



# **Integration and use of Information and Communication Technologies in the Management of County Governments in Kenya: A Case of Machakos County**

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**Okeyo, W. O**

**Deputy Vice-Chancellor**

The Management University of Africa, Kenya

**Kioko, S.K**

Masters Student, School of Management and Leadership

The Management University of Africa, Kenya

<sup>1</sup>Corresponding Author: Email - wokeyo@mua.ac.ke; washokeyo@gmail.com

<sup>2</sup>Co- Author: Email – shedykioko@gmail.com

# INTEGRATION AND USE OF ICT IN THE MANAGEMENT OF MACHAKOS COUNTY GOVERNMENT, KENYA

Okeyo, W. O<sup>1</sup>

Deputy Vice-Chancellor

The Management University of Africa, Kenya

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Kioko, S.K<sup>2</sup>

Masters Student, School of Management and Leadership

The Management University of Africa, Kenya

## ABSTRACT

*ICT is the engine of growth in every country, especially in young economies that are now growing. These economies are currently equipping their citizens with knowledge in information technology since it is the fastest way to good governance in the emerging information economies globally. However, integration and use of ICT is affected by many factors. The study used cross sectional survey with a sample of 118 employees from Machakos County collected primary data using questionnaires. Descriptive statistics, correlation and aggregation data collection methods were used in the study. From the study, it was found that ICT infrastructure and staff competence both have significant influence the integration and the use ICT in the management of county government of Machakos. Thus, the study concludes that ICT infrastructure and staff competence are important factors that the county should address with regards to the incorporation and the use of information and communication technologies. The study recommends investment to upgrade the infrastructure and training of staff to improve delivery of service by the county governments.*

**Keywords:** *Information communication technology, infrastructure, management, staff capacity.*

## 1. INTRODUCTION

Information communication technologies (ICTs) benchmarked the 20<sup>th</sup> Century and mainly featured in the beginning of the 21<sup>st</sup> Century (Tilwawala, Myers, & Andrade, 2009). The dissemination of tools like the computers, the internet, and the cell phone media has empowered societies to attain the required mechanism that make new innovations reachable to the many, to improve application in various sectors of the economy (Chisenga, 2006). The main problem that needs to be solved at this digital time is the existing difference between those with and those without this knowledge and application. Evidence of developments from several nations show that ICT sector contribute immensely to the national Gross Domestic Product (GDP), marketability of products including services (Sharma, 2012). ICT impacts positively on the governance sector and other sectors of the economy.

ICT integration plays a greater role in many sectors of an economy (Sharma, 2012). It link local governance through increase of learning, traditional activities, work motivation, improvement of justice system national security provision (Lee, Rao, & Braynov, 2003). African governments have liberalized the ICT sectors have allocated a significant amount of funds to their ICT financial needs (Bollou & Ngwenyama, 2002). However, there is a general limitation of the inability to achieve a balance between the use of technology and the need to improve the growth and development objectives. The main contributing factor to slow connectivity in Africa has been the absence of the necessary resources, and difficulty in integrating local languages in the learning system, as well as a variation in methods of updating contents of materials within web sites (Kamel & Weigler, 2001).

In Kenya, an exponential growth in the using ICT during the past decade has had pervasive impacts on society and daily lives (Chisenga, 2006). ICT is increasingly being used in Government institutions to; improve governance, to improve efficiency in service delivery, improve transparency in the way services are offered, improve revenue collections, and improve services in various departments like human resource, procurement and other devolved units in the new government dispensation.

Locally, scanty studies have been conducted on ICT integration in the county governments especially in Machakos County (Haliso, 2013; Al-Rashidi, 2011). Magutu and Lelei, 2010 conducted studies with bias on national government. They specifically studied Information Systems Implementation in State Corporations with a bias on State Parastatals. Whereas there are persistent problems of ICT integration and use in county governments which lead to poor management and service delivery, there is a dearth of research in this area. This study sought to fill this gap by examining factors impeding the integration and the use of ICT in management of county governments. It sought the answer to the research question: what factors affect the integration and the use of ICT in the management of Machakos County government. The specific objectives were to establish relationship between ICT infrastructure and integration and determine the relationship of staff skills and capacity on integration and use of information and communication technology.

## **2. LITERATURE REVIEW**

### **2.1 Theoretical Literature**

This study was anchored on Rodger's theory of Diffusion of Innovation. The theory developed by Rodgers in 1962 is argued to be among oldest theories of social science. Rodgers (2003) definition of innovation as an idea, a practice, or a project perceived to be new by an individual or by a unit of adoption. This theory explains how over time an idea, a product gains momentum and then diffuses or spreads through a specific population or social system. The end result of diffusion is that people as a social system, adopt a new idea, behavior, or product. Adoption means a person does something in a different way than they had previously. The adoption key is that, persons should perceive the idea, behavior, product to be new or to be innovative. Through this diffusion is possible (Sahin, 2006).

