FACTORS AFFECTING IMPLEMENTATION OF ENTERPRISE RESOURCE PLANNING SOFTWARE IN THE TELECOMMUNICATION INDUSTRY IN KENYA: A CASE OF TELKOM KENYA.

By

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DECLARATION

This research project is my original work and it has not been presented for an award in any other University.

Signature ..... Date 9-9-2010

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L50/72767/08

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

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DEDICATION

My study is dedicated to my wife, Margaret Wamuyu and my son Baraka Munene for their support and patience during the entire period of my study and my entire family for their encouragement and continued prayers towards successful completion of this course.

Thank you and God bless you abundantly.

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ABSTRACT

In order to respond to today's dynamic business nature many firms have implemented enterprise resource planning (ERP) systems. ERP can be defined as a large - scale information system that integrates all business functions into one unified function. Such an integration of different information systems has proved to give organizations substantial benefits that include cost reductions, improved productivity, better managerial decision-making, and facilitation of process and structural change. ERP has become one of the most significant information technology events since the 1990s. Today ERP is regarded as a foundation for the integration of organization-wide information systems. Companies are realizing that they have to implement ERP in order to remain competitive. Adoption of ERP however seems beset by high failure rates leading to a large waste of investment and other resources. This research project sought to identify and understand the factors affecting such implementation in Telecommunication firms in Kenya, focusing on a case of Telkom Kenya. The objectives of the study are to determine how adoption process affects the implementation of ERP by Telkom by: assessing how finances affect the implementation of ERP by Telkom; examining how the technical aspect of ERP affects the implementation of ERP by Telkom; and determining how the human resource affects the implementation of ERP by Telkom. The research questions are: How does the adoption process of ERP affect the implementation of ERP by Telkom Kenya? How do finances affect the implementation of ERP by Telkom Kenya? How do technical aspects of ERP affect its implementation of ERP by Telkom Kenya? How does the human resource affect the implementation of ERP by Telkom Kenya? A descriptive survey methodology was adopted with the Telkom staff in Nairobi as the target population. Using stratified sampling based on the departments in the company, a survey was conducted using a self administrated, semi-structured questionnaire. Interpretation of data was done using SPSS. The research findings showed that the majority of respondents considered the following factors to have affected the implementation of ERP to a great extent: human resource factors; financial factors; technical factors; and adoption process factors. Based on the findings I have made a conclusion that the factors considered do indeed affect the implementation of ERP. Some specific and general recommendations for telecom companies intending to implement ERP are included in this report. Another observation was that Telkom implemented an ERP system that is built using open source software, indicating a notable departure from the observed local implementation trends. This was done by the company's staff without engaging external consultants. Further research may be necessary to investigate the relationships among the variables considered in this study. It would also be instructive and beneficial to have further research to study the Enterprise Resource Planning implementation experiences in Kenya, and particularly innovative approaches like the one observed in this study or the leasing of software as a service (SaaS) from vendors instead of investing in expensive "off-the-shelf" ERP software.

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ACRONYMS AND ABBREVIATIONS

ERP - Enterprise resource planning

IT – Information Technology

ICTs - Information and communication Technologies

B2B - Business to business electronic commerce

EDI - Electronic Data Interchange

XML - Extensible Markup Language

TQM - Total Quality Management

CDMA - Code Division Multi-Access

GSM – Global System for Mobile communications

BPR - Business Process Reengineering

GUI - Graphical User Interface

OS - Operating Systems

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The adoption of Information and Communication Technologies (ICT) by organizations goes back to 50s of the last century, when mainframes were used to process enormous quantity of structured data such as sales or wages (Al-Mashari, 2002). In the last decades ICT have changed their rationale within organizations. Besides processing data, ICT are now used for networking data and people (for example through e-mails, intranets, and internet). ICT today, in other words, are more integration technologies than processing technologies within organizations (Harold, 2005).

From an organizational point of view, this evolution of the ICT is quite consistent with the evolution of structural and governance organizational models. ICT are actually considered essential for the passage to models, which are based on integrated and flexible structures.

Enterprise resource planning has emerged as the most important development of the 1990s for flexible integrated ICT organizational models.

1.1.1 Enterprise Resource Planning (ERP)

Enterprise resource planning (ERP) is an integrated computer-based system used to manage internal and external resources including tangible assets, financial resources, materials, and human resources. It is a software architecture whose purpose is to facilitate the flow of information among all business functions inside the boundaries of the organization and manage the connections to outside stakeholders. Built on a centralized database and normally utilizing a common computing platform, ERP systems consolidate all business operations into a uniform and enterprise wide system environment (Bidgoli. Hossein, 2004). According to, (1998) ERP has had a positive impact on the ability of businesses to improve working capital, implement a total quality management culture, lower inventory levels, optimize raw materials and sell and deliver products to the customers Molla and Bhalla (2006). ERP has helped alleviate the arduous job of supporting inflexible systems that in most cases result in cost increases, data redundancy and inaccuracy, and above all, various inefficiencies. Ideally, ERP is a computer system

that keeps managers informed about what is happening in real-time throughout a corporation and its global connections. Enterprise resource planning (ERP) systems can be regarded as one of the most innovative developments in information technology (IT) of the 1990s Gupta, (2000). With the growing interest of many organizations in moving from functional to process-based IT infrastructure, ERP systems have become one of today's most widespread IT solutions. What have motivated organizations to implement ERP systems are their integration and standardization capabilities, flexible client/server architecture, and their abilities to drive effective business reengineering and management of core and support processes (Chatterjee et al,. 2006).

While ERP systems have traditionally been used by capital-intensive industries, such as manufacturing, construction, aerospace, and defense, they have recently been implemented in the finance, education, insurance, retail, and telecommunications sectors (Chung and Snyder, 2000). ERP systems are now considered the standard technology on which many organizations are operating their business, and they are, therefore, known by the specific ERP standard they are adopting (Sweat, 1998). Currently, SAP, Oracle, PeopleSoft, Baan, and J.D. Edwards are considered the top ERP vendors. Despite the differences in the marketing policies of their vendors, these packages have similar offerings and shortcomings, and they still adopt the MRPII's model for the manufacturing planning components of their system products (Gray and Landvater, 1999). ERP systems are beneficial in providing support for all variations of best business practices, in enabling the implementation of these practices with a view towards enhancing productivity, and in empowering the customer to modify the

Chang (2007) notes that today's and tomorrow's business manager should understand what an ERP system can do for an organization. In today's e-Business world, ERP is also enabling the formation of extended enterprises operating within value networks. Vendors and suppliers within these "virtually-wired" entities are able to communicate instantaneously with each other and with customers far more easily, cheaply, and quickly than ever before. In their rush to evolve as e-businesses, many traditional companies hasten to update existing business processes while receiving benefits of an important fact: e-Business simply will work in the sound business infrastructures based on well-functioning ERP systems. (Chang, 2007)

Beginning in the 1980s, ERP became one of the most significant events of the 1990s. Over 80% of global Fortune 1000 companies have installed ERP systems. Over 50% of the large printed circuit board manufacturers in North America are running businesses with ERP systems. More and more companies 'turbo-charged' their business to run at breakneck speed on a transactional backbone called Enterprise Resource Planning (ERP) system

Enterprise Resource Planning is not a single system, but a framework that includes administrative applications (finance, accounting), manufacturing resources planning applications (sales, procurement, production, planning), and human resources applications (payroll, benefits). ERP is the backbone of e-business. In other words, ERP is the business operating system, the equivalent of the Windows operating system for a Personal Computer. ERP supports day-to-day business activities, which provide data to everyone in the company, from shop floor engineers to the executive suite, or making decisions and taking actions faster, and more intelligent.

1.1.2 Telecommunication Industry in Kenya

The telecommunication industry in Kenya is going through profound changes. In the past decade, technological advancement and regulatory restructuring have transformed the industry. Markets that were formerly distinct, discrete and vertical have coalesced across their old boundaries with a massive investment of capital - much of it originating from private sector participants. (Communications Commission of Kenya)

The Telecommunication industry comprises of telephone communication, Communication through the internet, audio and visual media, postal communications, fax etc. The mobile telecommunication industry is one of the fast growing industries in the recent times. In 2002 the industry recorded the first billion customers and within a span of another 3 years the second billion has been achieved. The total number of mobile connections is now equivalent to nearly a third of the estimated world population of 6.5 billion, (Martin Garner, Director Wireless Intelligence). And although total connections are higher than the real number of users due to multiple connections, or inactive pre-paid connections, this is still a significant landmark for the industry. Kenya is part of this growth having launched mobile telecommunication industry since 2000 where Kencel –

Celtel (now Zain - Airtel), Safaricom, Yu and Orange Mobile have been licensed by the Kenyan Government. This has seen the number of mobile subscribers in the country hitting 19.3 million, as of December 2009 representing a penetration rate of about 50 per cent (Communication Commission of Kenya).

