IMPLICATION OF ENTERPRISE RESOURCE PLANNING SYSTEMS IMPLEMENTATION IN PUBLIC INSTITUITIONS IN KENYA: A CASE OF COMMUNICATIONS AUTHORITY OF KENYA

BY

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UNITED STATES INTERNATIONAL UNIVERSITY- AFRICA

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STUDENT'S DECLARATION

I, the undersigned , declare that this is my original work and has not been submitted to any other college, institution or university other than the United States International University-Africa in Nairobi for academic credit.

Signed: _____   Date: _____

Michael Githiga (ID: 641615)

This research report has been presented for examination purposes with my approval as the appointed supervisor.

Signed: _____   Date: _____

Dr. Joseph Ngugi Kamau

Signed: _____   Date: _____

Dean, School of Business Chandaria School of Business

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ABSTRACT

This study was motivated by the high failure rate of ERP systems around the world after the implementation stage with most studies reporting failure rates of between 65% and 75%. Many developed countries public institutions have embraced Enterprise Resource Planning (ERP) with the aim of improving on the efficiency. Enterprise resource planning (ERP) system has been one of the most widespread business management systems, providing benefits of real-time abilities and appropriate communication for businesses and government owned public institutions. Drawing from the resource based theory of strategy with reflection on the competitive advantage and the different roles the stakeholders play in the value chain. The ability to create linkages among activities and departments in an organization is a source of competitive advantage, seamless cooperation and information flow throughout the value chain. The study investigated the implications of ERP implementation in public institutions, a case study of Communications Authority of Kenya (CA). Objectives were derived for the study on the implications of ERP implementation. The outcome can be applied in the development of a Strategy document to guide institutions in ERP adoption.

The study used descriptive survey design to analyze data. This research design was suitable for the study as an aid in describing the objective of the study. The target population was executive and management staff of Communications Authority of Kenya with a sample of 91 respondents. Sixty-Eight (68) responses were received representing a 74% response rate. Data was cleaned and analyzed using SPSS and study employed descriptive statistics, factor analysis, path analysis and in structural modeling equation (SEM) to investigate the implications among variables and measure the strength and direction.

Results indicated that, ERP system led to improved business processes and overall productivity improvement. However, to achieve desired productivity of enterprise systems, technical improvements and reduction of operational costs is required. Individual employee implications had a positive and significant standardized coefficient value (β=0.8969, T-value =37.5829, $p<0.05$) as indicated in table 4.10 and figure 4.3 and 4.4. This indicates that individual employee implications were a statistically significant indicator of implementation. Information-Quality and implementation had a positive and significant standardized coefficient value (β=0.8369, T-value =27.7004, $p<0.05$) as indicated in table 4.10 and figure 4.3 and 4.4. This indicates that information quality was a statistically significant indicator of implementation. Organizational Implications had a positive and

significant standardized coefficient value (β=0.9757, T-value =209.0845, p<0.05) as indicated in table 4.10 and figure 4.3 and 4.4. This indicates that Organizational Implications is a statistically significant indicator of implementation.

Based on the findings of the study, the following can be concluded: Implementation of ERP strategy is an important aspect of an organization's continuity even in government sponsored institutions. ERP implementation in Communications Authority of Kenya was part of the organization's corporate plan, for efficiency in its daily operations as well as transparency and accountability to the general public. During the implementation phase of ERPs, the management should include and involve the employees to enable them to become familiar with the system and its use as well as reduce resistance to the use of the system. The fundamental role of ERP systems is to make business operations easier and more efficient.

The study recommends a match between the organizational processes and the ERP system for successful implementation. All stakeholders need to be involved and understanding of their expectations to be made clear in the initial stages of the project. ERP software should be localized to fit the user's requirements. The requirements usually depend on country, language, and cultural codes.

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Above all I am thankful to God. Without Him, completion of this work would not have been possible. May His name be glorified forever and ever, Amen.

DEDICATION

I dedicate this thesis to my family and friends for their sacrifice during those long hours I was absent from their lives. To my parents, this is for you.

LIST OF ABBREVIATIONS

CA   : Kenya Communication Authority

ERP   : Enterprise Resource Planning

ICT   : Information Communication and Technology

MRP : Material Requirement Planning

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<center>**CHAPTER ONE**</center>

1.0 INTRODUCTION

1.1   Background of the Study

In today's competitive environment, enterprises are expected to be reformed in order to achieve competitive advantages. The fastest and most effective way to achieve this goal is to introduce a new Information system (IS) to carry out the reform. One of such systems is enterprise resources planning (ERP), which ensures all operational systems of the company, are fully Integrated Maguire *et al*. (2016). By providing real-time access to operational and financial data, ERP system allows companies to streamline their management structure and create more flexible, more democratic and flatter organizations (Davenport, 2012).

Enterprise Resource Planning (ERP) is business operations management software that enables organizations to integrate information systems applications in order to manage the business and automate various office functions for instance, information technology, finance, procurement and/or human resources. ERP is an information system that brings together different subsystems into one system. This operation refers to integration. For instance, in an organization could be having three main information systems. The first system handles human resources; the second system handles finance; and the third system handles Procurement. ERP integrates these three subsystems into a single system that shares data among these subsystems. The organizations therefore develop synergy in their operations and raise performance (Almgren *at al*, 2014). ERP system implementation can shrink value creation cycles, increase precision of demand for materials management and efficient inventory management, moreover it becomes a primary tool for re-engineering (Singla, 2015).

Many organizations today are looking for ways in which they can improve their businesses in response to the growing global competition. One approach that has been used is the deployment of information systems such as Enterprise Resource Planning (ERP) systems, which integrate business processes seamlessly across the value chain (Annamalai & Ramayah, 2011). Businesses of all sizes use these (ERP) systems in order to improve their efficiency, profitability and business performance while at the same time replacing old outdated legacy systems in search of competitive advantage (Alexis, 2008; Jaiswal & Vanapalli, 2008; Parthasarathy & Anbazhagan, 2008). The main driving force for these

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changes is the hope that ERP systems will improve business performance considerably (Grant *et al*., 2013; Kilic *et al.,* 2015). ERP systems are software solutions offered by developers who are in the business of selling software solutions made up of wholesome solutions covering all functions within an organization (Davenport, 1998). While retailing ERP systems, vendors promise buyers improved business productivity, cost saving and eventual profitability and these assurances have motivated many organizations to purchase and integrate these systems into their business environments (Tilley *et al.,* 2007). Some of the worlds leading ERP systems implemented in developed countries like the USA, UK, Canada and Australia include SAP, Oracle, BaaN, PeopleSoft and JD Edwards (Davenport, 1998).

Despite the benefits that can be achieved from a successful ERP system implementation, there is evidence of high failure in ERP implementation projects in various parts of both the developed and developing countries such as Kenya (Otieno, 2008; Sun *et al.,* 2015). Examples cited of companies that have experienced ERP related failures include FoxMeyer Drug, Dell Computer, Applied Materials and Dow Chemical, all based in developed countries. Such failures have resulted in catastrophic consequences. For instance, the FoxMeyer Drug ERP related failure led to its bankruptcy (Gunasekaran, 2007). According to Monk and Wagner (2012), almost 75% of the ERP implementations are considered as failures because they miss to deliver on the promises made at the beginning of the system purchase process. This is a very high failure rate, indicating a gap in the whole process of implementing these ERP systems from initiation to routinization. It would appear as if key implementation processes and practices are not followed during the implementation process. ERP failures can be partly explained because firms often fail to adequately address how people use and share information (Davenport, 1998).

In a more recent case, Levi Strauss, an apparel manufacturer and retailer, publicized declining profits and blamed this decline on their ERP (SAP) implementation (Jeng & Dunk, 2013). However, the users of the system are the accountants and the information communication technology supports the system, in most of the cases many thought that with the successful implementation of the ERP system replaces the duties of accountants. It is in this context that the study will explain the effect of the implementation of ERP system on the duties of accountants. The findings of this study will provide the management of with a better understanding on the allocation of duties and setting of achievable performance target which are measureable. ERP systems have transformed businesses

throughout the world. Structures are leaner and more efficient, reduction in cost of operations, great service delivery, and statutory compliance more prevalent. ERP system automates operations and delivers an electronic trail of employee responsibility, which enhances information management quality by enabling integration of enterprise-wide information and brings down bureaucratic process and operating costs (Park, Park, & Woo, 2015).

The term "ERP" was perceived and invented in the 1970s but its real benefits to the business world were only realized in the early 1990s. Nah (2011) define ERP as a packaged business software system that enable a company to manage the efficient and effective use of resources by providing a total integrated solution for the organization's information processing needs. The possible utilities from ERP include dramatic reduction in inventory, progressed reductions in working capital, sharing information about clients. Most important attributes of ERP are its abilities to automate and integrate business processes across organizational functions and locations, enable implementation of all variations of best business practices with a view towards enhancing productivity, share common data and practices across the entire enterprise in order to reduce errors, produce and access information in a real-time environment to facilitate rapid and better decisions and cost reductions (Soh, 2011). Workflow management, process flow, redundancy and duty allocation are roles greatly facilitate by ERP system. ERP supports process-oriented ERP organizations (Kumar *et al*, 2010) which predominant in government institutions. ERP implementation in public institution brings increased participation, transparency and accountability, availability of information necessary for decision making and administrative procedures (Coleman, Perry, & Mason, 2012).

ERP implementations in developing countries face specific difficulties over and above the difficulties faced by developed countries and these include inexperienced and unskilled staff, absence of good quality data and lack of money to finance ERP implementations (Soja, 2006). Majority of ERP implementations in India for example, have failed as a result of user resistance to change (Wong *et al.,* 2005); high attrition rates of ERP project team members (Dixit & Prakash, 2011); mismanagement of resources (Holland & Light, 1999) and unrealistic project targets (Wong *et al.,* 2005). A specific example of an ERP implementation failure in India was the Indira Gandhi Conservation Monitoring Centre which was initially intended to be a national information provider based on a set of core

environmental information systems. Despite more than a year of planning, analysis and design work, the ERP system never became operational (Puri *et al.,* 2000).

Various studies carried out in Africa have revealed ERP implementation failures similar to those reported on a global scale. El Sawah et al. (2008) developed a quantitative model in Egypt to measure ERP implementation success and established that Egyptian organizational culture hindered the integration of ERP systems leading to high rates of failure. Ramburn, Seymour and Gopaul (2013) found out that the failure at the implementation stage of a large South African organization's ERP system was as a result of a number of intra-organizational barriers to efficient knowledge creation, transfer and use. Inadequate training, lack of technical knowledge, lack of knowledge on project initiatives and lack of change management were cited as major challenges leading to ERP implementation failure. Contextualization of the ERP system processes from the users' perspective and system configuration were found to be key success factors for the ERP implementation process (Ramburn *et al.,* 2013).

In Ghana, the implementation of an accounts and personnel computerization project in the Volta River Authority failed due to resentment, bitterness and feelings of alienation among low level staff. Resistance and nonuse particularly among older workers led to the abandonment of the otherwise good system all together (Tettey, 2000). In Nigeria, an ERP solution that would have deepened accountability in the Nigerian National Petroleum Corporation's business processes failed with government officials mismanaging billions of naira. The project, which had 86 weeks' completion timeline, dragged for more than three years and cost more than double the contract sum originally approved by the Nigerian presidency (Udo, 2015).

 In Kenya, Idris (2014) established that the challenges faced during implementation varied from one organization to the other but the most common were the length and complications of system integration and customization. These challenges may be minimized through the involvement of top management in providing the project with the right quantity and quality of resources in good time. Kimani (2013) investigated the factors which influence the implementation of ERP systems in state owned corporations in Kenya, with a specific focus on the Nairobi City Water and Sewerage Company. He established that top management support, staff training, systems security, IT infrastructure and effective project management

were major challenges to achieving success in the implementation of ERP systems. Mbungu (2008) investigated ERP implementation challenges in the dairy industry in Kenya and found out that lack of employee skills, limited organization resources, minimal stakeholder's involvement and organization culture were key impediments to the implementation of ERP systems in the dairy sector. Miheso (2013) investigated the implementation of IFMIS, an IT system implemented by the Kenya government to improve on financial data recording, tracking and overall information management. The study established that the implementation of IFMIS was affected by complex issues involving top management commitment, human technical capacity, ICT infrastructure and change management. In an unrelated study, Ndung'u and Kyalo (2015) evaluated ERP implementations in universities in Kenya and established that most of the implementation projects had been abandoned or had stalled altogether. Institutional connectivity and limited expertise to drive the implementation processes were highlighted as key obstacles to success ERP implementation.

