

**INFLUENCE OF INFORMATION AND COMMUNICATION TECHNOLOGY  
INVESTMENT ON ORGANIZATIONAL PERFORMANCE. A CASE OF KENYA  
REVENUE AUTHORITY**

**Protus Muya Onyango**

Jomo Kenyatta University of Agriculture  
and Technology Department of  
Entrepreneurship and Procurement (EPD)

KENYA

**Dr. Karanja Ngugi**

Kenyatta University Department of  
Accounting and Finance

KENYA

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**ABSTRACT**

ICT is a known variable that helps in organization performance. Statistics has shown that investment in ICT improve information and knowledge management inside a firm and can reduce transaction costs and increase the speed and reliability of transactions. This study is designed to analyze the Influence of ICT Investment on Organizational Performance by reviewing five study variables namely investment cost, ICT competency, ICT policy and government regulations and organization structure. The study was carried out at the Kenya Revenue Authority. The sample of the study comprised of the top, middle and low (operational) level management. This study is descriptive in nature hence it employed descriptive case study design. This methodology was commonly used in case studies because it involves seeking information rather than testing. The study used a questionnaire as the research instruments for data collection. SPSS computer program was used for data analysis. Quantitative data was presented into frequencies, percentages and tables while qualitative data was organized into themes/categories according to the objectives of the study. The study established that ICT Investment costs are a critical ingredient of ICT that has a positive influence on the Organizational Performance at Kenya Revenue Authority. The study also revealed that competent employees with ICT skills positively enhanced organizational performance at Kenya Revenue Authority. The research established that ICT policy and regulations had a positive effect on organizational performance at Kenya Revenue Authority. The study revealed that ICT investment had a positive impact on organizational performance at Kenya Revenue Authority.

**Keywords:** *Information and communication technology investment on organizational performance*

## Introduction

Growth in global ICT spending over the past three decades has been considerable. Avram outlined in 2001 that global ICT expenditure was growing at a rate faster than worldwide GDP. In 2005, Gwillim, Dovey and Wieder (2005) suggested that global ICT spending exceeds \$1 trillion per annum. According to Agarwal and Lucas (2005), ICT is one of the most important business driving forces of the 21<sup>st</sup> century. The reasons for this considerable growth can be linked to the increased realization of ICT's importance in achieving competitive advantage. The significant increase in ICT's scale, complexity, strategic focus, connectivity and processing power in recent years has further heightened awareness of ICT's potential to positively affect an organization's competitive position (Kohli & Sherer, 2002).

Though the Information and Communication Technology (ICT) Sector has been liberalized in Kenya in the last few years which has led to a rapid growth in Technology deployment in the country (Oyelaran-Oyeyinka & Barclay, 2004), past research has established a number of factors that affect ICT acceptance decisions and attitudes (Jungwoo, 2004). This has led to the low density of ICT whereby infrastructure, congestion and costs have been significant impediments of technology usage in Kenya (Oyelaran-Oyeyinka & Barclay, 2004). Inability to identify project costs and benefits, control budget overruns and manage actual achievements against expectations can be associated with failing to formally evaluate the ICT investment. According to Todorova (2006), the importance of evaluation in improving the ICT investment management process is well established.

Despite its early lead in the past decade, Kenya's ICT sector has lagged behind its East African neighbors, Tanzania and Uganda. A key reason for this has been an outmoded regulatory regime and a lack of focus and coordination in addressing ICT challenges and opportunities. The Government of Kenya is committed to removing barriers to ICT development. To guide and coordinate its efforts, the government needs a comprehensive policy driven by the input and commitment of all the groups and sectors who will be responsible for turning the policy into reality. This is a crucial point: twice in the recent past, attempts to develop a national ICT policy in Kenya have failed. Besides neglecting to include all public and private sector stakeholders, these earlier processes were not directly linked to other national development plans.

