IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY ON KENGEN'S PERFORMANCE

NYANG'AU ENOCK NYAKOE

A MANAGEMENT RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE MASTER OF BUSINESS ADMINISTRATION (MBA) DEGREE OF BUSINESS OF UNIVERSITY OF NAIROBI

2014

DECLARATION

This research project is my original work and has not been submitted to this university or any other university for academic award.

Sign ……. ……..

Enock Nyakoe Nyang'au Date

D61/62808/2011

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

Sign ……. ……..

Mr. James T. Kariuki Date

Lecturer

School of Business

University of Nairobi

ACKNOWLEDGEMENT

My sincere gratitude goes to Almighty God for the much needed strength, courage and good health. I am so thankful to my supervisor Mr. James T. Kariuki for his tireless efforts in correcting me whenever I deviated.

DEDICATION

I dedicate this research project to my family for their moral support and bearing with me throughout the process. May the Almighty God Bless you abundantly. I will forever remain grateful and thankful to you all.

ABSTRACT

The aim of this study was to ascertain the impact of Information and Communication Technology (ICT) on KenGen's performance. Specifically the study sought to determine the impact of Information and Communications Technology on KenGen's performance and to establish the challenges of using ICT at KenGen. The study adopted descriptive survey design. The participants comprised of 302 employees of KenGen working in different departments and levels. The study relied on data collected through questionnaires structured to meet the objectives of the study. Data was analyzed with the help of SPSS. The main findings were that, ICT had facilitated production of ad hoc reports, improved quality of work, enabled availability of reliable information on power generation and facilitated knowledge sharing and building on each other's ideas in real time. In addition, ICT had enabled KenGen to empower its employees and facilitated employees learning. However, impact of ICT on performance is being hindered by insufficient access rights to the systems. The study recommends that the KenGen management should ensure that employees have adequate access rights to the system to enable them work comfortably. Further the management should facilitate training of employees on ICT systems so that they can have required skills and knowledge on the systems.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATION AND ACRONYMS

ALP	-	Average labor productivity
ERP	-	Enterprise Resource Planning
ICT	-	Information and Communication Technology
IDA	-	International Development Association
IP	-	Internet Protocol
IS	-	Information System
IT	-	Information Technology
ITPOSMO		Information Technology Processes, Objectives, Skills, Management Systems
KPLC	-	Kenya Power and Lighting Company Limited
MW	-	Megawatts
SCADA	-	Supervisory Control and Data Acquisition
SPSS	-	Statistical Package for the Social Sciences
TAM	-	Technology Acceptance Model
TRA	-	Theory of Reasoned Action
TFP	-	Total Factor Productivity
VPN	-	Virtual Private Networks

CHAPTER ONE
INTRODUCTION

1.1 Background

The evolution of Information and Communication Technologies (ICTs) during the last decade has significantly altered the business landscape on a worldwide scale (Gardner, 2007). The integration of ICTs in the business processes resulted in numerous examples of enhanced organizational performance both in developed and developing countries. The International Development Association (IDA), which is the part of the World Bank whose aim of to assist the world's poorest countries, suggests that the growth in access to ICTs is boosting economic productivity, raising incomes of families and small businesses, and providing source of government revenue (Beynon, 2002).

Globally, organizations and businesses have incorporated ICT in their day to day operations. New Information and Communication Technologies in particular high speed internet (because of quick data processing and relaying information) are changing business operations within companies, transforming public service delivery and democratizing innovations (Gable and Raman, 2010). Use of computer and Internet in small, medium and large business set ups has been on the rise in the recent times. There is sharp reduction in the use of manual or paper work in the operations of businesses. Business information like stock level, prices and even customers are kept in electronic forms. Internet services have enabled business owners and customers transact business without physical movement. It has also enabled businesses to improve efficiency and effectiveness of their businesses, (Greenberg 2001).

According to Hammoud (2008), Information and communication technologies (ICTs) are constantly and rapidly evolving. New products and services are incessantly being developed and launched in the market. This inevitably affects the definition of the ICT industry. Its 'boundaries'

are constantly being modified and redefined. The ICT sector is considered to include manufacturing and assembling of ICT equipment, variety of service activities ranging from telecommunications to software development and provision of interconnectivity services. Voss (2003) gives definition of Information and Communication Technologies (ICT) as diverse set of technological tools and resources used to communicate, create, disseminate, store, and manage information. These technological tools include computers, Internet, broadcasting technologies (radio and television) and telephony. This study adopted Voss's definition because of its broad nature.

ICT plays a major role globally in offering inter-connectivity between continents and countries making communication between the continents easier (Schneider and Barsoux, 2007).This has also enabled multinational companies to receive information while miles away (Greenberg, 2001).

Use of information and Communication technology in organizations has come with a lot of social and cultural challenges which include gender, social norms, education and age among others (Hubona et al., 2006). Despite of the challenges, it has also brought a lot of benefits to the organizations. According to Payne (2003), ICT has brought a positive impact in business today by increasing productivity in various sectors. It has made it easier to communicate efficiently and effectively by the use of networking and mailing system. E-marketing has also made it easier for businesses to reach their clients hence enhancing productivity in various business industries (Rashid et al., 2008).

1.1.1 ICT and Performance

Information and knowledge are the foundation of the ICT and performance. The pervasiveness of ICT is affecting traditional performance. New products, new processes and new organisational forms are improving the production function and increasing output. New technologies are

strengthening the bases of highly innovative firms, widening their set of "eligible choices" and increasing their performance (Greenberg 2004).

ICT has provided new technologies that reduce transport costs, production costs, enhanced quality, and faster workflows thus facilitating organizational performance. Communication and co-operative working is being made easier and less costly, and is producing several benefits in terms of cost and time saving, routines, information exchange, and increased quality and variety of output (Brynjolfsson and Hitt, 2000).

According to Thong (2004) it is now a common argument that ICT has led to improvement in organizational performance. But it might be more appropriate to say (because of the gains of ICT) that– rather than widespread productivity gains across the level of the whole economy – ICT has led to massive improvement in performance. The productivity gains from ICT as a competitive factor, there is significant differences by sector and nation in the extent to which ICT has been successfully exploited. This (difference) remains a key challenge for policymakers (Thong 2004). Greenberg (2004) argue that the role of information and communications technology (ICT) in promoting productivity growth is an issue that has attracted particular attention not only in Australia, but also other countries, in the context of the 'new economy' debate. Whilst it is now generally agreed that the use of ICT has a positive influence on productivity growth — at least in industries that use ICT intensively — the observed differences across countries in the extent of ICT uptake and related productivity effects have continued to be a puzzle.

Advances in ICT have progressively reduced the costs of gathering, storing, retrieving, processing, analyzing and transmitting information. Through these, ICT has provided firms with

cheaper and easier access to more accurate, timely and useful information. Firms could take opportunity to undertake pre-existing information-related tasks more quickly, effectively and cheaply than by more traditional labour-intensive means. Firms employs use of ICTs as a means to develop and introduce value adding and efficiency-enhancing innovations in products, and organizational structures. Processes like invoice processing, enquiries, data capture and processing have been automated through ICT and thus leading to enhanced performance (Mgaya 2009).

Successful organisations have recognised that computers and communications technology have fundamentally altered the very nature of organisational work and the overall performance.(Because of automation of processes) This in turn often requires the rethinking of the strategy of the organisation with a subsequent remaking of its basic structure and processes (Greenberg 2004).

1.1.2 Performance

Performance is a measure of how well a mechanism/process achieves its purpose. In enterprise management, Moullin (2003) defines an organization's performance as "how well the organization is managed" and "the value the organization delivers for customers and other stakeholders."