Yusuf and Wanjau (2014) reviewed the implementation of knowledge management (KM) practices in the National Treasury and established that the existing hierarchical organizational structure hindered sharing of information. Other impediments to knowledge sharing in the treasury included organizational culture and inadequate skills in information technology and networking. Other studies by Nzuki and Okelo-Odongo, 2015, Sikuku, 2014, Wamicha and Seymour, 2015 listed employee resistance to change, change strategies, technical competence, project management and business process reengineering as some of the reasons leading to ERP implementation failures in Kenya. These findings were consistent with the finding by Otieno (2008) that the main challenges facing ERP systems implementation in Kenya was the non-existence of well-qualified employees in the implementing organizations to manage the process.

Since the late 1990s, government institutions worldwide have issued several assertions of intent, action plans and strategy plans dealing with the high-tech advancement of interfaces of various stakeholders with government authorities. However, scholars and consultants alike recurrently emphasize the very limited achievement of numerous e-government undertakings which resulted to low level uptake by users and by citizens. This hampers the full exploitation of the potential (Coleman, Perry, & Mason, 2012).

According to Huang and Palvia (2017), the ERP system adopted in North America, Europe and Asia amounted to 66 percent, 22 percent and 9 percent respectively of the Enterprise Resource Planning (ERP) software that had been adopted globally. Additionally, the study indicated that the level of ERP software adopted in the rest of the world, namely; Africa and South America was equivalent to only 3 percent. The ERP adoption disparities between the developed and the developing countries were attributed to factors that hindered the ERP adoption. In Singapore the government strategy would be equated with business strategy, irrespective of the clearly differences. Government strategies could be described less in reference to a competitive marketplace, but instead account issues like delivery of services to its citizens (Davison, Louis &, Ma, 2005). Hong Kong had achieved to implement the government strategy and aligning it to e-government strategy. In Africa, Zimbabwe had a website demonstrating central government basic functionality and in Malawi, the situation is fairly progressed. The central government online platform offered links to some 22 government ministries which was a demonstration of e-government strategic thinking (Davison *et al,* 2005).

In Kenya, public institutions libraries have applied integrated information management systems and ERP in order to remain steadfast, other related externalities and risks of the up-to-date knowledge-based economy by implementing Open Source software systems (Makori & Osebe, 2016). The challenges facing the manufacturing sector of Kenya included low levels of productivity and the high cost of production (RoK, 2009). A survey carried out on the Kenya's manufacturing sector found that the majority of manufacturers were still using old and inefficient technology which was incapable of achieving the desired efficiency levels (KAM, 2006).

According to the survey of 2009, it was established that there was need for the government to formulate viable strategies that laid emphasis on technological innovations, quality of labor force, research and development, and full utilization of government incentives (RoK, 2009). According to KAM (2006), the manufacturers needed to address their internal weaknesses regarding the inefficiencies that originated from the use of longstanding technology. Due to the outstanding contribution of the sector to the country's economy, coupled with the government's support for development of technological innovations, the new study focused on issues affecting the adoption of ERP system. According to Nyaga (2006) investigation on critical success factors for successful Implementation of Enterprise

Resource Planning (ERP) Systems in Kenya resolved that "Teamwork and composition in the ERP implementer vendor-consultant partnership, good communication between the implementation partners, cross functional ERP core team, change management program and culture are critical successful factors in ERP implementation. Furthermore, user training, education and support should be available. Change agents should also perform a major role in the implementation to facilitate change and communication in order to leverage on the corporate culture".

1.2   Statement of the Problem

For public organizations to survive and effectively deliver their mandate, they have to adapt to the conditions prevailing in their operating environment. Virtually all industries and business sectors across the world are currently undergoing pressure greater than before from their respective external and internal environment. These turbulent external and internal environmental forces have raised the need for organizations change their strategies, mode of operations and structures in order to survive. Coping with the increasingly competitive environment has called on firms to rethink their marketing strategies (Pearce & Robinson. 2008). However, as Law and Kesti (2014) outlines, e-government goes beyond putting forms and services offering online, instead rethink end-user preference which deviate from the notion of "build it and they will use it" mentality.

Although there were studies (Mumo, 2017) on ERP systems capabilities and critical success factors in the implementation in Kenya, studies on implications of implementations and relating to government owned institutions were rare. ERP implementations are inundated with high failure rates and inability to understand expected benefits and the rate of failure has been estimated as 60-90 percent. However, the potential of new and innovative uses of ICT as a tool have been ascribed for contributing a significant positive role in transforming the foundational system to new progressed IT-enabled integrated system Law and Kesti (2014). Since ERP implementation by public institutions in Kenya was emerging and dynamic, there was need to build a body on the body of knowledge. The research was aimed at filling these gaps.

1.3   Purpose of the Study

The purpose of the study was to investigate the implications of ERP implementation in government institutions in Kenya, a case of Communications Authority of Kenya.

1.4   Research Questions

The study was guided by the following questions

1.4.1 What are the implications of ERP implementation on the employees?

1.4.2 What are the implications of ERP implementation on the organization?

1.4.3 What are the implications of ERP implementation on the Information quality?

1.5   Significance of the Study

1.5.1   Communications Authority of Kenya

The study was motivated by the fact that there was lack of foundational theoretical studies touching on the implications of ERP implementation in Kenya especially in government owned institutions. This research report is meant for both Communications Authority of Kenya and other public organizations and contribute to the empirical application and implications of ERP implementation. Moreover, any organization looking forward to adopt ERP system needs to understand the implications of ERP implementations. Communications Authority and other Public organization can enhance the success and capabilities of ERP systems.

1.5.2   Policy Makers

The study offers a road map for organization considering implementing Enterprise resource programme. The study puts across the benefits and externalities of ERP to the economy and thereby proactively seek better governance, transparency and prioritization from their leadership in government. This study shall be a relevant to policy makers and key decision makers in Kenya. For instance; Parliament, KRA, and county governments. The study provides a key tool of evaluation by government's Auditor General and form part of e-government benchmark and key performance indicator during annual audits. The study provides the implication of ERP of reporting of tax matters which can aid on tax collection matter. The national treasury would be interested to know ERP implication on budgetary compliance, Income and Expenditure reporting by public institution in Kenya.

1.5.3 Researchers

The study offers relevant to scholar willing to do further studies and add to the body of knowledge.

1.6   Scope of the Study

The study was conducted in Communications Authority of Kenya headquarters in Nairobi with population of 91 executive and management staff members, from which a sample of 68 was obtained. It was a study which Finance, Procurement and Human Resources Strategic Business Units were analyzed on the implication that they had received from ERP implementation. The study was conduct during the semester of Spring 2018.

1.7   Definition of Terms

1.7.1   Communications Authority

The Communications Authority of Kenya is the regulator for the communications sector in Kenya, established in 1999 and responsible for facilitating the development of the Information and Communications sectors including; broadcasting, multimedia, telecommunications, electronic commerce, postal and courier services (Heldeweg & Kica, 2014).

1.7.2 Enterprise Resource Planning

Enterprise resource planning (ERP) is business operations management software that enables organizations to integrate applications (Almgren, 2014).

1.7.2   Collaborative E-Government

This refers to the ICT-facilitated environments for government including various aspects of digital government (Chun, 2013).

1.7.3   Information Communication and Technology

Information and communications technology (ICT) refers to unification of communications and the incorporation of telecommunications, computers, enterprise software, Internet or Web-based system used by government institutions Law and Kesti (2014).

1.8   Chapter Summary

This Chapter has addressed the issues of implication of ERP in Kenya and with reference to Communications Authority of Kenya. It has also attempted to explain the implication of ERP in service delivery and efficiency. The chapter introduced the background of the problem in order to achieve vivid understanding of the topic, references of other related studies by scholars followed by a clear problem statement. Outlines clear purpose and scope of the study. Finally, the chapter includes definition of terminologies and concepts in the

text. Subsequently, chapter two provides literature on the research questions to ensure significance to the research problem. Chapter three provides the study methods and techniques which direct impact on the findings of the study. The findings from chapter four will be presented and analyzed on the basis of the research questions and finally Discussion, conclusions and recommendations from the findings.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

The central point of this study was implications of ERP implementation in public institutions in Kenya. It particularly focused on implications of ERP implementation on the organization, employees and information quality. The chapter begins with assessment of literature on implication of ERP implementation on employee in section 2.2, on the organization in section 2.3, on information quality in section 2.4 and concludes with a chapter summary in section 2.5.

2.2 Implications of ERP Implementation on Employees

Public organizations purchase and implement ERP systems with an objective of achieving efficiency, effectiveness and improve on performance A significant aspect in developing an ERP system is to evaluate and measure its performance. This can be achieved by creating a clear means for determining the relationships between the objectives of the ERP implementation and the ERP performance indicators for measuring its performance (Al-Mashari, 2015). Appraising the impact of ERP implementation helps in examining the contribution of ERP systems to organizations and enhancement in employees' productivity, service quality and innovation. In this day and age of Globalization; employees learning, discharge of duty, aptitudes gives the upper hand in achieving world class organization status like Microsoft, IBM and so on. What's more, HR must form that upper hand in order to keep pace with the employees. That implies updating of HR's conventions. In mid-1900's HRM capacities used to involve enlisting and terminating of workers, compensations and overseeing the advantage designs.

The capacity comprised to a great extent of guaranteeing business continuity while strategies came second. Today HRM work is moving from defender and screener to vital accomplice and change operator. HRM as a key business accomplice whose work has real challenges, particularly in organizations with different specialty units whereby procedures might not be brought together. Management of recruitments centrally and co-coordinating training programs organization wide (Jalil, Zaouia, & El Bouanani, 2016).

Organizations, in the current information age, are faced with challenges of making their different types of systems that work together and seamlessly exchanging information across

these business units. One solution to this problem is to implement enterprise applications. These systems enable organizations to integrate, execute and coordinate business processes across the entire organization including all levels of management allowing organizations to become more flexible and productive (Laudon & Laudon, 2016).

2.2.1 Types of Enterprise Applications

There are four major types of enterprise applications including: enterprise systems, supply chain management systems, customer relationship management systems and knowledge management systems. ERP systems are being used in organizations to integrate their functional business processes (manufacturing and production, finance and accounting, sales and marketing and human resources), that have been implemented as scattered systems, into a single software system. This system facilitates the integration of information by utilizing a central data repository allowing effective use of information by different parts within an organization (Laudon & Laudon, 2016).

ERP systems can be defined as integrated software package composed of set of standard functional modules such as production, sales, human resources, finance, etc., which can be adapted to the specific needs of each organization. ERP systems have emerged to be responsible for some of the enormous transformation in businesses caused by clients' demands for fast services, wider choices and lower prices. Other factors such as globalization, the need for process standardization and the highly changeable expectations of customers, have also participated in business transformation. ERP systems have been employed in both large and small-medium organizations because of these systems abilities to efficiently respond to these challenges (Botta-Genoulaz & Millet, 2006). This of course, has drawn organizations' attention to invest in ERP systems.

According to Jacobsen, (2007), implementing ERP systems allows organizations to achieve many benefits including: availability of integrated information, high responsiveness to customers needs and the provision of timely information to decision makers. Another key benefit of ERP systems is the integration of information throughout the supply chain which leads to reduction in inventory handling costs and improved operating performance. This of course excels the performance of the functional areas within organizations. For instance, in sales, increased efficiency leads to satisfied customers through providing lower quotes and increased turnovers. In service, accessibility of customers' data and services history in

addition to (e.g. warranty information) leads to improved interaction with customers. Therefore, it can be noted that implementing ERP systems elevates and improves the performance of organizations as a whole. For example, all information can be located in a central place that can easily accessed and shared by the business units. This eliminates the need for legacy systems that maintain incompatible and fragmented data (Sumner, 2005).

Employees output is a particularly key aspect to shareholders and management which is the singular purpose of their employment, the ERP system enables maximum exploitation of their potentials. During turbulent times, the emphasis is created on making things done through increased productivity of employees through provision of timely information. A firm decides to adopt ERP for various reasons, mainly to deal with prevailing inefficiencies in the value chain and processes, in response to competitive atmosphere, to adopt a new strategic position, and the priority of senior management. These justifications emanate from organizational necessity or through technological innovation, or a mixture (Cooper, 2003). Cooper (2003), developed a six level process of the ERP implementation process: initiation, adoption, adaptation, acceptance, routinization, and infusion.

