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ICTs AND REVENUE COLLECTION IN NAIROBI CITY COUNTY GOVERNMENT, KENYA

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ABSTRACT

The objective of this project was to find out the major role of ICTs in revenue collection in Nairobi City County government, Kenya. Currently NCCG has for a long time relied on manual way of carrying out revenue collection, which provides increased hindrance towards efficient revenue collection. Factors here include lack of accountability, slow access time of services, poor compliance by business owners and lack of security, which leads to loss of revenue. ICT policy is of great importance once adopted hence will increase efficiency in revenue collection. This therefore was a drive for authorities to be more innovative in how to use new technologies and be innovative to enhance revenue collection. To achieve safety of revenue collection, information security and ICT skills must be adopted in line with current ICT Policy. The study is directed by economic theory and technology acceptance model. The target population for the study was lower-level management staffs who deal directly with revenue collection and middle level management staff in NCCG and KRA. The sampling techniques to be used was purposive sampling using questionnaires to the staff. The study found that ICT infrastructure positively influences revenue collection in Nairobi City County Government. ICT Policy positively influences revenue collection in Nairobi City County Government. The study therefore recommends KRA and county government to increase their ICT infrastructure. These include hardware and software in support towards network availability; global universal Innovative ICT infrastructure; and timely design and implementation. Also, county government to develop other policies that can help enhance revenue collection in the county. The various policies to be developed are on communication platform, market size, and public service delivery ratio.

Key Words: *ICT, Revenue Collection, ICT Infrastructure, ICT Policy*

Background of the Study

Information Communication Technology is the fastest growing technology in the world today; ICTs adoption for running daily administrative and business transactions has made organizations both private and public to use it as a tool for managing their daily activities and efficient revenue collection (Al-mamary, Shamsuddin, & Aziati, 2014). There have been numerous changes in world of business and government revenue collection. The changes kicked off when technological innovation was equipped for use. ICT strategies on revenue collection applications started in USA, and then spread to the developing nations (Muthama, 2013). The need for efficient revenue collection is of importance in many developing

countries. ICTs has revolutionized business operations, gave competitive advantage and increased efficiency in revenue collection. Uses of e-payment and e-commerce have been of value concerning ICTs advancement in business and government services. Improvement of revenue collection in Nairobi City County Government is the key to meet its mandate to offer quality and timely service delivery to the citizens. Strengthening domestic resource mobilization, offers many potential benefits to Kenya economies as it will reduce the dependency on external flows, thereby reducing one of the sources of damaging volatility in resource availability. It reduces vulnerability to external shocks and gives Kenyan counties greater policy space thereby increases their ownership of the development process as well as strengthening their income capacity (United Nations, 2005). The quality of measures also matters towards increasing revenue by further charging readily compliant citizens.

ICTs are growing fastest. Globally, government authorities all over the world usually levy revenue charges which are the engines of financial growth and development. The development of an integrated revenue collection system provides the necessary platform to support administration in collecting own source revenue efficiently. They provide ecommerce, research and management services. They also do offer employment, best ICTs and boost the country's economy (UN-HABITAT, 2004). World Bank had been assisting the developing countries through donations. It has support Nairobi City County with funds so as to adopt the use of ICTs in revenue collection so as to enhance accountability.

The Revenue collection in Kenya has been majorly run by both the KRA and the N.C.C.G. Kenya has witnessed a rapid growth in ICT that allows the ICT policy to be adopted. Thus, all government services must be available online, every Kenyan citizen has online access and that government services be delivered quickly, fully at the time and place that they are needed (ICT policy, 2019). Consequently, the Kenyan government through KRA has implemented reforms to address the aspect of e-payment on e-commerce by enforcement of rules and policies to guide in proper and efficient revenue collection. The importance of ecommerce has grown as advances in Information and Communication Technology have created many opportunities to leverage self-service technology for large gains in efficiency and convenience (Capgemini, 2006). The rationale behind the establishment of the epayment arose from the need to enhance efficiency, transparency, trust and accountability in critical area of the public sector. Compliance is vital in revenue collection in that without full compliance from business clients there will be low revenue collection.