Measuring performance is a multi-dimensional concept. Effectiveness and efficiency are the two fundamental dimensions of performance; this is emphasized by (Adams et al. 2002): "Effectiveness refers to the extent to which stakeholder requirements are met, while efficiency is a measure of how economically the firm's resources are utilized when providing a given level of stakeholder satisfaction". To attain superior relative-performance, an organization must achieve its expected objective with greater efficiency and effectiveness than its competitors (Neely 1998).

Performance can be measured through examining Effectiveness where by a process characteristic indicating the degree to which the process output (work product) conforms to requirements, Efficiency; a process characteristic indicating the degree to which the process produces the required output at minimum resource cost, Quality; the degree to which a product or service meets customer requirements and expectations, Timeliness; Measures whether a unit of work was done correctly and on time (Neely 1998).

In this context, performance is measured through examining the cost elements, quality of the work done by employees, time taken to accomplish various tasks in the organisation and flexibility of the system (KenGen Intranet 2014).

1.1.3 Kenya Electricity Generating Company

Kenya Electricity Generating Company Limited, (KenGen) is the leading electric power generation company in Kenya. It produces about 80 percent of electricity consumed in the country (Musyoka 2005). KenGen has 3,016 employees working in different departments and levels across the company. The company has invested heavily in ICT in line with the overall strategy for it to achieve its goals of producing 3,000 MW by 2018. For example it has successfully rolled out Enterprise Resource Planning (ERP) which runs on SAP and with numerous modules which include Material Management (MM), Project System (PS), Finance and Control (FC) to enable it enhance processes and improve services. It has also installed Supervisory Control and Data Acquisition (SCADA) system whose role is to integrate all power stations for better management and supply of power effectively to the national grid. Plants that have been connected include, Kindaruma, Kiambere, Masinga, Ngong, Olkaria, Sondu and Kipevu. KenGen also offers environmental management services and consultancy services in technical services and geothermal electricity generation fields (KenGen Intranet, 2014).

KenGen has installed a biometric access system in its head quarters premises. This project initially was intended to eliminate cases of employee sneaking from work and encourage employees to report to their place of work on time. It was also intended to assist human resource department in monitoring time aspect of the employees. However, despite the installation of biometric access system, employees still abscond duties, come late and even leave early than the company's official time. This system has not been very effective in KenGen despite the huge investment in terms of monetary and time the company incurred (KenGen Intranet, 2014).

All employees in KenGen have access to electronic mail system. Official communication within the company is through email system. Employees have access to computers where they can attend to various issues on time and wherever they are. Top management employees have ipads and laptops installed with Virtual Private Networks (VPN) which enables them to access the company's systems easily from outside KenGen. Through this, the company is able to realize easy and faster workflow and decision making process is quick (KenGen Intranet, 2014).

Employees in KenGen fill their annual, emergency or maternity/paternity leaves through the system called Workflowgen. This makes the process of workflows quite faster and the supervisors can approve the same from anywhere in the country. Also employees use biometric system that authenticates them whenever they want to access the head office premises. This system doubles up for security purposes and human resource management of employees' time and accountability (KenGen Intranet, 2014).

KenGen has employed use of Internet Protocol (IP) phones across all its branches country wide. This has minimized the cost of calling within the company. Video conferencing has made it easier for managers to hold meetings without travelling. This has reduced the cost of travelling and enhanced time management for the employees (KenGen Intranet, 2014).

EasyDoc in SAP module helps management to manage hard copy documents. This is done by scanning all documents like title deeds, contracts and proof of payment documents, by storing them in the server for future reference. This system has helped the retrieval process of the same information more easily as opposed to physically locating the documents which used to consume more time and storage (KenGen Intranet, 2014).

1.2 Statement of Research Problem

Solow (2003) states that approximately 70% increase in company production can be attributed to technological change. Heavy amount of capital has been invested to achieve technological change. ICT scope ranges from influencing employees and consumers to companies' output. Energy producing companies are also working towards cleaner production that is supported by ICT solutions.

Investment in ICT has increased globally in the recent past (Hage and Dewar, 2007). Most organizations have realized that reliable and effective ICT systems can help them achieve and realize their goals quite easily. Organizations have allocated a bigger budget to ICT departments. Contributions made by ICT in organization have made companies to be more competitive towards their rivals and easy differentiation of products in the market. ICT has changed the way organizations operates in totality, from the way data is captured, processed and even output of the results on the activities of the company (Legris & Collerette 2006).

Productivity is the fundamental economic measure of a technology's contribution. With this in mind, CEOs and line managers have increasingly begun to question their huge investments in computers and related technologies. The lack of good quantitative measures for the output and value created by IT has made the ICT manager's job of justifying investments particularly difficult. Academics have had similar problems assessing the contributions of this critical new

technology, and this has been generally interpreted as a negative signal of its value (Legris & Collerette 2006).

The effects of ICT on corporate performance are subject to debate because not all studies have demonstrated clear payoffs from ICT investments (Chan, 2000, Kohli and Devaraj, 2003). Chan found out that ICT had a minimal impact on companies' processes and output while Kohli and Devaraj realised that ICT was viewed as a hindrance by employees in their work. Also, the results vary depending on how performance and ICT payoffs are measured and analysed. For example Hitt and Brynjolfsson (1996) did a study on Effect of ICT in Oil Producing companies and found positive impact of ICT investments on productivity. Prasad and Harker, (1997) did a study on the Influence of ICT on performance and the results showed that there was no positive effects of ICT capital on productivity, while ICT positively contributed to output and profitability.

Information technology plays an important role in leveraging productivity and efficiency in both public and private organizations. Organizations that have efficient and effective ICT systems are able to realize significant performance gains and thus improve their competitiveness (Nickerson, 2007). Atzeni and Carboni (2004) investigated the impact of ICT on total factor productivity (TFP) and its contribution to output growth, they concluded that the impact was positive. Gable and Raman (2010) investigated on the effects of ICT on business operations and concluded that ICT is a major pillar in driving organizations day to day operations. KenGen has invested heavily in ICT in all its power stations and administration offices. However the management has not attributed positively on the impact of this investment in the company's productivity. There is no study that has been done to examine the Impact of ICT on KenGen performance. Hence this study will draw light on the impact of ICT on KenGen performance and will seek to answer this research question; what is the impact of Information and Communications Technology on performance in KenGen?

1.3 Objectives of the Study

1.3.1 General Objective

The overall objective of this study was to determine the impact of Information and Communications Technology on KenGen's performance.

1.3.2 Specific Objectives

The specific objectives were:

a) To determine the effect of Information and Communications Technology on KenGen performance.

b) To establish the challenges of Information and Communications Technology on KenGen performance.

1.4 Value of the study

The study findings will be useful to the management of KenGen because it will show areas the company needs to improve in order to enhance overall performance of the company. Prospective researchers will find this study useful because it would provide a study gap that can be studied on.

The study findings will be a reference point for other parastatals and even private entities in Kenya on how ICT can improve organizational performance. In addition, the study findings will be helpful to the government and other government agencies in assessing organizational performance with the view of making informed decisions in regard to ICT and performance in the country.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter contains review and summarized literature from other researchers who have carried out research in the same field of study. The specific areas covered in the literature review include effects of Information and Communication Technology, empirical review and theoretical foundation.

2.2 Impact of Information Communication and Technology

The key to understanding the impacts of ICT on performance is to view ICT as an enabler of innovation (Koellinger 2005). This conceptualization of new technologies as possible enablers of innovation allows a market-based approach to study the relationship between ICT and performance. It also allows investigation of why different firms that invest in the same technology may exhibit different payoffs. In addition, this concept allows us to argue that ICT remains of a strategic relevance for firms as long as it enables innovation. Innovation is a strategic variable because it allows firms to differentiate their products, services and production processes vis-à-vis their competitors, at least in the short run.