The choice of ERP system is made at the adoption stage whereby the implementation rationale, strategic alignment, financial muscle, organization readiness and cost benefit analysis are considered. The decision to implement an ERP system is made is at this stage. Acceptance stage refers to the end user willingness to use the ERP. Routinization stage refers to the institutionalization of the system and no longer considered new. Infusion stage refers to the process of entrenching an ERP system deeply and comprehensively in an individual's employees' or in an organization. Through continuous experience and effect of learning curve in the usage of the system, employees who graduate to the routine stage have the ability to use the system in a more inclusive and sophisticated manner. At the routine and infusion stages, the employees are able to exploit the ERP potentials and resulting to positive and higher individual performance.

Levine (1994), described that users usually struggle with understanding on how to apply the system to support their jobs. At first, they use the system to a small extent, over-time they find more useful additional features. Therefore, user's proficiency starts with simple and shallow usage while initially accepting the system. After accumulating more experiences, they progress into the routine stage. As employees become familiar with the

system, they might not be contented with the current use and start challenging the situation and find more functionality that may suit their work.

Dezdar and Sulaiman (2009) found that organizational impact and user satisfaction were the two most frequently used measures for ERP implementation. The user's satisfaction can be defined as those feelings and attitudes towards a variety of factors related to the delivery of information products and services, including being up-to-date, being precise, being comprehensive and so forth (Dezdar & Sulaiman, 2011). The other variable i.e. ERP organizational impacts relates to the effect of ERP system implementation and usage on the performance of the organization. Organizational impact refers to the realization of business goals and improved enterprise operating capabilities as a result of the ERP implementation. The perceived organizational impact variable covers both effectiveness and efficiency-based performance improvements in order to capture the business benefits of the ERP system.

Employee productivity is a particularly important issue to managers and supervisors as the primary purpose of their job is to get the most out of the people they are responsible for. In today's cost-competitive world, the emphasis is on getting things done through increasing the productivity of employees. Empowering employees by giving them timely information boosts productivity, and this can be done by using an integrated technology such as Enterprise Resource Planning system (ERP). Nurmilaakso (2009) stated that one of the reasons behind investing in ICT solutions is to improve labor productivity, where the ERP system has a positive influence on labor productivity. Therefore, adapting to the conceptualization, the more extended use of a system to support and individuals work the more increased is the performance of tasks. The tasks referring to the current task and more comprehensive set of jobs tasks. Given an institution, the way employees appreciate tasks and perform their jobs varies from the specified procedures and stages. This is contributed by the fact that some employees assimilate and perfect their duties through the system and are able to accomplish their task subconsciously than others. However, with proper decision making during ERP implementation this knowledge is shared and integrated amongst employees.

Today's business operates in a rival and competitive environment. The exponential growth and advancement in IT (information technology) is a significant factor that influence

today's business environment. This of course, has made a rival competition among organizations. Therefore, if organizations wish to remain successful and to be competitive, managers need to employ technologies towards similar course. This in turn helps organizations improve information flow, reduce costs and streamline business, offer product variety, establish linkage with suppliers and reduce response time to customer needs and expectations. Organizations may be composed of different dispersed units that require integration. Therefore, managers can focus on ICT (Information and Communication Technologies) to integrate information and communication across units of an organization. Currently, a popular approach to the development of an integrated enterprise-wide system is the implementation of an enterprise resource planning (ERP) system (Beheshti, 2006).

2.2.2 Challenges Are Facing Organizations

Many challenges are facing organizations; These challenges (such as ease in international trade barriers, economic liberalization, globalization and privatization) have made a heavy burden on organizations specifically in developing countries (which is the case of Jordan) to survive in such environment. This of course has increased the pressure on these organizations to come up with effective and competitive capabilities to survive and succeed. Enterprise Resource Planning (ERP) is often considered as one of the solutions for organizations to survive. ERP systems can successfully integrate the processes of each department, decrease costs, improve effectiveness, increase clients' level of satisfaction and immediately share information with the whole enterprise (Davenport *et al*, 1998).

However, a significant aspect for developing an ERP system is to evaluate and measure its performance. This can be achieved by constructing a process for determining the relationships between the objectives of the ERP implementation project and the ERP performance indicators for measuring its performance (Al-Mashari *et al,* 2015). Evaluating the impact of ERP implementation helps in analyzing the contribution of ERP systems to organizations. Many Jordanian organizations (who implemented ERP systems) do not realize whether the use and deployment of an ERP system enhances their employees' productivity, service quality and innovation. As mentioned by (McNurlin & Sprague, 2009) that the mission of the information systems in organizations nowadays has expanded to improve the performance of its employees through the use of IT.

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Furthermore, Molla and Bhalla (2006) mentioned that despite the expansion of ERP implementation in developing countries, yet there are failures and difficulties facing the implementation of ERP systems. Based on this context, this research provides an excellent opportunity for researchers and practitioners to understand and resolve some of the important issues associated with the use and implementation of ERP systems specifically in Jordanian organizations and generally in organizations in developing countries who are experiencing similar context and situations.

2.3   Implications of ERP Implementation on Organization

Enterprise Resource Planning has been implemented in organizations since its onset in the 1990s. According to Molla and Bhalla (2006), although ERP systems were discovered in the 1990s, most of the first organizations implemented in the late 2000s. ERP implementation has a diverse multi-discipline effect on the entire organization. Organizations who have implemented the system demonstrate a high ability to provide accurate and yet timely information that enables decision making, increased productivity of employees, reduced costs that the staff undergoes, enhances inter-departmental co-ordination among other advantages. The implications of implementing ERP systems to an organization have an effect on the finances, productivity, and the manner of conducting business.

Organizations adopt the ERP systems because they are cost-effective. ERP's use is cost-effectiveness is both in the short term and in the long term basis. For instance, a company called Allied Waste decided to enroll an ERP system which cost them $130 million on the computer systems (Madhavan & Otago, 2008). The company's expenditure on the ERP was huge, but the reduction on running costs resulted to low operational costs that was good in the long term. The company's decision to enroll ERP system was compatible with its management style and structure of the company. As a result of the ERP adoption, Allied Wastes acquired Multiple Trash Haulers. The quick growth of the company was attributed to the cost cutting on the operational costs. When it was compared with the other companies in the industry that never adopted the ERP system, Allied Waste did exceptionally well. In today's current state of the company, it is doing well with great decentralized management system as a result of the adoption of the ERP systems. Therefore, adoption of ERP program in an organization is cost-effective.

2.3.1 ERP Implementation

ERP implementation is the firm's ability to adapt, configure, and integrate information flows and business processes. Even though a firm may implement ERP, it needs to adapt, reconfigure, and integrate its information flow and business processes on a continuous basis because markets dynamics change and new technology are created (Teece, 2008). Successful ERP implementation involves redesigning business processes from an inflexible, mass-transaction orientation to an agile, lean, and knowledge-based processes (Ngai, Law, & Wat, 2015); Tsai *et al*, 2015). During business process transformation efforts, firms must incorporate corresponding training programs, operating procedures, and information technologies to support the emerging infrastructure. The result of appropriately implementing ERP is to improve firm performance primarily caused by redesigned business processes, integrated managerial functions, accelerated reporting cycles, and expanded information capabilities (Chung *et al,* 2007).

Snow, Duncan, Johnson, and Scott (2014) classify business strategy firms into four categories: defenders, prospectors, analyzers, and reactors. Each type has a unique configuration of contextual and structural factors. The Snow, Duncan, Johnson, & Scott (2014) typology is useful because it is based on a firm's product-market orientation that is responsive to environmental challenges. Defender firms follow a cost-leader orientation in which they concentrate on established products and markets. They take strategic advantage by minimizing costs through improved operating efficiencies. This focus leads defender firms to employ short-term financial strategy and performance.

Conversely, prospectors seek to exploit emerging market opportunities by emphasizing market research and responding to anticipated market changes. Prospectors consider new products their primary source of revenue growth. A critical aspect of product innovation is efficiently managing the flow of ideas from across the organization and turning them into reality (Holsapple, Wang & Wu, 2007). Prospectors need a system to improve the management and execution of product innovation by identifying opportunities, generating ideas and concepts, and selecting the most promising projects to pursue.

An organization that adopts an analyzer strategy has a mixer of innovativeness as well as seeking new market, however predominantly more defensive. Most large companies fall into the third category, because they want both to protect their base of operations and to

create new market opportunities. IBM uses analyzer strategies. Thousands of customers have purchased IBM computers over the last several decades. It is in IBM's interest to keep these customers satisfied and to introduce new products and services that update their computer facilities (Holsapple, Wang & Wu, 2007). Whenever IBM introduces a new computer system, for example, it develops procedures that help its customers to move from the older system to the new system. In this way IBM maintains its customer base. However, IBM also tries to create new markets. Its line of personal computers represents an effort to expand beyond its traditional base of mainframe computers. IBM has also invested in biotechnology, superconductivity technology, and other projects which are very innovative. Impact of ERP Implementation on Business Strategy: Management information systems such as ERP affect business strategy (Langfield-Smith, 2015). Business strategy involves long term planning that may include mergers and acquisitions, market segmentation, capital formation, products sourcing, supplier and customer relationship management, and product innovation. A firm's ability to have information readily available helps them achieve competitive advantage and strategic initiatives. The concept of receiving timely feedback, analyzing deviations from expectations and taking necessary decisions to correct deviations is rooted in cybernetic control theory.

2.3.2 Adoption of ERP Systems

While the adoption of ERP systems offer the means by which firms can survive and adapt, managers need to implement processes, procedures, systems, and metrics that will facilitate their business strategy. Because ERP systems can rapidly deliver a comprehensive set of interrelated data and information to decision makers, firms can achieve competitive advantage and strategic initiatives such as cost leadership and market differentiation. These are characteristics of a firm that would be defined as a prospector. An ERP system allows a firm to pursue strategic options such as mergers and alliances, product innovation, cost leadership, and market differentiation. Implementing an ERP system has a positive impact on the adoption of prospector-type business strategy because it effectively facilitates this approach.

Implementation of ERP systems cut on the operational costs of an organization activities. The most important reason for implementing of ERP system is to reduce on the cost of running a business. According to Langfield-Smith (2015), an organization should make a plan that will oversee the implementation of ERP system that increases on productivity

while decreasing on the cost necessary to support the business systems. The process of obtaining the best from an ERP system is called optimization. An ERP system is able to cut the operational costs of an organization by use of EAS (Elimination Automate and Standardize) theory. The theory of EAS is to look for ways to eliminate transactions from an organization process flow. Finally, if you cannot eliminate or automate transactions of an organization, you should standardize them to ensure that your manual efforts require the least amount of work possible to complete the processes. For instance, elimination of processes may be employed by removal of processes that are manual. Such a process should be replaced with an automated system which should be incorporated into the organization ERP. However, an automated system needs regular auditing. According to Langfield-Smith (2015), he states that standardization of the ERP system is important in order to check that all input data was done correctly.

Shared knowledge as results of implementation go beyond communication on how procedures and module works. The organization especially the core implementation team must comprehend the underpinning options and environment which they operate in. ERP software stocks an organization's data, processes, and information, entrenches its knowledge in business activities. These kind of knowledge may more likely reside in the organization's database in form of explicit operation's knowledge, as the process knowledge which is entrenched in the business procedures and practices or as knowledge recorded in process manuals on a routine basis. However tacit knowledge is entrenched in the minds of individual employees who directly work with the ERP systems. Unlike knowledge stored in databases which is obviously known to be formal knowledge used to support the employees' work depending with certain knowledge management processes, most of the knowledge in the minds of individual employees is tacit, natural and informal only demonstrated through communication channels (Wilson *et al,* 1997). The value of the ERP system is best experienced when the tacit knowledge is integrated into the system and the users appreciate the impact the system in the operations. The ERP benefits in an organization are closely related to the organization's operations, maintenance, upgrading the skills acquired amongst employees and knowledge transfer.

ERP system used in an organization is known to increase the productivity of the organization activities by integrating the processes and improving workflow, standardization of business practices, improvement management of orders, accurate

accounting of inventory, and good supply chain management. According to Langfield-Smith (2015), the productivity of an organization is arrived at by using ERP since it improves the accuracy of infromation obtained from all the departments. ERP systems have become very crucial for almost all organizations that want to gain from a competitive industry. Evidence from survey of companies that have installed the ERP system confirms that they obtained high work productivity when they adopted the plans. Some of the benefits that organizations benefited from are increased flexibility in information generation. Some businesses especially those that used internet marketing received important information from many clients available online (Langfield-Smith, 2015). In addition to that, ERP sytem improved productivity through the increased integration of accounts applications that improved on timely and reliable decision making. Cosequently, improved the company perfomance. However,in ERP systems implementation process can be dynamic and complex and therefore, success in an organization does not guarantee success in another. The effectivenes of an ERP systems is felt in an organization when the systems are implemented from a plan that is developed by an information technology professional.