### **2.2 Empirical Literature**

County governments regard integration of ICT as an innovation. Communication is the process in which participants create and share information with one another with the aim of reaching a mutual understanding. Communication occurs through channels between sources. To enhance the diffusion of Integration of ICT in County Governments, it should be ensured that the system is communicated through the most effective channels. It is further observed that innovation diffusion process includes a time dimension. Specifically, social system has a direct impact on the ability of an individual to be innovative and is a determining factor for social adopters.

#### **2.2.1 ICT infrastructure, and the integration and the use of ICT**

The ICT resources constitute tangible computer systems and people who participate in using them as well as input and output devices (Sarker, Zakir, & Rahman, 2006). They also include the software used to send, receive and manage signals transmitted. ICT infrastructure are all devices that supports the flow and processing of information (Sarker, Zakir, & Rahman, 2006). ICTs cannot exist in a vacuum therefore relay on computers, radios, software and other ICT as infrastructure. ICT infrastructure is essential foundation for information society.

Developing countries, Kenya included have limited computer application and uses in their public sector, they have inadequate infrastructure and with shortage of skilled manpower (Gichoya, 2005). Minimum connection to power enables few to possess computers at home in Kenya. Nzuki and Kyalo (2014) conducted a study on determinants of ICT integration in Tertiary Institutions. The study revealed the significance of enablers and infrastructure components that enable incorporation of determinant during the performance of educational functions.

### **2.2.2 Staff capacity and competence and the integration and the use of ICT**

The ability to master ICT is a major component in the achievement of competitive advantage in sustained development (Hanna, 2003). It is an important factor in delivering public services, education, training, micro credit and poverty reduction programs. To realize this potential, Hanna (2003) notes that, the focus on investment in physical infrastructure hardware, isolated experimentation and piecemeal implementation must be broadened and scaled up to address the enabling policies, institutions, infrastructures, skills, and to devise national strategies that are capable of agile adaptation and participatory social learning. In Kenya's most urban areas, commercial colleges and NGOs offer ICT programs but in the rural areas minimal digital learning is available (Ochara, 2008).

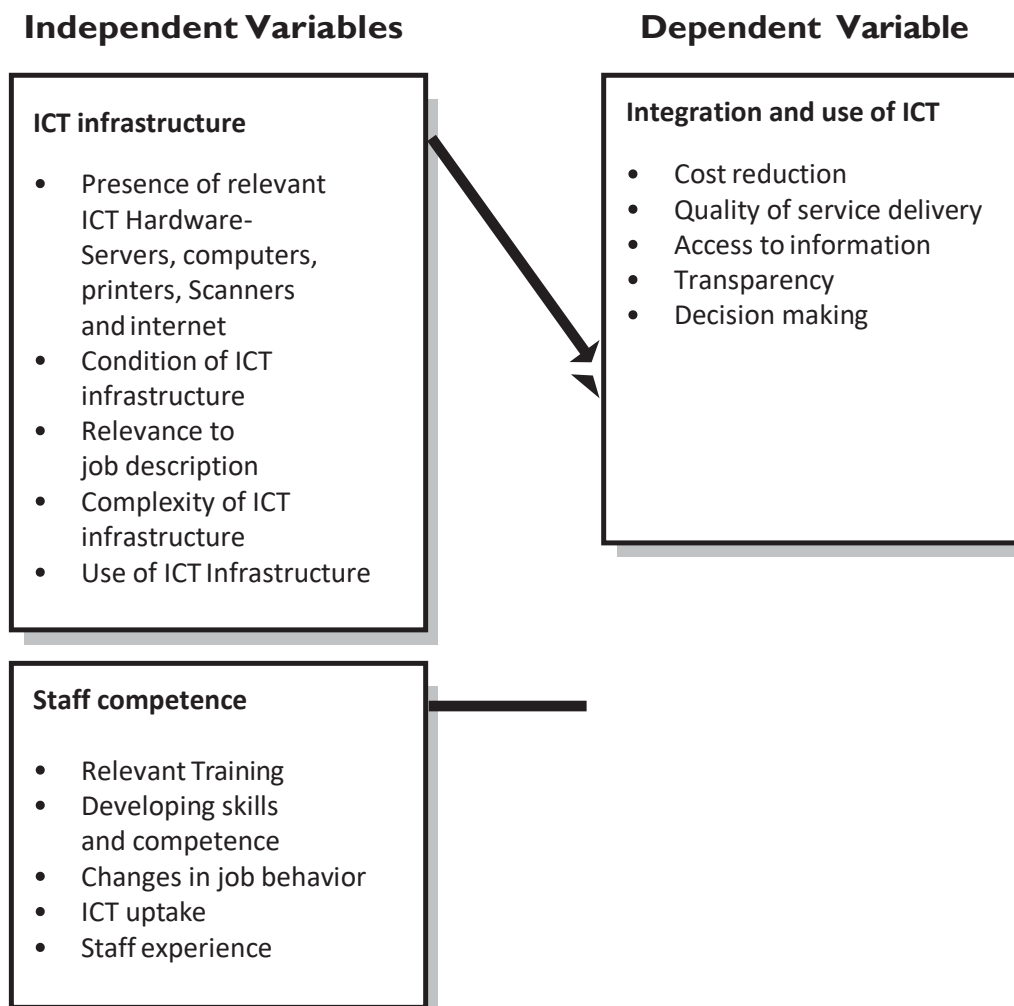
Murphy (2004) notes that weak human resource management and management capacity has been responsible for the derailment of IFMIS implementation in Kenya. Systems improvements (that is, macro model, MTEF, performance budgeting, cash management, IFMS, payroll/personnel systems) are typically undermined by failure to address complimentary human resource (manpower planning, recruitment, incentives, training), organizational restructuring and improved management capacity (delegation, middle management empowerment, team building). He further posits that IFMIS implementation is hindered by over-complex change projects requiring high levels of technical and management capacity.