A number of authors have also demonstrated an increasingly productive use of ICT in the user-sectors, and not only a productivity growth in the ICT producing sector itself (Oliner and Sichel 2000, Baily and Lawrence 2001). Gordon (2000) raised doubts about this productivity growth acceleration story and attributed most of the observed changes in US productivity to price-measurement problems and cyclical factors. Although measurement problems and a debate about the sustainability of ICT-enabled growth remain, there is now wide consensus that ICT does have positive effects on labour productivity and total factor productivity (Pilat 2005, van Ark 2002).

Schumpeter (1934) emphasize that entrepreneurship is the main engine of economic growth. Many researchers have attempted to explain the causal relationship between such growth and technological development. Solow (2003) introduced residual approach to measure the contribution of technological development to productivity growth. He found out that approximately 70% of productivity increase can be attributed to technological change. Hence, technology is considered to be the main driver of economic growth. According to Matthias (2011), contribution of ICT investment to the growth of value-added and average labor productivity (ALP) within the German energy industry decreased in the years 2001-2005.

With changes to the environment, organization must continuously change to cope with the changes (Donaldson, 1996). Performance of organizations has shifted from organizational to inter-organizational levels in recent years (Malore and Rockart, 1991). With increased competition, organization has to meet the international standards and customer needs. This requires proper coordination and productivity within the organization.

ICT enables coordination within and outside the organization. ICT enables people to shape coordination (Malore and Rockart, 1991): more efficient and effective coordination processes, more coordination processes and new coordination structures are all enables with the use of ICT. It also centralizes coordination structures hence lowering coordination cost.

Organizations are competing for customers with different strategies to meet their customers' demands. To achieve this, they have to offer the best services to their customers. Levesque and McDougall (2000) refers to the outcome of a successful service as what is often referred to as satisfied customer. Customer satisfaction is essential for an organization to keep its customers by preventing them from finding alternative service providers. Customer Service satisfaction is received through provision of quality goods and services. Customer Care Service is also essential through proper Communication Services. According to Johnston (2004), providing the customers with excellent service gives the outcome of delight and this type of services includes a closer

relationship between the buyer and the seller than just targeting satisfaction only. He further categorizes excellent customer service into 4 categories: delivering the promise, providing a personal touch, going the extra mile and dealing well with the promises and queries. ICT is an essential tool to properly achieve all of the aforementioned.

2.3 Empirical Review

Much has been talked about the Impact of ICT Investment in organizations. According to Dirk (2000) capital geared towards investment in ICT is important for economic growth. It establishes the infrastructure for the use of ICT (the ICT networks) and provides productive equipment and software to businesses. ICT investment in developing countries has risen from less than 15% investment in the early 1980s, to between 15% and 30% in 2001. Since investment adds to the capital available to workers, it contributes to labour productivity growth (Gordian, 2004). Estimates show that ICT accounted for 0.3 to 0.8 percentages of GDP growth and labour productivity between 1995 to 2001.

An analysis of the profitability of ICT investments in an empirical study that explicitly considered the competitive dynamics in a market showed that the profits of non-adopters of ICT are reduced as other firms adopt new ICT. Furthermore, the gross profit gains of ICT adoption are related to firm and industry characteristics and the number of other users of the technology (Stoneman and Kwon, 1996). Along similar lines, another study suggests that early adopters of ICT are likely to benefit, but once the technology becomes common competitive advantage is lost (Weill, 1992).

Empirical studies show that in Finland, Ireland and Korea, close to one percentage of aggregate labour productivity growth over the 1995-2001 period was due to the strong productivity performance attributed by ICT in manufacturing sector, (Swartz and Orgill, 2000). In the United States, Japan and Sweden, the ICT-producing sector also contributed significantly to productivity

growth, (Hage and Dewar 2007). The ICT-producing services sector (telecommunications and computer services) play a greater role in aggregate productivity growth and has also been characterised by rapid progress. Partly, this is linked to the liberalisation of telecommunications markets and the high speed of technological change in this market. The contribution of this sector to overall productivity growth therefore increased in several countries over the 1990s (Thong 2004). Some of the productivity growth in companies has been attributed to ICT both locally and globally. The emergence of computer services industry has also seen industries grow in developing countries.

According to Teo et al., (2007) the strongest evidence for the economic impacts of ICT emerges from firm-level studies. Firm-level data point to factors influencing the impacts of ICT that cannot be observed at the aggregate level. For example, the role of ICT in helping firms gain market share can only be examined with firm-level data, as can the role of organisational change. Over the past years, much progress has been made in developing statistics on the use of various ICT technologies in the economy. In addition, many countries have developed databases that provide detailed and comprehensive data on the performance of individual firms. Combining these two sources of information can help establish a link between firm performance and their use of ICT. Moreover, providing that these databases cover a large proportion of the economy, they can also link the performance of individual firms to that of the economy as a whole (Quinn, 2011).

The empirical evidence from such studies, which have now been carried out in many countries, shows that ICT may have several impacts, (Nickerson, 2007). For example, the effective use of ICT may help firms gain market share at the cost of less productive firms, which could raise overall productivity. In addition, the use of ICT may help firms innovate, for example by helping them to expand their product range, customise the services offered, or respond better to client demand. Moreover, ICT may help reduce inefficiency in the use of capital and labour, for

instance by reducing inventories. These effects would all lead to higher productivity growth (Nykamp, 2009).

According to Bernard (2003), firm-level studies show that the use of ICT is part of a much broader range of changes that help firms to enhance performance. The impacts of ICT are not guaranteed, but depend on complementary investments, for example in appropriate skills, and on organisational changes, such as new strategies, new business processes and new organisational structures. Firms adopting these practices tend to gain market share and enjoy higher productivity gains than other firms (Hage, 2007). ICT use by firms is also closely linked to the ability of a company to adjust to changing demand and to innovate. Users of ICT often help make their investments more valuable through their own experimentation and innovation, for instance the introduction of new processes, products and applications. Without this process of "co-invention", which often has a slower pace than technological innovation, the economic impact of ICT would be more limited. Firms that have introduced process innovations in the past are often particularly successful in using ICT. This is particularly important in services, as ICT helps firms in re-inventing business processes and developing new applications (Heeks, 2004)

According to James (2009), firm-level evidence also shows that ICT is no panacea. Firms may well over-invest in ICT, either in an effort to compensate for lack of skills or competitive pressure, or because they lack a clear market strategy. It also takes time to adapt to ICT, for instance in changing organisational set-ups and worker-specific skills. James argues that firms that adopted network technologies several years ago, notably large firms, have often already been able to make the technology work, whereas more recent adopters are still adapting their organisation, management or skills. Evidence from the United Kingdom shows that among the firms that had already adopted ICT technologies in or before 1995, over 50 % of those firms purchased through electronic networks in 2000. For firms that only adopted ICT in 2000, fewer than 20% purchased through electronic networks in 2000.

The firm-level evidence also suggests that there are important cross-country differences in firms' use of ICT. For example, new firms in the United States seem to experiment more with ICT and relevant business models than those in other developing countries; they start at a smaller scale than European firms, but grow much more quickly and get higher returns from their investments in ICT when successful. This may be linked to less aversion to risk in the United States, linked to its financial system, which provides greater opportunities for risky financing to innovative entrepreneurs. Moreover, low regulatory burdens may enable US firms to start at a small scale, experiment, test the market and their business model, and, if successful, expand rapidly. Moreover, if they do not succeed, the costs of failure are relatively limited. In contrast, firms in other developing countries are often faced with high entry and exit costs. In a period of rapid technological change, greater scope for experimentation may enable new ideas and innovation to emerge more rapidly, leading to faster technology diffusion (Laudon, 2004).

2.4 Challenges in ICT in KenGen

According to Alexander (2004) change is the greatest challenge in implementing information systems in organizations. Employees all over are hard to shift from their normal routine duties to new ways of doing the same. Alexander argues that there should be a change agent within the organization to sensitize employees of the importance of changing from one system to another.

