

**INFLUENCE OF INFORMATION COMMUNICATION  
TECHNOLOGY ADOPTION ON SUCCESSFUL REVENUE  
COLLECTION PROCESS BY THE COUNTY  
GOVERNMENT OF NAIROBI, KENYA**

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**Influence of Information Communication Technology Adoption on  
Successful Revenue Collection Process by the County Government of  
Nairobi, Kenya**

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**A Thesis Submitted in Partial Fulfillment for the Degree of Master of  
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Technology**

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## DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

Signature .....

Date .....

**Linda Kiende Kibaara**

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

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## **DEDICATION**

I dedicate this research work to my Mum and Dad for their great support throughout my research, my sister for her dedication and Peter for his love and support during my study.

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## **ACRONYMS/ABBREVIATIONS**

<b>CCN</b>	County Government of Nairobi
<b>DOI</b>	Diffusion of Innovation
<b>EGM</b>	Electronic Graft Management
<b>GDP</b>	Gross Domestic Product
<b>GTA</b>	Grounded Theory Approach
<b>ICT</b>	Information Communication Technology
<b>IT</b>	Information Technology
<b>LAs</b>	Local Authorities
<b>POS</b>	Point of Sale
<b>SPSS</b>	Statistical Package for Social Sciences
<b>TAM</b>	Technology Acceptance Model
<b>U.S</b>	United States
<b>URA</b>	Uganda Revenue Authority
<b>UTAUT</b>	Unified Theory of Acceptance & Use of Technology

## DEFINITION OF OPERATIONAL TERMS

**Cloud computing:** This refers to a model for delivering information technology services in which resources are retrieved from the internet through web-based tools and applications, rather than a direct connection to a server (Soleimanian & Hashemi 2012).

**E-Government:** Electronic government (or e-government) refers to the utilization of Information Technology (IT), Information and Communication Technologies (ICTs), and other web-based telecommunication technologies to improve and/or enhance on the efficiency and effectiveness of service delivery in the public sector (Buhalis, 2004)

**E-Wallet:** This refers to an encrypted storage medium holding credit card and other financial information that can be used to complete electronic transactions without re-entering the stored data at the time of the transaction (Buhalis, 2004).

**Government Revenue:** Government revenue refer to the money received by a government from sources such as taxes levied on the incomes and wealth accumulation of individuals and corporations and on the goods and services produced, exports and imports, non-taxable sources such as

government-owned corporations' incomes, central bank revenue and capital receipts in the form of external loans and debts from international financial institutions (Poon, 2003).

**Information Communication Technology:** This refer to an umbrella term that includes any communication device or application, encompassing radio, Television, Phones, Computer Networks, Satellite systems, as well as the various services associated with them such as video conferencing and distance learning.

**Mobile phone technology:** Mobile phone technology is the technology used for cellular communication. Mobile phones connect to a wireless communications network through radio wave or satellite transmissions (Mensah et al, 2012).

## **ABSTRACT**

The purpose of this study was to determine the influence of ICT adoption on successful revenue collection process by the County Government of Nairobi. The objectives of the study were to determine influence of Cloud Computing on revenue collection process, to establish how Mobile Phone Technology influences revenue collection process, to analyze how E-Wallets influence revenue collection process and find out how e-government influences revenue collection process by the County Government of Nairobi. The study adopted a descriptive research design. The target population of the study was employees County Government of Nairobi from which a stratified sample was chosen for the study. The study relied on primary data collected using a questionnaire which was administered on a drop and pick later method. The filled questionnaires were checked for completeness, coded and entered into a statistical software which produced descriptive and inferential statistics to describe the data. The findings were presented using graphs, pie charts and tables for ease of understanding. The study found out that Cloud computing, Mobile phone technology and e-wallets have had a major positive influence on the revenue collection process. A regression analysis of the four independent variables on the dependent variable show that they collectively explain over two-thirds of all the changes in revenue collection process. The findings show that some of the electronic payment platforms were not accessible to the poor and recommended that the county government should develop and deploy an electronic payment platforms that are accessible to both the high income earners and low income earners.

## **CHAPTER ONE**

### **INTRODUCTION**

The study sought to analyze the influence of ICT adoption on revenue collection process in The County Government of Nairobi in Kenya. This chapter will specifically focus on the background of the study, statement of the problem, research questions, general and specific objectives, justification of the study, the scope of the study and the limitations of the study.

#### **1.1 Background of the study**

Effective penetration and utilization of ICT in the public service for high-end value-adding operations in local government is crucial to enhance effective and efficient services that satisfy the citizens and other stakeholders. ICT penetration and utilization in the local government has not reached the levels necessary to reap the benefits of ICT in revenue collection (AkomeaBonsu & Sampong, 2012). This is evident in the ongoing diffusion of ICT and e-business technologies and services among local authorities which is a striking example of the possible dynamics of technological change and economic development.

Virtually all economic spheres can be affected by technologically induced changes, including innovation dynamics, Productivity and growth, the development of market structures, and the composition of labor demand (Mensah *et al.*, 2012). Over the years, technology in business has been changing rapidly as the global environment becomes

highly competitive and innovative. The use of Information Communication Technology (ICT) has become very vital to all organizations that intend to remain competitive in the market.

Laudon and Laudon (2007) asserted that ICT includes all the technologies that facilitates the processing, transfer and exchange of information and communication services. It is considered as a subject of expertise that links information technology (computers and applications) and telecommunication networks (intranet and internet), that lets people and computers interrelate irrespective of physical location. Werthner and Klein (2005) conclude that the ICT term contains hardware, software, networks and people that should be integrated as a one unit by linking each one to the other in a clear process to generate the information that helps the decision makers, producing product and services presenting, promotion, controlling and for achieving the organization's aims and goals.

### **1.1.1 Global Perspective of Information Communication Technology Adoption**

After the Second World War, ICT became one of the largest industries in the world. Since the development of the integrated circuit in the mid 1970's and the personal computers in early 1980's, ICT field has really improved (Sunil & Meindl, 2001). During this time, the combination of affordable powerful computers, advanced telecommunications and digital control system has brought about great changes in the way people live and work.

