can begin. According to Harwood (2003) contracts differ from vendor to vendor. Some of the issues that need to be discussed include ;definitions, software license, warranty, price and payment, third party software, software errors, delivery, operating system, hardware requirements, software support, training, new releases, copyright/ownership, liability and cancellation of licenses.

William and Kremzer (2001) contend that ideally 100 percent but a minimum of 80 percent, of all the people in the company need to receive some education on ERP as part of the implementation process for its success. According to Harwood (2003) the implementation begins with the training of the project team so they are able to carry out their tasks, then definition of new processes. The testing and documentation, data set-up and end user training should then follow. The first phase of the training strategy is the activity that relates to training of the project team and systems administrators. The training should result in knowledge and skills about the application, implementation, practices and software functionality. It is essential to

learn how to navigate around the system and all the details of functionality (Harwood, 2003). Hustad and Bechina (2011) in a study of Project life cycles in four Small and Medium Enterprises noted that there was emphasis on training of users which remarkably improved project success.

Phase two of the training strategy is for the end users and the managers. The purpose is to train users on how to handle the system. It is recommended that the training is executed in workshops where the users receive the knowledge they need in order to work and navigate through the system (Harwood, 2003; William and Kremzer, 2001). Harwood (2003) advocates a process mapping which provides a quick and easy method to capture the complexity of a process that allows a whole picture to be viewed. It provides a reference point for issues related to the process provides a foundation for establishing process documentation and training material.

The pilot phase provides the opportunity to test the final version before going live. It is a simulation of the real world events. This phase often goes through three stages; preparation, simulation and follow-up. The preparation phase consists of complete scripts, ready data and program of events. Once the preparation is done the simulation of the pilot can be carried out. The simulation phase consists of a final check and testing of the system before going live. In the follow-up issues are exposed and adjustments are made. After this phase should everybody be satisfied and the system should work as expected (Harwood, 2003). Hustad and Bechina (2011), in a study of Project life cycles, three of the four companies in the study carried out comprehensive tests to get assurance that the system should work.

The final stage of process implementation is documentation. The documentation includes the procedures, structures and templates. The documentation should be carried out by those who defined the processes. The documents should include the process name, the purpose and description of the process, roles responsibilities, process flow, instructions and details of related documentation (e.g. sales order, invoice and purchase order) (Harwood, 2003).

All data needs to be highly accurate, complete and properly structured. Data is the basis for all events within the organization. Since data exists everywhere it needs to be correct otherwise there will be big risks and wrong decisions may be taken. The migration of data into systems can occur in two different ways, manually or electronically. By choosing the manual way to transfer data into the system there are cost and time increases to consider. The electronic method decreases the time and is more favorable especially if there is a large amount of data (Harwood, 2003). Hustad, and Bechina (2011) in a study of Project life cycles in four Small and Medium Enterprises noted that there was emphasis on clean data before shifting to the new system with one company putting emphasis on ‘discipline’ in the database and related structures.

Once a new system is implemented and has gone live and employees are trained properly then they should know what to do on the day the systems goes live. The success of the go live day is measured by the lack of issues but if there are any problems there should be mechanisms in place to deal with them(Harwood, 2003). A way to handle eventual problems is to set up a user help-desk, which supports the users when needed and allows the client to log issues that cannot be solved

immediately but can be solved later on. When the system has been running for some time it is essential to reflect upon the implementation and its progress. The review of the implementation is not the end of the life cycle but leads to the next major stage (Harwood, 2003; William and Kremzer, 2001).

The implementation should never really stop (Harwood, 2003) once a system has gone live and had some time to settle; issues can be raised and system improved. As the ERP system is a tool that facilitates the activities within an organization improvements of the new ERP system can be carried out. Focused evaluation of the company's situation, problems, opportunities, and strategies following the implementation, as well as ongoing training of new employees should continue for continued improvement (William and Kremzer, 2001).

Overall, according to Hasibuan and Dantes (2012), on a study of Key success factors on ERP system implementation life cycle, it is found that the ERP implementation methodology has a 52.20% role in determining the success of ERP implementation.

2.5. Enterprise Resource Planning Implementation Strategies

Four main implementation strategies can be employed: the phased approach strategy the direct approach strategy, parallel strategy, and the pilot study strategy, (Laudon and Laudon, 2006). Direct approach is also known as 'big-bang strategy' whereas the phased approach is also known as the 'step-by-step strategy' in various texts. Depending on the strategy used, there'll be benefits and/or drawbacks.

By using the Step-by-Step strategy the implementation proceeds in small steps (Welti, 1999). This Step-by-Step implementation can also be called phased implementation (O'Leary 2005). The phased operation allows an organization to implement the new system in stages (Shelly et al, 2010). The risk of failure is low and limited to the implemented module only, even though new interfaces need to be built between the existing and the new system. Studies done by Nyandiere (2002), Gatimu (2009) and Kangethe (2007) indicated that all the firms used the phased implementation strategy.

The big bang is also called 'Direct cutover' with the changeover from the old system to the new system occurring immediately the new system becomes operational. It may be used if the operating environment cannot support the legacy and new systems or they are incompatible. Other cases involve considerations for cost with this system being the least expensive (Shelly et al, 2010). Neal (2010) did a survey on implementation strategies methodology and from this survey he noted that the number of big bang users also had significant users in comparison with the phased rollout users. Johanson and Sudzina (2008) in an investigation into factors influencing specific approaches of ERP system implementation in three countries with over 200 companies participating, noted that big bang implementation was preferred by firms with high levels of growth of up to 10%. Nyagah (2006) noted that the least used approach during ERP implementation is the big bang approach.

In the Parallel implementation strategy, the legacy and the new system are run together for a time until everyone is assured that the new one is running smoothly. This approach is very expensive and requires a huge resource outlay (laudon and laudon, 2006). Nyagah (2006), in his investigation into the critical success factors for

successful implementation of ERP's noted that the Parallel big-bang approach was the most used with 56% of the respondents having used it.

The pilot study approach is carried out in one isolated part of the organization, e.g. a branch. If it works, it may be implemented in the rest of the organization simultaneously or in stages (laudon and laudon, 2006). As per Johanson and Sudzina (2008) research statistics on factors influencing specific approaches of ERP system implementation in three countries with over 200 companies, the least used approach used is the Pilot implementation strategy.

Some companies may choose a combination of strategies, like a mini big bang mixed with phased rollouts (i.e. "big bang" the important modules, then add in the peripheral modules later). Others may choose to implement a mid-market ERP system running at lower mechanical levels while keeping a major ERP system running at headquarters (Neal, 2010).