Users should be given relevant access rights and roles to the system for them to carry out their activities more effectively. Limited access rights and roles to the system is a big challenge to ICT investments. This will allow them continue using the system, (Thong 2004). Adequate training on users about the system is important to equip them with all round skills on the capabilities of the system. Lack of sufficient training on the system consequently leads to low system usage (Combe, 2004).

According to Gardner (2007) technological devices are expensive and costly to acquire. They need huge finances to acquire individual components like hardware and software. A company with inadequate finances won't be able to make a substantial ICT investment. Tully (2003) argues that user's altitude towards ICT determines its success. If the users have negative altitude, then the ICT in that company will fail to pick.

In KenGen, employees/users have profiles in various ICT systems. They are assigned roles that will assist them in performing their duties. However employees most often complain of having limited access rights to the system thus hindering them from performing their tasks properly. In addition, employees have raised issues such as not being aware of the various systems in place in the company as well as their (systems) roles (KenGen Intranet, 2014).

Employees/users in KenGen luck adequate training on the systems in place. Users who have access to the system hardly utilize the system fully because they have not been equipped with necessary skills and training on how to go about their work. User attitude and resistance has also contributed to poor system usage in KenGen (KenGen Intranet, 2014).

KenGen has done a substantial invested in ICT infrastructure and systems. However the cost of components like software (purchase and license renewal) and hardware is very high. It requires huge budget to completely acquire such systems at once. This is a challenge because much needed systems may delay to be bought and installed due to huge funds needed to acquire them (KenGen Intranet, 2014).

2.5 Theoretical Foundation

Davis (1989) presented Technology Acceptance Model (TAM) aiming to predict and explain ICT usage behavior, that is, what causes potential adopters to accept or reject the use of information technology. Theoretically, TAM is based on the Theory of Reasoned Action (TRA).

The model aims not only to explain key factors of user acceptance of information systems, but also to predict the relative importance of the factors in the diffusion of technological systems (Davis, Bagozzi, & Warshaw, 1989). In TAM, two theoretical constructs, perceived usefulness and perceived ease of use, are the fundamental determinants of system use, and predict attitudes toward the use of the system, that is, the user's willingness to use the system. Perceived usefulness refers to "the degree to which a person believes that using a particular system would enhance his or her job performance", and perceived ease of use refers to "the degree to which a person believes that using a particular system would be free of effort" (Venkatesh and Davis 2000).

Technology Acceptance Model claims that user's adoption of ICT is determined by intention to use, which in turn is driven by the user's attitude and belief about the system. TAM further explains that perceived usefulness and perceived ease of use are helpful in explaining difference in users' intention. In short, it can be concluded that TAM emphasizes on three factors that can influence usage of technology, namely attitude, perceive usefulness and perceive ease of use. Attitude is a mental and neural state of readiness, organized through experience (Davis *et al*., 1989).

TAM incorporates four influences (performance expectancy, effort expectancy, social influence, and facilitating conditions) on behavioral intentions, which then affect technology use. Moreover, these relationships are moderated by gender, age, experience, and voluntary of use and have demonstrated strong validity, reliability, and predictive power (Bhattacherjee & Sanford, 2006)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology, which was used to carry out the study. It further describes the type and source of data, the target population and sampling method and the technique that was used to select the sample size. It also describes how data was collected and analysed.

3.2 Research Design

This study used a case study design. It followed a descriptive research approach. Cooper and Schindler(2001) defines descriptive research approach as a formal, objective, systematic approach to describe and test relationships and examine cause and effect of interactions among variables. Descriptive research design was used because it provided an accurate account of the characteristics, behaviors, opinions, abilities, belief and knowledge of a particular individual, situation or group (Zikmund, et. al., 1983).

3.3 Target Population

The target population comprised of 3,016 employees working in different departments and levels. This population is distributed across all KenGen branches country wide.

3.4 Sample Design

Mugenda and Mugenda (1999) argue that the sample size of 10% is a good representative of the population. Therefore, only 10% of the population was sampled for this study that resulted in a sample size of 302 as shown in Table 3.1.

Table 3. 1: Sampling Frame

Levels	Frequency	Percentage %	Sample
Level 0 & 1	7	10	1
Level 2	47	10	5
Level 3	256	10	26
Level 4 & 5	2706	10	271
Total	**3016**	**10**	**302**

Source: Survey Data (2014)

3.5 Data Collection

The researcher administered questionnaires to the sampled population of KenGen employees. Primary data was collected by use of questionnaires. The questionnaires provided both quantitative and qualitative data. The questionnaire was divided into section A which was about General Information and section B which was about effect of ICT on KenGen's performance. The researcher collected the questionnaires from the respondents after a period of one week after which data processing and analysis took place.

3.6 Data Analysis

After the data was collected, it was coded. Data was analyzed by using descriptive statistics. Mean and standard deviation were used to analyze section A data. Frequency measures was used to analyze data in section B about the impact of ICT on KenGen's performance. Frequency tables were drawn from summarized data. Quantitative analysis was used to analyze the effect of Information and Communications Technology on KenGen's performance and establish the challenges of Information and Communications Technology on KenGen performance.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the findings, interpretations and presentation of data in line with the objectives of the study. The information obtained is presented in tabular form, percentages and in descriptive statistics.

4.2 Response

Out of 302 questionnaires which had been administered, 115 of them were returned. This translated to 38 % response rate.

4.3 Demographic Information

4.3.1 Distribution of Respondents by Gender

Table 4.1: Distribution of Respondents by Gender

Gender	Frequency	Percentage (%)
Male	65	56.5
Female	50	43.5
Total	**115**	**100.0**

Source: Survey Data (2014)

From Table 4.1, it is evident that majority of the respondents were male represented by 56.5 %.

4.3.2 Distribution of the Respondents by Education Level

The study sought to find the level of education of the respondents.

Table 4.2: Distribution of the Respondent by Education Level

Education Level	Frequency	Percentage
Secondary	22	19
Diploma / Certificate	40	35
Bachelor's Degree	45	39
Postgraduate Degree	8	7
Total	**115**	**100**

Source: Survey Data (2014)

Table 4.2 shows that majority of the respondents represented by 39% had bachelor's degree, 35% had diploma/certificate, 19 % had secondary level of education and 7 % had postgraduate degree.

4.3.3 Distribution of the Respondents by Duration of Service at KenGen

The study sought to find the duration of service of the respondents at KenGen.

Table 4.3: Distribution of Respondents by Duration of Service at KenGen

Duration of Service	Frequency	Percentage (%)
Below 5 years	29	25
6-10 years	55	48
11-15 years	23	20
16-20 Years	6	5
Over 21 years	2	2
Total	**115**	**100**

Source: Survey Data (2014)

Table 4.3 shows that 48 % have been working at KenGen for 6-10 years, 25 % have been with the company for Below 5 years, 20 % for 11 – 15years, 5 % for 16 – 20 years and 2 % for Over 21 years.

4.4 Impact of ICT on KenGen's Performance

This part presents information on the impact of Information and Communications Technology on KenGen's performance and the challenges of using ICT in KenGen.