There are various developments of ICT and electronic tools that have come into use such as Electronic Data Interchange (EDI), enterprise catalogs, and Electronic Point of Sales (EPOS), bar coding, Internet and electronic mail. All these have had a significant impact on government revenue collection process. In the words of Cravens (2000) the drivers of change in today's world include, deregulation, global excess capacity, global competition, changing customer expectations, ICT, demographic shifts and changing work and lifestyles. These changes have led organizations worldwide to embark on activities that will provide a source competitive advantage and embrace the usage of ICT (Kevin, 2006).

ICT is clearly considered as a key growth area in this century, specifically, in a dynamic business and highly competition environment which requires utilizing advanced ICT to improve efficiency and cost effectiveness, and to present high quality products and services to their customers. Recently, the term of ICT has expanded to include the role of ICT tools not just inside the company but outside the company, for example, UNDP report, 2001 claimed that ICT is considered as a tool of marketing and contacting customers and looking for possible customers, as well as presenting ICT services is distinguished as a potential service for customers (Werthner, & Klein, 2005).

According to Gholami *et al.* (2008) ICT is also considered as a key enabler for globalization, facilitating worldwide flows of information, capital, ideas, people and products. Some researchers such as (Christensen, 2000; Doganis, 2001; Werthner & Klein, 2005) have tried to combine the previous definition by considering ICT as a

group of elements (hardware, software, and people) that should be working together in the process to present the benefits to the organization in the form of information, product or services and so on.

### **1.1.2 Regional Perspective of Information Communication Technology Adoption**

The World Bank and African Development Bank (2012) observe that the mobile phone takes a lead role among the ICTs that have revolutionized Africa. According to President Kagame of the republic of Rwanda (2013), the internet is a needed public utility as much as water and electricity. Rwanda began to relentlessly develop its ICT in 2000 after it adopted the National Information Communications Infrastructure (NICI) policy and created a long-term plan to achieve full digitization in four five-year stages. The NICI plan was further integrated into

Vision 2020, which is the government's comprehensive programme to transform Rwanda into a middle-income country by 2020. The NICI's first stage (2000-2005) prepared the groundwork for ICT sector, including establishing institutional, legal and regulatory frameworks, as well as opening up the telecom market by reducing barriers for entry. Currently, there are 10 internet service providers, including MTN, TIGO, Altech Stream, Rwandatel, among others. In 2002 there were just two internet providers with 25,000 users. Today, there are approximately 1.2 million internet users in country of 12 million people, according to a June 2013 report by Rwanda Utilities Regulatory Agency.

The Rwanda government has enacted laws to govern electronic messages, signatures, transactions, data protection, cyber -security and ICT usage. It established the Rwanda Utilities and Regulatory Agency in 2002, which adopted the International Telecommunications Union (ITU) ICT industry standards. The ICT subscriber base in Rwanda has significantly increased. The number of fixed-line customers more than doubled between 2000 and 2010, mobile phone customers increased from 42,000 in 2000 to more than 3.5 million, and internet users increased from 1,200 to 493,900 during the same period.

The third stage, from 2011 to 2015, is focused on improving service delivery. One of the elements of this stage is the One Laptop per Child programme—an ambitious plan launched in 2008 to distribute laptops and electronic tablets in primary schools. By late 2012, about 115,000 laptops had been distributed to primary school children across the country.

The Rwanda Government in 2013 moved a step further in introducing a mobile facility that allowed declaration and payment of taxes by use of mobile phones (Werthner & Klein, 2005). With the continual adoption of Technology the Rwanda Revenue Authority registered a performance of 100 percent in gross revenue mobilization, Uganda Revenue Authority registered 97 percent while Kenya Revenue Authority registered a 90%. In the final stage (2016-2020), the government hopes to focus on skills, private sector and community development, as well as improving and enhancing e-government and cyber-security.

The case of Rwanda depicts the milestones achieved by government agencies as a result of adopting ICT in their day to day running of their duties. For example the adoption of ICT enabled the Rwandan Revenue authority achieve a commendable 100 percent in gross revenue mobilization. This shows that ICT can revolutionize the operations of major government departments to ensure efficiency and minimize leakages. Regionally, the Ugandan and Tanzanian revenue authorities have started reaping benefits of the ICT systems in their operations. Kenya, is the only country in the East African region where functional county governments exist and hence the study theorized that if the adoption of ICT in government agencies enabled improved revenue collection in national government agencies, a similar result would be achieved if the same systems were applied in the county governments.

### **1.1.3. Local Perspective of Information Communication Technology Adoption**

According to Ombati (2007) Information Communication Technology in Kenya is at the early adoption stage. Very few companies have the pre-requisite ICT infrastructure that is necessary for the implementation of technology in revenue collection process. This has been attributed to the astronomical costs that are involved in the setting up of the infrastructure as well as the skills gap that exists in the labour market.

The government of Kenya considers ICT as a key pillar in the success of Vision 2030 which aims at transforming the country into an industrialized nation by the year 2030. To this end, a fully fledged ICT board has been set up by the government to spearhead

the ICT revolution in the country which is a positive signal for adoption of Information Communication Technology in revenue collection (Maina, 2004).

This has in their master plan projects to be singled out for their ability to impact on Kenyans' livelihoods and the country's economic growth. These projects are the National Digital Registry Services, a Citizen Service Portal and Government Shared Services. The Connected Kenya Summit, first held in 2009, is the brainchild of the ICT Authority in consultation with ICT industry players and key government decision makers. Its aim is to establish a platform for collaboration, capacity building and knowledge sharing between government and the ICT sector with a view of linking and hastening implementation of government IT projects to world-class standards (Kevin, 2006).