### Statement of the problem

Chapter 469 of the laws of Kenya, charged Kenya Revenue Authority with the responsibility of collecting revenue on behalf of the Government of Kenya. Reports from KPMG (2014) show that the total revenue collected by KRA grew by 27% from 2012 to 2013. Further statistics show that the country continue to lose billions of money through non-compliance (RoK, 2014). Reports from World Bank (2014) link the loss of revenue due to ICT Infrastructure problems. Data from PWC (2013) show that loss of revenue lead to the lower economic development of Kenya. Would ICT investment be the cause of the loss of revenue by KRA? Previous studies from the background information show that ICT Investment is a key driver to organization performance. The extent of ICT use is considered a manifestation of technical readiness, and ICT maturity was reported to influence organizational performance and productivity (Mahmood and Hall, 2001).

According to Hirschheim and Smithson (1999), system introduction leads to economic, organizational, management and social consequences. However, due to ongoing technological evolutions and ability of competitors to acquire similar or more sophisticated applications, few organizations can maintain continuous competitive advantage from ICT. Inability to identify project costs and benefits, control budget overruns and manage actual achievements against expectations can be associated with failing to formally evaluate the ICT investment. With respect to developing nations, Kenya included, the literature is limited in resources when it comes to assessing the Influence of ICT Investment on Organizational Performance although the evaluation of ICT investments represents an important element for policy and decision makers (Thatcher & Oliver, 2001; Checchi, Hsieh and Straub, 2003). It is against this backdrop that the study sought to fill the existing research gap by analyzing the Influence of ICT Investment on Organizational Performance with reference to KRA.

### Research objectives

The general objective of the study was to establish the Influence of ICT Investment on Organizational Performance with reference to KRA.

### **Specific objectives**

- i. To determine the influence of ICT Investment cost on Organizational Performance at Kenya Revenue Authority
- ii. To establish the extent to which the Employee ICT Competency affect organizational performance at Kenya Revenue Authority.
- iii. To ascertain the impact of ICT policy and Government regulations on organizational performance at Kenya Revenue Authority.
- iv. To assess the effect of ICT organization structure on organizational performance at Kenya Revenue Authority.

### **Justification of the Study**

The research work shall offer the Kenya Revenue Authority a chance for strategic policy considerations related to the influence/power of ICT in Kenya. It is hoped that the findings of the study will make valuable additions to the existing literature and stimulate further interest in ICT based initiatives. The study will help the KRA to improve its investment in ICT and also identify strategic partners including ICT service providers who are critical in supplying required digital footprints. The results of this study would also be invaluable to researchers and scholars, as it forms a basis for further research. The students and academics would use this study as a basis for discussions on the role of intellectual capital on performance. The study will also be a source of reference material for future studies on other related topics; it would also help other academicians who undertake the same topic in their studies.

### **Scope of the Study**

The study covered the Influence of ICT Investment on Organizational Performance. Data was specifically collected from the three levels of management at the Kenya Revenue Authority which included the Top management, Middle management and lower level management staff.

### **Literature Review**

#### **Information Systems Success Theory**

Information systems success theory proposes that system quality and information quality affect users' usage of and satisfaction with information systems, further determining organizational

performance (DeLone and McLean, 2004). Service quality was later incorporated into the model. The new model argues that system quality, information quality and service quality affect usage and user satisfaction, further affecting net benefits such as increased knowledge sharing and lower costs (DeLone and McLean, 2004).

Since its inception information systems success theory has been widely applied and empirically validated in the contexts of traditional information systems and electronic commerce. Wixom and Todd (2005) noted that information quality and system quality affect data warehousing software users' satisfaction, perceived usefulness, perceived ease of use and usage behaviour. Zhang (2010) proposed that both system quality and information quality affect social networking users' satisfaction and sense of community. Song and Zahedi (2007) reported that system quality and information quality affect users' trust in health infomediaries. Lin (2008) noted that system quality and information quality affect virtual community user satisfaction. Chatterjee *et al.* (2009) conducted a qualitative study and found that system quality, content quality and service quality affect the usage of mobile technology in healthcare. Lee *et al.* (2009) found that better information quality increased the usage of mobile data services, whereas lower system quality decreased usage. The information system success theory was used in this study to determine the influence of ICT Investment costs on Organizational Performance at Kenya Revenue Authority.