Table 4.4 Impact of ICT on KenGen's Performance

Aspects of ICT	Strongly Disagree	Disagree	Agree	Strongly Agree
	%	%	%	%
ICT has facilitated production of ad hoc reports	3.47	13.92	76.52	6.09
ICT has increased data accessibility	1.74	23.48	57.39	17.39
ICT has reduced the number of people to needed to arrange and sort files.	2.61	28.7	50.43	18.26
ICT has made work more flexible	2.61	13.91	48.7	34.78
ICT has reduced cost of storing physical files	6.96	20	40.0	33.04
ICT has reduced cost of stationery in the company	4.3	20	48.8	26.9
Quality of work has improved due to ICT	4.35	11.3	56.52	27.83
Time for performing various tasks has reduced due to ICT	7.83	11.3	45.22	35.65
Reliable information on power generation is available due to ICT	0.87	13.91	59.13	26.09
ICT has helped save time for traveling from one station to another due to video conferencing	6.09	11.3	45.22	37.39
ICT has enabled easy coordination within the company	4.35	9.56	48.7	37.39
ICT has made it easy for coordination with various customers such as Kenya Power	6.96	13.04	45.22	34.78

Time taken to serve customers has reduced due to ICT	0.87	23.48	57.39	18.26
ICT has encouraged employees to explore more in research and innovation	1.74	14.78	60.87	22.61
History of machine maintenance and schedules is kept up-to-date due to ICT	4.35	15.65	41.74	38.26
Communication within the company has improved due to ICT	5.22	16.52	30.43	47.83
Communication to outside the company has improved due to ICT	3.48	12.17	44.35	40
ICT has facilitated quick decision making	4.35	20	42.61	33.04
ICT has enabled organization to empower its employees making them pursue life-learning skills	5.0	16.3	56.3	22.4
ICT has facilitated remote powering ON & OFF of machines according to demand of power	3.5	9.6	52.1	34.8
Employees are satisfied with ICT in the company	6.09	15.65	53.04	25.22
The overall performance of KenGen has improved due to ICT	3.48	13.04	46.09	37.39

Source: Survey Data (2014)

From Table 4.4, about effect of ICT on KenGen's performance, it reveals that majority of the respondents 76.52 % agreed to the fact that ICT has facilitated production of ad hoc reports 57.39 % agreed that ICT has increased data accessibility. Further, the results shows that 50.43 % agreed that ICT has reduced the number of people needed to arrange and sort files, 48.7 % agreed that ICT has made work more flexible. In addition, 40.0 % agreed that ICT has reduced cost of storing physical files while 48.8 % agreed that ICT has reduced cost of stationery in the company.

The study findings show that 56.52 % agreed that quality of work has improved, 45.22 % felt that time for performing various tasks had reduced due to ICT and 59.13 % felt that reliable information on power generation was available. The table further show that 45.22 % felt that ICT has helped save time for travelling from one station to another due to video conferencing, 48.7 % felt that ICT has enabled easy coordination within the company while 45.22 % felt that ICT has made it easy for coordination with various customers such as Kenya Power. Hence in line with Malore and Rockart, (1991) who said that ICT enables coordination, within and outside the organization.

The findings indicate that 75.65 % agreed that ICT has helped in knowledge sharing and building on each other's ideas in real time and 57.39 % agreed that the time taken to serve customers has reduced due to ICT. The findings further reveals that 60.87 % agreed that ICT has encouraged employees to explore more in research and innovation and 41.74% agreed that the history of machine maintenance and schedules is kept up-to-date due to ICT. In addition, 47.83 % strongly agreed that Communication within the company had improved and 44.35 % agreed that communication to outside the company has improved due to ICT.

The study reveals that 42.61 % of the respondents agreed that ICT has facilitated quick decision making, 56.3 % agreed that ICT has enabled organization to empower its employees making them pursue life-learning skills, 52.1% agreed that ICT has facilitated remote powering ON & OFF of machines according to demand of power, 53.04 % agreed that Employees are satisfied with ICT in the company and 46.09 % agreed that The overall performance of KenGen has improved due to ICT. Thus the study was in line with Benard (2003) who said that the use of ICT is part of a much broader range of changes that help firms to enhance performance.

Table 4.5 Challenges in ICT in KenGen

Aspects of ICT	Strongly Disagree	Disagree	Agree	Strongly Agree
	%	%	%	%
Change management has been handled properly in regard to ICT	3.3	20.0	66.9	9.8
Employee awareness on ICT has been carried out	16.52	35.65	39.13	8.7
Users have adequate access rights to the systems	12.17	56.52	26.09	5.22
Employees have negative attitude towards ICT	28.7	47.83	13.91	9.56
There is adequate training on the ICT systems	26.96	41.71	27.84	3.49
There is resistance towards system usage	27.83	43.48	20.86	7.83
Top management support has an impact on ICT	13.91	43.48	27.83	14.78
There is adequate ICT skills in the company	19.13	40.0	34.78	6.09
The budget allocated for ICT is adequate	22.6	41.76	28.7	6.94
Team-work/spirit has been emphasized among the employees	24.35	40.87	25.21	9.57

Source: Survey Data (2014)

From Table 4.5, majority of the respondents agreed that change management has been handled properly in regard to ICT that is 66.9 %, 39.13 % agreed that employee awareness on ICT has been carried out, however, 56.52 % disagreed that users have adequate access rights to the systems. The table also shows that 47.83 % disagreed that employees have negative attitude towards ICT, 41.71 % disagreed that there is adequate training on the ICT systems. In addition findings reveals that 43.48 % disagreed that there is resistance towards system usage, 40.0 % disagreed that there is adequate ICT skills in the company and 41.76 % disagreed that the budget

allocated for ICT is adequate while 40.87 % disagreed that team-work/spirit has been emphasized among the employees.

The study findings were in line with Combe, (2004) who said that adequate training on users about the system is important to equip them with all round skills on the capabilities of the system. The study findings in the overall scale showed that users accepted to use various ICT systems in the company. These study findings affirmed to the Technology Acceptance Model by Devis (1989), who sought to predict and explain ICT usage behavior on this model that is what causes potential adopters to accept or reject the use of Information technology.

A cross tabulation of bio data and key aspects of the study was done and the results presented in the following tables.

Table 4.6 Cross Tabulation of Level of Education and Data Accessibility

Level of education	ICT has increased data accessibility			
	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
Postgraduate	87.5	0	12.5	0
Bachelors	26	37	11	26
Diploma	51.1	0	35.6	13.3
Secondary	0	100	0	0

Source: Survey Data (2014)

The respondents whose level of education was bachelors agreed by 87.5% that ICT had increased data accessibility while holders of secondary education agreed by 100% that ICT had increased data accessibility.

Table 4.7 Cross Tabulation of Level of Education and Quality of Work

Level of education	Quality of work has improved due to ICT			
	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
Postgraduate	71.4	28.6	0	0
Bachelors	41.8	34.5	11	12.7

Diploma	65.5	24.1	7	3.4
Secondary	0	100	0	0

Source: Survey Data (2014)

The respondents with postgraduate, bachelors and diploma level of education strongly agreed that ICT improved quality of work. Secondary level of education holders agreed by 100% that quality of work has improved due to ICT.

Table 4.8 Cross Tabulation of Level of Education and Overall Performance

Level of education	The overall performance of KenGen has improved due to ICT			
	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
Postgraduate	100	0	0	0
Bachelors	42.6	53.2	4.3	0
Diploma	27.4	63.6	4.5	4.5

Source: Survey Data (2014)

The respondents with postgraduate, bachelors and diploma as their level of education agreed that the overall performance of KenGen has improved due to ICT.

Table 4.9 Cross Tabulation of Level of Education and Decision Making

Level of education	ICT has facilitated quick decision making			
	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
Postgraduate	20	60	20	0
Bachelors	44.4	47.2	5.6	2.8
Diploma	35.3	52.9	5.9	5.9

Source: Survey Data (2014)

The respondents with postgraduate, bachelors and diploma as their level of education agreed that ICT had facilitated quick decision making.

Table 5.0 Cross Tabulation of Level of Education and Budget Allocated for ICT

Level of education	The budget allocated for ICT is adequate			
	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
Postgraduate	12.5	37.5	50	0
Bachelors	7.4	33.3	38.9	20.4
Diploma	11.5	27	42.3	19.2

Source: Survey Data (2014)

Half of postgraduate respondents agreed that ICT budget allocation was adequate. Respondents with bachelors disagreed by 59.3% that budget allocated for ICT was adequate while diploma holders disagreed by 61.5% that budget allocated for ICT was adequate.