Some of today's leading government projects have links with Connected Kenya. With its remarkable mix of decision-makers from government and leading ICT thinkers from the industry, the Summit has enabled its participants to develop unique insights that allow them to successfully respond and design their engagement in Kenya's vibrant ICT sector. Projects such as Kenya Open Data Initiative, Huduma i-citizen's portal and the development of a national Information Security Policy were informed or refined from discussions and panels held at Connected Kenya (Maina, 2004).

#### **1.1.4 Nairobi County Government**

The City of Nairobi started as a small railway depot in 1899 to serve the Kenya-Uganda Railway. The East African Railway Company established the town between 1899 and 1903 when it was gazetted as a Township and later upgraded to Municipal Board in 1928 under the management of a local authority. In 1950 the Nairobi municipality was granted City status through Royal Charter by the British Colonial administration. Nairobi later got incorporated under the Local Government Act Cap.265 which came into effect in January 1964. Following the promulgation of the new constitution of Kenya (Republic of Kenya, (2010) that formed the 47 devolved units, the county governments were empowered to collect revenue and incur expense locally (Owuor *et al.*, 2013) on economic development, economic growth and improved service delivery at the county level without relying on the National Government (Ngotho & Kerongo, 2014).

The County has 17 constituencies: Dagoretti South, Dagoretti North, Embakasi Central, Embakasi East, Embakasi North, Embakasi West, Embakasi South, Kibra, Kasarani, Kamukunji, Langata, Makadara, Mathare, Roysambu, Ruaraka, Starehe and Westland. Nairobi City County is responsible for the delivery of a number of services to residents within its area of jurisdiction which covers 700 Km<sup>2</sup>. According to the 2009 National Population census the city had a population of 4 million people but currently it is estimated to be home to over 7 million people, 60 per cent of whom are the youth, 52

per cent women, 70 per cent reside in informal settlements. Nairobi is estimated to generate over 60 per cent of the GDP.

The Nairobi County government was the first county to adopt e-payment system in Kenya, which went live to bring efficiency and convenience in revenue collection (Njanja, 2014). Most of the other counties majorly depended on the manual collection methods which were subject to corruption and leakages. With pressure for the public to deliver services to the citizens, county governments have been forced to rely on the disbursements from the national government. According to Ngotho and Kerongo, (2014) a sound revenue system for county governments is a vital pre-condition for the success in promoting efficiency in the service delivery and economic development at the counties. Ismail (2013) notes that the main challenges in revenue collection in county governments rotate around the revenue collection systems.

To eliminate or significantly reduce corruption, the e-payment project provides an alternative means of payment of county revenue that do not require cash to exchange hands (Kinyanjui & Kahonge, 2013). In Nairobi Central Business District, users of city parking space can make payments using mobile money, debit cards, over-the counter payments at 29 partner banks and at independent agent stalls spread across the city. The agents send money on behalf of a client but issue a receipt to confirm the transaction. All the digital payment options offered are linked to the system through the Nairobi County e-wallet that is created on signing up. No charges are incurred when making payments through independent agents, the e-county mobile app and using mobile

money, but banks offering the service may impose a charge on transactions. (Okiro, 2015)

## **1.2 Statement of the Problem**

The promulgation of the new constitution in 2010 created 47 distinct devolved county governments which had the power to collect revenue and incur costs in terms of recurrent and infrastructure project (Republic of Kenya, 2010). According to Odd-Helge (2006) this mandate therefore empowers the county governments to collect revenue from taxation, permit fees, cess, license fees, parking fees and other sources and use the funds to cater for their operational costs. When the County Governments fail to optimally collect requisite revenues, the public will negatively be affected by being denied vital services, a challenges that would drastically affect the devolution process (Fjeldstad & Heggstad, 2012). County governments however have always depended on disbursements from the national government due to their inefficiencies in revenue collection. According to Bird (2010) a sound revenue system for devolved governments sets the pace for the success of fiscal decentralization since it is the avenue for administrative accountability by empowering communities.

The County Government of Nairobi, the largest Local Authority in Kenya, produces more than half of the country's Gross Domestic Product. In order to counter inefficiencies in revenues collection, the County Government of Nairobi partnered with Jambo pay and launched the electronic payment system. This made Nairobi the first of the 47 devolved units to adopt Epayments for Rent and parking fees. According to

Muema et al. (2014), a modern e-payment for services, provided convenience in revenue collection through use of devices such as mobile devices in the parking industry, highly improve revenue collection performance and gain a competitive edge. According to Mueke (2015) the e-payment revenue from business licenses have grown 60 percent. However, he further noted that the system is yet to bear fruit because some officials are sabotaging it. Most of the fees the government charged still ended up in the pockets of county government staff. This means that the county therefore needed to improve targeting revenue collection mechanisms and systems to reach collection targets aimed at expanding the revenue base and increasing tax compliance through integration of proper technology in revenue collection (Wekesa, 2015).

According to Kinyanjui and Kahonge (2013) the success of the e-payments system would be measured by the rate of adoption by users as well as its compliance to budget estimates. Literature reviewed in this study (Muema et al., 2014; Kinyanjui & Kahonge, 2013; Wahab, 2012; Wekesa, 2015; Fjeldstad & Heggstad, 2012) tried to explain the inefficiencies experienced by the county governments in their quest to raise the much needed revenue to finance their operations. Okiro (2015) attempted to explain the impact of e-payment system on revenue collection by the Nairobi City County Government. This study therefore seeks to enrich on the literature by evaluating the impact of each component of the electronic payment system on the success of the revenue collection process of the county government of Nairobi.

### **1.3 Objectives of the Study**

#### **1.3.1 General Objective**

The study seeks to analyze the influence of ICT adoption on revenue collection process by government of Kenya

#### **1.3.2 Specific Objectives.**

The specific objectives of this study were:

- i. To find out the influence of Cloud Computing on revenue collection process in Nairobi County government
- ii. To establish the influence of Mobile Phone Technology on revenue collection process in Nairobi County government
- iii. To find out how E-Wallets influence revenue collection process in Nairobi County government
- iv. To analyze the influence of e-government on revenue collection process in Nairobi County government
- v. To establish the various ways in which the county government of Nairobi can enhance its E-payment system of revenue collection to be leak free and all-inclusive to all users.