Telecommunications development has been affected by, and is a subject of, the socioeconomic environment under which it operates. The ensuing telecommunications reforms are a political response to address national socioeconomic needs. The impact of competition in the mobile telecommunication industry has resulted in faster expansion and growth of the sector (Communication Commission of Kenya).

The business environment in the country has drastically changed resulting in mobile telecommunication companies going global and thus increasing competition in the industry. Prices have also come down due to competition. A notable feature in the Kenyan market since sector reforms in 1999 was the fast expansion and uptake of cellular services. Cellular has grown from under 7,000 customers to over 19 million according to the Communication Commission of Kenya.

1.1.3 Telkom Kenya

Telkom Kenya is the sole provider of landline phone services in Kenya. It was previously a part of the Kenya Posts and Telecommunications Corporation (KPTC) which was the sole provider of both postal and telecommunication services. In 1999 KPTC was split into the Communication Commission of Kenya (CCK), the Postal Corporation of Kenya (CCK) and Telkom Kenya.

France Telecom now holds 51% of Telkom Kenya's shares, the balance being held by the Government of Kenya. According to an International Herald Tribune report, France Telecom and the Kenyan government are to bring 11 and 19 percent of their respective shareholdings on the market within three years of the deal's completion.

Telkom Kenya was established as a telecommunications operator under the Companies Act in April 1999. Telkom Kenya provides integrated communications solutions in Kenya with the widest range of voice and data services as well as network facilities for residential and business customers, although this is rapidly changing as other operators take advantage of the unified license to venture into fixed telecommunications

services. Telkom plays a prominent role in the information and communications technology sector, serving millions of Kenyans across the country. The company currently has a customer base of about a million customers on both fixed and wireless telephone service as well as GSM Mobile service with a country-wide presence.

Its new partnership, new investments and a fresh new approach to doing business have inspired a new corporate identity under the Orange brand.

1.1.3 Enterprise Resource Planning (ERP) in Kenya

Many of the larger firms especially in the service industry as well as those associated with multinational corporations have successfully implemented ERP systems (Molla and Bhalla, 2006). However a study revealed limited usage of ERP systems in Kenya and limited scope of implementation in terms of the number of modules implemented, resulting in reduced expected benefits. Limited functionality is an indication that ERP is being used as a transaction processing system rather than a strategic tool as observed in Kenya (Otieno and Abeysinghe, 2004).

Paradoxically Otieno and Abeysinghe, (2004) found no literature compiled on the ERP implementation experiences in Kenya and Africa at large. This is in spite of the need for documentation of ERP implementation experiences as a way of organizational learning in order to avoid implementation pitfalls which can lead to catastrophic outcomes. (Otieno & Abeysinghe, 2004).

This state of affairs speaks of the lack of scholarly knowledge about how ERP acts in practice. It is against this background that this study attempts to understand the factors which affect implementation of ERPs in telecommunication companies in Kenya.

Otieno (2004) also found that foreign vendors have a 100% market share in Kenya, and that considerable cultural conflicts are likely considering that these systems which are being implemented in the Kenyan context were developed in western countries. The systems have built-in value bias reflecting the value priorities of the culture in western countries (Soh, 2004).

There are significant contextual differences between firms implementing ERP packages in Kenya and vendor firms which are mainly based in Europe and North America. Where such contextual differences between the package and the implementing organization exist,

it will be important to consider the source of the contextual differences and how the differences may affect the implementation and subsequently the use of the system (Orlikowski, 2000).

1.2 Problem Description

1.2.1 Background of the Problem

Globalization has made today's business more challenging with increasing competition, rising customer expectations, and expanding markets. This places pressure on companies to reduce cost across the supply chain, reduce inventory, improve logistics operations, expand product variety, improve delivery schedules, improve quality, and reduce material flow time. Companies have realized that these challenges can only be met and the necessary changes made when they share information among their suppliers, distributors, and customers. In order to remain competitive, organizations are increasingly developing collaboration and/or strategic partnerships with their suppliers to share common goal in the business. To accomplish these objectives, companies are increasingly adopting enterprise resource planning (ERP) systems. Implementing an ERP system often constitutes a company's largest Information Systems investment and in many cases the largest corporate project (Sumner, 2000). This is more so in businesses of developing countries where many of the operational, control and managerial systems have yet to be automated and where legacy systems are not as entrenched as in the businesses in the West. Hence, for many organizations ERP is an enormous investment.

Failure rates for ERP implementation projects are high. If an organization' core business systems have an infrastructure that is ill prepared for the changes necessary for ERP system success, an integration project will fail no matter what types of ERP software packages an organization decides to implement.

1.2.2 Statement of the Problem

None of the known local studies is known to have researched on the factors affecting the implementation of ERP in telecommunication firms in Kenya. It is in this light that the researcher aims at filling the existing academic gap through carrying out a survey on the factors affecting implementation if ERP software in telecommunication companies in Kenya, focusing on the case of Telkom.

1.3 Purpose of the Study

The purpose of the study was to investigate factors affecting the implementation of ERP by telecommunication firms in Kenya, a case of Telkom Kenya.

1.4 Objectives of the Study

The objectives of the study were to:

1. Determine how adoption process affects the implementation of ERP by Telkom.
2. Assess how finances affect the implementation of ERP by Telkom.
3. Examine how the technical aspect of ERP affects the implementation of ERP by Telkom.
4. Determine how the human resource affects the implementation of ERP by Telkom.

1.5 Research Questions

1. How does the adoption process of ERP affect the implementation of ERP by Telkom Kenya?
2. How do finances affect the implementation of ERP by Telkom Kenya?
3. How do technical aspects of ERP affect its implementation of ERP by Telkom Kenya?
4. How does the human resource affect the implementation of ERP by Telkom Kenya?

1.6 Significance of the Study

It has been noted by Alemayehu Molla et al that although ERP Systems are diffusing globally, there is little research on ERP reflecting the experiences in developing countries in general (Molla and Bhalla, 2006). A study in 2004 also found that there is no literature on ERP implementation experience in Kenya (Otieno & Aybesinghe, 2004)

Molla and Bhalla, (2006) further notes that some businesses in developing countries (especially those with strong linkage to multinationals) have already implemented or are in the process of implementing ERP. Although research has picked this trend, there has been comparatively little literature on the ERP experiences of companies in developing regions,

exceptions being studies such as Skok and Doringer (2001) and Tarafdar and Roy (2003). These previous studies were predominantly concerned with the investigations of drivers and facilitators, implementation problems and critical factors that influence ERP in Asia.

Muscatello & Parente found that ERP implementation failure rates are estimated to be as high as 50% (Muscatello & Parente 2006:61). Another study further asserts that 70 percent of ERP implementations fail to deliver anticipated benefits (Wang et al 2007).

On the basis of this background – the growing investment in, and potential of, ERP systems in developing countries combined with high rates of failure but relatively little literature on ERP experiences in developing countries (Molla and Bhalla 2006) – this study sets out in general terms to address the question of the factors affecting the implementation of ERP specifically in telecommunication firms in Kenya, by focusing on the experience of Telkom Kenya Limited.

The results of the study are valuable to the telecommunication industry in getting reliable insights on enterprise resource planning that they can employ to impact positively on the company performance. The study is useful to the Telkom Kenya management in that it provides an insight into the implementation of enterprise resource planning.

To the business community; the study will help business community in appreciating enterprise resource planning and the factors affecting its implementation in our local setting.

To academicians; the study will broaden the knowledge on enterprise resource planning and provide a basis to academicians for future research on enterprise resource planning. This will expand their knowledge on key factors that affect the implementation of ERP and hence identify areas of further empirical research.

1.7 Assumptions of the Study

The study assumed that the telecommunication companies in Kenya are implementing or are considering implementing enterprise resource planning software systems in their organizations. It further assumed that data given by the respondent was correct and accurate for this study; the study also assumed that the respondents have sufficient knowledge to answer the questionnaire correctly. In sampling, the assumption was made that the sample possesses the same characteristics as, and therefore represents the population.

1.8 Limitations of the Study

Mainly because of time and financial limitations the method used was descriptive research design. The study was carried out in only one firm for the same reasons. The researcher was the one financing this study. The variables in this case cannot be controlled by the researcher. The focus was on the telecommunication industry in Kenya results may not be accurately generalized to apply to all industries. The goal was to identify the variables and describe how they relate but not to establish causality or correlation between any two variables.