Statement of the Problem

Perennially, revenue collection by NCCG / KRA has not been as per the targets set. In 2013, the county government missed its target for locally collected six main county revenue streams with a revenue of 43%; raising Kshs1.3 billion only against a target of Kshs3.02 billion (Adam smith, 2013). Revenue collections in NCCG over the years have been conducted manually as most KRA staff and NCCG staff are not familiar with ICT policies and regulations. They as well lack ICT skills and infrastructure for online services. Manual way of revenue collection has many problems causing inefficiency such as unaccountability of revenue collection data and results, slow access time for revenue collection to both business client and KRA staff, information insecurity, inadequacy in making changes in case of errors and unnecessary space consumption. These have led to loss and low revenue collections in NCCG.

To achieve increase of revenue streams ratio within NCCG, KRA requires more innovations and creativity in developing ICTs. This is important in all the six key revenue streams of NCCG, namely; single business permits, parking fees, land rates, markets, building plan permits, advertisements and billboards. ICT industry has become a source of digitalization

NCCG software services. According to Otieno et al (2013), ICT systems and hardware in revenue collection by Local Authorities boost the revenue collection. Administration of revenue collection has been weak hence; this is believed to be due to challenges facing Kenyans such as ICT infrastructure inequality and inadequate hardware and software support towards network availability and low telecommunication services. According to Senaji et al (2020), automation of revenue collection processes enables fairer and less corrupt tax systems and enhances the operations of the municipalities.

However, it was not clear whether ICTs in revenue collection processes offers great efficiency and effectiveness in the six key revenue streams and utilizes ICT policy within NCCG. This was from his study about effects of innovation in revenue collection processes on organizational performance in Nairobi City County. Rotich (2014) in his study about ICT consideration and revenue collection in NCCG found out that use of ICT on financial allocation positively relate to revenue collections and they had significant impact. However, it was not clear whether ICTs offers information security, proper communication platform and increases revenue compliance in NCCG. This study therefore aimed to bridge the exiting knowledge gap by investigating the impact of ICTs on revenue collection in Nairobi City County Government.

Specific Objectives

i. To establish the role of ICTs majorly ICT infrastructure in revenue collection in Nairobi City County Government.
ii. To determine the role of ICT Policy in revenue collection in Nairobi City County Government

LITERATURE REVIEW

Theoretical Review

Systems Theory

Kat and Kahn (1966) first applied this theory by adapting it to organizational upgrade of needs. This approach identifies organizational needs by mapping the repeated cycles of input, throughput, output, and feedback between an organization and its external environment then coming up with single system. We can apply systems theory in ICT infrastructure support. Systems receive input from the environment as information or in the form of resources then process the input internally and release outputs into the environment in an attempt to restore equilibrium to the environment. The system then seeks feedback to determine if the output was effective in restoring equilibrium. As can be seen, the systems approach focuses on the means used to maintain organizational survival and emphasize long-term goals (Bertalanffy, 1951).

The systems approach is an external standard that measures effectiveness based on long-term growth or sustainability of any designed ICTs. To achieve these especially in systems upgrade, hardware and software is needed in support towards network availability. Effective systems are characterized by a steady state that systems theorists call homeostasis in order to avoid the static connotations of equilibrium and to bring out the dynamic, processual, potential-maintaining properties of unstable systems (Buckley, 1967). If an organization is able to maintain homeostasis, which includes not just survival but also growth, then it is effective. Most effective organizations, according to systems theory, adapt to their environment as required. Organizations that exist in dynamic environments must be open systems. An open organization monitors its environment and collects information about environmental deviations input.

The most important information is negative input, according to systems theorists, because this information alerts the organization to problems that need to be corrected. Negative input tells the organization that it is doing something wrong and that it must make adjustments to correct the problem. Positive input tells the organization that it is doing something right and that it should continue or increase that activity. Organizations then organize and process this information to formulate solutions or responses to these changes. As Cutlip, Center and Broom (2006) noted, open systems use information to respond to environmental changes and adjust accordingly. The adjustments affect the structure or process of the organization, or both. The structure is what the organization is, whereas process is what the organization does. Adjustments are intended to reduce, maintain, or increase the deviations. Processing positive and negative input to adjust to environmental change is called throughput. In the throughput of information, the organization analyzes it and tailors it strategically to fit with the organization's goals, values, and within the relationship context it holds with publics. System theory is highly applicable in global ICT infrastructure, ICT security and ICT skills towards revenue collection hence timely design and implementation in support for upgrade of needs as required by individuals and environment.