ERP use for an organization have an economic-effectiveness which generates from its use. The determination of economic effectiveness requires that you consider several multi-disciplinary sections of the society. For instance, one needs to consider social, legal, psychological, ergonomic, managerial, organizational, technical. And economic factors among others in determination how an ERP sytems impacts an organization (Langfield-Smith, 2015). However, the application of the formula in obtaining the economic savings by use of ERP has several constraints. According to the Tambovcev and, the lack of regimentation of the management goals and information technology is a setback while using the formula. Despite the setback, the formulation of sustainable economic and information models of an organization ar important to improve in the modes of assessing economic importance of an ERP system in an organization.

2.3.3 ERP Implications in an Organization

Examination into ERP implications in an organization can be defined through the various modules contained in a system and can be applied in various processes, geographical sites and departments in an organization (Holsapple, Wang & Wu 2007). According to Holsapple, Wang and Wu (2007), the scope of ERP implementation has a relation with the

benefits obtained by embracing a firm whereby the scope of ERP implementation refers to the extent to which the ERP system is disseminated within an organization and its business processes. ERP therefore, has the potential to leverage on the organizations resources and develop competitive advantage.

In an effort to evaluate the implications of an ERP system to an organization, balance scorecard framework has been one of the models applied. Balanced scorecard model was introduced by; the premise of the model is that the evaluation of organization performance demands a balanced consideration of both financial and non-financial aspects (Wilson *et al*, 1997). According balanced scorecard, implications of ERP can be assessed using four measures: financial performance, internal processes, customer satisfaction, and innovation and learning. Financial performance assesses reflect the input of an ERP system implementation to enhanced financial position of a firm.

Financial performance of a firm stems from the efficacy of the three other activities: internal processes, customer satisfaction, and innovation and learning. Therefore, it is key for an organization to recognize and fulfill its customers, consequently the implication of the ERP implementation need to be tied to particular indicators in customers' expectations such as service turn-around time, quality of service, service performance, and cost. By doing so, the organization has to consider internal business processes which consequently support these customer-based measures. Internal business processes can be enhanced through ERP implementation, which results in operational efficiency, reduction in redundant operations, reduction in work complexity among others. (Tsai *et al,* 2015). For the organization to be able to cope with changing and turbulent environment, there is need to appraise its capability in learning, innovation and growth. In this perspective, the implication of an ERP implementation is appraised by the ability of a firm to learn and grow. Accordingly, the indicators are understanding of organization process, and employees job achievements (Tsai *et al*, 2015).

Public organizations that have implemented ERP in their institutions have a system that enhances the continuous communication of vital information across all the functional units (Baily, Farmer, Crocker, & Jessop, 2015). The virtue of communication across the departments is important since it improves efficiency, increases performance, and improves productivity. Finally, ERP program in procurement department of an organization has

enhanced tracking and forecasting and improved customer service satisfaction. Customers' satisfaction is paramount for to ensure that an organization grows. The timely movement of goods and services is of importance since reduces instances of delayed production of goods and services. However, the application of ERP programs to an institution requires dynamic learning by the personnel that will be managing the database. The system may be simple by explanation, but it requires a lot of effort in man hour to ensure that all the ERP programs are functional. Proper functionality requires that the ERP architecture works in harmony in a standard format that is in accordance with the code of practices in the public organization (Baily, Farmer, Crocker & Jessop, 2015).

Despite ERP application enhancing smooth and efficient management of an organization, it requires heavy capital investment and expertise to implement. ERP programs require the hiring of experts to code a program that is unique to the activities of a public organization. Other cost incurred is in training of a public organization staff so that they may be in a position to run the program in the public organization. The high costs incurred act as a discouragement for most public organizations to implement the ERP systems (Baily, Farmer, Crocker & Jessop, 2015). In addition to that, the success in application of software comes from the will to make it succeed from the users. It is known that garbage in gives garbage out. For effective and efficient utilization of the ERP software, it calls for training from people who are conversant with the software. Training of personnel should never be termed as an expensive expenditure for a company because it is through the same expenditure that savings, and efficiency is upheld.

2.4 Implications of ERP Implementation on the Information Quality

High quality of information is paramount for the success of an organization. ERP systems can only provide a competitive advantage only when they are applied with other organizational resources. The incorporation of Information Technology (IT) in a business improves on the organization's mode of carrying its activities with the aim of improving the quality of information handled. The idea of information quality has its origin in the accounting studies where emphasis was on guaranteeing the steadfastness of data. This emphasis moved to managing of data as key asset as a result of development in database knowledge in the 1970s. Databases comprised of relational databases (Tsai *et al*, 2015). Emergence of Enterprise Resource Planning systems in 1990s and increased application

data banks on the onset of 2000s made it obligatory for organizations to develop means to manage the explosion of information.

Organizations have often erred in maintaining existing information systems, when those systems were no longer manageable or profitable. A significant investment is required, however, to implement an enterprise resource planning (ERP) system and the supporting technology required to become more competitive and to obtain company- wide control and integration information. For organizations considering implementing an ERP, it is essential that data quality (DQ) issues be thoroughly understood. Thus, organizations should obtain knowledge of the critical success factors essential to ensure DQ during the implementation process (Chang *et al,* 2011). ERP systems use relational database technology to integrate the various elements of an organization's information systems. They provide a number of separate, but integrated modules (Tsai *et al*, 2015). The use of an ERP avoids the costs of maintaining many separate "legacy" systems and overcomes the problems associated with interfacing different systems. It is quite expensive to implement an ERP system, requiring multimillion- dollar budgets and large project teams. Despite the expense, such systems are becoming very widely used in the world's largest companies.

This of course, has drawn organizations' attention to invest in ERP systems. According to Chang *et al.* (2011), ERP revenues grew to over $28 Billion in 2006 and it continued to grow with an estimate of 47.7 Billion in 2011. Implementing ERP systems allows organizations to achieve many benefits including the availability of integrated information, high responsiveness to customers' and suppliers' needs and the provision of timely information to decision makers. Another key benefit of ERP systems is the integration of information throughout the supply chain which leads to cost and inventory reductions and improved operating performance. This of course excels the performance of the functional areas within organizations. For instance, in sales, increased efficiency leads to satisfy customers through providing lower quotes and increased responsiveness. In service, accessible data on customers' services history in addition to (e.g. warranty information) leads to improved interaction with customers. Therefore, it can be noted that implementing ERP systems elevates and improves the performance of organizations. Form a technical perspective, ERP systems provides many advantages. For example, all information can be allocated in a central place that is ready for being accessed and shared by the functional

departments. This eliminates the need for legacy systems that maintain incompatible and fragmented data (Sumner, 2005).

However, implementing ERP systems require considerable time and cost, and it may take time before realizing the benefits of investment in ERP systems (Sumner, 2005). Botta-Botta-Genoulaz and Millet (2006) stated that ERP projects showed difficulties and even failure in implementation. The expected outcomes of ERP projects were rarely reached and costs were over budgeted. Davenport (1998), discussed the two reasons that leads to this failure: first, the technical complexity associated with the implementation process of ERP which requires a great deal of expertise. Second, the mismatch between the technical specifications of the ERP system and the business requirements of the organization.

Dezdar and Sulaiman (2009) found that that organizational impact and user satisfaction were the two most frequently used measures for ERP implementation. The user's satisfaction can be defined as those feelings and attitudes towards a variety of factors related to the delivery of information products and services, including being up-to-date, being precise, being comprehensive and so forth (Dezdar & Sulaiman, 2009). The other variable i.e. ERP organizational impacts relates to the effect of ERP system implementation and usage on the performance of the organization. Organizational impact refers to the realization of business goals and improved enterprise operating capabilities as a result of the ERP implementation. The perceived organizational impact variable covers both effectiveness and efficiency-based performance improvements in order to capture the business benefits of the ERP system.

2.4.1 ERP and Employee Productivity

Productivity Employee productivity is a particularly important issue to managers and supervisors as the primary purpose of their job is to get the most out of the people they are responsible for. Dezdar and Sulaiman (2009), stated that employees are the secret of the success of any manufacturing industry. In today's cost-competitive world, the emphasis is on getting things done through increasing the productivity of employees. Empowering employees by giving them timely information boosts productivity, and this can be done by using an integrated technology such as enterprise resource planning system (ERP). Nurmilaakso (2009) stated that one of the reasons behind investing in ICT solutions is to

improve labor productivity, where the ERP system has a positive influence on labor productivity.

Service Quality has been typically regarded as a key strategic component of competitive advantage and the enhancement of service and product quality in organizations and still until present). Many factors cause poor product quality in small manufacturing companies that cannot afford advanced management systems such as: problem allocation delays and intervention, poor human resource allocation and poor inventory management. However, the introduction of IT in quality management had contributed greatly to the enhancement of quality awareness towards the improvement of services and products and in reduction of quality costs. Innovation Kanter (2,010) defined innovation as the creation and exploitation of new ideas. Innovation is being increasingly seen as a critical competitive advantage and has been recognized as an important trend. Innovation is often characterized as a type of organizational capital and has been broadly defined as an idea, a product or process, system or device that is perceived to be new to an individual, a firm, an industrial sector or a society as a whole (Rogers, 2015). Research relating to the use of IT in managing innovation remains sparse, with an exception of researchers such as Cooper (2003), who provide an outline of the practitioner experience with existing tools used in new product development processes. Organizations that use the best technologies are not always the most profitable firms or the ones with the largest market shares, since there is other factor that plays a major role in determining the degree of innovativeness in an organization such as the size and the profit of the organization.

2.4.2 ERP Implementation Implication

ERP implementation implication towards an organization information quality is well demonstrated through the ability of the system to provide accurate and timely information to enable decision making, enhance inter-departmental co-ordination as a result of information sharing, competitive advantage and increased sense of achievement among employees (Chang *et al,* 2011). Moreover, change in management processes can as well be demonstrated through an organization learning and innovation as a result of ERP implementation (Chand, Hachey, Hunton, Owhoso, & Vasudevan, 2005).

ERP systems integrates all the processes of an organizations departments and promotes easier sharing of information. For instance, from a functional lens of an organization

activities, ERP integrates the departments of finance, human resource, marketing, production, and management among others which promotes delivery of quality and timely information. For a long time, many researchers have been attempting to find out measures of information system success. Among the various studies, the one reported by Chand *et al,* (2011), has been widely cited. They surveyed 180 articles attempting to measure IS success and proposed that the existing IS measures can be grouped into six dimensions: system quality: the measures of the system, information quality: the measures of the IS information, information use: the use of the IS information, user satisfaction: the user response to the use of the IS, individual impact: the effect of the IS on individual performance, and organizational impact: the effect of the IS on organizational performance.

Bailey and Pearson (2009) which include the human aspect of IS success, such as the quality of IS services (which includes the improvement of user's system knowledge, the attitude and competency of IS staff, and the efficiency of services) and the resolution of conflict between the user and IS department (which includes the competition between users and IS department for corporate resources, the allocation of information resources to user departments, the communications and relationship of users and IS department, the personal control over computer-based IS, and the organizational position of the IS department).

An ERP system promotes value chain addition of information in an organization that has multiple departments. The quality of information that is shared in such a case is of high quality and promotes efficiency of an organization's operations. The figure below is a thematic view of value chain addition of an organization that has many operations. From the figure, each department has its own computer information sub-system. The ERP systems operates by the integration of each single computer information system that represents the departments. Each computer information center is optimized to function with accordance to the characteristics of the department's activity. Information is shared in timely manner through their integration by the making of a common network unit. ERP systems functions by combining all the individual computer sub-systems of the organization to making a database. When such is accomplished, the information value is added since all departments can access what they want from a database.

2.4.3 The Integration of ERP Systems

The integration of ERP systems helps in availing of information from all the departments of an organization. According to Rogers (2015), ERP system allows an organization's functional units to communicate directly with each other. This improves information delivery by the following four outcomes. Firstly, ERP increases the speed of information sharing. Organizations that have already implemented the system benefit from the high speed of information sharing. Secondly, ERP helps in increasing structural connectivity across units and their respective activities. According to Rogers (2015), improved structural connectivity helps an organizations department in making timely choices. Structural connectivity helps in the use of comprehensive performance tools such as the balance scorecard.