2.6 Factors for Choosing an Implementation Strategy

The process of choosing an implementation strategy as per O'Leary (2005) starts with the use of a costs-benefit analysis determining whether to implement an ERP system. The next step is the decision on which strategy to use while implementing an ERP system. The choice of implementation strategy depends on organizational characteristics as size, structure, complexity and controls of the organization. Usually, smaller and less complex organizations use the Big Bang approach whereas the larger and more complex organizations often use a phased or Step-by-Step strategy. A small organization using Big-Bang approach carries little risk whereas its more appropriate

for a larger organization to use Step-by-Step approach. The risks of failure and no fall-back are minimal. According to Welti (1999) the implementation strategy should be adopted on the basis of available people, expertise, financing and time which would impact on the objectives of the project and the costs.

The final changeover decision is arrived at by ensuring wide consultations among various stakeholders and with due regard to the nature of the business and the degree of acceptable risk (Shelly et al, 2010). Johansson and Sudzina (2008) in an investigation into factors influencing ERP implementation strategies in three countries with over 200 companies saw some indication that the following factors influence the choice of implementation strategy: Chief information officer; Country; IS/IT Strategy; Organization Size and Growth.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents a discussion on the research methodology to be used to address the research objective. This encompasses the design, the population of study, data collection methodology and data analysis.

3.2 Research Design

The study used a descriptive survey research approach. The descriptive survey measures characteristics of a population either at a fixed point in time, or comparatively over time and are designed to measure what occurred rather than why (Gray, 2004). The descriptive survey research approach is preferred because it uses fixed response questions to reduce variability in results; it's easy to use and allows simplicity in coding, analysis and interpretation of data. Surveys involve the systematic collecting of data, whether this is by interview, questionnaire or observation methods, so at the very heart of a survey lies the importance of standardization (Sapsford, 1999).

3.3 Population of Study

The population of study is composed of all the 43 commercial banks in Kenya. This is a census survey. The choice of Census survey as opposed to sampling is because sampling on 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 (Mugenda and Mugenda, 2003). This is a small population and sampling is not necessary when the population is small. Besides, this data is truly representative of the

whole population and benchmark data may be obtained for future studies (Mclellan, 1999).

3.4 Data Collection

Primary data was collected using a self-administered questionnaire. The respondents were the heads of information technology, Information technology staff, Project managers, Information system auditors and/or bank auditors within the banks. One respondent was chosen per bank. The respondents chosen were those who were intimately knowledgeable and skilled on system implementations within those banks. The questionnaire is divided into the following sections as follows: Section 1 covered demographics for the Firm and the respondent; Section 2 covered the activities for implementation of ERP's; Section 3 covered strategies used in implementing ERP systems while Section 4 covered factors that influence the choice of ERP implementation strategies.

3.5 Data Analysis

Once the completed questionnaires were received, the researcher checked for completeness, cleaned the data then analysed it. The collation and analysis was done using Microsoft excel as well as SPSS (Statistical Package for social sciences). The analysis from the data has been presented in form of Tables and charts. Demographics were analysed using mean scores and percentages from the demographic data results which included job titles, ages, academic and professional qualifications and the availability of an ERP system. Results on the activities of ERP system implementation (from section 2) were analyzed using mean scores and percentages; results on ERP Implementation Strategies (from section 3) were analysed using

percentages and descriptive statistics whereas results relating the Factors influencing the choice of ERP implementation Strategies (from section 4) were analysed using means, standard deviations and factor analysis.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1. Introduction

This chapter presents the findings from data collection in relation to the Enterprise resource planning systems implementation in commercial banks in Kenya. The research instrument used was a questionnaire administered by the researcher. The information was analysed using Microsoft excel and SPSS (Statistical Package for social sciences). A total of 16 banks responded to the questionnaire. The respondent's data has been analyzed according to the objectives of the research which were establishing the activities of ERP implementation in commercial banks in Kenya; determining implementation strategies for ERP systems by commercial banks in Kenya and determining factors influencing the choice of ERP implementation strategies in commercial banks in Kenya. There is the demographics analysis based on frequencies and percentages; analysis of activities of ERP system implementation using means and standard deviations, analysis of the strategies of ERP implementation using means and standard deviations as well as the factors influencing the choice of ERP implementation strategy by use of means, standard deviations and factor analysis.

4.2. Demographics

The analysis of demographics attempts to determine the job titles of the respondents in line with the targeted specialists namely, internal auditors, ICT staff and project managers; determine the relative ages of the respondents; establish the experience level which may give an indication of the level of expertise; establish the level of

education and any professional certifications which may give an inclination into the understanding of enterprise resource planning systems and also determine the Bank tier which gives us an indication of the banks rank in form of asset base.

4.2.1. Job Titles

The respondents were required to indicate their job titles. Data analysis was done and the results are shown in Table 4.2.1.

Table 4.2.1: Job Titles

Titles	**Frequency**	**Percentage**
Internal audit	7	43.75%
ICT	7	43.75%
Project managers	2	12.5%
Total	16	100.00

From Table 4.2.1, respondents from the internal audit department and Information, communication and technology form the majority sharing 43.75% whereas project managers represent 12.5% of the respondents.

4.2.2. Age

The respondents were required to indicate their age. Data collected was analyzed and is shown in Table 4.2.2.

Table 4.2.2: Age

Age range	**Frequency**	**Percentage**
18-25 Years	0	-
26-30 Years	5	31.25%
31-35 Years	4	25%
36-40 Years	5	31.25%
41-45 Years	1	6.25%
46-50 Years	1	6.25%
> 50 Years	0	-
Total	16	100.00

From the age's data analysis on Table 4.2.2, majority of the respondents lie within the 36-40 and 26-30 years of age at 31.25% each. Second is the 31-35 years age range at 25%. Respondents within the age ranges of 41-45 years and 46-50 years each have 6.25% representation.

4.2.3. Level of Education

The respondents were required to indicate their level of education. Data collected was analysed and is shown in Table 4.2.3.

Table 4.2.3: Level of Education

Level of education	**Frequency**	**Percentage**
Diploma	2	12.5%
Degree	7	43.75%
Post graduate	7	43.75%
	17	100

Table 4.2.3 shows that the majority of respondents have degrees and postgraduate level education with both tying at 43.75% whereas 12.5% have diploma level of education.

4.2.4. Professional Certifications

The respondents were required to indicate whether they had professional certifications. Data collected was analysed and is shown in Table 4.2.4.