Diffusion of Innovation Theory

Diffusion of Innovation (DOI) Theory, developed by E.M. Rogers in 1962, is one of the oldest social science theories. It originated in communication to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. The end result of this diffusion is that people, as part of a social system, adopt a new idea, behavior, or product. Adoption means that a person does something differently than what they had previously for example purchase or use a new product, acquire and perform a new behavior among others. The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. It is through this that diffusion is possible. Adoption of a new idea, behavior, product or innovation does not happen simultaneously in a social system; rather it is a process whereby some people are more ready to adopt the innovation than others.

Researchers have found that people who adopt an innovation early have different characteristics than people who adopt an innovation later. When promoting an innovation to a target population, it is important to understand the characters of the target population that will help or hinder adoption of the innovation. There are five established adopter categories, these include innovators, early adopters, early majority, late majority and laggards. The National ICT policy captures the ICT ambitions of our citizens and corporations and creates a framework for their timely realization. It takes close cognizance of our history, social, economic and operational environment, legal and regulatory framework, current capacities and capabilities and existing policies from the arms of government. Diffusion of innovation theory is highly applicable to citizens in their effort to achieve needs in line with government-controlled regulations. ICT policy has four key areas, which include mobile first, skills and innovation, market and public service delivery. E-government as used in ICT policy, enhances more effectively and efficiently delivers government services to citizens and businesses units. It is the application of ICT in government operations, achieving public ends by digital means (UN E-government knowledgebase, 2020).

Efficient revenue collection is dependent on e-government rules adherences. Diffusion theory is highly applicable here in regard to attitude, subjective norm, readiness to accept change and perceived behavioral control. ICT policy is guided by the following principles; putting ICT at the center of the national economic agenda, improving access to ICT especially broadband, efficient public service delivery, maintaining an open government and putting the

private sector first and leveraging on ICT to promote sustainable development goals (ICT Policy, 2019). While the majority of the general population tends to fall in the middle categories, it is still necessary to understand the characteristics of the target population