Third, ERP provides a comprehensive information picture that integrates functions, departments, and hierarchical levels into a composite, action-response chain of events. For instance, in an organization that deals with supply of materials, entering of a new order automatically deducts available material from inventory, orders needed material from suppliers, updates the production forecast, revises work schedules, and prepares new market projections. Such an automated program makes availability of timely information to all the units of an organization. Lastly, ERP provides a single, comprehensive database in which all the organization's transactions are entered, recorded, processed, monitored, and reported Rogers (2015). This reduces data entry and monitoring. Additionally, it facilitates the use of tacit knowledge (intangible, embedded in individual experience), and enables the coordination of customer driven strategies (such as mass customization) The outcomes of ERP systems for whichever organization is making information readily available at all times. ERP implementation is boost to intellectual capital which is strategic resource in a contemporary firm which is derived from collective knowledge inherent to a firm (Winter, 1998).

Intellectual capital refers to the accumulation of knowledge and capabilities of the employees, as well institutionalized knowledge in form of process structures and databanks. Social capital is the value of relationships and knowledge. Intellectual capital is a key strategic resource element because of its uniqueness and only inherent in a particular organization. Intellectual capital with enhancement from information technology has capability of generating intangible value, which result to profitability and fiercely

competitive organization in the turbulent times. Implementation of ERP systems is likely to generate positive results on intellectual capital. Moreover, when organizations implement an ERP system, they are expected to harness the necessary skills to effectively apply and use them. Therefore, a considerable level of learning capacity is key to effective ERP implementation. Upon ERP implementation in an organization with learning capacity, intellectual capital – knowledge within employees, firm as a whole, and existing relationships amongst employees and firm's partners, most likely obtain great support (Youndt *et al*, 2004).

However, this is greatly dependent on organizations' learning capability. A closer look learning capability is the extent of knowledge accumulation in a firm which includes proper condition for organization learning such as managerial commitment, peoples view point on the system, transparency and knowledge management, experimentation and assimilation. Because a firm's learning comprises the creation, planning, storage, dissemination, and knowledge application which are key to knowledge accumulation in an organization (Pentland, 2015).

2.5   Chapter Summary

This chapter has reviewed literature on the three specific research objectives that shall govern the scope of this study; the implications of ERP implementation on the employees, the implications of ERP implementation on the organization and the implications of ERP implementation on the Information quality. The next chapter describes the research design and methodology, outlining how data shall be sourced and analyzed for interpretation.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1   Introduction

The previous chapter identified a gap in the current knowledge about the Implication of ERP implementation in Public organizations in Kenya. The literature review composed of three objectives; the implication of ERP implementation to the employees, Organization and information quality. This chapter dealt with research design, population and sample, data collection methods, research procedures, data analysis methods and finally the chapter summary.

3.2   Research Design

A research design is a framework that constitutes the blue print for collection, measurement and analysis of data which entails detailing the procedures necessary for getting the information needed to solve the research problem (Cooper, 2003). Research design is thus an integrated map of the research project that determines the most suitable method of investigation, the nature of the instruments, the sampling plan and the types of data. A number of research designs exist but the main categories are: exploratory, descriptive, and causal and correlational design.

Descriptive research design is about what, where and how of a phenomenon. The design adopted was a cross-sectional survey. The survey strategy is usually associated with a deductive research approach and is a popular and common strategy in business and management research where it is commonly used to answer 'what', 'who', where', 'how much', and 'how many' questions. Surveys are therefore used for descriptive research. Survey strategies using questionnaires are popular as they allow the collection of standardized data from a sizeable population in a highly economical way allowing easy comparison (Saunders et al., 2016). Descriptive research was used to obtain information concerning the current status of the phenomena and to describe what exists with respect to variables or conditions in a situation. The main aim of descriptive research is to provide an accurate and valid representation of the factors or variables that are relevant to the research questions. A correlation is defined as a relationship between two variables. The purpose of using correlations in research is to figure out which variables are connected. Correlational

research represents a general approach to research that focuses on assessing the co-variation among naturally occurring variables. The goal of correlational research is to identify predictive relationships by using correlations or more sophisticated statistical techniques (Cooper, 2003).

3.3 Population and Sampling Design

3.3.1 Target Population

In research, a population refers to the total collection of elements about which the researcher wishes to make inference. It is the universe of people, place or things to be investigated (Saunders, Lewis & Thornhill, 2016). Target population also refers to all the members of a population to which research findings can be generalized and provide an accurate record of the sampling framework from which the sample is to be drawn (Saunders, Lewis & Thornhill, 2016). This study on Communications Authority of Kenya, the target population comprised of the executive and management staff. The description of the target population has all ages, all genders, and persons from all education background and works in Communications Authority of Kenya. The total number of executive and management staff in Communications authority of Kenya is 91 persons.

Table 3:1: Population Distribution

Category	Frequency	Percentage
Executives	8	5
Management	83	95
Total	**91**	**100**

Source: Source: Communications Authority of Kenya, (2016)

3.4 Sampling Design

Sampling is the process of selecting a sufficient number of the right elements from the population, so that a study of the sample and an understanding of its properties or characteristics make it possible to generalize such properties or characteristics to the population elements (Sekaran & Bougie, 2013). The design therefore maps out the procedure to be followed to draw the study's sample.

3.4.1 Sampling Frame

Sekaran and Bougie (2013) state that a sampling frame is a physical representation of all the elements of the population from which the sample size is drawn. According to them, sample frame is the detailed presentation of population of study outlined in a table or figure. The list could be of institutions, individuals, geographical areas, or other units (Brown & Churchill, 2014). In this study the list came from Communications Authority of Kenya.

3.4.2 Sampling Technique

Literature and previous studies confirm that sampling can be divided into two broad categories: probability or representative sampling and non-probability sampling (Saunders *et al*., 2003; Kothari, 2003). Non-probability sampling is used in large-scale surveys where the subjects are not known and thus non-random selection is used (Saunders, *et al.,* 2003). According to Saunders et al. (2003) four types of non-probability sampling have been identified: convenient, snowball, quota and purposive or judgmental sampling. Four types of probability sampling are: systematic, simple random, stratified random and cluster sampling, (Saunders *et al.,* 2003). The adoption of a census was also preferred because of its benefits. First, all respondents have the same opportunity to participate, in this case target population of Communications Authority of Kenya. Whether a particular technique is of stratified random sampling type or different type; it depends on a variety of factors such as object, scope and nature of the study and amount of money for the purpose.

3.4.3 Sample Size

The sample size is a smaller set of the larger population (Cooper, 2003). A sample size refers to the number of items to be selected from the universe to constitute a sample. The sample size is an important feature of any empirical study in which the goal is to make inferences about a population from a sample. In practice, the sample size used in a study is determined based on the expense of data collection, and the need to have sufficient statistical power. Considering the size of the target population, a census was deemed to be the most appropriate method to achieve answer the study objectives.

3.5 Data Collection Methods

Primary data was collected using a questionnaire. The questionnaire had two parts. The first part collected biographical data whereas the second part, representing the five research questions. The questionnaire was closed ended. The Likert scale with fixed five choice questions was used to measure the answers of the respondents in the second part of the tool.

Under each research question, there were two sub subsections. In the first subsection, a scale of 1-5 was used to gauge the extent to which respondents agreed or disagree with the given statements on the type of leadership styles. The scale ratings were as follows: 1= Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree.

The respondents were informed ahead of time and appointments set before questionnaires were hand delivered to all the target respondent. The questionnaire was chosen for data collection because it takes a shorter time for them to reach the respondents. Questionnaires also have an advantage in the sense that since they are answered anonymously, then sensitive or personal questions are answered more truthfully (Saunders, Lewis & Thornhill, 2016).

3.6   Data Analysis Methods

The study used descriptive statistics to analyze the collected data. Descriptive and inferential analysis was carried out to determine frequencies, proportions and percentages of the various variables. Descriptive tables were generated to show the level of responses to various factors. The data which was obtained from the structured questions in the questionnaire was coded, classified under different variables and entries made into Statistical Package for Social Science (SPSS). The use of Microsoft Excel program was used in order to generate graphs, pie charts, polygons from the tabulated data received. Linear Regression- according to Brown and Churchill (2014), Linear Regression as a statistical technique for data analysis was used to determine the relationship that exist between the leadership styles (independent variables) and employee performance variables (dependent variable). It also enables the researcher to make a prediction about an outcome (or criterion) variable based on knowledge of some predictor variable. This was preferred because it uses data very efficiently and good results are normally obtained with relatively small data sets.

3.7   Chapter Summary

Chapter three has described the methodology and procedures that was used to carry out the study. It started with a brief introduction highlighting the general methodology and structure of the chapter. The chapter also highlighted the method that was used to conduct the research and its application justified. The population was defined and the sampling technique, and sample size described. Finally, the data collection techniques and research

procedures used were discussed. The next chapter is Chapter four which discusses the Results and Findings of the study.

CHAPTER FOUR

4.0 RESULTS AND FINDINGS

4.1   Introduction

This chapter presents the analysed results and findings of the study on the research questions concerning the data collected from the respondents. The first section covers the response rate. The second section is about the background information, which presents demographic presentation of the respondents. The other section deals with the objective questions as answered and the final section will discuss the summary of the whole chapter.

4.2   Response Rate

A response rate is the total number of respondents or individuals participated in a study and it is presented in the form of percentage. This study had 73 individuals responding to Implication of ERP implementation questionnaire: A case study on Communications Authority of Kenya. Table 4.1 represents the response rate of the study. From the study, it is clear that 93% of the respondents took part in the study while 7% did not participate in the study. The study, therefore, implies that the response rate was good to be used.

Table 4:1: Response Rate

Category	Frequency	Percentage
Responded	68	74
Not Responded	23	26
Total	91	100

Source: Research Data (2017)

4.3   Demographic Information

4.3.1 Gender

Figure 4.1 shows the gender representation of the study. From the figure, it is clearly shown that 57% of the population at the Communications Authority were female while 43% were male. The study implies that majority of the population in Communications Authority were female.
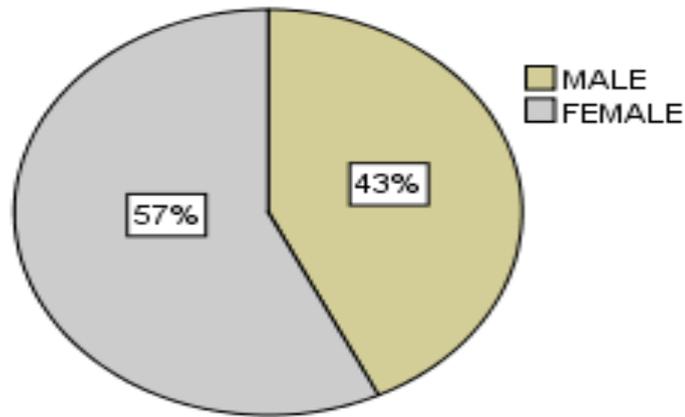
Figure 4:1: Sex of Respondents

Source: Research Data (2017)

4.3.2 Age of the Respondents

To show the age representation of the population in Communications Authority of Kenya, Figure 4.2 was used. The figure indicates that 82% represents individuals were between the ages of 29-39 years while those who are between 40 to 50 years are represented by 7%. The study also shows that 11% of respondents are above 50 years of age. The implication of the study is that majority of the population working at Communications Authority of Kenya were between 29 to 39 years of age.
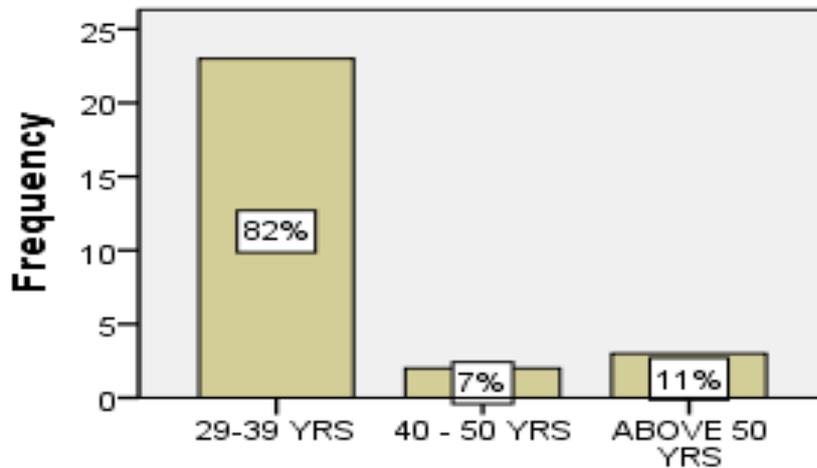
Figure 4:2: Age of Respondents

Source: Research Data (2017)

4.3.3 Working Experience

Table 4.2 is a cross-tabulation revealing the relationship between year of experience at Communications Authority of Kenya and how the experience has been while working for the organization. From the table, 78.6% of the respondents have been working for the organization for less than 5 years while 21.4% of the respondents had worked for 11-15 years. The table shows that 50% of respondents working for Communications of Kenya have had a very good working experience, 39.3% have had a good working experience and 10.7% have had a fair working experience.