### **2.3 Research gaps**

The number of previous studies in this area indicates that it is an area worthy of doing research. ICT integration has and continues to be a challenge in many county governments. Its integration is yet to reach its full potential and its utilization is limited. The literature review highlighted several factors that affect ICT integration for service delivery. However, there is limited information on ICT integration in the county government ministries. There is a need for a study that will investigate the issues raised by literature and explore the practical experience in county government offices. There has been no study or assessment of the ICT integration in the county government offices. This is the information that this study will sought to add to the ICT integration area of knowledge. Locally, scanty studies have been conducted on ICT integration in the County governments. Several studies (Gichoya, 2005; Haliso, 2013; Al-Rashidi, 2011) have focused on national government. This study sought to fill these gaps by examining factors that impede integration and use of ICT in management of county governments and sought to answer the research question: what are the factors that affect integration and use of ICTs in the management of County government?

## 2.4 Conceptual Framework

From the Figure 2.1 the dependent variable is integration and use of ICT. Its measures include Cost reduction, Quality of service delivery, improved access to information, Transparency and Improved decision making. The independent variables are ICT infrastructure and staff capacity.



**Figure 2.1: Conceptual Framework**

The following hypotheses were used in the study based on the conceptual framework.

**H<sub>1</sub>:** There is a significant relationship between ICT infrastructure and the integration and use of ICT

**H<sub>2</sub>:** There is a significant relationship between staff skills and capacity and the integration and use of information and communication technology

### **3. RESEARCH METHODOLOGY**

The study adopted the cross sectional design and targeted a population consisting of all the 1175 employees of Machakos County government. A total sample of 118 representing 10% of the employees was studied in line with Mugenda and Mugenda (2003). Stratified proportional random sampling technique was used to select the study sample based on departments within the county government. The data collection instrument was a questionnaire and was tested through a pilot study on ten respondents. These respondents were excluded from the final study. Analysis of the pilot test showed Cronbach's alpha values greater than 0.7 (Cronbach, 1951) for all the variables which confirmed internal consistency in the questionnaire. The study used primary data which was collected through drop and pick method. This data was analysed using regression and correlation techniques in Statistical Package for Social Sciences (SPSS) version 21 software. The regression analysis was done using a linear regression model of the form  $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + e$  where  $Y$  = Integration and use of ICT;  $X_1$  = ICT infrastructure;  $X_2$  = Staff competence;  $\beta_0$  represents the constant;  $\beta_{1,2}$  are regression coefficients and  $e$  is error term.

### **4. RESULTS, FINDINGS, AND DISCUSSION**

#### **4.1 Preliminary analysis**

Preliminary analysis shows that a total of 111 questionnaires were returned out of 118 which represent an overall response rate of 94%. It also shows that sixty percent (60%) of these were from male. The modal age group was found to be 26-35 years which represents 36% of the questionnaires returned. Majority (54%) of the respondents were educated up to University level. Finally, analysis by years in employment indicated that majority (67%) of respondents had worked in the county government for 4 to 5 years. Correlation between the variables was done using Pearson correlation approach. The results reveal that ICT infrastructure, and integration and use of ICT are positively correlated ( $r=0.244$ ) and the correlation is significant ( $p \leq 0.010$ ). The results further indicate that staff capacity and competence and integration and use of ICT are also positively and significantly correlated ( $r=0.208$ ,  $p \leq 0.028$ ). Therefore both factors in this study show positive and significant correlation with use and integration of ICT.