Conceptual Framework

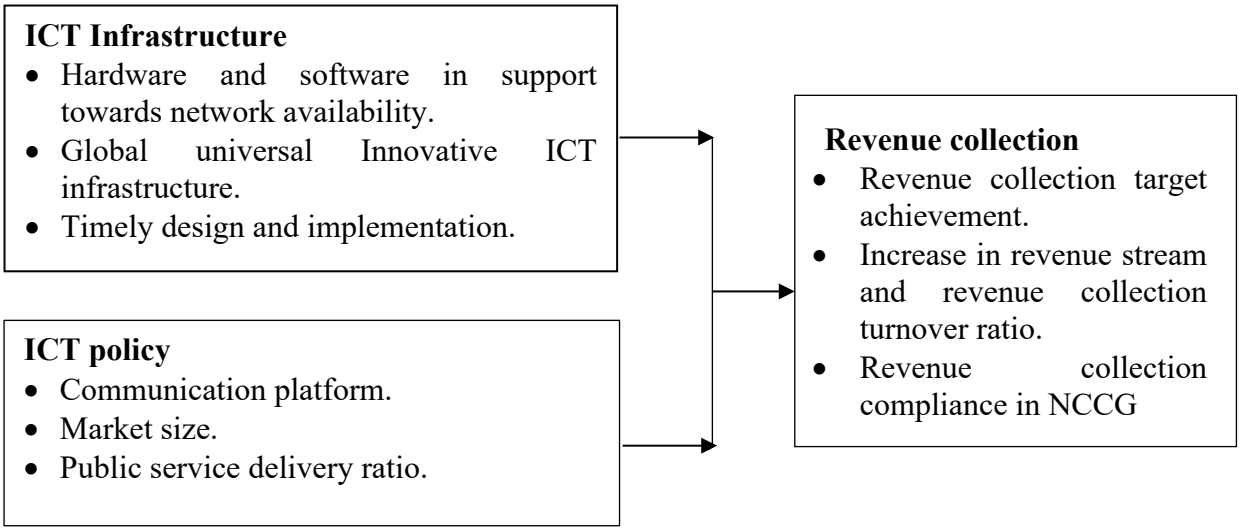

Figure 1: Conceptual Framework

ICT Infrastructure

ICT infrastructure encompasses all the devices, hardware and software, networks, protocols and procedures that are employed in the ICT fields to foster interaction amongst different stakeholders. There indeed appears to be a general acceptance that ICTs is likely to play a very essential role in tax management and as such most authorities have invested heavily in the recruitment for or developing their computer hardware and software audit capabilities hence importance of ICT infrastructure. It is currently used by the Company and the Company Subsidiaries constitutes on the ICT and other systems infrastructure reasonably necessary to carry on the Business as it is currently conducted. The goal of ICT infrastructure management is to use proven, repeatable processes to provide a stable operating environment for everyone using the technology. Global universal innovative ICT infrastructure concept deployed in ICT infrastructure adopts management processes which is use in various organizations. These processes include; ICT design and planning, ICT deployment, ICT operations management and ICT technical support. It builds ICT strategies in managing the organizations, improving services to customers and employees, lower business risks and increased income hence decreased expenses due to improved efficiency.

ICT encompasses vital components of modern infrastructure, with widespread applications throughout global economies (Pradhan et al., 2015). ICT can play an essential role in social and economic development, gross domestic product (GDP), productivity, organizational infrastructure, international cooperation in finance, trade, foreign direct investment (FDI), poverty reduction, employment and democratic maturity in countries (Shirazi et al., 2009; and Bon et al., 2016). Infrastructure development and deployment is a capital-intensive undertaking and should be managed on a prudential basis nationally (ICT Policy, 2019). Technological advances that have an impact on an organization and its levels of automation, achievement and potential, provide a fertile ground for innovative activities that result in new or improved goods and services (Marr 2009).

For example, we are seeing a shift from voice call over mobile phones to voice call on internet call, an application of network infrastructure which is cheaper over short and long

distances. Applications such as Skype and Zoom are becoming instrumental communication tools. The goal of ICT infrastructure is to increase availability of business systems and ensure continuity of business operations. This Strategic pillar result into the development of the New Data Centre and upgrade of LAN & WAN connectivity in key stations. The key lessons learnt from this includes the need to: maintain technology platform standards; build internal skills capacity and ensure knowledge transfer from vendors; have in place technology lifecycle management and enforcement of SLAs/penalties (KRA ICT strategy 2018 – 2021).

ICT Policy

The National ICT policy was last reviewed in 2019. Since then, the sector has experienced rapid technological advancement, changes to the legal and administrative framework and many emerging issues. The latter include increased IT enabled services, increased demand on bandwidth and for QOS challenges of cyber-security, integration projects and harmonization of ICT policies regionally and internationally. The main policy objectives are to; create the infrastructure conditions for use of high speed, wireless, internet across the country, grow the contribution of ICT to the economy to 10%, leverage regional and international cooperation and engagements to ensure that Kenya is able to harness global opportunities, position the country to take advantage of emerging trends such as the shared and gig economy by enhancing our education skills of our people, fostering an innovation and start-up ecosystem. Finally, to gain global recognition for innovation, efficiency and quality in public service delivery it is important to adhere to ICT policy regulations.

The Kenya National ICT Policy (2019) outlines the policy of the Government of Kenya in relation to the design, development, acquisition, deployment, operation, support and evolution of public and private ICTs. It defines the current and forward-looking position of the government on various areas of the evolving and emerging technology landscape in Kenya. In order to support this goal, it is necessary that there be a robust, capable backbone to back haul traffic, and that the conditions in the marketplace are conducive to the provision of competitively priced, affordable last-mile connectivity for every citizen. Before the digitalization, there were many tax frauds cases since no one enjoys paying taxes. There was mistrust between those collecting taxes and taxpayers.

This mistrust generates a game theoretic coexistence between tax agents and taxpayers, with agents perceiving taxpayers as criminals unwilling to pay their taxes, and taxpayers wary of government agencies' high-handedness in collection of taxes (KRA, 2004). This created the need for the tax agents to improve their image by building trust and public confidence (Moyi and Ronge, 2006). ICTs are essential to increase transparency and accountability of government agencies, reduce transaction costs in service delivery and enhance participation of citizens, businesses and civil society in the government. In line with objective of this study, there is need for tax systems to meet the following three criteria: they must be efficient, equitable and simple (Knoester, 2010).