Table 4:2: Cross Tabulations

			Experience			
			Good	Very good	Fair	Total
Length of service	Less than 5 years	Count	8	11	3	22
		% within	36.4%	50.0%	13.6%	78.6%
	11-15 years	Count	3	3	0	6
		% within	50.0%	50.0%	0.0%	21.4%
Total		Count	11	14	3	28
		% within	39.3%	50.0%	10.7%	100.0%

Source: Research Data (2017)

4.4   Descriptive Analysis of Study Variables

4.4.1 Individual-Implications

In this section, the study establishes how the implications of ERP implementation on the employees at Communications authority of Kenya. The study aspects addressed include: presence of ERP System, The ERP system enhances my awareness and recall of job related information, The ERP system enhances my effectiveness in the job, how much of your work is performed through the ERP, The ERP system increases my productivity, how much has ERP software impacted on your daily work, and The ERP system user interface can be easily adapted to one's personal approach.

Table 4:3: Implications of ERP Implementation on the Employees

Individual-Implications	SD (%)	D (%)	U (%)	A (%)	SA (%)	Mean	Std
I have learnt much through the presence of ERP System	11	18	29	43	0	3.0	1.0
The ERP system enhances my awareness and recall of job related information	11	18	50	21	0	2.8	0.9
The ERP system enhances my effectiveness in the job	21	0	18	61	0	3.2	1.2
How much of your work is performed through the ERP	0	11	68	21	0	3.1	0.6
The ERP system increases my productivity	0	7	43	39	11	3.5	0.8
How much has ERP software impacted on your daily work?	0	21	25	32	21	3.5	1.1
The ER P system user interface can be easily adapted to one's personal approach	0	21	11	21	46	3.9	1.2

Source: Research Data (2017)

The study sought to find out whether implications of ERP implementation affects public institutions in Kenya. The findings are as indicated in table 4.3. From the findings, 43% agreed that they have learnt much through the presence of ERP System, 21% agreed that the ERP system enhances their awareness and recall of job related information, 61% agreed that ERP system enhances their effectiveness in the job, 21% agreed that much of your work is performed through the ERP, 39% agreed that ERP system increases their productivity, 32% agreed that ERP software had impacted on their daily work 46% agreed that ERP system user interface can be easily adapted to one's personal approach.

4.4.2 Implications of ERP Implementation on the Organization

The study sought to find out the implication of ERP on the organization. The results are as indicated in table 4.4. From the findings 54% agreed that ERP system is cost effective, 43% agreed that ERP system has resulted in reduced staff costs, 50% agreed that ERP system has resulted in overall productivity improvement, 67% agreed that ERP system has resulted

in improved outcomes or outputs, 32% agreed that ERP system has resulted in increased capacity to manage a growing volume of activity (Transactions, population growth, and others), 61% agreed that ERP system has resulted in improved business processes and 71% agreed that all data within the ERP system was fully integrated and consistent.

Table 4:4: ERP Implementation and the Organization

Organizational-Implications	SD (%)	D (%)	U (%)	A (%)	SA (%)	Mean	Std
The ERP system is cost effective	0	11	36	43	11	3.5	0.8
The ERP system has resulted in reduced staff costs	0	39	18	32	11	3.1	1.1
The ERP system has resulted in overall productivity improvement	0	21	29	39	11	3.4	1.0
The ERP system has resulted in improved outcomes or outputs	0	11	21	46	21	3.8	0.9
ERP system has resulted in increased capacity to manage a growing volume of activity (transactions, population growth)	0	18	50	21	11	3.3	0.9
The ERP system has resulted in improved business processes	0	11	29	50	11	3.6	0.8
All data within the ERP system is fully integrated and consistent	0	11	18	39	32	3.9	1.0

Source: Research Data (2017)

4.4.3 ERP Implementation and Information Quality

The study aimed at investigating the implications of ERP implementation on the Information quality. The findings are as shown in table 4.5. The findings indicate that 32% of the respondents agreed that ERP system provides output that seems to be exactly what is needed, 50% agreed that ERP system can be easily modified, corrected or improved, 32% of the respondents agreed that Information needed from ERP system was always available, 48% agreed that Information from ERP system was in a form that was readily usable, 48% agreed that Information from ERP system is easy to understand, 43% agreed that Information from ERP system appears readable, clear and well formatted and 54% finally Information from ERP system was concise.

Table 4:5: ERP Implementation and Information Quality

Information-Quality	SD (%)	D (%)	U (%)	A (%)	SA (%)	Mean	Std
The ERP system provides output that seems to be exactly what is needed	21	21	25	32	0	2.7	1.2
The ERP system can be easily modified, corrected or improved	11	11	29	29	21	3.4	1.3
Information needed from ERP system is always available	11	11	46	11	21	3.2	1.2
Information from The ERP system is in a form that is readily usable	0	0	52	48	0	3.5	0.5
Information from ERP system is easy to understand	24	0	28	48	0	3.0	1.2
Information from ERP system appears readable, clear and well formatted	11	0	46	32	11	3.3	1.1
Information from ERP system is concise	0	0	46	43	11	3.6	0.7

Source: Research Data (2017)

4.5 Inferential Statistics

The data analysis followed a two-step approach. First the measurement model was assessed and analysed to confirm construct validity. The second step involved establishing the relationships between all latent variables using structural equation modelling (SEM). PLS algorithm and Bootstrapping algorithm was run in SmartPLS 2.0

4.5.1 Measurement Model
The confirmatory factor analysis was conducted in order to assess the extent to which the observed data fits the pre-specified theoretically driven model. The model fits for the measurement model in partial least squares (PLS) were validated using four criteria. These were construct uni-dimensionality, construct reliability, convergent validity and discriminant validity (Hair *et al.,* 2011).

4.5.2 Construct Uni-dimensionality
Construct uni-dimensionality was initially assessed by verifying that the measurement items measured the specific construct. Further construct uni-dimensionality was performed through the verification of the cross loadings of scales and constructs to ensure that the

scales loaded heavily on the relevant constructs. The loadings and cross loadings are indicated in table 4.6. All the loadings and cross loadings were adequate and demonstrated construct uni-dimensionality.

Table 4:6: Cross loading

Items	Individual Implications	Information Quality	Organizational Implications	T value	p values
II1	0.743			10.40	0.000
II2	0.791			13.78	0.000
II3	0.862			20.10	0.000
II4	0.864			21.59	0.000
II5	0.744			15.23	0.000
II6	0.860			19.14	0.000
II7	0.576			6.05	0.000
IQ1		0.927		77.07	0.000
IQ2		0.946		66.03	0.000
IQ3		0.838		27.93	0.000
IQ4		0.700		21.00	0.000
IQ5		0.887		29.04	0.000
IQ6		0.756		11.84	0.000
IQ7		0.742		11.14	0.000
OI1			0.668	5.87	0.000
OI2			0.682	5.18	0.000
OI3			0.941	60.21	0.000
OI4			0.789	16.43	0.000
OI5			0.934	42.38	0.000
OI6			0.679	7.22	0.000
OI7			0.737	9.47	0.000

Source: Research Data (2017)

4.5.3 Construct Reliability

Construct reliability was assessed by computing the composite reliability and the Cronbach alpha of the constructs. Composite reliability measures were evaluated by using SmartPLS. The Cronbach alphas were all above the 0.6 threshold as specified for PLS analysis (Hair *et al.,* 2010) indicating good reliability and composite reliability of reflective items were all above the acceptable 0.7 threshold which means all the variables in the study exhibited construct reliability. All constructs were viewed to have acceptable reliability levels

because the composite reliability scores for all constructs were above the 0.7 threshold. Details of construct reliability are presented in Table 4.7.

Table 4:7: Reliability of Constructs

	Number	Composite Reliability	Cronbach's Alpha
Implementation	21	0.956	0.950
Individual Implications	7	0.916	0.891
Information-Quality	7	0.940	0.926
Organizational Implications	7	0.916	0.890

Source: Research Data (2017)

4.5.4 Convergent Validity

Convergent validity refers to the degree to which two or more items that measure a construct in theory converge or share high proportion of variance in reality. It is measured by three measures; factor loadings, composite reliability (CR) and average variance extracted (AVE). Convergent validity is achieved if composite reliability values for the construct are least 0.7 and the average variance extracted (AVE) are at least 0.5 (Hair *et al.,* 2010). Also all factor loadings should be statistically significant and should be above 0.5, as indicated in table 4.7, 4.8 and 4.0

Table 4:8: Convergent Validity

Variables	Number of items	**AVE**
Implementation	21	0.513
Individual Implications	7	0.613
Information-Quality	7	0.693
Organizational Implications	7	0.614

Source: Research Data (2017)

4.5.5 Discriminant Validity

Discriminant Validity is the extent to which items measuring one construct differentiate from items measuring other constructs. There are two criteria to assess the discriminant Validity. The first criterion is that the inter-construct correlation should not be higher than 0.9. The second criterion is the square root of the Average Variance Extracted (AVE) of the construct should be larger than its correlation with the other constructs. As in correlation matrix illustrated in Table 4.9 the diagonal elements are the square root of the average

variance extracted of all the latent constructs. The discriminant validity is assumed if the diagonal elements are higher than other off-diagonal elements in their rows and columns. This situation is apparently the case in the correlation matrix and thus the discriminant validity is confirmed.

Table 4:9: Discriminant Validity

	Individual Implications	Information-Quality	Organizational Implications
Individual Implications	**0.783**		
Information-Quality	0.529	**0.833**	
Organizational Implications	0.806	0.735	**0.783**

Source: Research Data (2017)

4.6 Structural Model Estimation

Having established the validity and the reliability of the measurement model, the next step was to test the hypothesized relationship by running PLS algorithm and Bootstrapping algorithm in SmartPLS 2.0.
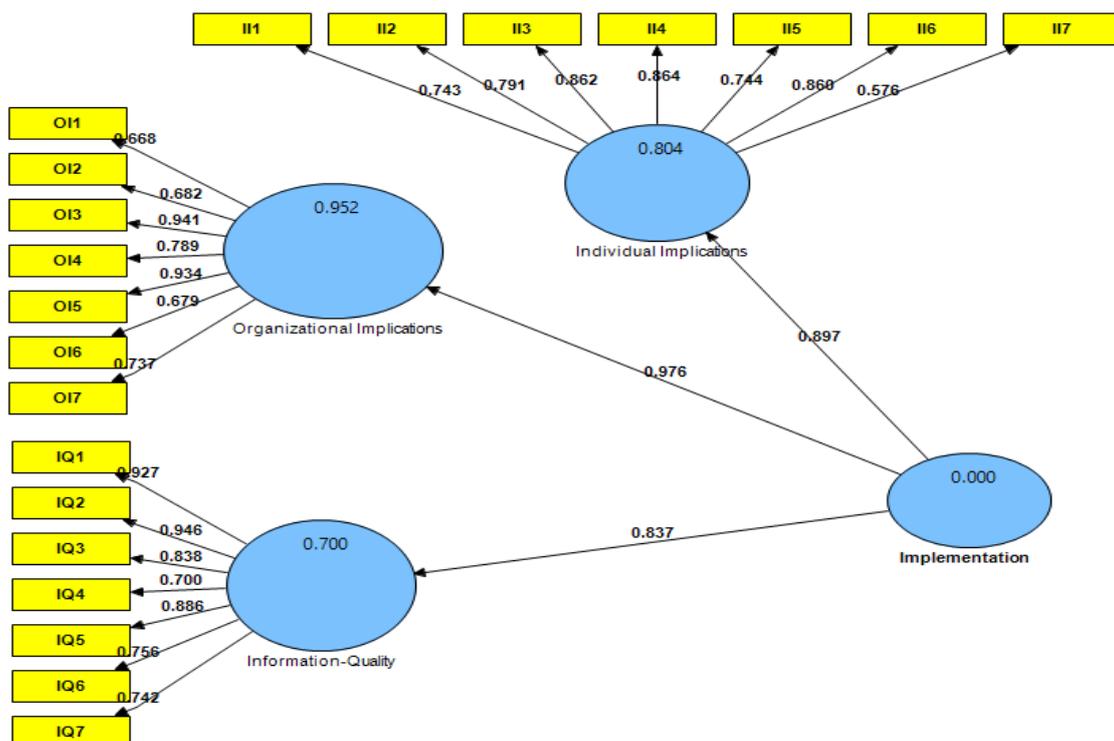