Table 5.1 Cross Tabulation of Level of Education and Top Management Support

Level of education	Top management support has an impact on ICT			
	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
Postgraduate	25	50	25	0
Bachelors	4.8	33.3	47.6	14.3
Diploma	0	35.3	58.8	5.9

Source: Survey Data (2014)

The respondents with postgraduate education agreed by 50% that top management support had an impact on ICT. From Table 5.1, bachelors and diploma holders disagreed by 61.9% and 64.7% respectively that top management support had an impact on ICT.

Table 5.2 Cross Tabulation of Level of Education and Access Rights to the Systems

Level of education	Users have adequate access rights to the systems			
	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
Postgraduate	0	14.3	42.9	42.9
Bachelors	0	35.3	56.9	7.8
Diploma	9.4	18.8	65.6	6.3

Source: Survey Data (2014)

From Table 5.2, the researcher discovered that respondents with post graduate education disagreed by 85.8% that users had adequate access rights to the system. The respondents with bachelors who disagreed stood at 56.9% while diploma was 65.6%.

Table 5.3 Cross Tabulation of Years of Service at KenGen and Change Management

Years of service at KenGen	Change management has been handled properly in regard to ICT			
	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
Over 21	100	0	0	0
16-20	16.7	25	41.7	16.7
11-15	33.3	58.4	8.3	0
6 – 10	25	28.6	21.4	25
Below 5	12.5	37.5	34.4	15.6

Source: Survey Data (2014)

The respondents who had worked at KenGen for over 21 years, 11-15 and 6-10 years agreed that change management had been handled properly in regard to ICT while respondents who had worked at KenGen for 16-20 years and below 5 years disagreed that change management had been handled properly in regard to ICT.

Table 5.4 Cross Tabulation of Years of Service at KenGen and Top Management Support

Years of service at KenGen	Top management support has an impact on ICT			
	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
Over 21	100	0	0	0
16-20	14.3	21.4	42.9	21.4
11-15	36.2	57.4	6.4	0
6 – 10	70.6	9.8	9.8	9.8
Below 5	25.8	19.4	29	25.8

Source: Survey Data (2014)

The respondents who had worked over 21 years, 11-15years and 6-10 years of service at KenGen agreed that top management support had an impact on ICT while those with 16-20 years of service at KenGen disagreed.

Table 5.5 Cross Tabulation of Years of Service at KenGen and Access Rights to the Systems

Years of service at KenGen	Users have adequate access rights to the systems			
	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
Over 21	0	0	0	100
16-20	33.3	22.2	16.7	27.8
11-15	2.4	0	26.8	71
6 – 10	22.4	16.3	45	16.3
Below 5	72.4	7	17.2	3.4

Source: Survey Data (2014)

The respondents who had worked at KenGen for over 21 years, 11-15 years and 6-10 years disagreed that user had adequate access rights to the systems while respondents who had worked at KenGen for 16-20 and below 5 years agreed that users had adequate access rights to the systems.

4.5 Chi Square Test

The researcher did a Chi Square test on key aspects of the study which included; quality of work, speed of accomplishment tasks and data handling costs which are presented as follows: -

Table 5.6 Quality of Work Chi Square Test

	Null Hypothesis	Test	Significance	Decision
1	The categories of quality occur with equal probabilities	One-Sample Chi Square test	.000	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is .05.

Source: Survey Data (2014)

The results of Chi Square test on quality of work indicates p=0.000, that is, p<0.05 hence the researcher upholds the alternative hypothesis ICT has an impact on quality of work in the company.

Table 5.7 Speed of Completing Tasks Chi Square Test

	Null Hypothesis	Test	Significance	Decision
1	The categories of tasks occur with equal probabilities	One-Sample Chi Square test	.000	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is .05.
Source: Survey Data (2014)

From table 5.7, the significance of Chi Square Test is 0.000 (p<0.05) which confirms that there is significance relationship between speed of completing tasks with automation of processes using ICT applications.

Table 5.8 Data Handling Costs Chi Square Test

	Null Hypothesis	Test	Significance	Decision
1	The categories of files occur with equal probabilities	One-Sample Chi Square test	.000	Reject the null hypothesis
2	The categories of stationery occur with equal probabilities	One-Sample Chi Square test	.000	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is .05.
Source: Survey Data (2014)

From table 5.8, the significance of Chi Square Test for both costs of physical file storage and stationery is 0.000 (p<0.05) which attests that physical files were occupying a lot of company space and also that much of printing papers and notepads are minimally used. This meant cost of stationery was brought down with presence of ICT.

Table 5.9 User Access Rights to the Systems Chi Square Test

	Null Hypothesis	Test	Significance	Decision
1	The categories of access occur with equal probabilities	One-Sample Chi Square test	.000	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is .05.
Source: Survey Data (2014)

Inadequacy of users access rights to the systems is confirmed (P<0.05) in table 5.9. The significance value =0.000.

Table 5.10 Budget allocation for ICT Chi Square Test

	Null Hypothesis	Test	Significance	Decision
1	The categories of budget occur with equal probabilities	One-Sample Chi Square test	.244	Retain the null hypothesis

Asymptotic significances are displayed. The significance level is .05.
Source: Survey Data (2014)

The hypothesis that budget allocation for ICT is not adequate is confirmed (P>0.05) since significance value = 0.244. The management therefore needs to increase budget allocation to ICT.

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The purpose of this chapter is to give the summary, conclusions and recommendation of the study.

5.2 Summary

The objective of the study was to determine the impact of Information and Communication Technology on KenGen performance. The specific objectives were to determine the effect of Information and Communications Technology on KenGen's performance, and to establish the challenges of Information and Communications Technology on KenGen's performance.

The researcher reviewed previous studies with a view to establish academic gaps which the present study sought to bridge. This was done through library research. The procedure included: reading, evaluating the methodology employed in terms of design choice, target population, sample and sampling procedure data collection instruments (that is suitability, validity and reliability), data collection procedures, data analysis, findings and recommendations. The study benefited so much from the literature review for it guided the present study by pointing to areas that needed to be investigated.

The study employed quantitative and descriptive research design. Data from the field was coded, processed and analyzed by the use of the computer software. The information was presented in percentages and tables and finally the impact of ICT on KenGen's performance was measured.

The study findings showed that in relation to the effects of ICT on performance, 76.52% of the respondents agreed that ICT had facilitated production of ad hoc reports. Majority (50.43%) of the respondents also agreed that ICT had increased data accessibility. 59.13% of the respondents

agreed that reliable information on power generation was available because of ICT and 56.52% of the respondents also agreed that quality of work had improved due to ICT. The study found out that 75.65% of the respondents agreed that ICT had helped in knowledge sharing and building on each other's ideas in real time, 60.87% agreed that ICT had encouraged employees to explore more in research and innovation, 53.04% of the respondents agreed that ICT had facilitated remote powering ON and OFF of machines according to the demand of power and also 47.83% agreed that agreed that communication within the company had improved due to ICT.

The study sort to establish the challenges on Information and Communication Telecommunication and found that out that 40 % of the respondents disagreed that there was adequate ICT skills in the company, 56.52 % disagreed that users have adequate access rights to the system, while 41.76 % of the respondents disagreed that the budget allocated for ICT was adequate.

5.3 Conclusions

The study findings showed that ICT had a big role in KenGen performance. The study indicated that ICT had facilitated production of ad hoc reports, increased data accessibility, reduced of the number of people to arrange and sort files, made work more flexible, cost of storing physical files has reduced, cost of the stationery has reduced in the company, quality of work has improved, time for performing various tasks has reduced, reliable information on power generation has been made available, travelling time has been saved due to video conferencing, easy coordination within the company and coordination with various customers such as Kenya Power had been made easy because most processes are done through the system.