Empirical Literature Review

ICT Infrastructure

In this study, automation of tax collection process has been defined as a new technology-based based on ICTs that does not necessitate for tax payers to go to tax authorities to pay their taxes due (Gidisu, 2012). Previous research results show that ICT infrastructure plays a critical positive role on economic growth (Hong, 2017; Salahuddin & Alam, 2016; Pradhan *et al.*, 2015; and Sassi & Goaied, 2013). System is composed of turning in tax declaration forms that defines tax owned to tax authorities in an electronic format and pay taxes due via electronic environments based on Internet. Automation of tax payment was first coined in

USA. Australia is among the countries that had implemented the system in the management of their municipalities (Turner *et al*, 2014). This is achieved in international organizations such as United Nations Conference on Trade, UNDP, Development Gateway of World Bank Group and the World Trade Organization (WTO). These organizations help governments of developing countries by raising awareness about e-commerce, providing policy, consultancy on technology transfer know-how and infrastructural support (Sandmo, 2004).

However, Mureithi and Moyi (2003), contends that developing countries still need to do a lot to embrace online payments and e-commerce as a source of revenue collection. Some of the limitations faced by ICT infrastructure include obsolete business devices and models of the traditional industrial age, low rates of internet access, lack of basic automation in place, poor management skill, lack of e-commerce integration and an inefficient supply chain (Mureithi and Moyi, 2003). Organizations therefore are seriously lagging behind in embracing e-commerce and use of ICTs within itself in developing countries. The digital divide varies tremendously between the developed and developing world, as well as among developing countries themselves (Mureithi & Moyi, 2003). Most developing countries have not yet faced major concerns about how the growth of ICT might affect tax revenue collection, but eventually they will need to confront this issue as e-commerce volume rises.

According to Karingi and Wanjala (2005) e-commerce in ICT is a major concern for international agencies and tax authorities worldwide. Majority of the countries have taken the EU VAT as a model, whereby the consumption tax treatment of supplies from non-resident suppliers to domestic recipients is generally the same in the EU and other jurisdictions with a VAT system. Tax is imposed on domestic consumption. Supplies of services or intangible property to domestic businesses that are registered for VAT purposes are subject to the reverse charge rule (as is the case with Australia and Canada) or indirectly taxed when the recipients make taxable supplies. Supplies of services or intangible property to private consumers may or may not be subject to tax (Karingi and Wanjala, 2005).

ICT Policy

ICT policy takes close cognizance of our history, social, economic and operational environment, legal and regulatory framework, current capacities and capabilities and existing policies from other arms of government; and develops a carefully thought through achievable way forward for our country. According to Sandmo (2004), much light being thrown on macroeconomic aspects are emergent issues like legal, regulation, and taxation of e-commerce to contribute in instant revenue collection in developing countries. Recent technology advancements, globalization, intense competition and changing customer needs have led to massive restructuring of the service industry. One of the objectives of ICT policy is skills and innovations. There is increase in innovations to ensure customer satisfaction.

Kariuki (2009) investigated the impact of automation as a structural change strategy on customs clearing procedures at Kenya Revenue Authority. Porter and Stern (2002) states that innovation activities of the organizations within a country are strongly influenced by national policy rooted on innovative imperatives. Goh (2005) states that, to achieve an innovation-driven economy, the objective of industrial policy generation should be an accelerated pace of competitive and sustainable industrial growth within a functional framework characterized by a growing market orientation and private sector-led development. According to Muthoni (2015), who researched on determinants of implementation of ICT projects in Kenya; found that some factors like top management support, ICT policy and resources allocation affects the use of ICT in Kenya.

According to Seifert and Bonham (2003), e- government services should be cheaper and quicker. To help in achieving this, formulating and developing County Government ICT infrastructure should be adopted. For instance, developing county website and portals, coordinating the development of the County ICT policy and regulatory framework is important. The Nairobi City County's mission is "city of choice to invest, work and live in". Therefore, to accelerate to the county's mission, ICT sector need to enable its clients to interact with Nairobi City County and have access to the services provided with ease. This can only be achieved effectively by automating services and enabling the clients to communicate through our web portal platform and online forms.

RESEARCH METHODOLOGY

This study adopted descriptive survey design. The six key revenue streams include; Single business permits, parking fees, land rates, markets, building plan permits, advertisements and billboards. The population for this study composed of the NCCG staff and KRA staff both of middle level management and low-level management.