## **1.4 Research Questions**

The study sought to answer the following questions:

- i. How does Cloud Computing influence revenue collection process in Nairobi County Government?
- ii. To what extent does use of Mobile Technology influence revenue collection process in Nairobi County Government?
- iii. How does the use of E-Wallets influence revenue collection process in Nairobi County Government?
- iv. What is the influence of e-government on revenue collection process in Nairobi County Government?
- v. What are the various ways in which the county government of Nairobi can enhance its Epayment system of revenue collection to be leak free and all-inclusive to all users?

## **1.5 Justification of the Study**

The findings of the proposed study offer benefit to County government, policy makers and the subsequent researchers.

### **1.5.1 Nairobi County Government**

First, it informs local authorities, and particularly the county government policy makers on the relevance of using relevant information communication technologies in the process of mobilization of revenue in the County. A critical assessment and

understanding of information communication technology in Nairobi County can lead to the development of effective strategies of developing the County through increased revenue collection methods and mobilization.

### **1.5.2 Academic Researchers**

The study opened areas for further research and act as a source of reference to subsequent researchers. The concept of use of ICT in revenue collection in the public sector is a developing area of interest in research and hence this study opens the platform for further research. Further research is recommended to address the gaps in the influence of ICT on the revenue collection process by governments.

### **1.5.3 Policy Makers**

The study is an eye opener to policy makers to develop policies to regulate revenue collection avenues in the public sector. Only a few county governments have adopted the E- wallet method of enhancing revenue collection. However, this adoption has come with a fair share of opportunities as well as challenges. This study therefore brings into insight the challenges and opportunities brought about by the adoption of technology in revenue collection in the public sector which will guide policy makers when making guidelines to streamline revenue collection in the county and national governments.

## **1.6 Scope of the Study**

The study sought to determine the influence of ICT adoption on revenue collection process: a case study of Nairobi County Government. The study concentrated on four variables; Cloud Computing, Mobile Phone Technology, E-Wallets and E-government on how they influence revenue collection process in Kenya. The study involved 244 employees of The County Government of Nairobi as the target population from top level management, middle level management and low level management where the respondents were considered to be ones benefiting from the study. Questionnaires were used as instruments to collect data.

## **1.7 Limitations of the Study**

There were several anticipated limitations in the course of this study. Firstly, there were challenges in obtaining information from the top management of the Nairobi City County where some were having busy schedule to participate in the study or simply choose not to answer the questionnaires. Secondly, there was resistance from some respondents primarily because they were suspicious of the study intentions. An introduction letter from the university assured them of their anonymity and the fact that the findings would be used purely for academic purposes. The accuracy of the results was dependent on the honesty of the respondents, though with the assurance given to the respondents it was the hope of the researcher that honest responses were given.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The chapter reviews the literature that focuses on the area of the Influence of ICT adoption on Revenue Collection. The chapter commences by reviewing theories that inform the discussion on ICT adoption and usage. It then deals on the empirical studies that focus on the influence of ICT adoption on revenue collection.

#### **2.2 Theoretical Review**

A theory is a set of interrelated principles and definitions that present a systematic view of phenomena by specifying relationship among variables with the purpose of explaining natural phenomena (Charmaz, 2006). In effect, a theory includes a set of basic assumptions and axioms as the foundation and the body of theory is composed of logical interrelated, empirically verifiable propositions.

##### **2.2.1 Unified Theory of Acceptance and Use of Technology (UTAUT)**

UTAUT (Venkatesh *et al.*, 2003) is one of theories used in Information System research. It was developed as an attempt to unify the constructs of the prominent competing IT acceptance models, including TAM. UTAUT conveys four key constructs, i.e. performance expectancy, effort expectancy, social influences and facilitating conditions (Venkatesh *et al.*, 2003). Performance expectancy relates to the

degree to which an individual perceives that using a new innovation can facilitate improving his/her performance. Effort expectancy measures the degree to which an individual perceives that the innovation will be easy to use. These two constructs are similar to those from TAM.

Social influence refers to the degree to which an individual perceives that an important person around him/her feels that he/she should use the innovation. Finally, facilitating conditions measure the degree to which an individual perceives that organizational and technical infrastructure exists to support the use of the system. Venkantesh *et al.* (2003) suggest that adoption will occur when users perceive that performance expectancy; social influence and facilitating conditions are high. Contrarily, a high degree of effort needed to use an innovation will not favor adoption.

This theory supports the variables mobile technology by relating how acceptance in the use of mobile phones can improve on revenue collection process. Currently over 95% of the city population own a mobile phone and have access to the various mobile money platforms (Mpesa, Airtel Money and Orange Money). The tenets of this theory show that the available supporting systems have supported the adoption of the electronic payment systems. Secondly, many city residents have adopted the cashless style of transacting with over half of the transactions being done using soft money (credit cards, mobile money, bank transfers and internet banking). This theory suggests that if there are supporting mechanisms to a new method of doing things, it has a higher chance of being accepted.

### **2.2.2 Technology Acceptance Model (TAM)**

TAM is a popular model in Information System adoption research (Bagozzi, 2007). TAM suggests that technology acceptance is determined by perceived usefulness and perceived ease of use of an innovation. In addition, perceived ease of use influences perceived usefulness. Perceived usefulness and perceived ease of use are both influenced by external variables such as system characteristics, organizational influences, and the nature of development process.

Davis, Bagozi and Warshaw (1989) dropped attitude towards use in their refined TAM model. Davis (1989) posits that perceived usefulness refers to the degree to which a person believes that using a particular system would help to perform his/her job better; while perceived ease of use refers to the degree to which a person believes that using a particular system would be free of effort. This theory supports the variable cloud computing by relating how ease in usefulness and the belief that the technology will assist the user in performing his/ her duty can improve on revenue collection process.