Table 4.2.4: Professional Certifications

Professional certifications	**Frequency**	**Percentage**
Have	13	81.25%
Don't have	3	18.75%
	16	100.00

81.25% of the respondents have professional certifications related to their professions.

4.2.5. Years of Experience

The respondents were required to indicate whether their years of experience. Data was analysed and is shown in Table 4.2.5.

Table 4.2.5: Years of Experience

Years of experience	**Frequency**	**Percentage**
0-3Years	3	18.75%
4-7Years	5	31.25%
8-11Years	4	25%
12-15Years	4	25%
16-18Years	0	-
19-22Years	0	-
23-26Years	0	-
27-30Years	0	-
>30 Years	0	-
Total	16	100.00

Majority of the respondents have between 4-7 years of experience at 31.25%. Those with 8-11 years and 12-15 years of experience tie at 25% whereas those with 0-3 years of experience are at 18.75%.

4.2.6. Bank Tier

Respondents were also required to indicate the bank tier which would give the relative size of the bank based on capital and assets. The data was analysed and is shown in Table 4.2.6.

Table 4.2.6: Bank Tier

Bank tier	**Frequency**	**percentage**
Tier 1.	1	6.25 %
Tier 2.	6	37.50 %
Tier 3	6	37.50 %
Tier 4	3	18.75 %
	16	100.00

Table 6 shows that majority of the respondent banks lie in Tier 2 and 3 in terms of capital and asset base. These two tiers tie at 37.5% whereas 18.75% of the respondents are from tier 4 banks. Tier 1 bank respondents are at 6.25%.

All respondents confirmed that they had an enterprise resource planning system in place.

4.3. Activities Undertaken During Enterprise Resource Planning Implementation

The study asked respondents to state the extent to which the following activities were undertaken during the Enterprise resource planning system implementation. The responses were rated on a five point Likert scale where: 1 - to no extent 2 – Small extent 3 – moderate extent 4- great extent and 5- very great extent. The responses were analyzed using means and standard deviations. The interpretations based on the likert scale are that all mean scores of 3 to 3.99 are activities that happen to a moderate extent whereas those with one from 4 to 4.99 happen to a great extent. Those factors with mean scores of 3 and below are of no interest as they represent small extent and no extent at all. Findings are presented in Table 4.3.1.

Table 4.3.1: Activities During ERP System Implementation

Activity	**Mean**	**Median**	**Mode**	**Variance**	**Standard Deviation**
Selection of Project Leader	4.44	5.00	5.00	1.00	1.00
Data Migration	4.38	4.50	5.00	0.48	0.70
Formation of Operational level project team- Consisting of operating department managers.	4.19	4.00	5.00	1.03	1.01
Cost and benefits analysis	4.13	4.00	4.00	0.36	0.60
Selection of Full time Team to support Project Leader	4.13	4.50	5.00	1.23	1.11
Staff training	4.06	4.00	5.00	0.81	0.90
Issuance of a request for proposal	4.00	4.50	5.00	1.50	1.22
Cost analysis of different ERP systems	4.00	4.00	4.00	0.38	0.61
Determination of hardware requirements.	3.94	4.00	4.00	0.31	0.56
User acceptance tests	3.94	4.00	5.00	1.18	1.09
SWOT analysis	3.88	4.00	4.00	0.73	0.86

Activity	Mean	Median	Mode	Variance	Standard Deviation
Project team and system administrator training (functionality and navigation training).	3.88	4.00	4.00	0.73	0.86
End users and managers training (operating the system)	3.81	4.00	4.00	0.65	0.81
Interface tests	3.81	4.00	4.00	1.28	1.13
Business issue analysis-Key issues that need to be addressed to make a list of requirement.	3.75	4.00	4.00	1.19	1.09
Initial need and staff awareness training	3.75	4.00	3.00	0.56	0.75
Post go-live improvements and upgrades	3.75	4.00	4.00	0.31	0.56
Analysis functionalities of different systems	3.69	3.50	3.00	1.21	1.10
Data clean up	3.69	4.00	4.00	1.09	1.04
Post implementation review	3.63	4.00	4.00	0.73	0.86
Referencing from other banks who have had successful implementations	3.56	4.00	4.00	1.00	1.00
Determination of training requirements	3.56	4.00	4.00	1.00	1.00
Process documentation-Procedures to be used with the new system	3.56	4.00	4.00	1.50	1.22
System documentation-Templates	3.56	4.00	4.00	1.37	1.17
Technical skills and experience analysis of potential vendors staff	3.50	4.00	4.00	0.75	0.87
Executive training	3.44	3.00	3.00	0.62	0.79
Formation of Executive steering committee	3.44	4.00	3.00	1.13	1.06
Software support framework analysis of different vendors to determine who provides best support.	3.44	3.00	3.00	0.87	0.93
Business process analysis	3.31	4.00	4.00	1.71	1.31
Stress tests	3.13	4.00	4.00	1.62	1.27

From Table 4.3.1 and based on the mean scores there are 8 activities that fall within the large extent to the very large extent range and these, from the highest ranking are: Selection of a project leader (4.44), Data migration (4.38), Formation of an operational level project team (4.19), Costs and benefits analysis (4.13), Selection of a

full time team to support the project leader (4.13), staff training (4.06) and issuance of a request for proposal and cost analysis of different ERP systems (4.00).

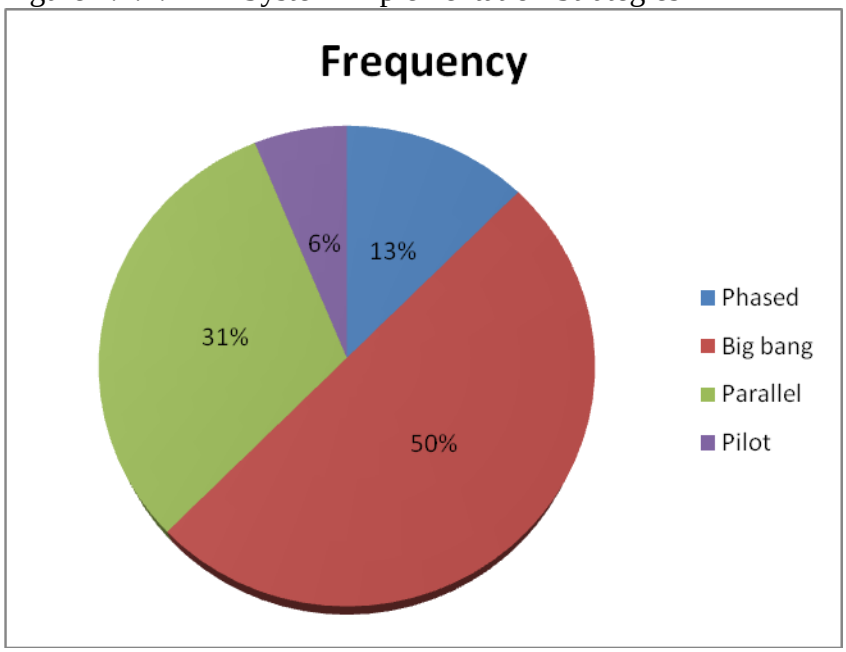
Overall, all the activities seem to be carried out by all respondents. This is based on the mean scores which range between 3.94 on determination of hardware requirements to 3.13 on the stress tests activity indicating that all are carried out to a moderate extent.