1.9 Delimitations of the Study

The scope of this study was limited to addressing the factors affecting the implementation of ERP by telecommunication firms in Kenya and specifically it looked at Telkom Kenya. Data was collected through a semi structured questionnaire which introduces some limitations. The respondents of the study were employees of Telkom Kenya working in Nairobi. The study employed a descriptive survey. The study only focused on one industry due to limitation of finance and time for data collection.

1.10 Definition of Significant Terms

Financial factors – is used in this study to refer to those factors related to the funding of the ERP project as well as the financial considerations and assumptions for the ERP project.

Adoption of ERP – Actions in preparation for, and adaptation to the requirements of implementing ERP. These include business process re-engineering, change management, staff awareness, etc

Technical factors – factors relating to technical aspects of the total ERP solution including the hardware, software, availability of technical support, the size and scope of the implementation,

Human resource factors – Factors relating to the capacity and attitude and reaction of the organization's personnel to the implementation of the ERP system.

Enterprise Resource Management (ERP) System - an integrated computer-based system used to manage internal and external resources including tangible assets, financial resources, materials, and human resources. The system here refers to the hardware, software and communication network interconnecting the computers.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The business environment world over has changed more in the last five years than it did over the last 50 years (Markus et al,2000). The key forces are customer, competition and change. The pace of change continues to accelerate and enterprises around the world seek to undergo business process reengineering (BPR), revitalize, reinvent and resize themselves in an effort to position for success in the twenty-first century. Business process re-engineering represents the radical transition that enterprises must make to keep pace with today's ever-changing global markets (Teltumbde, 2000). The winners of tomorrow will be those businesses that most effectively gather and act quickly upon crucial information. Making informed business decisions will enable enterprises to accomplish their business growth and enable them to utilize the information to competitive advantage. To make it possible for the enterprises to execute this vision, the need will be for an adequate infrastructure that provides information across the enterprise. The use of information technology (IT) facilitates the creation of integrated management information, and offers new possibilities for the enterprises (Teltumbde, 2000).

2.2 Evolution of Enterprise Resource Planning

Manufacturing enterprises involved in manufacturing, sales and distribution activities have been using computers for 30 years to improve productivity, profitability and information flow across the enterprise (Gupta, 2000). ERP system traces its roots commencing from standard inventory control packages to material requirements planning (MRP), and manufacturing resource planning (MRP II). An inventory control system was the software designed to handle traditional inventory processes. It was one of the early business applications, which did not belong to the finance and accounting area.

In the 1970s, the production-oriented information systems were known by the name MRP. At its core MRP is a time-phased order release system that schedules and releases manufacturing work orders and purchase orders, so that sub-assemblies and components arrive at the assembly station just as they are required. Some of the benefits of MRP are

reduction of inventories, improved customer service, enhanced efficiency and effectiveness (Siriginidi, 2000).

As competitive pressures increased and users became more sophisticated, MRP evolved and expanded to include more business functions such as product costing and marketing. In the early 1980s, MRP expanded from a material planning and control system to a company-wide system capable of planning virtually all the firm's resources. This expanded approach was MRPII. A major purpose of MRPII is to integrate primary functions (i.e. production, marketing and finance) and other functions such as personnel, engineering and purchasing into the planning process to improve the efficiency of the manufacturing enterprise (Chen, 2001). MRPII has certain extensions like rough cut capacity planning and capacity requirements planning for production scheduling on the shop floor as well as feedback from manufacturing shops on the progress of fabrication. Since the 1980s, the number of MRPII installations has continued to increase, as MRPII applications became available on mini and micro computers (Siriginidi, 2000).

Like MRP, MRPII focused on the manufacturing process. The next stage of MRPII evolution was just-in-time (JIT) methodology that combined with the plummeting price of computing to create the islands of automation in late 1980s. A key difference between MRPII and ERP is that while MRPII has traditionally focused on the planning and scheduling of internal resources, ERP strives to plan and schedule supplier resources as well, based on the dynamic customer demands and schedules (Chen, 2001). The maturity stage of ERP occurred in the mid-1990s. The scope offered by ERP expanded to include other "back-office" functions such as order management, financial management, warehousing, distribution production, quality control, asset management and human resources management. The evolution of extended-ERP systems has further expanded in recent years to include more "front-office" functions, such as sales force and marketing automation, electronic commerce and supply chain management systems. The scope of ERP implementation encompasses what is often referred to as the entire value chain of the enterprise, from prospect and customer management through order fulfillment and delivery. An enterprise, to stay competitive, has to not only identify information needs but also ensure that the information infrastructure provides the right support to serve the enterprise, its customers and suppliers. If it does not do so, then it runs the risk of being disconnected and excluded from future opportunities (Siriginidi, 2000).

The technological evolution of ERP from MRP has been presented in detail by Chen (2001) and Chung and Snyder (2000). Information system technology evolved from mainframe-based computing through the client/server era to the Internet era. Earlier the ERP systems were developed only to work with huge mainframe computers. Most of the current ERP systems are based on the client/server solution model (Rao, 2000). In a client/server environment, the server stores the data, maintaining their integrity and consistency and processes the requests of the user from the client desktops. The load of data processing and application logic is divided between the server and the client (Gupta, 2000). Now, ERP vendors are – as many other software vendors – forced to move from a traditional client/server to browser/Web server architecture in order to deliver e-business capabilities (Yen et al., 2002). These systems are built with a clear separation of functional components. The user interface implemented using graphical user interface (GUI) techniques is deployed on client machines. Powerful server machines host the databases and business logic written as server procedures. The databases are built using relational database technology. Relational database systems have enabled the vendors to put in the necessary flexibility in terms of business logic and data structures to support parallel business practice implementations. These technologies in general have allowed the users to architect the system in such a way that installation, customization and extensions are possible in shorter timeframes (Rao, 2000).

2.3 Enterprise Resource Planning Adoption

Total quality management (TQM) and business process re-engineering (BPR) movements are believed to be among the contributing factors to the heightened attention to the employment of IT in key business functions (Soliman and Youssef,, 1998). Several researchers point to the linkages between ERP and BPR, where the former is considered a driving technology of BPR. ERP systems are seen to be effective in tying the business functional units with the various organizational information systems and their associated databases, which in the end can support the strategic aims of modern organizations (Soliman 1998).

One of the major challenges in ERP adoption is flexibility assurance. Organizations will always need to integrate newly-acquired business functionalities into its data processing systems with the minimum time possible (Gupta, 2000). The flexibility of ERP systems refers to the extent to which an ERP system may be dynamically reconfigurable to

define new business models and processes (Stedman, 1999). However, one of the major drivers of implementing ERP systems is their competence of being designed based on best practices and their ability to standardize business processes and systems (Cooke and Peterson, 1998). Organizations view ERP-enabled standardization as a vital means to integrate dispersed organizational systems, provide a seamless access to information organization-wide, and make informed decisions on strategic and daily business matters (Österle et al., 2000). However, standardization in ERP context is without shortcomings. Several researchers point to the fact that standardization might be achieved at the cost of flexibility (Bancroft et al., 1998), which is another important business requirement for organizations to accommodate emerging changes in business processes and IT systems (Österle et al., 2000). However, it is at the ERP package selection phase that a balance between standardization and flexibility should be considered, based on a careful determination of industrial and organizational demands (Keller and Teufel, 1998). Attention to other important factors is also important to ensure a balanced implementation approach.

The adoption of ERP system in an organization requires intense efforts, focusing on both technological and business themes of implementation. Critical to the success of these efforts is the adequate organizational preparedness for embarking on ERP. The following list developed by Rao (2000) describes the major factors that have to be considered in the preparation stage of ERP implementation:

Infrastructure resources planning – making sure that adequate infrastructure is planned for in a way that it becomes reliably available well in time (both for the pre-implementation and the post- implementation stages). Local area network – ensuring network support for any ERP or other applications. Servers – deploying adequate server/network, even during the training/modeling phase. PCs – introducing new PCs with latest configuration that would be quite adequate for most ERPs. Training facilities – establishing adequate training center to work as competency center. Human resources planning – focusing on building a teamwork environment where team size spans across the entire organization. Education about ERP – ERP education should be carried out across the organization about ERP success and failure practices. Commitment to release the right people – ERP is recognized as a difficult but necessary project, and the best people must work full-time on the project. Top management's commitment – top management must

have a change mindset through learning at all levels: commitment to implement a version ensuring minimal customization and quick implementation; ability and willingness to consider an ongoing site as a Greenfield site; manual systems that are working reasonably well – carrying out audit exercise to find the current status and corresponding corrective actions. Top management must make the strategic decision on whether to execute a centralized or a decentralized implementation.