The tenets of the technology acceptance model show that in a society that is dynamic and easily accepts change, related technological changes are accepted faster. The widespread use of mobile phones and adoption of mobile banking in Kenya laid the platform for the introduction of e-payment service. The banking system has also revolutionized to make the traditional banking practices unattractive to customers. Kenya can be said to be one of the region's fastest to embrace emerging innovations in the ICT sector and hence stimulated the acceptance of the electronic payment system by

the county government. This theory illustrates how the culture of a population in a given area in terms of accepting technological innovations influences their acceptance to a new innovation aimed at making their day to day lives easier.

### **2.2.3 Diffusion of Innovation (DOI)**

Diffusion of innovation (DOI) is a theory explaining why and to what extent a new idea or technology reaches individuals or organizations in a social system. The DOI theory, which is based on psychological and sociological theories, is perhaps the most used innovation adoption theory in ICT adoption (Parker & Castleman, 2009). Rogers (1995) defines innovation diffusion as: “the process by which an innovation is communicated through communication channels over times among the members of a social system”. In DOI, adoption is the acceptance of innovation taking place in five steps: knowledge, persuasion, decision, implementation and confirmation (Rogers, 1995). Adopters can be categorized as innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%), and laggards (16%).

Social networks, such as media and interpersonal contacts, provide information and influence adoption opinion and decision over time. DOI suggests that perceived characteristics of an innovation, such as relative advantage, compatibility, complexity, triability and observability, determine the adoption or rejection of an innovation. In the DOI theory, the pattern of communication flow determines the pattern of adoption across the members of the adopting social system. The informed users are persuaded to adopt the innovations. The key important features studied in this process are the persons

involved and the communication flow pattern (Rogers, 1995). The DOI theory was developed in the context of an adoption unit making a voluntary decision to adopt or reject an innovation based on the perceived benefits of innovation.

In Kenya, the culture of cashless payments has grown over the last decade with majority of Nairobi residents preferring to use e-payments as a substitute to paying in cash. Before this, all transactions were in cash and there had been many cases of losses due to security concerns. The technique was initially developed by banks by the introduction of PIN-secured credit cards and was later adopted by mobile money service providers. The technology has diffused so fast that even the smallest canteen in the neighbourhood has a means of accessing cashless payments. This diffusion enabled the county government to use the already existing structures to enable city residents pay rent and parking fees via the existing electronic payment systems. The tenets of this theory illustrate how the diffusion of technology in a given geographical area influence the acceptance of a related innovation that applies the already existing systems.

#### **2.2.4 Grounded Theory Approach - GTA**

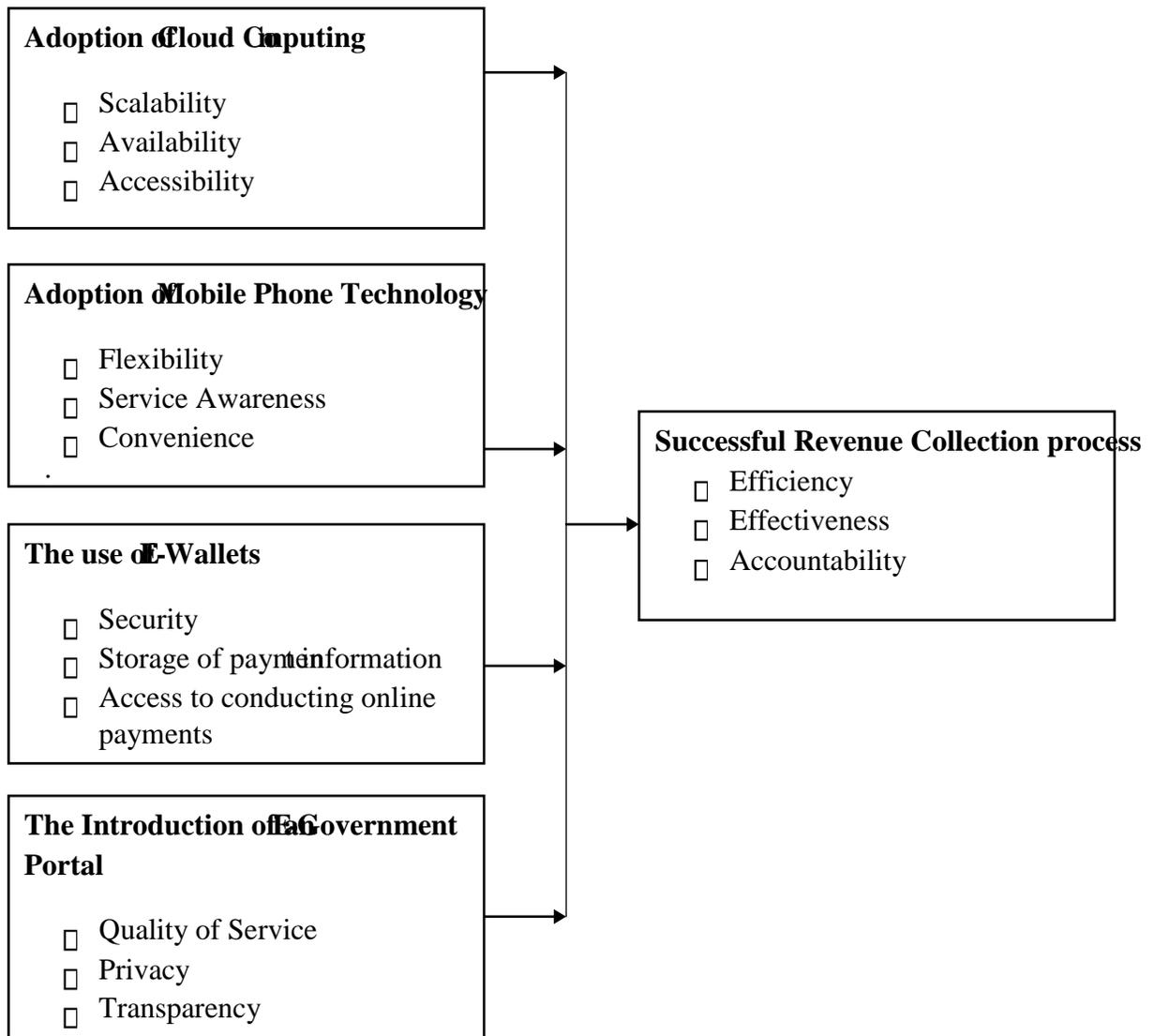
This study has also found the Grounded Theory Approach (GTA) (Strauss & Corbin, 1990) to fit well with the nature and the objective of the study. GTA helps a researcher to inductively explore the context, and then deduce meaningful findings from raw data. In GTA, a researcher interprets and makes sense of data to identify important insights as they describe a particular phenomenon (Kevin, 2006). The findings can then be refined into a substantive theory to explain the situation under observation. The grounded