4.4. Enterprise Resource Planning Implementation Strategies

4.4.1. Implementation Strategies

The respondents were also asked on the Enterprise resource planning systems implementation strategies used. The responses were rated on a five point Likert scale where: 1 - to no extent 2 – Small extent 3 – moderate extent 4- great extent and 5- very great extent. Findings are presented in Figure 4.4.1.

Figure 4.4.1: ERP System Implementation Strategies



The big bang implementation strategy is the most used among the respondents at 50%, followed by the parallel implementation strategy at 31%; then the phased approach at 13% and lastly the pilot strategy at 6%. Based on the literature review, the pilot implementation strategy is also the least used.

4.4.2. Stakeholder Consultations

The respondents were also asked to indicate to what extent they consulted the following stakeholders. whom they consulted. The responses were rated on a five point Likert scale where: 1 - to no extent 2 – Small extent 3 – moderate extent 4- great extent and 5- very great extent. The interpretations based on the likert scale are that all mean scores of 3 to 3.99 mean that stakeholder consultations happen to a moderate extent whereas those with mean scores from 4 to 4.99 mean that stakeholder consultations happen to a great extent. Those factors with mean scores of 3 and below are of no interest as they represent small extent and no extent at all. The findings are presented in Table 4.4.2.

Table 4.4.2: Extent of Stakeholder Consultations.

Consultation strategy	**Mean**	**Median**	**Mode**	**Variance**	**Std Dev**
Consulting Top management	4.75	5.00	5.00	0.31	0.56
Consulting Directors	4.56	5.00	5.00	0.50	0.70
Consulting Mid-level management	3.81	4.00	4.00	0.65	0.81
Consulting Shareholders	3.69	4.00	5.00	2.21	1.49
Consulting Other staff	2.69	3.00	3.00	0.84	0.92
Consulting Customers	1.56	1.00	1.00	0.75	0.86

Table 4.4.2 shows that the respondents consulted the following stakeholders in order of ranking: top management the most with a mean score of 4.75, directors at 4.56, Mid-level management at 3.81 and shareholders at 3.69. Consultations with other staff

and customers were not considered very essential based on their mean scores of 2.69 and 1.56 respectively.

4.5. Factors that Influence Enterprise Resource planning Implementation Strategy

4.5.1. Introduction

The study asked respondents to indicate to what extent they considered the following factors in determining the implementation strategy to use for the Enterprise resource planning system. The responses were rated on a five point Likert scale where: 1 - to no extent 2 – Small extent 3 – moderate extent 4- great extent and 5- very great extent. The interpretations based on the likert scale are that all mean scores of 3 to 3.99 mean that the specific factor influences ERP implementation strategy to a moderate extent whereas those with mean scores from 4 to 4.99 mean that specific factor influences ERP implementation strategy to a great extent. Those factors with mean scores of 3 and below are of no interest as they represent small extent and no extent at all. The findings are summarized in Table 4.5.1.

Table 4.5.1: Factors that Influence Enterprise Resource Planning Implementation Strategy.

Factor	Mean	Median	Mode	Variance	Std Dev
Growth of the bank	4.44	4.00	4.00	0.25	0.50
Financing available	4.31	4.00	5.00	0.46	0.68
Number of organisations products	4.06	4.00	4.00	0.18	0.43
Organisation Controls	4.00	4.00	4.00	0.88	0.94
Complexity of the organisations operations	3.94	4.00	4.00	0.81	0.90
Information System/Information Technology Strategy of the organization.	3.94	4.00	4.00	0.31	0.56
Competency level of vendor staff (skill, knowledge and experience).	3.88	4.00	4.00	0.86	0.93
Time: Duration given to complete the project.	3.81	4.00	4.00	0.53	0.73

Factor	Mean	Median	Mode	Variance	Std Dev
Cost-benefit analysis done on the Legacy system Versus the New system	3.81	4.00	5.00	0.87	0.93
Number of organisations customers	3.75	4.00	4.00	0.94	0.97
Organization size	3.69	4.00	4.00	0.71	0.85
Vendors reputation in handling specific implementation strategy	3.69	4.00	4.00	0.71	0.85
Organisations Steering committee Directive to implement specific strategy.	3.63	4.00	4.00	0.98	0.99
Chief information officer/ ICT influence	3.56	4.00	4.00	1.00	1.00
Competency level of Organisations staff (skill, knowledge and experience).	3.44	4.00	4.00	1.00	1.00
Number of vendor staff available for support.	3.38	3.00	3.00	0.61	0.78
Feedback from other organizations experiences	3.31	4.00	4.00	1.09	1.04
Organisation structure	3.25	3.00	3.00	1.31	1.15
Organisation Tier	3.13	3.00	4.00	1.23	1.11
Vendor advice to pick a specific strategy.	3.13	3.00	4.00	0.86	0.93
Level of Steering committee training	3.06	3.00	3.00	0.93	0.97
Level of comfort with organisations operational user training	2.94	3.00	3.00	1.14	1.07
Level of user involvement in the project.	2.81	3.00	4.00	1.03	1.02
Geographic location	2.38	2.00	1.00	1.36	1.17

Out of the 24 factors, 21 (87.5%) influence the choice of implementation strategy with four of these having the largest influence. These are Growth of the bank with a mean score of 4.44, Financing available with a mean score of 4.31, number of organizations products at 4.06 and organization controls at 4.00. It seems that the choice of strategy is heavily pegged on the growth of commercial banks.

4.5.2. Factor Analysis

Factor analysis is a statistical procedure used to identify a small number of factors that can be used to represent relationships among sets of interrelated variables. The basic assumptions are usually that the underlying factors can be used to explain complex events or trends. Factor analysis was carried out on the data and the results have been presented in tables as follows.