#### 4.2 Results of tests of study hypothesis

The overall objective of this study was to determine if selected management factors affect integration and use of ICT in Machakos County. The study was guided by two hypotheses. These hypotheses were tested using regression analysis techniques based on the model presented in Research Methodology chapter of this article. The results of the tests are shown in Tables 4.1, 4.2 and 4.3.

**Table 4.1 - Overall model summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.810 <sup>a</sup>	.656	.629	.4295798

a. Predictors: (Constant), ICT Infrastructure and Staff competence

**Table 4.2 - Analysis of Variance (ANOVA)**

Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6.418	4	1.604	.000 <sup>b</sup>
	Residual	19.561	106	.185	
	Total	25.979	110		

a. Dependent Variable: Integration and use of ICT

b. Predictors: (Constant), infrastructure, staff capacity

**Table 4.3 - Regression coefficients**

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. Error			
1	(Constant)	1.472	.453	3.245	.002
	ICT infrastructure	.220	.084	.224	.010
	Staff capacity and competence	.132	.051	.223	.011

a. Dependent Variable: Use and integration of ICT

As shown in Tables 4.1 and 4.2, the results of the tests for hypothesis  $H_1$ , stated which that “there is a significant relationship between ICT infrastructure and the integration and use of ICT”, returned a regression coefficient ( $\beta$ ) of 0.224 and a p-value of 0.010. This indicates that ICT infrastructure has a positive and significant effect on integration and use of ICT such that one unit change of ICT infrastructure results in 22.4% variation in integration and use of ICT.

The tests from the table for the second hypothesis  $H_2$ , which stated that “there is a significant relationship between staff skills and capacity, and integration and use of ICT” show a regression coefficient ( $\beta$ ) of 0.223 and a p-value of  $p \leq 0.011$ . This suggests that changes in staff skills and capacity affect integration and use of ICT such that a unit change results in 22.3% variation ICT integration and use.

These results may be written in functional as  $Y = 1.472 + 0.224X_1 + 0.223X_2$ , where  $Y =$  Integration and use of ICT;  $X_1 =$  ICT infrastructure;  $X_2 =$  Staff capacity and competence.

### **4.3 Findings and discussion**

The first objective purposed to establish if there exists a close relationship between use and integration of ICT and ICT infrastructure. The findings demonstrate the existence a positive correlation between these variables. This is consistent with Nzuki and Kyalo (2014) who found that elaborate ICT infrastructure is among factors that serve as a backbone to ICT integration into the education.

The study's second objective was to evaluate the effect of staff capacity and competence on integration and ICT use in the managerial goals of the county. The outcomes are that the two variables are positively related. This finding is in support of the study by Hanna (2003) which shows that the ability to master the use of ICT has become a core requirement for competition and recommended development.

## **5. CONCLUSION, IMPLICATIONS, AND RECOMMENDATIONS**

### **5.1 Conclusion of the study**

The overall objective of the study was to determine the relationship between management factors and use and integration of ICT in Machakos County. The study has achieved this overall objective and has established that management factors are related to use and integration of ICT such that 62.9% of variations on use and integration of ICT is caused by management factors *Ceteris Paribus*. Specifically, the study concludes that ICT infrastructure is an essential foundation for the information society. ICT infrastructure is a important enhancer (or barrier) to implementation of e-governance and ICT integration project which are essential for quality service delivery. The study also concludes that staff capacity and skills through mastering ICT use is one of the core competencies for integration and use of ICT in the management of County governments. This is therefore probably going to become one of the major competencies in delivery of public services, poverty reduction programmes, provision of micro-credit facilities as well as training and education. This is very significant because the availability of a skillful workforce is integral for successful ICT integration programmes.

### **5.2 Implications and recommendation for future**

The findings from this study have implication to the theory and academia, policy formulation and industry and practice. The study will be important to the county governments. The study will bring out the main areas of concern in the ICT Integration in the county governments. It will give suggestions on how ICT integration can be fully utilized to enable the county government achieve its goals and objective. This will definitely assist counties establish clear roadmaps when it comes to ICT development as well as deployment of ICT applications with the view to bolster management effectiveness and efficiency. The result of the study is of benefit to the policy makers in formulating a strategy of ICT integration in devolved governments. In a similar vein, results of this study can be used to enlighten all stakeholders on how to achieve the objectives highlighted in the National ICT Policy

2006. This study's findings will contribute towards current literature by adding to the pool of knowledge that is available in this topic. Therefore, it will assist both researchers as well as scholars seeking carry out more studies on the topic.

The study recommends that county governments should invest and maintain ICT infrastructure to facilitate use and integration of ICT and reap from the resulting efficiency and effectiveness. Further, the study recommends that county government management should encourage and support use of ICT in all areas in the county government. Internet should be introduced where the county staff can access information at the click of the button. The management can enhance this by empowering ICT function through increased resource allocation, both human resource and funding.

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