Purposive sampling was used to identify sample size. Lower management staff of both KRA and NCCG are the frontline officers who deal immediately with revenue collection in each revenue stream hence they are the ones who have appropriate data and information. The study samples a total of 120 respondents. The research instrument for the study was a questionnaire.

The study used qualitative analysis though the use of computer software specifically Statistical Package for Social Sciences (SPSS). Findings were presented in form of tables, charts and graphs for easy interpretation and understanding about the relationship between ICTs and revenue collection in NCCG. The correlation and coefficient of determination between the independent variable and the dependent variable were computed.

RESEARCH FINDINGS

The study targeted 120 respondents but 107 of them filled and returned the questionnaire, forming a response rate of 89.2%. A response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent (Mugenda & Mugenda (2018). Hence in our case the response rate was excellent.

Descriptive Statistics on Independent and Dependent Variables

Role of ICT Infrastructure

Respondents were further asked to indicate their level of agreement with various statements on the role of ICTs majorly ICT infrastructure in revenue collection in Nairobi City County Government. Table 1 presents the findings obtained.

Table 1: Descriptive Statistics on Role of ICT Infrastructure

	Mean	Std. Dev.
We have devices and networks that facilitate interaction amongst different stakeholders	3.966	1.225
The county government has realized that ICTs play a very essential role in tax management	3.897	1.212
Our institution has invested heavily in the recruitment and developing computer hardware and software audit capabilities hence importance of ICT infrastructure	3.966	1.345
The company uses ICT and other systems infrastructure to carry on the	3.793	1.286

Business		
ICT systems and infrastructure improve revenue collection efficiency	3.931	1.152
Total mean	3.911	0.977

Based on the findings, they have devices and networks that facilitate interaction amongst different stakeholders (M= 3.966, SD= 1.225); their institution has invested heavily in the recruitment and developing computer hardware and software audit capabilities hence importance of ICT infrastructure (M= 3.966, SD= 1.345); and that ICT systems and infrastructure improve revenue collection efficiency (M= 3.931, SD= 1.152). The respondents were in agreement that the county government has realized that ICTs play a very essential role in tax management (M= 3.897, SD= 1.212); and that the company uses ICT and other systems infrastructure to carry on the Business (M= 3.793, SD= 1.286).

The findings agree with Turner *et al*, (2014) that system is composed of turning in tax declaration forms that defines tax owned to tax authorities in an electronic format and pay taxes due via electronic environments based on Internet. It also agrees with Mureithi and Moyi (2003) that developing countries still need to do a lot to embrace online payments and e-commerce as a source of revenue collection. Some of the limitations faced by ICT infrastructure include obsolete business devices and models of the traditional industrial age, low rates of internet access, lack of basic automation in place, poor management skill, lack of e-commerce integration and an inefficient supply chain.

ICT Policy

Respondents were also asked to give their level of agreement with various statements on the role of ICT Policy in revenue collection in Nairobi City County Government. Table 2 presents the findings obtained.

Table 2: Descriptive Statistics on ICT Policy

	Mean	**Std. Dev.**
From the last policy review, our sector has experienced changes to the legal and administrative framework	3.862	1.279
Change in policy has led to increased IT enabled services and increased demand on bandwidth	3.966	1.152
There has been increases integration projects and harmonization of ICT policies regionally and internationally	3.931	1.285
We adhere to ICT policy regulations to gain global recognition for innovation, efficiency and quality in public service delivery	4.000	1.418
Before the digitalization, there were many tax frauds cases	3.862	1.424

Based on the findings, respondents agreed that they adhere to ICT policy regulations to gain global recognition for innovation, efficiency and quality in public service delivery (M= 4.000, SD=1.418); that change in policy has led to increased IT enabled services and increased demand on bandwidth (M= 3.966, SD= 1.152); that there has been increases integration projects and harmonization of ICT policies regionally and internationally (M= 3.931, SD= 1.285); that from the last policy review, our sector has experienced changes to the legal and administrative framework (M= 3.862, SD= 1.279; and that before the digitalization, there were many tax frauds cases (M= 3.862, SD= 1.424).

The study findings are in agreement with those of Porter and Stern (2002) that innovation activities of the organizations within a country are strongly influenced by national policy rooted on innovative imperatives. Goh (2005) states that, to achieve an innovation-driven

economy, the objective of industrial policy generation should be an accelerated pace of competitive and sustainable industrial growth within a functional framework characterized by a growing market orientation and private sector-led development.