Figure 4:3: Items loadings and path coefficient
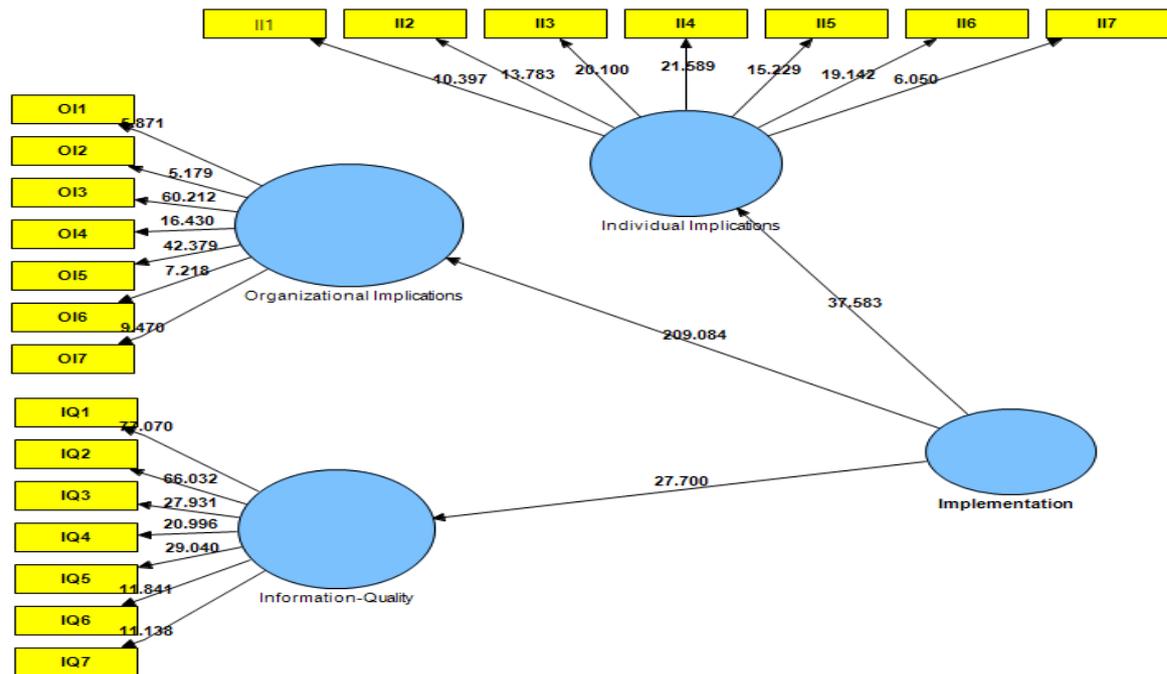
42

Source: Research Data (2017)

Figure 4:4: Significance of factor loadings and path coefficient

Source: Research Data (2017)

Table 4:10: Path Coefficients

Path	Path coefficient	Standard Error	T Statistics	P values
Implementation -> Individual Implications	0.8969	0.0239	37.5829	0.000
Implementation -> Information-Quality	0.8369	0.0302	27.7004	0.000
Implementation -> Organizational Implications	0.9757	0.0047	209.0845	0.000

Source: Research Data (2017)

4.6.1 Individual Implications and Implementation

Individual implications has a positive and significant standardized coefficient value (β=0.8969, T-value =37.5829, p<0.05) as indicated in table 4.10 and figure 4.3 and 4.4. This indicates that individual implications was a statistically significant indicator of implementation.

4.6.2 Information-Quality and Implementation

Information-Quality and implementation had a positive and significant standardized coefficient value (β=0.8369, T-value =27.7004, p<0.05) as indicated in table 4.10 and

figure 4.3 and 4.4. This indicates that information quality was a statistically significant indicator of implementation.

4.6.3 Organizational Implications and Implementation

Organizational Implications had a positive and significant standardized coefficient value (β=0.9757, T-value =209.0845, $p<0.05$) as indicated in table 4.10 and figure 4.3 and 4.4. This indicates that Organizational Implications is a statistically significant indicator of implementation.

4.7   Chapter Summary

This chapter provided the results and findings with respect to the data given out by the respondents from Communication Authority of Kenya. The chapter provided analysis on the response rate, background information. The next chapter provides the summary, discussions, conclusions and recommendations.

CHAPTER FIVE

5.0 SUMMARY, DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1   Introduction

This chapter presents the discussion, conclusions and recommendations of the study. In part 5.2, the summary of the study is presented. The discussion and conclusion of the study is in part 5.3 and 5.4 respectively. Part 5.5 demonstrates the recommendations.

5.2   Summary of Findings

The purpose of the study was to determine implication of Enterprise Resource Planning Systems implementation in public institutions in Kenya a case of Communications Authority of Kenya. The study adopted a descriptive research method in gathering, analysing, interpretation, and presentation of information. The descriptive research design helped in focusing at the strength of relationship. The study employed the use of questionnaires to obtain relevant information from respondents. The study adopted a descriptive and inferential statistics in data analysis and presentation.

The study summarizes that the implications of ERP implementation on the employees at Communications Authority of Kenya. The study aspects addressed include: presence of ERP System, The ERP system enhances my awareness and recall of job related information, The ERP system enhances my effectiveness in the job, how much of your work is performed through the ERP, The ERP system increases my productivity, how much has ERP software impacted on your daily work, and The ERP system user interface can be easily adapted to one's personal approach.

To achieve desired productivity of enterprise systems, technical improvements and reduction of operational costs is required. From the study, this can be done by aligning institutional functions to functionality of enterprise system under implementation. This resonates with observations by Sylvester and Robert (2004) on the need for examining system characteristics and aligning these with functional areas of the institution in need of automation. From the study, public institutions should prepare for implementation of ERP systems by aligning their functional areas to meet ease of automation and integration of their operations with implemented enterprise systems. This would help in choosing an ERP

implementation type and customization that not only meets institutional functional needs but also budgetary constraints of the respective institution. In cognizance of recommendations by Pollock (2004), public institutions should focus on restructuring their functional elements for ease of implementation of enterprise systems.

The study summarizes that to find out the implication of ERP on the organization. The results indicated in table 4.4. From the findings 54% agreed that ERP system was cost effective, 43% agreed that ERP system has resulted in reduced staff costs, 50% agreed that ERP system had resulted in overall productivity improvement, 67% agreed that ERP system has resulted in improved outcomes or outputs, 32% agreed that ERP system had resulted in increased capacity to manage a growing volume of activity (e.g. Transactions, population growth among others). 61% agreed that ERP system has resulted in improved business processes and 71% agreed that all data within the ERP system is fully integrated and consistent.

To achieve desired levels of service delivery in institutions, use of adequate mix of both internal and external expertise is required in implementation of enterprise systems by public institutions. This ensures that ERP projects undertaken are assured of continuity to completion while maintaining desired functionality with a critical success factor for successful ERP system based service delivery, public institutions should provide relevant training for their staff while sustaining adequate technical support from external staff in implementing their enterprise system. This helps in ease of technology transfer and capacity building for staff tasked with implementation of enterprise systems in respective institutions.

The above findings resonate with arguments by Leon (2015), which indicate that ERP system implementation is a people project and not a technology project. This was evident from the findings of the study where inadequate employees were cited as critical factors affecting implementation of enterprise systems in sampled public institutions. The study investigated the implications of ERP implementation on the Information quality. The findings from in table 4.5. The findings indicate that 32% of the respondents agreed that ERP system provided output that seems to be exactly as what was needed, 50% agreed that ERP system can be easily modified, corrected or improved, 32% of the respondents agreed that Information needed from ERP system is always available, 48% agreed that Information from ERP system was in a form that was readily usable, 48% agreed that Information from

ERP system was easy to understand, 43% agreed that Information from ERP system appeared readable, clear and well formatted and 54% finally Information from ERP system was concise.

From the study, high levels uncertainty in institutional connectivity was decried by most respondents. A high frequency of problems experienced with communication interfaces, institutions need to address connectivity issues to be in a position to provide uninterrupted communication and seamless connectivity over enterprise systems platforms implemented. The above findings fail to meet recommendations by Sullivan and Bozeman (2010) which foresee increased efficiency, process improvements and improved resource management from implementation of enterprise systems in institutions. Despite these setbacks, there have been significant efforts towards seamless connectivity of departments in public institutions using enterprise systems.

5.3   Discussions of Results

5.3.1 Implications of ERP Implementation on the Employees

The study establishes how the implications of ERP implementation on the employees at communication Authority of Kenya. The study aspects addressed include: presence of ERP System, The ERP system enhances employee awareness and recall of job related information, The ERP system enhances employee effectiveness in the job, how much of your work is performed through the ERP, The ERP system increases employee productivity, how much has ERP software impacted on your daily work, and The ERP system user interface can be easily adapted to one's personal approach adapting to the conceptualization by Levine (1994), the more extended use of a system to support and individuals work the more increased is the performance of tasks.

While institutions have substantially invested in ERP implementation, little research has been carried out about ERP implementation in institutions environment (Nielsen, 2012). In this section, focusing on the institutions environment, findings in MIT case study compare to what previous studies indicate. According to Muinde (2016), the major benefits of ERP implementation are improved productivity and reduced cost. Particularly, the central repository that stores data can give institutions to easy and up-to date access to users. This study's case also shows the main benefit is real-time integrated data and easy access. Also, he indicated that "One of the common goal of all the educational institutions

is a paper free environment and these ERP systems need to be able to facilitate this change". By implementing ERP system, MIT converted many paper processes to ERP system processes. Although some processes still allow a paper work for handling exceptions, this resulted in decreasing manual work.

Fisher (2006) examined staff perceptions of ERP implementation in three Australian institutions. One aspect of an implementation of an ERP system was that it could be perceived of power redistribution in an organization. He described that power redistribution could occur resistance of change such as the development of shadow systems. MIT's case shows this fact that DLCs keep maintaining shadow systems to complement their specific requirements the ERP system cannot meet. Moreover, Fisher (2006) indicated that the delayed timeframe for ERP implementation in institutions made more positive perceptions for the adoption of new technology. This contrasts that corporate sector emphasizes on keeping specific timeframes for successful implementation (Livingstone, 2012). The delayed timeframe can be perceived to give more time for additional training and help staff to relieve pressure from using new system. Ken Le Vie, a project member in MIT SAP implementation also recalled that the delay "go-live" date made most of people relieved. "We probably did not know how challenging SAP is going to be, but we certainly knew it meant to increase our (Ken Le Vie, 2013)."

Moreover, Abbas (2011) presented that "the structures of the institutions are very rigid and resistant to change, so the focus is on the change of processes not technology". In this sense, the role of top management is critical to plan and monitor across an organization during ERP implementation. For successful ERP implementation, all the users should be informed and involved about the implementation process and progress (Abbas, 2011). The effective and efficient communication increases the possibility of success of ERP implementation.

5.3.2 Implications of ERP Implementation on the Organization

Implementing ERPs is a way to integrate all business units, provide real-time data for timely decision, speeding up production and supply in the market, decrease assets needed to run the business, maximize customer satisfaction etc. for improving firm performance. ERPs investment tends to achieve strategic and operational goals of firm which ultimately

reveal improved performance. A good number of issues at different stages of ERPs implementation have been reported by prior studies.

The study sought to find out the implication of ERP on the organization. The results are as indicated in table 4.4. From the findings 54% agreed that ERP system was cost effective, 43% agreed that ERP system had resulted in reduced staff costs, 50% agreed that ERP system had resulted in overall productivity improvement, 67% agreed that ERP system had resulted in improved outcomes or outputs, 32% agreed that ERP system has resulted in increased capacity to manage a growing volume of activity (including transactions, population growth, among others), 61% agreed that ERP system had resulted in improved business processes and 71% agreed that all data within the ERP system was fully integrated and consistent. Organizations adopt the ERP systems because they are cost-effective. ERP's use cost-effectiveness is relevant both in the short term and in the long term basis. For instance, a company called Allied Waste decided to enroll an ERP system which cost them $130 million on the computer systems (Markus & Tanis, 2000). The company's expenditure was huge, but the reduction on running costs resulted to low operational costs thus was good in the long term. The company's decision to enroll ERP system was the compatibility with its management style and structure of the company. As a result of the ERP adoption, Allied Wastes acquired multiple trash haulers (Markus & Tanis, 2000).