4.5.2.1. Communalities

Table 4.5.2.1 shows the communalities extracted using principal component analysis extraction. Communality is the proportion of variance accounted for by the common factors of a variable.

Communalities

Table 4.5.2.1: Communalities

	Initial	Extraction
Level of Steering committee training	1	0.955
Competency level of vendor staff (skill, knowledge and experience).	1	0.951
Level of user involvement in the project.	1	0.944
Organisation Controls	1	0.91
Vendors reputation in handling specific implementation strategy	1	0.909
Complexity of the organisations operations	1	0.901
Organisation Tier	1	0.889
Competency level of Organisations staff (skill, knowledge and experience).	1	0.884
Feedback from other organizations experiences	1	0.883
Level of comfort with organisations operational user training	1	0.881
Number of vendor staff available for support.	1	0.881
Organization size	1	0.879
Geographic location	1	0.863
Organisation structure	1	0.842
Financing available	1	0.837
Organisations Steering committee Directive to implement specific strategy.	1	0.803
Number of organisations products	1	0.79

	Initial	Extraction
Vendor advice to pick a specific strategy.	1	0.777
Number of organisations customers	1	0.756
Chief information officer/ ICT influence	1	0.731
Time: Duration given to complete the project.	1	0.688
Growth of the bank	1	0.664
Information System/Information Technology Strategy of the organization.	1	0.597
Cost-benefit analysis done on the Legacy system Versus the New system	1	0.551

From Table 4.5.2.1 it is evident that there is high communality with the highest being the level of steering committee training at 0.955 and the Cost-benefit analysis done on the Legacy system Versus the New system at 0.551. This indicates that a large portion of the common factors explain the variance.

4.5.2.2. Total Variance Explained

Table 4.5.2.2 shows the total variance explained which is the initial solution.

Table 4.5.2.2: Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.368	30.699	30.699	7.37	30.699	30.699	5.82	24.256	24.256
2	3.883	16.178	46.877	3.88	16.178	46.877	3.85	16.039	40.295
3	3.299	13.745	60.622	3.3	13.745	60.622	3.73	15.528	55.823
4	2.517	10.487	71.109	2.52	10.487	71.109	2.5	10.401	66.224
5	1.453	6.056	77.165	1.45	6.056	77.165	2.19	9.102	75.326
6	1.248	5.201	82.366	1.25	5.201	82.366	1.69	7.04	82.366
7	0.997	4.155	86.522						
8	0.905	3.771	90.293						
9	0.777	3.236	93.529						
10	0.623	2.597	96.126						
11	0.486	2.027	98.152						

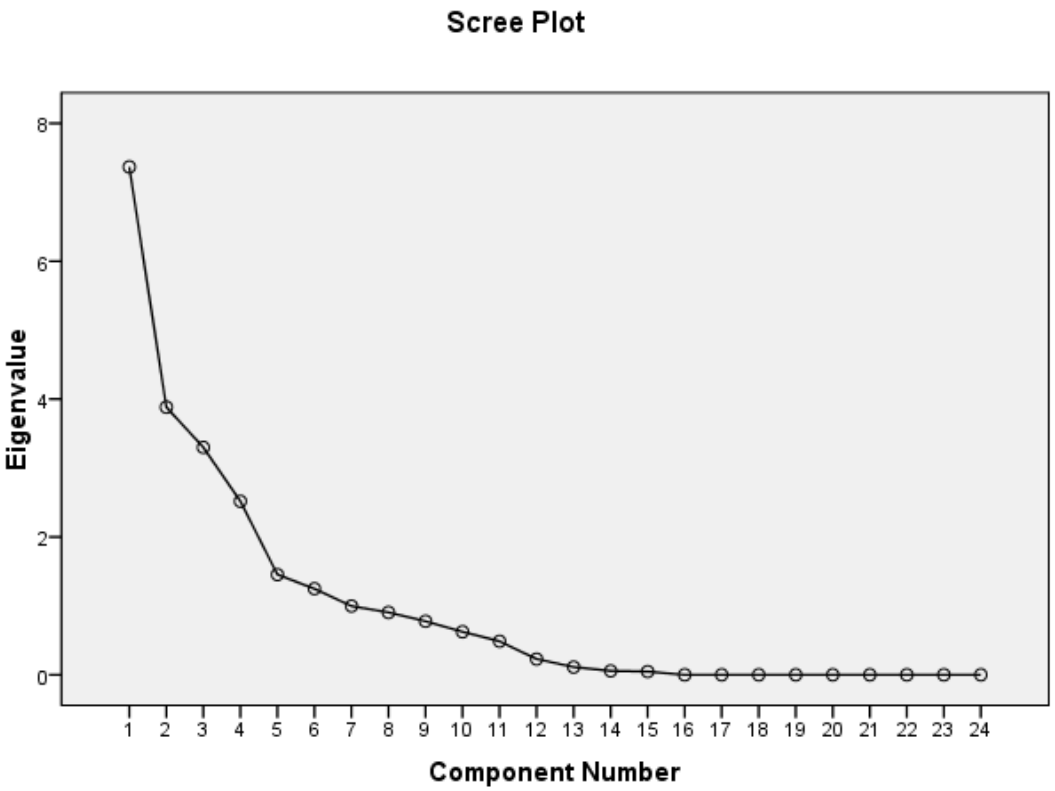
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
12	0.228	0.95	99.103						
13	0.112	0.466	99.569						
14	0.056	0.234	99.803						
15	0.047	0.197	100						
16	3.43E-16	1.43E-15	100						
17	1.83E-16	7.63E-16	100						
18	9.03E-17	3.76E-16	100						
19	3.24E-17	1.35E-16	100						
20	-1.82E-17	-7.59E-17	100						
21	-5.28E-17	-2.20E-16	100						
22	-1.22E-16	-5.07E-16	100						
23	-1.98E-16	-8.26E-16	100						
24	-3.67E-16	-1.53E-15	100						

From table 4.5.2.2, six components have a value of more than one and therefore have enough total variance to represent a unique factor. Therefore six factors were deemed significant for analysis and the rest disregarded. The six factors account for 82.366% of the variance explained.

4.5.2.3. Scree Plot

The scree plot presents a line graph of the Eigen value against the component numbers.

Figure 4.5.2.3: Scree Plot



From Figure 4.5.2.3 it is evident that the graph gradually flattens after factor 6.