### Agency Cost Theory

Eisenhardt (1989) has articulated the usefulness of agency theory in analyzing managerial problems characterized by goal conflicts, outcome uncertainty, and unprogrammed or team-oriented tasks. Many ICT activities fit this description, and it has been suggested that a large number of organizational problems in the management of ICT can be analyzed successfully in an agency context (Gurbaxani and Kemerer 1989; Beath and Straub 1989; Robey and Zmud 1989; Klepper 1990). The design of effective control mechanisms for IS activities is particularly difficult, since the agency relationship occurs in a dynamic, rapidly changing environment and management practices have little time to stabilize (Nolan 1979; Gurbaxani and Mendelson 1990). An alternative approach would be transaction cost economics, an approach with similarities to agency theory in its emphasis on information and uncertainty (Williamson 1985). However, as noted by Eisenhardt (1989), agency theory distinguishes itself from transaction cost

theory by its inclusion of the notions of risk aversion and information as a commodity. The agency cost theory was used in this study to establish the extent to which the competency (managerial skills) of ICT employees affect organizational performance at Kenya Revenue Authority.

### Public Interest Theories of Regulation

According to the public interest theories, regulation can be explained not only by imperfect competition, unstable market processes and missing markets, but also by the need to prevent or correct undesirable market results. In a competitive market economy, participants in the economic process are rewarded according to their marginal productivity contribution. The first group of regulation theories proceeds from the assumptions of full information, perfect enforcement and benevolent regulators. According to these theories, the regulation of firms or other economic actors contributes to the promotion of the public interest. This public interest can further be described as the best possible allocation of scarce resources for individual and collective goods and services in society. Equalization of prices and marginal costs characterizes equilibrium in a competitive market. If costs are lower than the given market price, a firm will profit from a further expansion of production. If costs are higher than price, a firm will increase its profits by curtailing production until price again equals marginal cost.

Market equilibrium, and more generally equilibrium of all markets is thus a situation of an optimal allocation of scarce resources. In this situation supply equals demand and under the given circumstances can market players do no better. A great number of conditions have to be satisfied for an optimal allocation in a competitive market economy to exist (Boadway and Bruce, 1984). One of the methods of achieving efficiency in the allocation of resources when a market failure is identified is government regulation (Arrow, 1970, 1985; Shubik, 1970). In the earlier development of the public interest theories of regulation, it was assumed that a market failure was a sufficient condition to explain government regulation (Baumol, 1952). But soon the theory was criticized for its Nirwana approach, implying that it assumed that theoretically efficient institutions could be seen to efficiently replace or correct inefficient real world institutions (Demsetz, 1968).the public interest theory of regulation was used to explain the impact of ICT policy and regulations on organizational performance at Kenya Revenue Authority.

### **Weick's Model Theory of Organizing**

One of the sophisticated theories of organizational structure is Weick's model theory of organizing. It takes into account the high-stressed, fast-paced nature of today's business and reduces equivocality (Patching, 2000). Equivocality boils down to any lack of productivity due to an employee, on any level, having to check with superiors which is brought about by bureaucracy and unaligned organizational structure which greatly affect the management style of the organization (Ashcraft, 2005). In the Weick's model, there is an information system, which includes frequently and sometimes previously tackled issues (Harenstam, Bejerot, Leijon, Scheele & Waldenstrom, 2004). Employees have access to this information and use it to combat any ambivalence or inertia that might hinder making business decisions (Borjas, 2012). The decisiveness gained by using the information system leads to higher productivity due to ease with which structures can be modified to suit the prevailing or anticipated needs. The Weick model theory of organizing was used to assess the effect of ICT organization structure on organizational performance at KRA.