The study findings indicated that ICT has helped in knowledge sharing and building on each other's ideas in real time, Time taken to serve customers had reduced due to ICT, ICT has

encouraged employees to explore more in research and innovation, History of machine maintenance and schedules is kept up-to-date, improved communication within the company, Communication to outside the company has improved, ICT has facilitated quick decision making, ICT has enabled organization to empower its employees making them pursue life-learning skills, facilitated remote powering ON & OFF of machines according to demand of power and the overall performance of KenGen has improved due to ICT.

The study findings showed that there are a number of challenges experienced with the ICT in the company. A big number of the respondents indicated that users had inadequate access rights to the systems hence hindering them from utilizing the systems fully. Most of the respondents also indicated that employees had a negative attitude towards ICT and also there was high resistance towards system usage. Majority of the respondents indicated that there was inadequate training on the ICT systems and also that top management support has an impact on ICT and majority also indicated that there is inadequate ICT skills in the company as well as insufficient budget allocation for ICT and finally a big number of the respondents indicated that inadequate Team-work/spirit has been emphasized among the employees.

However, a big number of the respondents indicated that change management has been handled properly in regard to ICT and Employee awareness on ICT has been carried out successfully.

5.4 Recommendations

The study recommendations were that the management should ensure that employees have enough access rights to the system to enable them work comfortably, the management should facilitate for training of the employees on ICT systems so that they can have required skills and knowledge on the systems.

The study recommends that KenGen should carry out employee awareness program on the ICT systems in place at the company. This will enlighten the employees on the various capabilities of the system who will in turn embrace it by full utilization.

5.5 Areas for further research

Due to limitations in scope and time constraints, it is not possible to address all key areas, related to, the focal points of this study. The study focused on the impact of Information and Communication Technology on KenGen performance. There is need for further study to be done on the impact of Information and Communication Technology at departmental or sectional levels.

REFERENCES

Abwao V. (2002). *Information technology applications in business management within Kenyan companies.* A survey of insurance firms in Nairobi. An Unpublished MBA Project, University of Nairobi

Alam G.M. and Khalifa M.T.B. (2009). *The impact of introducing a business marketing approach to education:* a study on private HE in Bangladesh. Afr. J. Bus. Manage., 3(9):

Alexander, H. (2004). Collaborative Customer Relationship Management *Springer-Verlag Berlin Heidelberg New York*

Anderson, P, and Tushman, M.L. (2009). Managing through cycles of technological change, *Research-Technology Management*, Vol. 34 No.3.

Attewell, P. (2010). *Technology diffusion and organizational learning*: the case of business computing, Organization Science 3 (1).

Beynon-Davies, P., (2002). *Information systems : An introduction to informatics in organisations*. Basingstoke: Palgrave.

Bhattacherjee, A., and Sanford, C. (2006). Influence processes for information technology acceptance: An elaboration likelihood model. *MIS Quarterly, 30*(4), 805-825.

Black, S. and Lynch, L. (2001) How to Compete: Impact of Workplace Practices and Information Technology on Productivity: Review of Economics and Statistics, 83

Blili, S., and Raymond, L. (2004). Information Technology: Threats and Opportunities for Small and Medium-Sized Enterprises. *International Journal of Information Management* 13, (6).

Bresnahan T. F, Brynjolfson, E. and Hitt (L. M. 2002), Information Technology, Workplace Organization, and the Demand of Skilled Labour: Quarterly Journal of Economics, 107

Brynjolfson, E. and Hitt (L. M. 2000) *Introducing a business information system into an engineering company: Journal of Information, Knowledge and Systems Management, Vol. 2,*

Chisenga, J. (2004). *The Use of ICTs in African Public Libraries: A Survey of Ten Countries in Anglophone Africa*. Oxford: International network for the availability of Scientific Publications (INASP).

Chisenga, J. (2006). Information and communication Technologies: Opportunities and Challenges For National and University Libraries in Eastern, Central and Southern Africa. *Keynote paper presented at the standing conference of African National and University libraries of Eastern, Central and Southern Africa (SCANUL-ECS), The courtyard Hotel, Dar es Salaam, Tanzania*.

Combe, C. (2004). Assessing customer relationship management strategies for creating competitive advantage in electronic business. *Journal of Knowledge Management* Practice.

Cooper, D.R and Schindler, P.S. (2003). *Business Research Methods* (8th edn) McGraw-Hill: New York

Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. 1989 *Management Science* **35** 982- 1003.

Davis, Bagozzi, and Warshaw. (1989). User acceptance of computer technology: A comparison of two theoretical models. Management Sience, 35, 982-1003.

Delone, W. H. and Mclean, E.R. (2002). *Last update, Information Systems Success Revisited* [Homepage of IEEE Computer Society], [Online]. Available: http://csdl.computer.org/comp/proceedings/hicss/2002/1435/08/14350238.pdf.

Donaldson L. (1996) The Normal Science of Structural Contingency Theory. Organizational Studies.

Gable, G.G. and Raman, K.S., (2010). Government Initiatives for IT Adoption in Small Businesses: Experiences of the Singapore Small Enterprises Computerisation Programme. *International Information Systems* 1, (1).

Galliers, D.R., Madon, S. and Rashid, R. (2008). Information Systems and Culture: Applying the 'stages of growth' concepts to development administration. *Information technology for Development*, 8(2).

Gardner, B. (2007). *Ensuring Successful Information Technology Utilisation in Developing Countries*. Garborone: Botswana (Pty) Limited, Botswana.

Greenberg, P. (2001) *Public Organizations in the Age of Globalization and Technology*, Public Organization Review, 7: 181-189

Greenberg, P. (2004). *ICT at the Speed of Light*: Capturing and Keeping Customers in Internet Real Time', Berkeley, CA: McGraw-Hill.

Greenan, N. and Mairesse S. (1996) Computers and Productivity in France: Some Evidence: National Bureau of Economic Research Working Paper 5836

Hage, R. D. (2007). Elite values versus organizational structure in predicting innovation, *Administrative Science Quarterly* 18.

Hammond C, J. (2008). Growing Up in Technological Worlds. How Modern Technologies Shape the Everyday Lives of Young People. Bulletin of Science, Technology and Society.

Heeks, R. (2004). *Last update, Building Transparency, Fighting Corruption with ICTs* [Homepage of iconnect online], [Online]. Available: http://www.iconnect-online.org/base/ic_show_news?sc=118&id=2363.

Hubona, G.S., Truex, D.P., Wang, J. and Straub, D.W. (2006). *Cultural and globalization issues impacting the organizational use of information technology,* Armonk: Sharpe.

Katundu, D. (2006). *Electronic Services in Kenyan Libraries*. A Key Note Address presented at the State Chapter of the Kenyan Library Association.

KenGen Intranet. (2014). Retrieved July 2, 2014, from KenGen Intranet: http://kgenintranet:8080/intranetnew/

Kipsang, N. (2003). *A survey of outsourcing information technology services by commercial banks in Kenya*, An Unpublished MBA Project, University of Nairobi

Kothari, C. R. (2004). *Research Methodology: Methods and Techniques*. New Delhi: Wiley,.

Laudon, K. C. & Laudon, J. P. (2004). *Management Information Systems.* Pearson Education.

Limo, A., (2003). Last update, Computer use bound to transform Kenya [Homepage of Nation Media Group], [Online]. Available: http://www.nationaudio.com/News/DailyNation/24122003/Comment/Comment241220031.html.

Mbithi P.K. (2004). *Service delivery approaches & the strategic positioning of information technology management consultancy firms in Kenya*, An Unpublished MBA Project, University of Nairobi

Moullin, M. (2003). "Defining Performance Measurement." Perspectives on Performance

Mgaya, R.J. (2009). *Adoption and diffusion of group support systems in Tanzania*, Delft University of Technology.