4.5.2.4. Component Matrix

The component matrix indicates how each item correlates with each of the five retained factors. The Table 4.5.2.4 component matrix extracted using the principal component analysis gives an idea how the items correlate with the factors, but the interpretation shall be done on the rotated component matrix in Table 4.5.2.5

Table 4.5.2.4: Component Matrix

Component Matrix[a]						
	Component					
	1	2	3	4	5	6
Complexity of the organisations operations	0.86	-0.12	-0.34	-0.18		
Level of comfort with organisations operational user training	0.85		0.134	0.325		-0.17
Level of user involvement in the project.	0.84		0.111	0.454	0.112	
Vendor advice to pick a specific strategy.	0.82			-0.13	0.238	-0.17

Component Matrix[a]						
	Component					
	1	2	3	4	5	6
Level of Steering committee training	0.76	-0.21	0.343	0.36	0.153	-0.26
Organisation structure	0.73		0.424	-0.2	-0.26	0.104
Organisation Controls	0.73		-0.43	-0.42	-0.11	
Information System/Information Technology Strategy of the organization.	0.71	0.226	-0.14	0.108		0.12
Organisations Steering committee Directive to implement specific strategy.	0.67	-0.45	-0.3	-0.16	0.14	-0.15
Feedback from other organizations experiences	0.6	-0.15	-0.5		-0.45	-0.22
Number of organisations customers	0.59	-0.44		-0.31	0.215	0.271
Number of vendor staff available for support.	0.1	0.827		0.228	0.3	-0.21
Chief information officer/ ICT influence	0.12	0.767		-0.12	0.33	
Vendors reputation in handling specific implementation strategy	0.5	0.708	-0.27	0.178	-0.12	0.191
Competency level of vendor staff (skill, knowledge and experience).	0.16	0.655	-0.59	0.386		
Competency level of Organisations staff (skill, knowledge and experience).	0.3	0.592	0.463	0.336	-0.33	0.119
Time: Duration given to complete the project.		0.573	0.54	-0.23		
Growth of the bank	0.19		-0.73		0.291	
Geographic location	0.36	0.21	0.605	-0.36	0.149	-0.41
Organisation Tier	0.6	0.165	0.296	-0.62		0.15
Organization size	0.33	-0.33	0.523	0.547	-0.26	0.166
Financing available	0.19	-0.29	0.287	0.229	0.699	0.306
Number of organisations products	0.23	0.406	0.147	-0.47		0.567
Cost-benefit analysis done on the Legacy system Versus the New system	0.35	-0.18	-0.14	0.41		0.457

4.5.2.5. Rotated Component Matrix.

The rotated component matrix gives a clear indication how each item correlates with each factor after rotation using the Varimax with Kaiser Normalisation. The rotations converged in 12 iterations.

Table 4.5.2.5: Rotated Component Matrix

Rotated Component Matrix						
	Component					
	1	2	3	4	5	6
Complexity of the organisations operations	0.905	0.17			0.188	

Rotated Component Matrix						
	Component					
	1	2	3	4	5	6
Organisation Controls	0.902				0.211	-0.2
Organisations Steering committee Directive to implement specific strategy.	0.852		-0.19		-0.11	0.145
Feedback from other organizations experiences	0.739	0.18		-0.22		-0.5
Vendor advice to pick a specific strategy.	0.724	0.255	0.22	0.295		0.212
Number of organisations customers	0.628		-0.33		0.31	0.387
Information System/Information Technology Strategy of the organization.	0.519	0.346	0.392		0.218	
Growth of the bank	0.463	-0.38	0.336	-0.41	-0.13	0.118
Organization size		0.883	-0.27			
Level of Steering committee training	0.469	0.737		0.26	-0.21	0.284
Level of user involvement in the project.	0.533	0.733	0.219			0.256
Level of comfort with organisations operational user training	0.576	0.712	0.152	0.108		
Competency level of Organisations staff (skill, knowledge and experience).	-0.24	0.65	0.463	0.204	0.33	-0.2
Organisation structure	0.446	0.549	-0.16	0.302	0.471	
Number of vendor staff available for support.	-0.11		0.886	0.272		
Competency level of vendor staff (skill, knowledge and experience).	0.105		0.858	-0.36		-0.26
Vendors reputation in handling specific implementation strategy	0.254	0.221	0.802	-0.14	0.317	-0.18
Chief information officer/ ICT influence		-0.22	0.752	0.25	0.204	0.118
Geographic location	0.174	0.177		0.879	0.138	
Time: Duration given to complete the project.	-0.23		0.31	0.636	0.356	
Cost-benefit analysis done on the Legacy system Versus the New system	0.184	0.391		-0.53	0.108	0.257
Number of organisations products			0.185		0.86	
Organisation Tier	0.457			0.449	0.686	
Financing available		0.216				0.884

From Table 4.5.2.6, the researcher has grouped items with their appropriate factors showing the extent they may influence the choice of implementation strategies. The minimum correlation selected is 0.5. Factor solutions that have less than three important variables will not be chosen because they will not be able to explain much of the overall variability.

Table 4.5.2.6: Isolation of Factors

Factor	**Variables**
1	• Complexity of the organisations operations • Organisation Controls • Organisations steering committee Directive to implement specific strategy. • Feedback from other organizations experiences. • Vendor advice to pick a specific strategy • Number of organisations customers • Information System/Information Technology Strategy of the organization • Level of user involvement in the project. • Level of comfort with organisations operational user training
2	• Organization size • Level of Steering committee training • Level of user involvement in the project. • Level of comfort with organisations operational user training • Competency level of Organisations staff (skill, knowledge and experience). • Organisation structure.
3	• Number of vendor staff available for support. • Competency level of vendor staff (skill, knowledge and experience). • Vendors reputation in handling specific implementation strategy • Chief information officer/ ICT influence
4	• Geographic location • Time: Duration given to complete the project
5	• Number of organisations products • Organisation Tier
6	• Financing available

From Table 4.5.2.6, Factor 1 indicates that a large majority of commercial banks implementation strategies for Enterprise resource planning systems are driven by Complexity of the organisations operations; organisation controls; organisations steering committee directive to implement specific strategy; feedback from other organizations experiences; vendor advice to pick a specific strategy; number of organisations customers; Information System/Information Technology Strategy of the organization; level of user involvement in the project and the level of comfort with the

organisations operational user training. Factor 1 represents the concept of Organization Strategy.

Factor 2 indicates that a small majority of commercial banks in Kenya implementation strategies for Enterprise resource planning systems are driven by Organization size; level of Steering committee training; level of user involvement in the project; level of comfort with organisations operational user training; competency level of organisations staff (skill, knowledge and experience) and the organisation structure. Factor 2 represents the concept of Organisation structure and development.