### **Empirical review**

#### **Investment Cost**

Information and Communication Technology (ICT) is a multi-trillion dollar industry. A study on the elusive nature of delivering benefits from IT investment by Remenyi (2000) found that ICT investment offers potential for significant organizational improvement and competitive advantage. However, ICT investment does not always translate into monetary rewards. Reports of project failure, budget and timescale overruns, and limited or negative returns are not uncommon. Some organizations may lack objective information regarding the benefits and costs investing in ICT (Remenyi, 2000).

Further, evaluation complexity increases as ICT becomes more integrated in organizational structures and processes and when different interconnected ICT. Projects take place simultaneously. A study by Remenyi et al (2007) on the effective measurement and management of ICT costs and benefits found that the difficulties associated with evaluating ICT costs and benefits are “super challenging”. Simultaneous investment in technologies from automate, informate and transformate eras makes evaluation more difficult. Accurately determining total

ICT costs is often impaired by incorrect overhead allocation procedures and unclear system boundaries. Remote unanticipated effects may also arise, which decreases the chances of total costs being accounted for (Mylonopoulos et al, 2004).

### **Employee ICT Competency**

According to English (2005), every employee in the ICT firm needs to be aware of the ICT-security risks as well as the potential consequences of such security breaches which ensures confidence which in the process contributes towards more business. In the process, this will lead to positive growth and expansion of the firm in the long run (Pohjola, 2002). Often not enough attention is given to this human aspect and as Siponen (2001) states: “Nothing is done as long as nothing goes wrong.” and yet the cost of doing nothing can be huge to the ICT firm. Managers could play an essential role in making sure that every employee is aware of the ICT-security risks and thus improving the integrity of the ICT provider. The manager needs to understand the importance of a high quality of information in terms of completeness and collective significance (English, 2005). Bresnahan, Brynjolfsson and Hitt (2002) argue that the most important cause of computer security violations on the Internet is the lack of technical knowledge of the users which partly may be attributed to the ICT provider. Bresnahan, Brynjolfsson and Hitt (2002) observed could affect the potential investment in ICT.

### **ICT Policy**

Common ICT policies include creating a regulator and licensing scheme, investment or assistance in the construction of infrastructure, introducing ICT programs into schools and creating initiatives to promote universal access to these new technologies. Through policy, governments have the opportunity and the power to significantly alter how an ICT industry develops, and how successful it is. Good policy can overcome inequalities in development, build better infrastructure, and shape how companies approach their market and build their customer base. While many governments in the developing world struggle with the implementation and enforcement of policies and do not focus much attention on their ICT industry, there is significant potential in using policy to improve ICT industries (KIC, 2006).

### **Government regulations**



Wilson (2007) found that regulation can help ensure market competition and intervention to address areas of market failure, where market mechanisms alone may be insufficient to achieve desired policy outcomes for example, in universal access which in the end contributes towards the growth of the sector. Wilson (2007) notes that many countries have established a regulatory authority separate from government and in charge of regulatory mechanisms to promote the use of ICTs such as licensing strategies, spectrum allocation, interconnection settlements, dispute resolution, among others (Wilson, 2007).

While many countries have begun reform through the establishment of a regulatory authority and allow competition, they may not have simplified licensing procedures which in the process affect investment in ICT. A number of developing countries still charge high license fees, limiting competition. Some countries also have multiple service specific licenses, which are increasingly outdated given technological convergence, with inter-modal competition between platforms (International Telecommunication Union (ITU), 2012). ITU observes that a sound regulatory environment and stable institutions are the key factors driving ICT investment.

### ICT Competency

The ever changing technology and heavy investment in ICTs has resulted in increased demand for various ICT skills. In the last few decades, numerous studies have attempted to address issues related to ICT skill needs. Complexity relates to the knowledge and expertise of employees (Rogers, 2003). In companies where management and employees have knowledge and expertise, they are more likely to grasp innovation. The skills of both staff and management will therefore have an impact on the level to which an organization can invest in ICT. Hadjimanolis (2000) argues that because small companies do not have the resources less is spent on training. It is also more likely that smaller companies will employ generalist rather than specialist staff (Thong, 1996) thereby impacting on staff skills.