theory approach involves steps such as open, focused, axial, and selective coding (ibid). It also utilizes tools such as memo writing and theoretical comparisons (Charmaz, 2006). Such tools assist a researcher to gather, interpret, and relate concepts from raw data.

In this research, GTA provided us with a relevant way of exploring and making sense of the adoption issues in County Government of Nairobi. This theory allows the researcher to establish and understand the relationship between County Government of Nairobi's adoption of ICT' initiatives with multiple factors. This theory supports the variables e-government by relating how provision of government services by use of technology can improve on revenue collection process.

### **2.3 Conceptual Framework**

Conceptual framework is a concise description of the phenomenon under study accompanied by a graphical or visual depiction of the major variables of the study (Mugenda, 2008). It is used to outline possible courses of action or to present a preferred approach to an idea or thought. In this study the researcher conceptual framework depicts the relationship between independent variables and dependent variable



Independent Variables

Dependent Variable

**Figure 2.1: Conceptual Framework**

### **2.3.1 Revenue Collection Process**

The interest for improving revenue collection process in developing countries is increasing. The national government and counties are both looking for newer and more efficient ways of collecting revenue from its citizens. Most developing countries are emerging from the crisis with their fiscal prospects broadly intact (IMF, 2010), but with many still facing a fundamental need to raise more revenue from their own tax bases. Achieving the Millennium Development Goals, for instance, has been suggested to require increasing domestic revenues in low-income countries (LICs) by around 4 percent of GDP (United Nations, 2005).

Infrastructure needs are also extensive (IMF, 2010a), and there are climate challenges to address. Advanced economies are increasingly focused on improving their support of these revenue mobilization efforts. In this context the G-20 leaders called in November 2010 for the Fund, with others, to report on key issues in strengthening revenue mobilization. Improving revenue administration is essential for enhanced and fairer revenue mobilization and for wider governance improvement; though success is hard to evaluate. It may be too much to assert that “in developing countries, tax administration is tax policy” (Casanegra de Jantscher, 1990): tax policy needs to utilize the ICT, the framework within which the revenue administration must operate.

### **2.3.2 Cloud Computing**

Cloud computing is a model for enabling convenient access to networks and applications quickly, common set of configurable computing resources (e.g., networks, servers, storage and applications) that can work with little or interfere with the service provider to provide or be released immediately (Hashemi, 2013).

Cloud computing provides three major types of services which include; Software as a Service (SaaS) – Here, software is provided as a service meaning the end user, cannot control or manage any cloud infrastructure including network, servers, operating systems storage and applications (Sachdeva, 2011). Platform as a Service (PaaS)- Here, the client is able to install preferred applications on the cloud infrastructure set. Infrastructure as a service (IaaS)- Here, the Cloud consumers use basic computing resources such as processing power, storage, networking components or middleware on demand.

According to Rick Holgate, president of the American Government of Technology, Cloud computing is just one of those innovations most governments across the globe are looking to undertake in their attempts to cut down on government spending (Woherem, 2000). Cloud computing offers a safer and more reliable alternative to the traditional ways of transacting online. Among the greatest advantages of cloud computing in provision of government services is accessibility. Since it's an online storage, this means it's always available unless internet service is down. This means that e-government services uptime is always expected to be greater than 99%.

Cloud computing is designed to provide services with unlimited elasticity, read scalability in the technology frontier (Hashemi, 2013). Cloud Computing comes in different types; Public, private, hybrid and community. A suitable model for the cloud computing in e-governance can be selected based on the actual requirements and type of e-service to be provided. With regards to Revenue collection and the sensitivity that comes with this service, Private cloud is highly advisable (Rogers, 1995). Private cloud has a higher security and can be set exclusively to handle e-governance application avoiding the possibilities of intrusion from hackers who could be using services under the same cloud on a public platform.

### **2.3.3 Mobile Phone Technology**

Mobile technology is a key ICT tool that has affected business and also government agencies positively (Vulkan, 2008). ICT as a Driver of Industry, which aims at transforming key Vision 2030 economic sectors to significantly enhance productivity, global competitiveness and growth; and the third pillar is Developing ICT Businesses that can produce and or provide exportable quality products and services that are comparable to the best in the world.

Integrated ICT infrastructure, which seeks to provide the integrated infrastructure backbone, requires enabling cost effective delivery of ICT products and services to Kenyans; and the third foundation is integrated information infrastructure which aims at improving the quality of eGovernment services and enable the country to transition to a knowledge-based society (Charmaz, 2006). Kenya has emerged as an African ICT hub,

in innovative technologies particularly in the mobile sector. The implementation of mobile transfer services from in 2007 has put Kenya on the world map.

Currently, all the four mobile operators and two licensed content service providers (Mobikash Africa and MobilePay) are offering mobile money transfer services. Furthermore, with mobile phones collaborating with the banking sector, new mobile banking products have emerged (Rutenbeck, 2012). In addition, most bills from public and private institutions ranging from electricity, water, insurance, travel and NHIF and NSSF contributions among others can now be paid via mobile phone platforms. In practice, the distinction between administration and policy is often hard (and pointless) to make.