The keys to successful implementation of ERP are related to securing top management commitment, forming cross-functional task forces to link project management with business units, carrying out an assessment exercise of hardware requirements, making deployment in a step-by-step introduction rather than all at once, starting early planning on user training and support, streamlining decision making to move implementation quickly, and being patient as ERP implementation takes time Gupta (2000). Factors relating to top management support, assignment of best people to implementation teams, and strong involvement of people from the field are important in reducing the resistance to changes involved in ERP implementation Cissna (1998).

2.4 Technical Aspects of ERP

Several ERP issues related to the technical side of implementation have been noted Rao, (2000). One of these issues is related to the increasing use of the Internet, which has raised the biggest challenge facing ERP suppliers. This challenge relates mainly to the need of addressing the global access issues and deployment of information systems that would accommodate to intra-organization and extra-organization needs effectively. ERP systems need to stimulate these technologies to provide complete (best business practices), usable (highly productive) and adaptable (easily installed and maintained) application systems (Rao, 2000).

Pu and Chan, (1999) proposes an evaluation framework for the different IT architectural choices for ERP systems based on identifying the requirements of eight components relating to: network infrastructure, server operating systems (OS) platform, database, data ownership, client OS/workstations, Web enablement, prerequisite user skills, and IT capacity. In addressing the problem that many organizations face when attempting to keep up with the new versions of their already implemented ERP system, Pu Ng and Chan (1999) develop an economic model of ERP life-cycle cost to assist in determining the best

time to select an upgrade and the best time to complete its implementation. Muar et al (1999) illustrate a knowledge-based decision workbench tool to reduce the time and effort spent on integration and migration tasks in ERP implementation. This workbench helps the user to define appropriate strategies, decide architectural configurations, and select a software package and plan for the implementation project. Seethamraju (1999) suggests that future ERP systems will be developed based on components rather than modules and will be designed for incremental migration rather than massive reengineering. He also predicts that the focus will be on managing dynamic rather than static configuration, which, in turn, requires managing multiple sourcing and partnership relationships. Sato et al. (1999) put forward several areas for future research, including integrating ERP and other systems on the Internet, modeling the effects and outcomes of various customizing changes in ERP, developing an ERP-oriented approach to process modeling, and the application of ERP systems in home business domains. Gable et al. (1997) suggest researching whether ERP implementation requirements should be specified in the same way as for designing and developing a custom system.

2.5 Implementation of an ERP System

A tremendous effort has been made in discussing the implementations of ERP systems. Al-Mashari and Zairi (2000) proposed an integrative framework for SAP implementation. Their framework was based on the premise that effective deployment of SAP is greatly determined by the extent to which certain key elements such as the business case, implementation strategy, change management and BPR, are comprehensively considered and fully integrated. A more detailed case study focused on SAP implementation is available from Sieber et al., (2000).

The successful implementation of ERP system increases competitiveness by increasing quality, reducing redundancy, speeding up processes, reducing lead times and inventory levels and increasing customer satisfaction (Gupta, 2000). It has become increasingly clear that implementing an ERP system requires extensive efforts to transform the organization's processes. ERP systems are supposedly based on best practice generic business processes. Therefore, when purchasing an off-the-shelf ERP system, organizations obtain these practices and subsequently are pushed into the direction of implementing them (Kremers and van Dissel, 2000).

Another positive aspect is that smaller firms that are very dependent on large companies are going to be forced into ERP packages to stay compliant with larger organizations' ERP systems. Enterprise preparedness for embarking an ERP system has been discussed by Siriginidi (2000). For instance, infrastructure resource planning, education about ERP, human resource planning, top management's commitment, training facilities and commitment to release the right people are among the factors that should be considered before implementing an ERP package. Chen (2001) claimed that economic and strategic justifications for an ERP project prior to installation are very necessary, not only because of the enormous investments and risks involved; the justification process helps to identify all the potential benefits that can be accrued with ERP implementation, which later become yardsticks for performance evaluation. Reductionism and complex thinking in the realm of ERP implementations have been discussed by Wood and Caldas (2001).

Failures of ERP system implementation projects have been known to lead to organizational bankruptcy (Markus et al., 2000). A methodological framework for dealing with the complex problem of evaluating ERP projects has been proposed by Teltumbde (2000). A study of problems and outcomes in ERP projects has been conducted by Markus et al. (2000). Two basic research questions were addressed. First, how successful are companies at different points in time in their ERP experiences, and how are different measures of success related? Second, what problems do ERP adopters encounter as they implement and deploy ERP, and how are these problems related to outcomes (Markus et al,2000) developed a four-phase model of ERP implementation: chartering, project, shake-down and onwards and upwards. The findings showed that the success of ERP systems depends on when it is measured and that success at one point of time may only be loosely related to success at another point of time. Companies experience problems at all phases of the ERP system life cycle and many of the problems experienced in later phases originated earlier, but remained unnoticed or uncorrected.

Most ERP systems contain best practice models. Current studies have not focused on the knowledge transfer practices involved in an ERP implementation including the various types of knowledge transferred and factors affecting this transfer. There are different approaches to ERP strategy, ranging from skeleton implementations to full functionality. There are also important differences in how organisations manage the gap between their legacy systems and the ERP business processes. It appears easier to mould the

organization to the ERP software rather than vice versa. In the following section, various implementation techniques will be presented (Gupta, 2000).

2.6 Impact of ERP on Telecommunication Firms

Enterprise Resource Planning plays a vital role in improving coordination and information access across the enterprising units and allows more effective management of task interdependence. It increases speed of information flows (Davenport, 1998), It creates value through integration of activities, enforced adoption of best practice improves operations, standardization increases efficiency, and one integrated relational database as the single source of data increases accuracy, and ease of access (O'Leary, 2000).

The generic system capabilities and its impact on enterprises include: Transactional ability – it transforms unstructured processes into structured transactions; Geographical capabilities – it transfers information rapidly and with ease across large distances, thus making the processes independent of geography; Automation capabilities – it replaces or reduces human labor in processes; Analytical capabilities – it introduces complex analytical methods to enlarge the scope of analysis; Informational capabilities – it brings vast amount of detailed information into the process; Sequential capabilities – enables changes in the sequence of tasks in a process, often allowing multiple tasks to be performed concurrently; Knowledge management capabilities – it allows collection, dissemination of knowledge and expertise to improve the process; Tracking – allows detailed tracking of task status, inputs and outputs; and Disintermediation capabilities – it connects two parties, internal or external within a process that would otherwise communicate through intermediaries (Wood and Caldas , 2001).