Revenue Collection

Respondents were also asked about the ICT systems which were currently used in KRA for revenue collection. They were required to give the extent to which they agreed with the systems having the following qualities. Table 3 presents the findings obtained.

Table 3: Rating of ICT Systems

Specifications	Mean	Std. Dev.
Easy to use	3.8	1.106
Easy to learn	3.96	1.045
Has user expectations	4.06	0.568
Error detection	3.97	0.905
User interface friendly	4.07	1.364
There is data security	4.01	0.672
Adequacy of features required	3.98	0.614

The findings presented in Table 3 show that all the mean value are above 3.5 an indication that the respondents agreed on average with the various qualities of KRA revenue collection system. They specifically agreed that it was user interface friendly (M= 4.07, SD= 1.364); has user expectations (M= 4.06, SD= 0.568); error detection (M= 3.97, SD= 0.905); there is data security (M= 4.01, SD= 0.672). They also agreed that it has adequacy of features required (M= 3.98, SD= 0.614); easy to learn (M= 3.96 SD= 1.045); and that it is easy to use (M= 3.8, SD= 1.106).

Having established what the respondents thought about the various features of the system used. Respondents were asked their opinion on the ICT systems which are currently used in KRA revenue collection in terms of the following attributes. Table 4.12 presents the findings obtained.

Table 4: Attributes of ICT Systems used in KRA

	Mean	Std. Dev.
Completeness	3.74	0.981
Accuracy	3.77	1.28
Timeliness	4.01	0.88
Traceability of transactions	3.98	0.958
Client support	3.90	0.936
There is data security	4.06	0.701
Adequacy of features required	3.75	1.306

Based on the findings presented in Table 4, the respondents were in agreement on the various attributes of the ICT systems used in KRA. The findings show that they agreed that there is data security (M= 4.06, SD= 0.701); timeliness of the system (M= 4.01, SD= 0.88); there is traceability of transactions (M= 3.98, SD=0.958); client support (M= 3.90, SD= 0.936); accuracy (M= 3.77, SD= 1.28); that adequacy of features required (M= 3.75, SD= 1.306); and on completeness (M= 3.74, SD= 0.981).

Correlation Analysis

Pearson R correlation was used to measure strength and the direction of linear relationship between variables. The bigger the correlation coefficient R, the stronger will be the

association between two variables. Correlation analysis also helped to detect any chance of multicollinearity. The relationship was considered small when r = ±0.1 to ±0.29, while the relationship was considered medium when r = ±0.3 to ±0.49, and when r= ±0.5 and above, the relationship was considered strong.

Table 5: Correlations

		Revenue collection	ICT Infrastructure	ICT policy
Revenue collection	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	107		
ICT Infrastructure	Pearson Correlation	.839**	1	
	Sig. (2-tailed)	.000		
	N	107	107	
ICT policy	Pearson Correlation	.748**	.025	1
	Sig. (2-tailed)	.000	.478	
	N	107	107	107

From the findings in Table 5, ICT Infrastructure was seen to have a strong significant relationship with Revenue collection (r=.839, p=0.000<0.05). ICT policy were also seen to have a strong positive and significant relationship with Revenue collection (r=.748, p=0.000). The relationship between the independent and the dependent variable was considered to be significant since the p-values (0.000) obtained were less than the selected level of significance (0.05). The findings suggest that ICT Infrastructure and ICT policy have significant relationship with revenue collection in Nairobi City County Government of Kenya. The findings also show that the independent variables were not strongly related with each other an indication that they were no severe multicollinearity.

Multiple Regression Analysis

Model Summary

Model summary is used to measure the amount of variation in the dependent variable that results from changes in the independent variables. In this study, model summary was used to measure the amount of variation in revenue collection in Nairobi City County Government as a result of changes in ICT Infrastructure, ICT policy, ICT skills and qualification, and Information Security.

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.868[a]	.753	.736	.07623

a. Predictors: (Constant), ICT Infrastructure, ICT policy, ICT skills and qualification, and Information Security

The findings presented in Table 6 show the value of R^2 to be 0.753. This implies that 75.3% variation in revenue collection in Nairobi City County Government can be explained by changes in ICT Infrastructure, ICT policy, ICT skills and qualification, and Information Security. The remaining 24.7% suggest that there are other factors that influence revenue collection in Nairobi City County Government that were not discussed in this model. The

findings further show that the variables used in this model were strongly related as indicated by correlation coefficient (R) of 0.868.