#### **2.3.4 E-Wallets**

E-wallets refers to an encrypted storage medium holding credit card and other financial information that can be used to complete electronic transactions without re-entering the stored data at the time of the transaction (Buhalis, 2004). The Nairobi city County Jambo Pay will developed and deployed an electronic payment platform and a citizen E-wallet service, which will be accessible from mobile phone, internet, Point of Sale (POS) devices and physical agents. They have set up an automated system for management of their accounts and funds collection.

Also referred to as a virtual wallet, (Rutenbeck, 2012) defines an e wallet as a software mechanism that allows users to store and use credit cards and electronic payment information on a server.

These are Internet-based application layers built on top of traditional payment options like card payments and bank transfers. Leaders in this area are Internet giants such as PayPal, Google Wallet and E-Wallets center on consumer accounts that have been pre-registered with these providers. These accounts store payment details based on consumers' preferred funding source. Common sources include traditional payment options like credit or debit cards, bank accounts or direct bank transfers. After accounts are funded, consumers can shop online and make payments to associated merchants simply by logging into their e-wallet. These e-wallet providers act as a trusted intermediary trusted by consumers and merchants alike for storing payment information and facilitating ease of checkout between buyers and sellers. In recent years, these providers are also transiting into the mobile wallet market for offline payments at POS terminals.

The provider acts as a payment processor. Based on the consumer's preferred funding source, they collect money from the consumer. The collected funds are then deposited into the merchant's accounts registered with the same provider. Online merchants then go online into their seller accounts to transfer deposited funds into their own bank accounts.

This model is currently limited by the geographic coverage of the e-wallet provider. As of this writing, Checkout by Amazon is only available for U.S.-based merchants. However, it is generally expected that as these players extend their international presence, we will likely see more countries supported. In addition to geography, cost is another factor of consideration, as this model is essentially an additional layer built on top of traditional card payments. E-Wallet providers' fees are also typically higher than card interchange fees. Online merchants should also note any costs associated with the aforementioned underlying banking infrastructure that are required to facilitate flow of funds.

### **2.3.5 The Introduction of the E-government Portal**

Poon (2003) describes E-government is simply the use of information and communications technology, such as the Internet, to improve the processes of government. Thus, e-government is in principle nothing new. Governments were among the first users of computers. But the global proliferation of the Internet, which effectively integrates information and communications technology on the basis of open standards, combined with the movement to reform public administration known as New Public Management, has for good reason generated a new wave of interest in the topic (Maina, 2004).

E-government promises to make revenue collection more efficient, responsive, transparent and legitimate and is also creating a rapidly growing market of goods and services, with a variety of new business opportunities (Ombati, 2007). To some, e-

government might seem to be little more than an effort to expand the market of e-commerce from business to government. Surely there is some truth in this. E-commerce is marketing and sales via the Internet. Since governmental institutions take part in marketing and sales activities, both as buyers and sellers, it is not inconsistent to speak of e-government applications of e-commerce (Poon, 2013). But e-commerce is not at the heart of e-government. The core task of government is governance, the job of regulating society, not marketing and sales.

In modern democracies, responsibility and power for regulation is divided up and shared among the legislative, executive and judicial branches of government. Simplifying somewhat, the legislature is responsible for making policy in the form of laws, the executive for implementing the policy and law enforcement, and the judiciary for resolving legal conflicts (Maringa, 2008). E-government is about improving the work of all of these branches of government, not just public administration in the narrow sense.

## **2.4 Empirical Review**

### **2.4.1 Cloud Computing**

Foster *et al.* (2008) study found out that when comparing the cloud idea to the existing clusters or supercomputers, it is obvious that the cloud is located globally and is made of heterogeneous and mostly anonymous computer networks. According to Foster *et al.* (2008) study, cloud computing and grid computing are the same when it comes to the vision, which is decreasing the costs of computing while increasing the flexibility,

quality and reliability by outsourcing a service to a third party. However the scale of how things were 10 years ago and how things are now, is different.

Werthner and Klein (2005) found out that the data that needs to be analyzed nowadays is huge and generates therefore even more computing demand. With virtualization and the huge investments of large companies such as Amazon, Google, and Microsoft it creates “real commercial large-scale systems containing hundreds of thousands of computers” (Foster *et al.*, 2008). In other words, cloud computing has put distributed computing into another stage. Now it needs just a simple user account to access on-demand computers that are located in data centers all around the world being able to compute a massive amount of data just-in-time (Foster *et al.*, 2008). That makes cloud computing new and exciting for companies to invest in.

#### **2.4.2 Mobile Technology influence on Revenue Collection Process**

According to the GSMA “The mobile economy 2014” report, the mobile economy has grown from just a little under one billion subscribers in 2003 to approximately 3.4 billion unique subscribers by the end of 2013. With this tripled user base has come with a revolution in how people interact with their mobile phones. Mobile technology is a key ICT tool that has affected business and also government agencies positively (Vulkan, 2008)

In Kenya, almost 80% of people with mobile phones use them for mobile money transfers putting the annual transfers to over \$10 Billion making Kenya a leading

country in all the mobile money payments and transfers across the globe. Due to this, the announcement of the County Government of Nairobi to switch to e-payment for its services was not a big surprise but was long overdue (Vulkan, 2008). With the numerous functionalities that a smart phone offers, individuals can easily do all their payments via the help of a mobile gadget.

Today's generation of phones can act as an entertainment device, a personal organizer (Calendar and notes), a communication gadget (Both voice and text) reason it is largely referred to as the smart phones or palmtops (Werthner & Klein, 2005). The Rwanda Government in 2013 moved a step further in introducing a mobile facility that allowed declaration and payment of taxes by use of mobile phones (Werthner & Klein, 2005). With the continual adoption of Technology the Rwanda Revenue Authority registered a performance of 100 percent in gross revenue mobilization, Uganda Revenue Authority registered 97 percent while Kenya Revenue Authority registered a 90%.