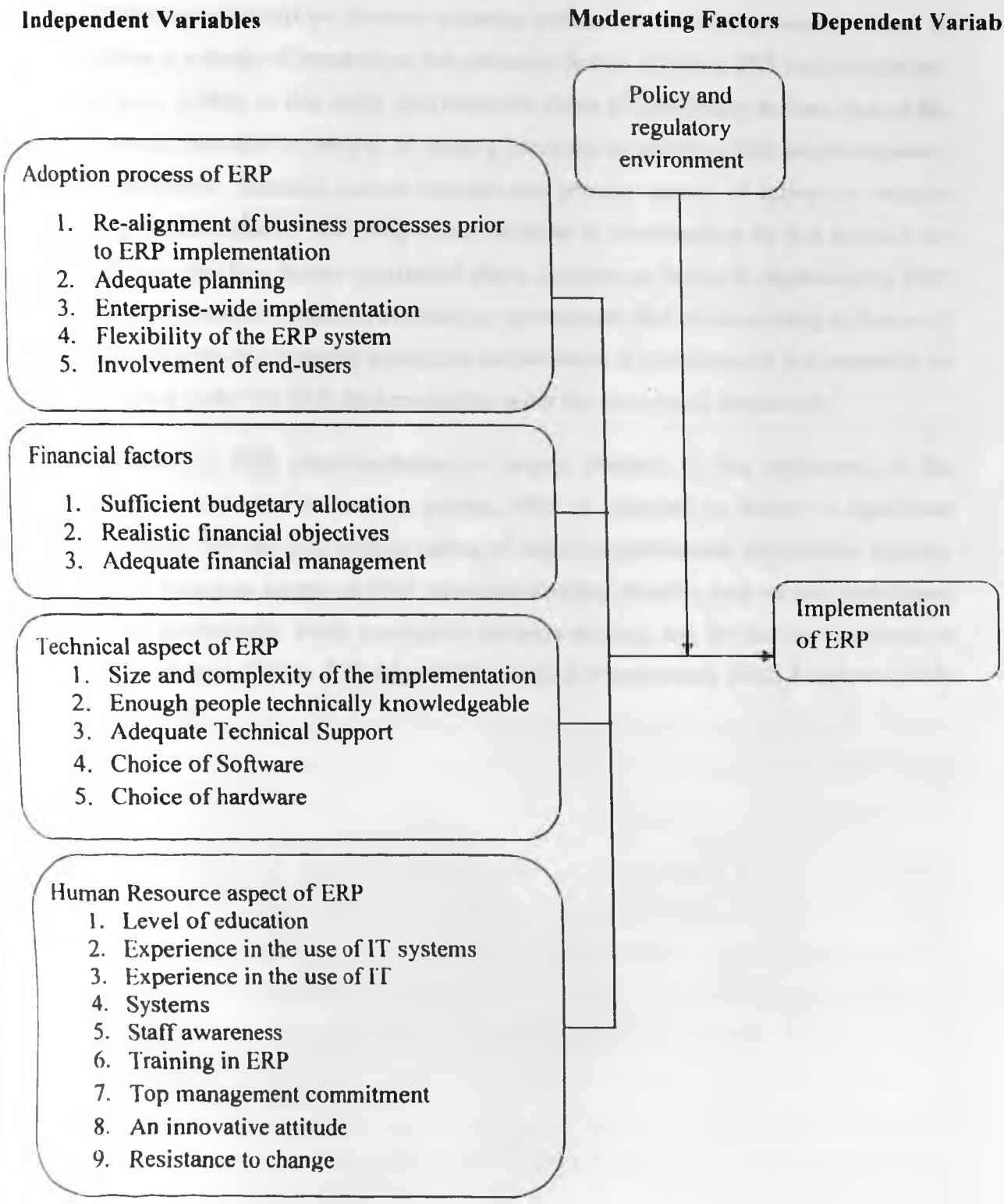
2.7 Benefits of ERP

Supply-chain capabilities of ERP increase efficiency and productivity for their users. By linking supply-chain applications with other business systems, users can slash cycle times and reduce inventory. They can also reach beyond their own corporate walls to better connect with suppliers, distributors, and end customers (Chen, 2001). ERP also helps in cross-enterprise application integration. This is where companies link their ERP systems directly to the disparate applications of their suppliers and customers. The overall benefit is to be able to share information with customers and suppliers (see the following list). For example, big suppliers are letting their customers dial into their systems and

extract select information. Accessing and delivering information in real time helps companies to better react to customers' needs (Wood and Caldas, 2001). The incidences of stock-outs are also found to be significantly reduced and even such incidences are largely due to extraneous delays, rather than planning inaccuracies. In the manufacturing sector, ERP implementation has reduced inventories anywhere.

The advantages include: ease of use; integration of all functions already established; suppliers and customers can be online communications; customization is an option; improved decision making due to availability of timely and appropriate information; improved process times; feasibility of administering control on the operations; Internet interface is an option and reduces planning inaccuracies (Wood and Caldas, 2001).

Figure 2.1: Conceptual Framework



Theoretical Framework

While the existing literature points to a considerable risk of failure in the implementation of enterprise resource planning systems in developing countries, there is nonetheless a scarcity of research on the particular factors affecting ERP implementation. Molla et al., (2006). In this study the researcher chose to specifically explore four of the main factors identified in review of existing literature as affecting ERP implementation, namely technical, financial, human resource and process aspects of enterprise resource planning implementation. The independent variables in consideration for this research are derived from the four factors mentioned above. Success or failure in implementing ERP will be the dependent variable. An enabling environment like the zero-rating in Kenya of value added taxes on computer equipment and software is considered by the researcher as a moderating factor for ERP implementation under this conceptual framework.

Success in ERP implementation is largely defined by the objectives of the organization deploying it, but in general, ERP is intended to deliver a significant improvement over the non-holistic nature of earlier organizational information systems. There are therefore reports of ERP systems providing benefits such as cost reductions, improved productivity, better managerial decision-making, and facilitation of process or structural change (Shang & Seddon 2000; Barki & Pinsonneault 2002; Kamhawi 2008; Federici 2009).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides the methodology of the study. It gives the specific procedures that were followed in undertaking the study. The research design, population, sampling design, data collection methods and data analysis are described in this chapter.

3.2 Research Design

A descriptive survey design was adopted for this study since it allows analysis of information systems phenomena in depth, providing the richness of description and understanding necessary to properly analyze ERP implementation (Darke et al., 1998).

The primary data-gathering was undertaken in July 2010. The research instrument was a self administrated questionnaire with open and closed-ended questions. Good case study research requires triangulation (Atkins & Sampson 2002). Here, the researcher utilized two different types of triangulation. First, triangulation of methods that combine analysis of observation by sitting with different staff to see their use (or non-use) of the ERP system, and a set of unstructured interviews. Second, triangulation of sources, with the interviews conducted with three different groups: two ERP experts who served as internal consultants, two senior internal managers associated with the ERP project, and four company employees at both management and lower levels who were ERP system users.

Descriptive a survey was employed in this study. The major purpose of descriptive research design is to describe the state of affairs as it is at present according to Magenta et al (1999). Descriptive survey is a process of collecting data in order to answer questions concerning the current status of the subjects in the study. The primary use of descriptive statistics is to describe information or data through the use of numbers (create number of pictures of the information). The characteristics of groups of numbers representing information or data are called descriptive statistics (Kay, 1997). According to Mugenda et al, (1999) this type of research attempts to describe such things as possible behavior, attitudes, values and characteristics.

The descriptive survey method matched with the purpose of this study, as its intention was to investigate the factors affecting the implementation of ERP software by Telkom

Kenya. The advantage or the purpose of using descriptive research design in this study was to ensure the in depth description of the state of affairs.

3.3 Target Population

The target population of the study consisted of a sample of the employees of Telkom Kenya working at their head office and departments in Nairobi. Out of the total population of 800 employees working in and around Nairobi, this study targeted 354 staff working in the Nairobi offices situated in Orange House, Telposta Towers and Extelcom House.

3.4 Sample Selection and Sample Size

The numbers of employees working with Telkom Kenya at their head office in Nairobi was obtained from the human resources department. Telkom Kenya had total of 354 employees working at their head office departments in Nairobi City.

3.4.1 Sampling Technique

Telkom has at least six major departments from which samples were selected as shown:

Sample	Total Number	Computation	Sample size
Marketing	111	$\frac{88}{354} \times 111$	29
Finance	56	$\frac{88}{354} \times 56$	15
IT and Networks	123	$\frac{88}{354} \times 123$	32
HQ and Administration	64	$\frac{88}{354} \times 64$	12
Total	**354**		**88**

3.4.2 Sample Size

The sample size of this study was 88 respondents who were used by this study. These employees were senior, middle level and junior employees in each department. They were deemed to have the relevant knowledge the researcher was be seeking. According to Mugenda et al. (2003), a representative sample is one that is at least 10%-20% of the population. This was 25% of the entire population.

3.5 Research Instruments

3.5.1 Pilot

Copies of the same questionnaires were distributed to the staff members in the each department. The questionnaire was subjected to a pilot application and improved using the response and advice of the volunteers as well as advice from the research Supervisor The questionnaire was partly structured, the scores were spread evenly and the questions were at a low difficulty level in order to enhance reliability of the research instrument (Isaac et al., 1990).

3.5.2 Validity

An instrument is said to be valid to the degree that it measures what it claims to measure. Validity is actually the degree to which a test or an instrument actually measures the variable it claims to measure (Kathuri & Pals 1993). The research instrument in this case is a self-administered semi-structured questionnaire targeting a population sample that is knowledgeable regarding the subject of the survey.

3.5.3 Reliability

The following formula was used to get the coefficient that is the reliability estimate.

$$r_{xx^1} = \frac{S_1^2}{S_x^2}$$ Where:

x = Performance on the first measurement

x^1 = Performance on the 2nd measurement

r_{xx^1} = Correlation coefficient between x and x^1

S_1^2 = Estimated variance of the true score

S_x^2 = Calculated variance of the observed scores

r_{xx^1} = ?

$S_1^2 = 0.192$

$S_x^2 = 0.232$

$r_{xx'} = \frac{0.192}{0.232}$

$r_{xx'} = 0.83$

From the calculation, the coefficient was 0.83 which is closer to 1 thus making the instruments reliable.

3.8 Data Collection Method

Primary data was collected using a structured questionnaire distributed to the target employees in Telkom Kenya. The study used questionnaires primarily due to their practicability and applicability to the research problem. The questionnaire contained a mix of open-ended and closed-ended questions. The respondents were given options of checking several boxes and questions in which respondents gave their views in their own words. The structure of the questionnaire was derived from the research questions. The questionnaire was divided into five sections each covering each of the specific study objectives. In order to ensure a high return rate the researcher used hand-delivery of the questionnaire to the various departments, directly appealing to the respondents or their supervisors. The questionnaires were collected personally by the researcher. A response rate of 90.9% was achieved.