Mugenda, O.M and Mugenda, A.G (2003). *Research Methods*, Quantitative & Qualitative Approaches, Acts Press, Nairobi

Malene T.W. and Rockart, J. F. (1991) Computer Networks and Corporate Scientific American, no 3, vol. 265

Mwithiga, L.T. (2002). *A survey of corporate user satisfaction information technology. The case of Kenya Shell*, An Unpublished MBA Project, University of Nairobi

Ngechu, M. (2004). *Understanding the research process and methods*. An introduction to research methods. Acts Press, Nairobi.

Nickerson, R.S. (2007). Why interactive computer systems are sometimes not used by people who might benefit from them, *International Journal of Man-Machine Studies*, Vol. 15.

Neely, A. (2002). Business performance measurement: Theory and Practice, Cambridge University Press.

Neely, A. (1998). "Three models of measurement: theory and practice." International

Journal of Business Performance Management 1(1): 47-64.Nykamp, M. (2009). *The Customer Differential: The Complete Guide to Implementing Customer Relationship Management*, American Management Association, New York.

Odedra, M. (2010). *Enforcement of Foreign Technology on Africa*: Its Effect on Society and the Use of Information Technology. African Technology Forum, August/September.

Okiy, R.B. (2005). Strengthening Information Provision in Nigerian university Libraries through Information communication technologies. *The Electronic Library* 2.

Onduso T.S. (2001). *A survey of ethical issues in the use of information technology among Commercial Banks in Kenya*, An Unpublished MBA Project, University of Nairobi

Orodho, P. (2003). *The practise of social research (10th Ed).* Thomson Belmont CA:

Payne, A. (2003). *Handbook of ICT*: Achieving Excellence in Customer Management, Butterworth- Heinemann, Oxford.

Pennings, J. M. and Harianto, F. (2010). The Diffusion of Technological Innovation in the Commercial Banking Industry, *Strategic Management Journal*, vol. 13, no. 1.

Polit, H. and Beck, T. (2003). *Basic Marketing Research*: A Decision-Making Approach', 2 nd Edition, Pearson Prentice Hall, Upper Saddle River, New Jersey.

Premkumar, G. and Ramamurthy, K. (2011). *The Role of Interorganisational and Organisational Factors on the Decision Model for Adoption of Interorganisational Systems'*, Decision Sciences, vol. 26, no. 3.

Quinn, J. B. (2011). Managing Innovation: Controlled Chaos, *Harvard Business Review*, vol. 63, no. 3.

Qureshi, S. (2008). Fostering civil associations in Africa through GOVERNET: an administrative reform network. *Journal of Information Technology for Development*, 8(2).

Reynolds, W., Savage, W. and Williams, A. (2007). *Your Own Business*: A Practical Guide to Success, ITP.

Schneider, V. and Barsoux, J. (2007). *State of the industry report*. Training and Development

Solow RM. Technical Change and Agreeable Production function. The Review of Economics and Statistics 1957: 39, 312-320

Shenkar, O. and Zeira, Y. (2007). Human resource management in international joint ventures: directions for research, *Academy of Management Review*, Vol. 12 No.3.

Stone, M. and Woodcock, N. (2001). *Defining ICT and Assessing its Quality'*, in Successful Customer Relationship Marketing, Foss, B. and Stone, M., Edition, London: Kogan.

Stueart R. D. and Moran, B. B. (2007). *Library and information center management*. 7th ed. Westport, CT: Libraries Unlimited.

Schumpeter J. Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capital Flow. McUrul (?)-Hill: New York: 1939

Solow R.M. (2003) Technical Change and Agreeable Production function. The Review of Economics and Statistics 1957: 39, 312-320

Teo, T. S. H., Tan, M. and Wong, K. (2007). A Contingency Model of Internet Adoption in Singapore, *International Journal of Electronic Commerce*, vol. 2, no. 2.

Thong, J. Y. L. and Yap, C. S. (2011). *CEO Characteristics, Organizational Characteristics and Information Technology Adoption in Small Businesses*, vol. 23, no. 4.

Thong, J.Y.L., (2004). An Integrated Model of Information Systems Adoption in Small Businesses. *Journal of Management Information Systems* 15, (4).

Venkatesh, V. and Davis, F.D 2000 *Management Science* 46 186-204.

Voss, C. (2003). Rethinking International Journal of Operations & Productions Management paradigms of service: *service in a virtual environment*, Vol. 23 No.1, pp.88-104.

APPENDICES

APPENDIX I: INTRODUCTION LETTER

Enock N. Nyang'au,

Box 9934 – 00200,

Nairobi.

Dear Respondent,

RE: DATA COLLECTION

I am a student at the University of Nairobi. I am currently doing a research study to fulfil the requirements of the Award of Master of Business Administration – Management Information System (MIS) Option on the **IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY ON KENGEN'S PERFORMANCE.** You have been selected to participate in this study and I would highly appreciate if you assisted me by responding to all questions in the attached questionnaire as completely, correctly and honestly as possible. Your response will be treated with utmost confidentiality and will be used only for research purposes of this study. Thank you in advance for your co-operation.

Yours faithfully,

Enock N. Nyang'au

Researcher

APPENDIX II: RESEARCH QUESTIONNAIRE

This questionnaire consists of two parts; kindly answer all the questions by ticking in the appropriate box or filling in the spaces provided.

SECTION A: GENERAL INFORMATION

1. Gender: Male [ ]

   Female [ ]

2. What is your highest education level? (Tick as applicable)

   Primary [ ]

   Secondary [ ]

   Diploma/certificate [ ]

   Bachelors' degree [ ]

   Postgraduate degree [ ]

   Others-specify……

3. Years of service/working period in KenGen (Tick where applicable)

   Below 5 years ☐

   6-10 years ☐

   11-15 years ☐

   16-20 Years ☐

   Over 21 years ☐

SECTION B:

Please indicate to which extent you agree or disagree with each of the following statements by ticking appropriate answer.

	Strongly Disagree	Disagree	Agree	Strongly Agree
1. ICT has facilitated production of ad hoc reports				
2. ICT has increased data accessibility				
3. ICT has reduced the number of people to needed to arrange and sort files.				
4. ICT has made work more flexible				
5. ICT has reduced cost of storing physical files				
6. ICT has reduced cost of stationery in the company				
7. Quality of work has improved due to ICT				
8. Time for performing various tasks has reduced due to ICT				
9. Reliable information on power generation is available due to ICT				
10. ICT has helped save time for traveling from one station to another due to video conferencing				
11. ICT has enabled easy coordination within the company				
12. ICT has made it easy for coordination with various customers such as Kenya Power				
13. ICT has helped in knowledge sharing and building on each other's ideas in real time				

14. Time taken to serve customers has reduced due to ICT				
15. ICT has encouraged employees to explore more in research and innovation				
16. History of machine maintenance and schedules is kept up-to-date due to ICT				
17. Communication within the company has improved due to ICT				
18. Communication to outside the company has improved due to ICT				
19. ICT has facilitated quick decision making				
20. ICT has enabled organization to empower its employees making them pursue life-learning skills				
21. ICT has facilitated remote powering ON & OFF of machines according to demand of power				
22. Employees are satisfied with ICT in the company				
23. The overall performance of KenGen has improved due to ICT				

Please indicate the extent to which you agree or disagree with each of the following statements by ticking appropriate answer.

	Strongly Disagree	Disagree	Agree	Strongly Agree
1. Change management has been handled properly in regard to ICT				
2. Employee awareness on ICT has been carried out				
3. Users have adequate access rights to the systems				
4. Employees have negative attitude towards ICT				
5. There is adequate training on the ICT systems				
6. There is resistance towards system usage				
7. Top management support has an impact on ICT				
8. There is adequate ICT skills in the company				
9. The budget allocated for ICT is adequate				
10. Team-work/spirit has been emphasized among the employees				

- THANK YOU –