Factor 3 indicates that a moderate number of commercial banks in Kenya implementation strategies for Enterprise resource planning systems are driven by the number of vendor staff available for support; competency level of vendor staff (skill, knowledge and experience); vendors reputation in handling specific implementation strategy and Chief information officer/ ICT influence. Factor 3 represents the concept of Competence under Experience, skills and knowledge.

Factor 4 indicates that a few implementation strategies for Enterprise resource planning systems are driven by geographic location and the duration given to complete the project. Factor 5 indicates that a few implementation strategies for Enterprise resource planning systems are driven by the number of organisations products and organization tier which represents the organization size. Factor 6 indicates that very few implementation strategies for Enterprise resource planning systems are driven by financing available.

4.6. Discussion of Results

This section discusses the results of the study in relation to the literature review. The study results indicate that all activities undertaken during the process of ERP system implementation are important. Some are however viewed as executed to a greater extent and are covered here. Most commercial banks in Kenya to a great extent seem to be in concurrence with Wallace and Kremzer (2001) as far as forming an operational level project team, selection of a full-time project leader and people who will work full time on the project. Staff training is also an essential part of the activities of implementation of an ERP (Harwood, 2003; William and Kremzer, 2001; Hustad and Bechina, 2011). The respondents also concur that it is carried out to a great extent thus supporting the training aspect during ERP project implementation. It is also essential to analyse costs related to the ERP implementation (Harwood, 2003; William and Kremzer, 2001; Heilala, et al, 2007). The respondents also concur to a great extent that Cost analysis of ERP systems is essential as well as a cost-benefit analysis. As per Harwood (2003) and Hustad and Bechina (2011), the respondents also concur to a great extent that Data migration is an essential part of the activities.

Studies by Nyagah (2006) indicate that the big-bang implementation strategy was the least used method of implementation of ERP systems. The results of this research are inconsistent with the above studies. They show that commercial banks in Kenya use the Big-bang implementation strategy to a large extent at 50%. The second most used approach is the parallel implementation strategy at 31% which according to Nyagah (2006) was the most used approach at 56%. Commercial banks in Kenya use the phased implementation strategy at 13% which is low which may be in line with studies by Nyandiere (2002), Gatimu (2009) and Kangethe (2007) which indicate that

a sizeable but not majority of organisations use the phased approach. The pilot implementation strategy is low at 6% and supports studies by Johanson and Sudzina, (2009) which show that this was the least used approach in over 200 companies.

Based on the mean scores of the factors that influence the choice of implementation strategies in commercial banks in Kenya, all apart from three had an influence on the choice of implementation strategy. The three with no influence include the level of comfort with organizations operational user training, level of user involvement in the project and geographic location. The factors that influence implementation strategy are in concurrence with Johanson and Sudzina (2008) studies which indicate that the IS/IT strategy, organization size and growth and the Chief information officer influence choice of implementation strategy. However, one factor in Johanson and Sudzina (2008) studies has been refuted. This is the country/geographic location. A factor analysis carried out indicated that three factor solutions can be used to summarise the factors that influence the choice of implementation. These are the organizations strategy, organisations structure and development as well as competence and skills of the vendor and organisations ICT staff.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter covers the conclusions that can be drawn from the analysed data, recommendations, limitations of the study and areas requiring further research. The study had the following objectives; to establish the activities of ERP implementation in commercial banks in Kenya; determine implementation strategies for ERP systems by commercial banks in Kenya; determine factors influencing the choice of ERP implementation strategies in commercial banks in Kenya.

5.2. Summary of Findings

The first objective was to establish the activities of ERP implementation in commercial banks in Kenya. The findings indicate that all the activities are actually undertaken with but with differing extents with the following having the highest extent of execution: Selection of a project leader, Data migration, Formation of an operational level project team, Costs and benefits analysis, Selection of a full time team to support the project leader, staff training and issuance of a request for proposal and cost analysis of different ERP systems. The second objective was to determine implementation strategies for ERP systems by commercial banks in Kenya. On this, the findings indicate that the big bang implementation strategy is the most used strategy followed by the parallel implementation strategy then the phased approach and lastly the pilot strategy. Along with the implementation strategies, consultations with stakeholders are also done with the extent consultation with top management ranking as highest, then the directors followed by the middle management and

shareholders. The extent of consultations with other staff and customers is low to non-existent. The third objective was to determine factors influencing the choice of ERP implementation strategies in commercial banks in Kenya. A large number (87.5%) of the factors influence the choice of implementation strategy from a moderate extent to a large extent. Key among the drivers is the growth of the bank; financing available, number of organizations products and organization controls. The factor analysis indicated that there were three factor solutions that can be strongly attributed to the choice of implementation strategies whereas three of the factor solutions cannot. These three are clustered into the concepts of organization strategy, organization structure and development and Vendor/ICT staff competence.

5.3. Conclusion

Commercial banks have invested heavily in technology to improve their competitive advantage as efficiency. They view all activities mentioned as essential with selection of a project team and a project leader essential to keep a focus on the project objectives. An operational level project team is also essential to ensure that departmental experts keep submitting valuable input to add value to the project. A cost and benefit analysis is also essential to ensure that the organization gets the best return on investment. A request for proposal is also an essential tool in gauging the capabilities of the vendors from a standard template to avoid bias. Commercial banks also view data migration as essential in keeping the integrity and availability of the data.

The most common implementation strategy in commercial banks in Kenya is the big-bang/direct cut-over strategy. This is largely due to the fact that this is the least expensive mode of implementation and is also used by companies that have sizeable

growth as noted in other studies; in the literature review and in the results on the drivers influencing the choice of implementation strategy herein. Consultation has been noted to be essential and majority of the respondents indicate that consultations with top management, directors, mid-level management and shareholders are essential. This is because of they will have the ability to put resources on the line for the success of the project.

Commercial banks in Kenya consider majority of the factors mentioned as essential in determining the choice of implementation strategy with the factors categorized into three clusters summarized as Organization strategy, organization structure and development as well as Vendor/ICT staff competence. The strategy determines whether the ERP fits into the organizations plans and how best to implement it, the structure determines the level of harmonization on the process of ERP implementation and thus the implementation strategy, training determines the learning curve whereas the vendor/ICT staff competence determines the quality of work that will be done in the ERP implementation for its success.