3.9 Data Analysis Techniques

For data collected to be meaningful, it was analyzed in a way that it is easy to understand. This included analysis of data to summarize the essential features and relationships of data in order to generalise from the analysis to determine patterns of behaviour and particular outcomes. Before processing the responses, the completed questionnaires were edited for completeness and consistency. The researcher used qualitative and quantitative technique in analyzing the data. A content analysis and

descriptive analysis were employed; this included mean, standard deviation, frequencies and percentages. The organised data was interpreted on account of concurrence and standard deviation to objectives using assistance of computer packages especially SPSS to communicate research findings. Tables and charts were used for data presentation.

3.10 Operational Definition of Variables

Table 3.1: Operational definition of variables

Objective	Research Question	Variable	Measurement	Scale
Effects of the adoption process on the implementation of ERP	Does the adoption process affect the implementation of ERP?	Adoption process	Ordinal	Measure of central tendency
Effects of finance on the implementation of ERP	Do finances affect the implementation of ERP?	Finances	Ordinal	Measure of central tendency
Effects of technical aspects on the implementation of ERP	Do technical aspects affect the implementation of ERP/?	Technical aspects	Ordinal	Measure of central tendency
Effects of human resources on the implementation of ERP	Do human resources affect the implementation of ERP?	Human resources	Ordinal	Measure of central tendency

3.11 Ethical Issues

The target company was informed of the nature of the research and assurances were given that all information would be treated with confidentiality permission obtained to carry out the research.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND PRESENTATION

4.1 Introduction

This chapter presents the data analysis, interpretation and presentation thereof on the study to investigate factors affecting the implementation of ERP by telecommunication firms in Kenya; the case of Telkom Kenya Limited. The study had targeted 88 respondents out of which 80 respondents filled and returned their questionnaire constituting 90.9% response rate. Data analysis was done through Statistical Package for Social Scientists (SPSS). Frequencies, percentages and mean were used to display the results which were presented in tables, charts and graphs.

4.2 Analysis of general information

The study sought to establish the respondent department, from the findings the study found that most of the respondents were from finance department, headquarters administration department, information technology department and sales and marketing department. This information gives credibility to the data collected as the same departments are the main ones involved in the enterprise resource planning system which this study seeks to investigate.

On the designation of the respondents the study revealed that the respondents were managers, heads of departments, clerks, marketing officers, human resource managers, staff, IT managers and IT technicians. This shows that most of the respondents were from the departments targeted by the study. The respondents' total work experiences in the company ranged from 5 to 26 years which is good time for one to clearly understand the company. This information shows that the respondents were well versed with the company's systems and therefore they could give credible information to the study.

Interviews with senior staff who were involved in the implementation of an enterprise resource planning system for Telkom revealed that the company implemented an ERP system between 2006 and 2008. The interviews further showed that Telkom Kenya built their own ERP system which marks a notable departure from the findings of Otieno and Abeysinghe (2004) that 100% of the ERP software packages deployed in Kenya were

sourced from Western Europe or North America. Telkom, taking advantage of its wealth of skilled technical human resource, formed a team that included software developers, web developers, systems and network engineers, business systems experts, and built a phased and modular ERP system which has served the company through its critical restructuring process over the last 4 years. The Telkom ERP system is based on the Microsoft .Net source code.

Table 4.2: Distribution of Respondents by age

Age (years)	Population	Percentage
Below 30	18	20
30-39	37	42.5
40-49	20	22.5
Above 50	13	15
Total	88	100

The study sought to find out the respondents' age category and therefore requested the respondents to indicate their age category. The study found that most of the respondents as shown by 42.5% were aged between 31 to 49 years, 22.5% were aged between 40 to 49 years, 20% were aged below 20 years and 15% were aged above 50 years of age.

Table 4.3: Distribution of respondent by level of education

Educational Level	Population	Percentage
Tertiary College	14	17.5
University Graduate	56	70
Post Graduate	10	12.5
Total	80	100

On the respondents' highest level of education, the study found that most of the respondents as shown by 70% were university graduates, 12.5% of the respondents were

holders of university post-graduate degrees and 17.5% had tertiary college as their highest level of education. This information shows that Telkom Kenya was being manned by well educated staff and who were in a position to understand enterprise resource planning system. The study further revealed that total number of employees in Telkom Kenya was above 100 employees.

4.3 Enterprise Resource Planning Adoption Process

On whether the company has implemented and adopted an enterprise resource planning system, the revealed that Telkom Kenya had adopted enterprise resource planning system as shown by 100% of the respondents who had indicated that their company had adopted enterprise resource planning system.

Table 4.4: Extent to which adoption process affects implementation of ERP

	Frequency	Percentage
Very great extent	23	28.8
Great extent	48	60.0
Moderate extent	9	11.2
Total	80	100.0

The study sought to know the extent to which the adoption process of ERP affected the implementation ERP software by Telkom Kenya. From the findings in the table the study found that most of the respondents as shown by 60% of the respondents indicated that adoption process affected implementation of ERP to a "great extent", 28.8% indicated "to very great extent", whereas 11.2% indicated to a moderate extent. The above information shows that the adoption process affected the implementation of ERP to a great extent.

Table 4.5: Extent to which various factors affects implementation

	Very Great Extent	Great extent	Moderate extent	Les extent	Not at all	Mean
Re-alignment of business processes before implementation (in order to be compatible with ERP. E.g. business process engineering)	25	40	10	4	1	1.9500
Adequate planning with regard to the solution selection and implementation process	61	10	6	3	0	1.1333
Enterprise wide implementation of the ERP in the organization	50	25	3	0	2	1.4167
Sufficient flexibility of ERP system to allow reconfiguration to define new business models and processes	50	25	3	0	2	1.4167
Involvement of end-users throughout the process right from the planning stage of the ERP to implementation	60	11	9	0	0	1.2333
The company change management capability	20	41	13	3	1	2.3667
The company project management capability	18	31	28	2	1	2.2667

The finding in the table shows the extent to which various adoption related factors affected the implementation of ERP software the study found that most of the respondents rated the following to very great extent as affecting the implementation of ERP software. They include; Adequate planning with regard to the solution selection and implementation process as shown by a mean of 1.1333. Involvement of end-users throughout the process right from the planning stage of the ERP to implementation as shown by mean of 1.2333. Sufficient flexibility of the ERP system to allow reconfiguration in order to define new business models and processes, and Enterprise-wide implementation of the ERP in the organization as shown by mean of 1.4167 in each case. Those rated to a great extent are re-alignment of business processes before implementation (in order to be compatible with ERP. e.g. business process engineering) as shown by mean of 1.95, the company project management capability as shown by mean of 2.2667 and company change management

capability as indicated by mean of 2.3667. This information shows that adoption related factors affect the implementation of ERP to a great extent.

4.4 Financial Factors

The study revealed that financial factors affected the implementation ERP software by Telkom Kenya as shown by 100% of the respondent who indicated yes to the question. This shows that financial factor affects the implementation of ERP software by Telkom Kenya.

Table 4.6: Extent to which financial factors affect implementation of ERP software

	Very Great Extent	Great extent	Moderate extent	Les extent	Not at all	Mean
Sufficient budgetary allocation for the implementation of ERP	67	10	0	3	0	1.0667
Appropriate financial objectives	60	15	3	2	0	1.1833
Adequate financial management	60	11	9	0	0	1.3000

In regard to rating the extent to which various financial factors affect the implementation of ERP software by Telkom Kenya, the study found that most of the respondents rated the following "to very great extent". They include, "sufficient budgetary allocation for the implementation of ERP" as shown by mean of 1.1833 and "appropriate financial objectives" as indicated by mean of 1.3. This information shows that financial factors affect the implementation of ERP software to a very great extent.

4.5 Effects of Human Resources

Table 4.7: Effects of human resources on the adoption of ERP

	Frequency	Percent
Yes	73	91.3
No	7	8.7
Total	80	100.0

The study sought to established whether human resource of Telkom affect the implementation of ERP software by Telkom, from the findings the study found that the majority of the respondents as shown by 91.3% indicated that human resources affected the implementation of ERP while 8.7% were of the opinion that human resource doesn't affect the adoption of ERP, this information shows that human resources affects the implementation of ERP software at Telkom Kenya. The study further revealed that employees affect the adoption of ERP software by Telkom Kenya through resistance to change, they must understand the working of the programs, there is need to educate them on the importance of ERP and ERP must be user-friendly for employees to readily accept it. The study further revealed that employee-related factors affect the implementation of an ERP system by Telkom Kenya to a "great extent" as indicated by 100% of the respondent.