According to Huang and Palvia (2011), the ERP system adopted in North America, Europe and Asia amounted to 66 percent, 22 percent and 9 percent respectively of the Enterprise Resource Planning (ERP) software that had been adopted globally. Additionally, the study indicated that the level of ERP software adopted in the rest of the world, namely; Africa and South America was equivalent to only 3%. The ERP adoption disparities between the developed and the developing countries were attributed to factors that hindered the ERP adoption. In Singapore the government strategy is equated with business strategy, irrespective of the clearly differences. Government strategies are described less in reference to a competitive marketplace, but instead account issues like delivery of services to its citizens (Davison, Louis & Ma, 2005). Hong Kong has achieved to implement the government strategy and align it to e-government strategy. In Africa, Zimbabwe has a website demonstrating central government basic functionality and in Malawi, the situation is fairly progressed. The central government online platform offers links to some 22

government ministries which is a demonstration of e-government strategic thinking (Davison, Wagner, & Ma, 2005).

The outcomes of this study are consistent with that found by (Xiang, Wang, Zhang, & Yuan, 2009). ERPs investment generates a dual effect: it is not only providing the strategic edge to adopters by reducing cost through sample periods but also provide the operating benefit through reduced operating expense after ERPs implementation. The important finding indicates that the performance gap between ERPs adopters and non-adopters will be getting wider with the passage of time. Keeping the result in mind it can be concluded that ERPs implementation shield the employees from deteriorating their performance in bearish market situation. The results about ERPs implementation impact on perform drawn by studies in developed world as well as in developing world are valid in the case of communication authority. The results are also in accordance with (Maier, Laumer, & Eckhardt, 2011) who found significant improvement in employee performance as compared to non-adopters in post ERPs implementation period. Because the results of ERPs' effect on firm's performance of adopters and non-adopters are mixed, the results are consistent with some findings in the developed and developing world while contrary to other studies conducted in the both parts of the worlds.

5.3.3 Implications of ERP Implementation on the Information Quality

According to Gartner (2011), a readiness assessment is an activity used to determine the degree of readiness of an organization to execute a major project or initiative and to help identify specific areas to focus on in the preparation process. The rating system should be used very early in the planning phase of the project before the ERP selection in ERP implementation. Originally, the purpose of the ratings for ERP readiness is to help identify specific areas for the ERP project team to focus on as they prepared to select and implement the ERP system best for them.

The findings indicate that 32% of the respondents agreed that ERP system provided output that seems to be exactly what was needed. According to Barki *et al* (2005) the scope of ERP implementation has a relation with the benefits obtained by embracing a firm whereby the scope of ERP implementation refers to the extent to which the ERP system is disseminated within an organization and its business processes. According balanced scorecard, implications of ERP can be assessed using four measures: financial performance,

internal processes, customer satisfaction, and innovation and learning. Financial performance assesses reflect the input of an ERP system implementation to enhanced financial position of a firm. Financial performance of a firm stems from the efficacy of the three other activities: internal processes, customer satisfaction, and innovation and learning.

ERP therefore, has the potential to leverage on the organizations resources and develop competitive advantage. Half of the respondents (50%) agreed that ERP system could be easily modified; corrected or improved the application of ERP programs to an institution requires dynamic learning by the personnel that will be managing the database. The system may be simple by explanation, but it required a lot of effort in man hour to ensure that all the ERP programs are functional. Proper functionality requires that the ERP architecture works in harmony in a standard format that is in accordance with the code of practices in the public organization (Bendoly, Donohue, & Schultz, 2006).

Thirty-two percent (32%) of the respondents agreed that Information needed from ERP system was always available, Databases comprised of relational databases (Mundie, 2016). Emergence of Enterprise Resource Planning systems in 1990s and increased application data banks on the onset of 2000s made it obligatory for organizations to develop means to manage the explosion of information (Mundie, 2016). ERP implementation implication towards an organization information quality is well demonstrated through the ability of the system to provide accurate and timely information to enable decision making, enhance inter-departmental co-ordination as a result of information sharing, competitive advantage and increased sense of achievement among employees (Chang *et al.,* 2011). 48% agreed that Information from ERP system was in a form that was readily usable, 48% agreed that Information from ERP system was easy to understand, 43% agreed that Information from ERP system appears readable, clear and well formatted and 54% finally Information from ERP system was concise. Public organizations that have implemented ERP in their institutions have a system that enhances the continuous communication of vital information across all the functional units (Jessop, 2011). The virtue of communication across the departments is important since it improves efficiency, increases performance, and improves productivity. Finally, ERP program in procurement department of an organization has enhanced tracking and forecasting and improved customer service satisfaction. Customers' satisfaction is paramount for to ensure that an organization grows. The timely movement

of goods and services is of importance since reduces instances of delayed production of goods and services (Baily, Farmer, Crocker,, & Jessop, 2015).

5.4   Conclusion

5.4.1 Implications of ERP Implementation on the Employees

Based on the findings of the study, the following can be concluded: Implementation of strategy is a very important aspect of an organization's continuity even in government sponsored institutions. ERP implementation in Communications Authority of Kenya was a part of the organization   corporate plan, for efficiency in its daily operations as well as transparency and accountability to the general public. During the implementation phase of ERPs, the management should include and involve the employees to enable them to become familiar with the system and its use as well as reduce resistance to the use of the system. The fundamental role of ERP systems is to make business operations easier and more efficient.   These includes functions like accounting, Human Resource procedure, procurement and stores management. The key factors that affect the implementation of ERPs in business were working with functionality and maintaining scope, the teamwork amongst the Project team, management support and consultants, internal readiness of the organization and training, organizational diversity, planning, development and budgeting and adequate testing of the newly acquired system.

In general, ERP systems have a positive impact on business because apart from making businesses more efficient and effective they also make businesses competitive both locally and globally.

5.4.2 Implications of ERP Implementation on the Organization

ERP implementation is viewed as a crucial solution for corporations aiming to meet increased competitive pressures and globalization. A successful ERP can be the backbone of business intelligence for an organization. Giving management a unified view of its processes. Unfortunately, ERP's have a reputation for costing a lot of money and providing meagre results, because the people who are expected to use the application do not know what it is or how it works. When ERP fails, it is usually because the company did not dedicate enough time or money to training and managing culture change issues. Faulty technology is often blamed. But eight out of nine times ERP problems are performance related.

The findings of this study provide a point or departure ERP system, the impact on' the implementation of ERP System in Office. The study has highlighted ERP system challenges as experienced by employees. The study indicates that the ERP system implementation can process classified under five major types: there is deficiency in the ERP system: employees are worried about data loss when they use the system. They tend system errors using the ERP system they experience difficulty in exporting data from ERP system, and are not satisfied with the quality of output from the ERP system. Results highlight the need for communication authority management to explore the opportunity to ensure that the employees are trained to be familiar with the system. Improve the ERP system reliability and reduce possible system errors.

5.4.3 Implications of ERP Implementation on the Information Quality

Based on the findings of the study concluded that ERP systems had reduced cost in operation and also time used to perform certain duties in the organization. The study however found that the implementation cost of the ERP system was too expensive with the least company spending a cost range into millions of dollars. The study concluded that ERP enables companies to break down traditional organization's granaries and thus increase the profits of the organization significantly. They have replaced them with a tightly integrated horizontal structure whereby the strategy, culture of the organization, process and technology are tightly aligned. By using integration technologies to integrate management of document activities, human resource intervention is only necessary in activity control.

5.5   Recommendations

5.5.1 Implications of ERP Implementation on the Employees

The management should embrace change to enhance success implementation of the ERP system at the Communication Authority of Kenya. The training of the developers and technical staff was to be given consideration. Communication authority of Kenya to invest heavily in the training of its human capital. While implementing ERP the management should take care of redundancy issues amongst employees since the various duties created from the use of the system need more departments integrated as others are formed. All the major driving forces towards adoption of new systems should be carefully considered. Timelines should be realistic. The scheduled time for completion of implementation and cost is inevitable to ensure that the desired results are obtain as agreed in the contract. For

the, implementation of the ERP to be successful, a better understanding of what is involved and the expectations of all stakeholders should be made clear in the initial stages, even as the project.

5.5.2 Implications of ERP Implementation on the Organization

Successful ERP project needs a match between the organizational processes and the ERP system. Therefore, the ERP implementing company should carefully assess and select ERP software. The selection of a suitable ERP system is an important step but time consuming and challenging. Companies intending to select ERP software must have a detailed requirements plan. A thorough assessment of the ERP system features is necessary before selecting the ERP vendor. The main criterion for choosing ERP software is that which fits well with local requirements. The ERP system should be compatible with existing business processes to minimize the need for BPR.

5.5.3 Implications of ERP Implementation on the Information Quality

The study the adopting company should select a suitable ERP vendor that is able to offer an ERP system with maximum flexibility and easy to customize, such that time and money spent on modification is minimized. Organizational change should be achieved step by step, by using a milder change strategy such as business process improvement. The various governmental regulations and the legal context of countries oblige companies to have country-specific requirements. ERP vendors should prepare themselves to deal with problems of the environment in which their ERP software is implemented. International ERP vendors should localize their ERP systems to reflect the characteristics of local management. Localization of ERP software means that development of the system fits the requirements of the user's context. The requirements usually depend on country, language, and cultural codes.

5.6   Suggestions for Further Research

The survey aimed at determining the perceived factors affecting the implementation of EPR at communication authority of Kenya. Further studies should be done on the efficiency of EPR in the public institutions in Kenya and on factors to consider when choosing EPR vendor. This is very important as it will ensure the right system and the right vendor has been chosen. Getting right the first time saves time and money. Also this will yield more insights useful for building the body of knowledge on this area of EPR.

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APPENDICES

Appendix 1: Sample Questionnaire

Questionnaire

Implication of ERP implementation questionnaire: A case study on Communications Authority of Kenya.

Introduction

This questionnaire asks you about the ERP software used in your department and your preference. It also has some demographic questions about you. All the information you provide will be treated as strictly confidential and your responses will not be associated with you personally. Your participation is voluntary. Questions or concerns about this questionnaire can be directed:

 Michael Githiga e-mail: githigam@gmail.com

Tel : +254723 929482

Instructions

1. Please answer the questions below as accurately as you can.
2. If you wish to comment on any questions or qualify your answers, please feel free to use the space in the margin
3. Certain questions employ 1-5 scale, with answers ranging from "strongly agree" to "strongly disagree". Please circle the number that best matches your opinion

SECTION 1: PERSONAL INFORMATION

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

2. What age group best describes your age?

Age (Years)	18 – 28	29 – 39	40 – 50	Above 50
Response				

3. What is your education level?

Level	No Education	Primary	Secondary	Bachelors	Postgraduate

Response					

4. For how long have you worked for your organization?

Length (years)	Less than 5	5 – 10	11 – 15	Above 15
Response				

SECTION 2: ABOUT YOUR EXPERIENCE WITH ERP SOFTWARE

Please indicate by circling the appropriate box the extent to which you agree or disagree with each of the statements below. The following scale is applied for all statements

Where 1= Strongly Disagree (SD); 2= Disagree (D); 3=Neutral (N); 4= Agree (A); 5=Strongly Agree (SA)

Individual-Implications						
1.	I have learnt much through the presence of ERP System	1	2	3	4	5
2.	The ERP system enhances my awareness and recall of job related information	1	2	3	4	5
3.	The ERP system enhances my effectiveness in the job	1	2	3	4	5
4.	How much of your work is performed through the ERP	1	2	3	4	5
5.	The ERP system increases my productivity	1	2	3	4	5
6.	How much has ERP software impacted on your daily work?	1	2	3	4	5
7.	TheERPsystem user interface can be easily adapted to one's personal approach					
Organizational-Implications						
1.	The ERP system is cost effective	1	2	3	4	5

2.	The ERP system has resulted in reduced staff costs	1	2	3	4	5
3.	The ERP system has resulted in overall productivity improvement	1	2	3	4	5
4.	The ERP system has resulted in improved outcomes or outputs	1	2	3	4	5
5.	The ERP system has resulted in increased capacity to manage a growing volume of activity (e.g. transactions, population growth, etc.)	1	2	3	4	5
6.	The ERP system has resulted in improved business processes	1	2	3	4	5
7.	All data within the ERP system is fully integrated and consistent	1	2	3	4	5
Information-Quality						
1.	The ERP system provides output that seems to be exactly what is needed	1	2	3	4	5
2.	The ERP system can be easily modified, corrected or improved	1	2	3	4	5
3.	Information needed from ERP system is always available	1	2	3	4	5
4.	Information from The ERP system is in a form that is readily usable	1	2	3	4	5
5.	Information from ERP system is easy to understand	1	2	3	4	5
6.	Information from ERP system appears readable, clear and well formatted	1	2	3	4	5
7.	Information from ERP system is concise	1	2	3	4	5

26 Any other comment that might be relevant and necessary for this study?

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THANK YOU FOR YOUR VALUED TIME AND RESPONSES