5.4. Recommendations

Based on the findings, the researcher would recommend that organisations getting into Enterprise resource planning system implementation ensure that they carry out all the activities mentioned. The organisations however have to ensure that they at least have to gauge how an activity is going to be beneficial to them in the long run. I would also recommend that organisations always determine the cost-benefit to any Enterprise resource planning system implementation so that they can gain maximum benefits from the implementation as well as ensure that they have cost savings. On drivers that influence the choice of implementation strategy, organizations should

ensure they strategize on the ERP implementation strategy based on the organizations needs; ensure that their structures are optimal to ERP implementation and there is available training to choose the right implementation strategy and that there is adequate competence among the vendor and internal ICT staff.

5.5. Limitations of Study

The use of these findings can only be done with due consideration of some limitations mentioned hereafter. The researcher is a first time researcher and has not carried out a project of this magnitude before and as such the learning curve was steep. Time was a challenge as some respondents were hard-pressed for time and asked for additional time. At the time of concluding the project some potential respondents had not returned the questionnaire and asked for additional time. Some respondents refused to participate in the questionnaire citing organization policies restricting the filling of research questionnaires. Some needed re-assurance that their responses would in no way jeopardize their jobs. There were also budgetary and time constraints on the researcher.

5.6. Suggestions for Further Study

There continues to be advancements in the field of Enterprise resource planning systems. Further research could be done to investigate how different implementation strategies influence success of the Enterprise resource planning system implemented and why they influence this success. Further research can also be carried out to determine the activities in the process of Enterprise resource planning implementation that are not essential and do not in any way affect the success of the implementation.

Research can also be carried out in relation to the extent of the relationship between implementation strategies and the factors that are used to make the choices of what strategy to implement as well as the relationship between implementation strategy and the activities of ERP implementation.

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Appendix 1: Questionnaire

Enterprise Resource Planning Systems Implementation Strategies in Commercial Banks in Kenya.

Thank you for your participation in this exercise and for your valuable input.

The following questionnaire's objective is to carry out a survey of implementation strategies that are used when implementing an ERP system in a bank. The study is intended to answer the following research questions:

Section 1: Demographics

a) What is your job title? _____

b) What is your age range? (tick as applicable)

18-25 Years [ ]

26-30 Years [ ]

31-35 Years [ ]

36-40 Years [ ]

41-45 Years [ ]

46-50 Years [ ]

> 50 Years [ ]

c) What is your highest level of education? (tick as applicable)

Diploma. [ ]

Degree. [ ]

Postgraduate. [ ]

d) What professional certifications do you hold?

Please state _____

_____

e) What number of years of experience do you have in the bank? (Tick range applicable)

0-3Years [ ]

4-7Years [ ]

8-11Years [ ]

12-15Years [ ]

16-18Years [ ]

19-22Years [ ]

23-26Years [ ]

27-30Years [ ]

>30 Years [ ]

f) What tier does the bank belong? (tick as applicable)

Tier 1. [ ]

Tier 2. [ ]

Tier 3 [ ]

Tier 4 [ ]

h) Do you use any Enterprise System (tick as applicable)?

Yes [ ]

No [ ]

Section 2: Process and Activities of ERP Implementation.

1 To what extent were the following activities performed while carrying out the implementation of the ERP system in the organization? (Tick to indicate the extent)

(1-No Extent at all; 2- Small Extent; 3- Moderate Extent; 4- Large Extent; 5- Very large Extent).

	1	**2**	**3**	**4**	**5**
SWOT analysis					
Cost and benefits analysis					
Executive training					
Formation of Executive steering committee					
Formation of Operational level project team- Consisting of operating department managers.					
Selection of Project Leader					
Selection of Full time Team to support Project Leader					
Staff training					

	1	2	3	4	5
Business process analysis					
Business issue analysis-Key issues that need to be addressed to make a list of requirement.					
Issuance of a request for proposal					
Analysis functionalities of different systems					
Cost analysis of different ERP systems					
Referencing from other banks who have had successful implementations					
Software support framework analysis of different vendors to determine who provides best support.					
Determination of hardware requirements.					
Determination of training requirements					
Technical skills and experience analysis of potential vendors staff					
Initial need and staff awareness training					
Project team and system administrator training (functionality and navigation training).					
End users and managers training (operating the system)					
Process documentation-Procedures to be used with the new system					
System documentation-Templates					
Data clean up					
User acceptance tests					
Stress tests					
Interface tests					
Data Migration					
Post implementation review					
Post go-live improvements and upgrades					

Others, Please state and rate according to the scale above, _____

_____

_____

_____

Section 3: Implementation Strategies Used for the Banks ERP System.

1. What implementation strategy did you employ for the Enterprise system in the organization? (Tick to indicate. You may tick more than one approach if applicable).

Phased/ Step by step approach. [ ]

Big bang/ direct cutover approach. [ ]

Parallel implementation strategy [ ]

Pilot study implementation strategy [ ]

Others. Please state _____

_____

_____

2. To what extent were the following people consulted before deciding on the ERP implementation strategy for the organization? (Tick to indicate the extent)

(1-No Extent at all; 2- Small Extent; 3- Moderate Extent;

4- Great Extent; 5- Very great Extent).

	1	**2**	**3**	**4**	**5**
Shareholders					
Directors					
Top management					
Middle level managers					
Other staff (other than those mentioned).					
Customers					

Others please state and rate accordingly_____

_____

_____

Section 4: Factors for Choice of an ERP Implementation Strategy.

1. To what extent was each of the following factors considered in determining the choice of an ERP implementation strategy for the organization? (Tick to indicate the extent)

(1-No Extent at all; 2- Small Extent; 3- Moderate Extent;

4- Great Extent; 5- Very great Extent).

	1	2	3	4	5
Organisation Tier					
Organisation structure					
Organisation Controls					
Complexity of the organisations operations					
Number of organisations customers					
Number of organisations products					
Competency level of Organisations staff (skill, knowledge and experience).					
Competency level of vendor staff (skill, knowledge and experience).					
Financing available					
Time: Duration given to complete the project.					
Chief information officer/ ICT influence					
Growth of the bank					
Geographic location					
Information System/Information Technology Strategy of the organization.					
Organization size					
Cost-benefit analysis done on the Legacy system Versus the New system					
Organisations Steering committee Directive to implement specific strategy.					
Level of Steering committee training					
Level of comfort with organisations operational user training					
Level of user involvement in the project.					
Vendor advice to pick a specific strategy.					
Number of vendor staff available for support.					
Vendors reputation in handling specific implementation strategy					
Feedback from other organizations experiences					

Others. Please state and rate accordingly_____

_____

_____