Table 4.8: Employees Resistance to Change

	Frequency	Percentage
Yes	48	60.0
No	32	40.0
Total	80	100.0

On whether there was resistance to change by employee on the adoption of ERP the study revealed that majority of the respondent as shown by 60% indicated that there was resistance to change while 40% of the respondent believed that there was no resistance to

change. This shows that there was resistance to change by employees during the adoption of ERP software at Telkom Kenya.

Table 4.9: Rating effects of human resource related factors

Human resource factor	Mean
Level of education	1.1500
Experience in the use of IT systems	1.1333
Awareness	1.9833
Training in the functions features and capabilities of the ERP system	1.2000
Top management commitment to the project	1.0167
An innovative attitude	2.0833
Resistance to change	1.1000

In regard to the effects of various human resource related factors and the extent to which they affected implementation the study found that most of the respondents rated the following "to very great extent" , top management commitment to the project as shown by mean of 1.0167, resistance to change as indicated by mean of 1.1, experience in the use of IT systems as shown by mean of 1.1333, level of education as shown by mean of 1.15 and training in the functions features and capabilities of the ERP system as shown by mean of 1.2. Those rated as affecting implementation of ERP rated "to a great extent" were awareness. As shown by a mean of 1.9833 and an innovative attitude as shown by mean of 2.0833. This information shows that human resources related factors had effects on the implementation of ERP software by Telkom Kenya.

4.6 Effects of the Technical Aspect of ERP Software

The study established that the technical aspect of ERP software affected the implementation of ERP software as indicated by 100% of the respondent. The was through complexity of the software, the software being user friendly, availability of technical support, software choice, the type of hardware used by Telkom and the technical training available. The study further revealed that Telkom Kenya had enough experts to handle the

implementation of ERP software as indicated by 100% of the respondents who indicated "yes".

Table 4.10: Extent to which technical aspects of ERP affect its implementation

Technical Aspect	Mean
Size and complexity of the implementation	1.3407
Enough people technically knowledgeable in computer programming	1.2857
Proper Technical Support	1.5824
Choice of Software	1.4835
Choice of hardware	1.7033

The study sought to established the extent to which various technical aspects of ERP affects the implementation of ERP, from the finding the study found that most of the respondent the following to very great extent, enough staff technically knowledgeable in computer programming as shown by 1.2857, size and complexity of the implementation as indicated by mean of 1.3407 and choice of software as shown by mean of 1.4835. Those rated to great extent were: proper technical support as shown by mean of 1.5824 and choice of hardware as indicated by mean of 1.7033. This information shows that technical related factors had great effects on the implementation of ERP by Telkom Kenya.

Table 4.11: Rating the extent to which various factors affects the implementation of ERP

Factors	Mean
Financial factors	1.1167
Technical aspect of ERP software	1.3833
Employee factors	1.2833
Industrial regulations	1.2167
Adoption process of ERP software	1.3500

Regarding rating the extent to which various factors affects the implementation of ERP programs the study found that the respondents rated the following "to very great

extent": financial factors as shown by mean of 1.1167, industrial regulations as shown by mean of 1.2167, adoption process of ERP software as shown by mean of 1.3500 and Technical aspect of ERP software as indicate by mean of 1.3833.

4.7 Correlations

Table 4.12: Correlations

		Implementation of ERP	Adoption process of ERP	Financial factors	Technical aspect of ERP	Human Resource aspect of ERP
Implementation of ERP	Pearson Correlation	1	0.214(**)	.046	.999(**)	.999(**)
	Sig. (2-tailed)		.001	.750	.000	.000
Adoption process of ERP	Pearson Correlation	0.214(**)	1	.168	-.202	-.207
	Sig. (2-tailed)	.001		.229	.146	.137
Financial factors	Pearson Correlation	.046	.168	1	.060	.034
	Sig. (2-tailed)	.750	.229		.669	.807
Technical aspect of ERP	Pearson Correlation	.999(**)	-.202	.060	1	.998(**)
	Sig. (2-tailed)	.000	.146	.669		.000
Human Resource aspect of ERP	Pearson Correlation	.999(**)	-.207	.034	.998(**)	1
	Sig. (2-tailed)	.000	.137	.807	.000	

** Correlation is significant at the 0.01 level (2-tailed).

From the above table 4.10, the study shows that Implementation of ERP has a strong positive correlation with Technical aspect of ERP and Human Resource aspect of ERP as shown by correction factor of 0.999. Implementation of ERP has a positive correlation with Adoption process of ERP as shown by correlation factor of 0.246 and financial factors as shown by factor of 0.046. This implies that the that technical aspect of ERP and Human Resource aspect of ERP has great impact on implementation of ERP while Adoption process of ERP and Financial factors has slight effect on implementation of ERP.

The other analysis of other variables also shows a strong positive correlation amongst themselves. This implies that they are important variables not only to implementation of ERP but also to each other except where the coefficient is negative or weak positive where on the data it lies between 0.025 and 0.060.

It is noted that there existed a very strong and positive correlation between Implementation of ERP has a strong positive correlation with Technical aspect of ERP and Human Resource aspect of ERP. The mentioned variables had correlation coefficients of above 0.999 and P- Values of less than 0.005.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

From the analysis of data collected, the following discussions, conclusions and recommendations were made. The responses were based on the objectives of the study which was to determine how adoption process affects the implementation of ERP by Telkom, assess how finances affect the implementation of ERP by Telkom, examine how the technical aspect of ERP affects the implementation of ERP by Telkom and Determine how the human resource affects the implementation of ERP by Telkom.

5.2 Summary of findings

The following is a highlight of the major findings of this study based on the specific objectives. The first major finding of the study was related to the effects of adoption process on the implementation of ERP by Telkom. The study revealed that Telkom Kenya had adopted enterprise resource planning system as shown by 100% of the respondent who had indicated that their company had adopted enterprise resource planning system.

The second major finding was related to identify how finances affect the implementation of ERP by Telkom. The study revealed that financial factors affected the implementation ERP software by Telkom Kenya as shown by 100% of the respondent who indicated yes to the question. This shows that financial factor affects the implementation of ERP software by Telkom Kenya.

The third major finding was related to examining how the technical aspect of ERP affects the implementation of ERP by Telkom. The study established that the technical aspect of ERP software affected the implementation of ERP software as indicated by 100% of the respondent, this was through complexity of the software , the software being user friendly , availability of technical support , software choice, the type of hardware posed by Telkom and the technical training available.

The fourth major finding was related to examine how human resource affects the implementation of ERP by Telkom. The study established that majority of the respondent

as shown by 91.3% indicated that human resources affected the implementation of ERP while 8.7% were of the opinion that human resource doesn't affect the adoption of ERP, this information shows that human resources affects the implementation of ERP software at Telkom Kenya.

5.3 Discussion

5.3.1 Adoption Process

From the findings the study found that Telkom Kenya had adopted enterprise resource planning system as shown by 100% of the respondent who had indicated that their company had adopted enterprise resource planning system.

The study sought to know the extent to which adoption related factors affected the implementation ERP software by Telkom Kenya. From the findings in the table the study found that adoption process affected implementation of ERP to a great extent.

On the extent to which various adoption related factors affected the implementation of ERP software , the study found that most of the respondents rated the following to "very great extent" as affecting the implementation of ERPP software they include; adequate planning with regard to the solution selection and implementation process, involvement of end-users throughout the process right from the planning stage of the ERP to implementation, sufficient flexibility of the ERP system to allow reconfiguration in order to define new business models and processes and enterprise wide implementation of the ERP in the organization. Those rated "to a great extent" are re-alignment of business processes before implementation (in order to be compatible with ERP, e.g. business process engineering), the company project management capability and the company change management capability. The flexibility of ERP systems refers to the extent to which an ERP system may be dynamically reconfigurable to define new business models and processes (Stedman, 1999). However, one of the major drivers of implementing ERP systems is their competence of being designed based on best practices and their ability to standardize business processes and systems (Cooke and Peterson, 1998). The adoption of ERP system in an organization requires intense efforts, focusing on both technological and business themes of implementation. Critical to the success of these efforts is the adequate organizational preparedness for embarking on ERP.

5.3.2 Financial Factors

From the findings the study revealed that financial factors affected the implementation ERP software by Telkom Kenya as shown by 100% of the respondent who indicated yes to the question. In regard to rating the extent to which various financial factors affects the implementation of ERP software by Telkom Kenya, the study found that most of the respondent rated the following "to a very great extent". They include sufficient budgetary allocation for the implementation of ERP and appropriate financial objectives. This information shows that financial factors affect the implementation of ERP software to very great extent.

5.3.3 Effects of Human Resources

On the Effects of human resources on the adoption of ERP, the study found human resources affected the implementation of ERP. The study further revealed that employee affects the adoption of ERP software by Telkom Kenya through resistance to change, they must understand the working of the programs, there is need to educate them on the importance of ERP and ERP must be user-friendly for employees to easily accept it. The study further revealed that employee-related factors affect the implementation of ERP software by Telkom Kenya to a great extent.