### Critique of Existing Literature

The study by the African Partnership Forum on ICT in Africa mandated to Gerster Consulting (2008) found that African governments and their international partners should prioritize ICT access and effective use at all levels. This study was much inclined on sovereign nations which give general country findings. The current study has been narrowed down and refined to a

specific organization which will give an organizational perspective on ICT investment and growth.

Hadjimanolis' (2000) study which revealed that because small companies do not have the resources less is spent on training. Aside from the fact that the study was done on small companies, it was also carried more than a decade ago. A more recent study on a larger institution is of essence. A study by Remenyi et al (2007) which found that the difficulties associated with evaluating ICT costs and benefits are “super challenging” failed to fully enrich the current study since it was more inclined on effective measurement and management of ICT costs and benefits. The current study is bent on assessing the effect of investing in ICT on organizational performance.

### Data Analysis/Findings

#### Regression analysis

#### Model Summary

Model	R	R Square	Adjusted R Square
1	.898 <sup>a</sup>	.806	.789

Adjusted R squared is coefficient of determination which tells us the variation in the dependent variable due to changes in the independent variable. From the findings in the above table the value of adjusted R squared was 0.789 an indication that there was variation of 78.9 percent on organization performance due to changes in ICT investment costs, competency of ICT employees, ICT policy regulation and ICT organization structure at 95 percent confidence interval . This shows that 78.9 percent changes in organization performance could be accounted to changes in ICT investment costs, competency of ICT employees, ICT policy and government regulations and ICT organization structure. R is the correlation coefficient which shows the relationship between the study variables, from the findings shown in the table above there was a strong positive relationship between the study variables as shown by 0.898. The statistics of the above regression show that ICT investment is a key variable of Kenya Revenue Authority performance.

Coefficients<sup>a</sup>

Model	Unstandardized Coefficients (B)	t	Sig (p-value)
1 (Constant)	1.350	0.825	0.419
ICT Investment costs	0.608	5.546	0.001
Competency of ICT employees	0.426	2.318	0.031
ICT policy and regulations	0.459	3.815	0.024
ICT organization structure	0.509	4.637	0.017

From the data in the above table the established regression equation was

$$Y = 1.350 + 0.608 X_1 + 0.426 X_2 + 0.459 X_3 + 0.509 X_4$$

Whereby Y = Organizational performance, X<sub>1</sub>= ICT Investment costs, X<sub>2</sub>= Employee ICT Competency, X<sub>3</sub>= ICT policy and government regulations and X<sub>4</sub>= ICT organization structure. The table 4.10 show that ICT investment cost was most significant variable (P value = 0.001) (t = 5.546), followed by ICT organization structure (P value = 0.017) (t = 4.637), followed by ICT policy and regulations (P value = 0.024) (t = 3.815) and followed by Competency of ICT employees (P value = 0.031) (t = 2.318).

### Conclusion

From the findings the study established that Software cost is an important ingredient of ICT investment cost and that it influences organizational performance thus the study concluded that ICT Investment costs had a positive influence on the Organizational Performance at Kenya Revenue Authority

The study also revealed that ICT employees with Cognitive skills is a key competency factor and that it influences organizational performance thus the study concludes that competent employees with ICT skills positively enhanced organizational performance at Kenya Revenue Authority.

The research established that licensing a critical factor of government regulations and it influences organizational performance thus the study concludes that ICT policy and regulations had a positive effect on organizational performance at Kenya Revenue Authority.

The study revealed that ICT organization structure is key to facilitating new organizational approaches, from lean production to team work to customer relations thus the study concludes that ICT organization structure had a positive impact on organizational performance at Kenya Revenue Authority.

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