Analysis of Variance

ANOVA is used to test for significance of the model. In this study 5% level of significance was used to test significance of the model.

Table 7: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.98	4	3.495	77.667	.000[b]
	Residual	4.586	102	0.045		
	Total	18.566	106			

a. Dependent Variable: revenue collection

b. Predictors: (Constant), ICT Infrastructure, ICT policy, ICT skills and qualification, and Information Security

From the findings in Table 7, the F-calculated was 77.736. The F-critical ($F_{4, 102}$) obtained from f-distribution tables was 2.459. This show that the F-calculated is greater that the f-critical value hence a linear significant relationship exists between ICT Infrastructure, ICT policy, ICT skills and qualification, and Information Security. In addition, the p-value (0.000) was less than the significance level (0.05). This confirms goodness of fit of the model in predicting the influence of ICT Infrastructure, ICT policy, ICT skills and qualification, and Information Security on revenue collection in Nairobi City County Government of Kenya.

Beta Coefficients of the Study Variables

Table 8: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.476	.117		12.615	.000
	ICT Infrastructure	.252	.058	.264	4.361	.002
	ICT policy	.205	.130	.215	6.831	.000

a. Dependent Variable: Revenue collection

From the beta coefficients findings presented in Table 8, the study fitted the following regression equation.

$$\mathbf{Y= 1.476 + 0.252\ X_1 + 0.205\ X_2 + \varepsilon}$$

From the findings, ICT infrastructure work is statistically significant to revenue collection ($\beta = 0.252$, $P = 0.000$). This implies that at 95% confidence level, ICT infrastructure had significant positive relationship with revenue collection in Nairobi City County Government. This implies that a unit increase in ICT infrastructure will result to increase in revenue collection in Nairobi City County Government by 0.252 units. These findings suggest that ICT infrastructure positively influences revenue collection in Nairobi City County Government.

The findings who that ICT Policy is statistically significant to revenue collection in Nairobi City County Government ($\beta = 0.205$, $P = 0.000$). This implies that at 95% confidence level, ICT Policy had significant positive relationship with revenue collection in Nairobi City County Government. This implies that a unit increase in ICT Policy will result to increase in revenue collection in Nairobi City County Government by 0.252 units. These findings

suggest that ICT Policy positively influences revenue collection in Nairobi City County Government.

Conclusions

The study found that ICT infrastructure work is statistically significant to revenue collection. This implies that at 95% confidence level, ICT infrastructure had significant positive relationship with revenue collection in Nairobi City County Government. This implies that a unit increase in ICT infrastructure will result to increase in revenue collection in Nairobi City County Government. The study therefore concludes that ICT infrastructure positively influences revenue collection in Nairobi City County Government.

The findings show that ICT policy is statistically significant to revenue collection in Nairobi City County Government. This implies that at 95% confidence level, ICT Policy had significant positive relationship with revenue collection in Nairobi City County Government. Therefore, a unit increase in ICT Policy will result to increase in revenue collection in Nairobi City County Government. Based on the findings of the study, it was concluded that ICT Policy positively influences revenue collection in Nairobi City County Government.

Recommendations

The study found that ICT infrastructure has positive influence on revenue collection. The study therefore recommends KRA and county government to increase their ICT infrastructure. These include hardware and software in support towards network availability; global universal Innovative ICT infrastructure; and timely design and implementation.

ICT policy was found to positively influence revenue collection. The study recommends county government to develop other policies that can help enhance revenue collection in the county. The various policies to be developed are on communication platform, market size, and public service delivery ratio.

Suggestions for Further Studies

The main focus of this study was to establish the appropriate role of ICTs in various research upgrades towards target achievement of revenue collection in Nairobi City County Government of Kenya. The study used ICT infrastructure, ICT Policy, ICT skills, and information security as independent variables but they only explained 75.3% variation in revenue collection. There is therefore need for another study to be conducted on other factors that affect revenue collection that were not discussed. The study was limited to Nairobi County; there is need for the study to be replicated in other counties to facilitate comparison and generalization of research findings.

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