On the resistance to change by employee on the adoption of ERP the study revealed that there was some resistance to change while 40% of the respondent believed that there was no resistance to change. This shows that there was resistance to change by employee during the adoption of ERP software at Telkom Kenya. In regard to the effects of various human resource related factors and the extent to which they affected implementation the study found that most of the respondent related the following "to very great extent": top management commitment to the project; resistance to change; experience in the use of IT systems; the level of education; and training in the functions, features and capabilities of the ERP system. Those affecting implementation of ERP to great extent are awareness, and an innovative attitude.

5.3.4 Effects of the Technical Aspects

The study established that the technical aspect of ERP software affected the implementation of ERP software as indicated by 100% of the respondent. This was through complexity of the software, the software being user friendly, availability of technical support, software choice, the type of hardware used by Telkom, and the technical

training available. The study further revealed that Telkom Kenya had enough experts to handle the implementation of ERP software.

On the extent to which various technical aspect of ERP affects the implementation of ERP, from the findings the study found that most of the respondents rated the following "to very great extent": enough people technically knowledgeable in computer programming; the size and complexity of the implementation; and choice of software. Those rated "to a great extent" were: proper technical support; and choice of hardware. On rating the extent to which various factors affect the implementation of ERP programs the study found that the respondents rated the following "to very great extent": financial factors, industrial regulations, adoption process of ERP software and technical aspect of ERP software.

5.4 Conclusion

From the findings the study it may be concluded that ERP adoption process affected the implementation of Enterprise Resource Planning software. The study further revealed that adoption related factors affected the implementation ERP software at Telkom Kenya to a great extent.

The study further revealed that financial factors affected the implementation ERP software by Telkom Kenya. In regard to rating the extent to which various financial factors affects the implementation of ERP software by Telkom Kenya, the study found that most of the respondents rated the following "to very great extent": sufficient budgetary allocation for the implementation of ERP and appropriate financial objectives. This information shows that financial factors affect the implementation of ERP software to very great extent.

The study also shows that human resource related factors affected the adoption of ERP to great extent, these effects were through resistance to change, the need to understand the working of the programs, there is also need to educate the staff on the importance of ERP and ERP must be user friendly for employees to readily accept it.

The study shows that technical aspects of ERP affected the implementation of ERP systems. This is through complexity of the software, the software being user friendly, availability of technical support, software choice, the choice of hardware deployed by

Telkom and the technical training available. The study further revealed that Telkom Kenya had enough experts to handle the implementation of ERP software.

5.5 New Knowledge

Contrary to the view that 100% of ERP were made in Western Europe or North America the study revealed that Telkom Kenya developed and deployed their own ERP software successfully. The ERP system has been in use since 2006. This has avoided the challenges of customization and culture conflict

5.6 Recommendation

From the findings, conclusions the study the researcher recommends that, should Telkom choose to implement a new ERP system, or implement any additions or changes to its ERP system, the company should put in place clear adoption process prior to the project so as to reduce the effects of the adoption process.

The study recommends that there should be adequate budgetary allocation on the ERP implementation process so as to reduce the effect of finance on the implementation of ERP systems.

The study further recommends that there should be adequate awareness, training and involvement of employee of the benefit and usage of ERP so as to reduce employee resistance to the implementation of ERP systems.

The study recommends that there should be enough technical support personnel, carefully considered choice of software and hardware, so as to reduce the effects of the technical aspect of ERP systems.

5.7 Generalizations

It may be generalized that there is capacity and resources in Kenya to develop ERP systems with the capacity to serve a major telecommunication company, then it follows that small to medium enterprises need not chose the option of buying expensive "off-the-shelf" ERPs which are generic and require great amounts of customization which sometimes does not end up making a optimal fit for the company's requirements

5.8 Further Research

There is little research into the Kenyan experience with regard to implementation of ERP. The findings of this study may inform further inquiry in the form of causal relationships between the various factors and either success or failure of ERP implementation projects in Kenya but also in developing countries in General

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APPENDICES

Appendix 1: Research Questionnaire

Part A: Respondents General Information

1 Respondents department:

_____

2. What is your designation?

_____

3. What is your total work experience in years?

_____

4. What is your length of time in the Company?

_____

5. Age category of the respondents

a. Below 30 years [ ]
b. 31 – 40 years [ ]
c. 40 – 49 years [ ]
d. 50 and above [ ]

6. Highest level of education attained

a. Tertiary college [ ]
b. University graduate [ ]
c. University postgraduate [ ]
d. Other (specify) _____

7. What is the total number of employees in your Company: Please tick one

Less than 50 [ ]
50 – 100 [ ]
Above 100 [ ]

Part B: ERP Adoption Process

8. Has your company implemented and adopted an enterprise resource planning system?

Yes [ ] No [ ]

9. If yes which are the factors that affected the implementation of ERP software by Telkom Kenya?

.....

.....

10. To what extent does the adoption process affects the implementation of ERP software by Telkom Kenya?

Very great extent [ ] great extent [ ] moderate extent [ ] less extent [ ] no extent [ ]

11. To what extent do the factors related to process affect implementation of ERP software? Choose the most appropriate rating for each on a scale of 1 to 5 (below)

Factors	Rating				
	1	2	3	4	5
Re-alignment of business processes prior to implementation (in order to be compatible with ERP, e.g. business process re-engineering)					
Adequate planning with regard to the selection of the ERP solution and implementation process					
Enterprise-wide implementation of the ERP in the organization					
Sufficient flexibility of the ERP system to allow reconfiguration to enable defining of new business models and processes					
Involvement of end-users throughout the process right from the planning stage of the ERP to implementation					
The company's change management capability					
The company's project management capability					

1=Very great extent; 2=great extent; 3= moderate extent; 4=less extent; 5= no extent at all

Part C: Effects of Finance

12. Do financial factors affect the implementation of ERP software by Telkom?

Yes [ ] No [ ]

13. To what extent do the financial factors affects the implementation of ERP software by Telkom Kenya?

Very great extent [ ] great extent [ ] moderate extent [ ] less extent [ ] no extent [ ]

14. To what extent do the following financial factors that affect implementation of ERP software by Telkom Kenya?

Factors	Rating				
	1	2	3	4	5
Sufficient budgetary allocation for the implementation of ERP					
Realistic financial objectives					
Adequate financial management					

1=Very great extent; 2=great extent; 3= moderate extent; 4=less extent; 5= no extent at all

Part d: Effects of the human resource

15. Does the human resource of Telkom affect the adoption of ERP software by Telkom Kenya?

Yes [ ] No [ ]

16. If yes how do employees affect the adoption of ERP software by Telkom Kenya?

.....

.....

.....

.....

17. To what extent does the employee affect the implementation of ERP software by Telkom Kenya?

Very great extent [ ] great extent [ ] moderate extent [ ] less extent [ ] no extent [ ]

18. Are/were there employee resistant to the adoption of ERP software by Telkom Kenya?

Yes [ ] No [ ]

19. To what extent does the human resource affect the adoption of ERP software by Telkom Kenya?

Factors	Rating				
	1	2	3	4	5
Level of education					
Experience in the use of IT systems					
Awareness					
Training in the functions features and capabilities of the ERP system					
Top management commitment to the project					
An innovative attitude					
Resistance to change					

1=Very great extent; 2=great extent; 3= moderate extent; 4=less extent; 5= no extent at all

Part E: Effects of the technical aspect of ERP software

20. Does the technical aspects of ERP software affects it implementation?

Yes [ ] No [ ]

21. If yes how do the technical aspects of ERP software affect its implementation by Telkom Kenya?

.....

.....

.....

22. Does Telkom Kenya have enough experts to handle the implementation of ERP software?

Yes [ ] No [ ]

23. To what extent do the technical aspects of ERP affect its implementation? Please rate it on a scale of 1 – 5 on the table provided below

Factors	Rating				
	1	2	3	4	5
Size and complexity of the implementation					
Enough people technically knowledgeable in computer programming					
Adequate Technical Support					
Choice of Software					
Choice of hardware					

1=Very great extent; 2=great extent; 3= moderate extent; 4=less extent; 5= no extent at all

24. To what extent do the financial factors listed below affect the implementation of ERP software by Telkom Kenya?

Factors	Rating				
	1	2	3	4	5
Financial factors					
Technical aspect of ERP software					
Employee factors					
Adoption process of ERP software					
Others					

1=Very great extent; 2=great extent; 3= moderate extent; 4=less extent; 5= no extent at all

THANK YOU FOR YOUR RESPONSES