#### **2.4.3 E-Wallets influence on revenue collection**

Since the advent of the Internet and e-commerce, governments have struggled to agree on tax treatment for cross-border online transactions. Unlike offline transactions, where the location of the buyers and sellers can be clearly and easily identified within a single geographic location and as such, an applicable tax rate applied, the nature of cross-border transactions mean that there is not one clear, single, overarching tax jurisdiction and applicable rules (Rutenbeck, 2012). For years, there have been discussions and some developments, but debates have been ongoing. With tight economic conditions, coupled

with burgeoning budget deficits, governments have stepped up efforts to recapture lost tax revenues and balance the playing field as increasing transaction volume continues to move online (Vulkan, 2008).

#### **2.4.4 E-government influence on revenue collection**

Existing literature highlights the revolutionary nature of e-government in governments, and provides a basis to investigate the evaluation of this phenomenon from a perspective of citizen derived value and benefits. However some scholars suggest that the evaluation of e-government is neglected, underdeveloped and under-managed this is not the result of exclusion, but it shows the extent of complexity that is fundamental to deriving an appropriate evaluation criteria. According to Vulkan (2008) the most frequently designated reasons for deficiency of in evaluation are problems of identifying and quantifying benefits and opportunity costs, lack of evaluation methods and techniques, and difficulty in interpreting results.

Some studies do take on traditional evaluation approach to evaluate e-government services. However, for accurate evaluations of e-government services consideration of multiple perspectives of stakeholders is essential (Rutenbeck, 2012). The focus here is to take a broader perspective, acknowledging that e-government not only permeates government agencies and their operational practices but also society, citizens and their social activities.

Maringa (2008) argues that the relationship between citizens and government services can be successfully transformed only if the citizens' perspectives of government services are objectively measured and the areas of improvement are correctly identified. This implies that the precise evaluation of e-government service needs to include not only all stakeholders' perspectives and the social and technical context of use but also consider inclusion of the specific needs of several groups of citizens which are using a specific e-government service such student, professional, and so forth (Rutenbeck, 2012).

Generally, to precisely determine the benefits that are associated with e-government evaluation are required though is difficult. E-government initiatives goals and objectives in practice are very varied as a result the gained benefits also vary, and the evaluations of the initiatives obviously will vary according to the different stakeholders' perspectives on the value of these benefits (Mensah et al., 2012).

#### **2.4.5. Successful Revenue Collection Process**

According to existing literature, ICT can help overcome the challenges experienced during revenue collection but the implementation must be done carefully. There is always a constant demand and pressure by all government revenue collection agencies to collect more revenue with fewer resources and more transparent resources while improving on the citizens' experience and value for money. Only few stakeholders may dispute on the potential of ICT for both the government and its citizens. If ICT

infrastructure is limited then the process of implementing technology in revenue collection processes may be unsuccessful.

Otieno *et al.* (2013) did a study on effects of information systems on revenue collection by local authorities in Homabay County, Kenya. The study realized that investment in ICT is indeed very important to local authorities as it improves on the efficiency as a result of timely revenue collection and effectiveness of revenue collection. The study recommended further studies on the attitude of staff towards the adoption of ICT on local authorities and the degree of computerization of revenue collection exercises and its cost effectiveness.

## **2.5 Critique of the Existing Literature**

Many researchers like Woherem (2000); Vulkan (2008) and Lee (2001) failed to link the part ICT on revenue collection process plays in implementing strategy successfully. Their study focuses on closing gaps of losses and how to prevent tax evasion. Furthermore the sample size used is too small to adequately give statistically significant findings, this is because the study was done in one corporation that had 60 subsidiaries which was the sample size of the study and only 44 responded. This makes the research inadequate to represent the whole population.

Mensah *et al.* (2012), in their study on Adoption of technology in revenue collection were not able to analyze other frameworks to revenue collection and ascertain whether they would be effective in the achieving proper execution of strategy within an

organization. The study being a conceptual paper did not involve collection and analysis of data and as such the study does not conclusively explore the research area. Whereas Rutenbeck (2012) in their study on performance management in revenue collection he did not link how technology influences revenue collection *visa ve* institutional performance.

Letting (2003) studied the relationship between technology and competitive advantage the case of vegetables and animal oils and fats manufacturers in Kenya; Maina (2004) researched on the relationship between technology strategy and competitive performance in the telephony industry in Kenya; Ombati (2007) did a survey on the relationship between technology and service quality in the banking industry in Kenya while Maringa (2008) established the relationship between investment in information communication technology and corporate performance at Kenya Revenue Authority. None of these researchers studied on the influence of ICT adoption on revenue collection process in County Governments

## **2.6 Summary of Literature**

With the rapid spread of Information and Communication Technologies (ICTs), new opportunities have been opened for a revival of public discourse and improved governance efficiency. Proper methods of revenue collection are critical in the viability of any organization (Mensah *et al.*, 2012). ICTs offer concrete opportunities for local and national governments to improve their performance in terms of transparency, participation and decentralization. The “mainstreaming” of ICTs within planning and

design of development strategies helps to strengthen the establishment of efficient, effective and transparent governance systems (Cravens, 2000).

On-line tools can significantly improve the rendering of services and information flows from administrations to their constituencies; communication among administrations and citizens can be enhanced and, lastly, ICTs offer unique opportunities for broadened citizen involvement and participation in the decision-making process (Dennis, 2007). This is particularly relevant in the developing countries context, where many countries have only recently undergone the transformation to democratic regimes, and where despite the efforts to introduce democratic governance, problems such as corruption of public administration and lack of transparency are still present.

Today e-governance is used: As a tool for bringing openness and effectiveness to local administration. Conducting transactions openly has proved to be very effective at fighting corruption. This is crucial for all those countries, where levels of corruption are still high (Doganis, 2001). An example of the efficient use of ICTs to fight corruption is the launching of the Electronic Graft Management (EGM) project in Kenya. The EGM project offered a corruption reporting facility in six towns with existing Internet infrastructure. Anonymity of users was ensured and reports were transmitted to EGM centers for analysis and follow-up with relevant authorities (Gholami *et al.*, 2008). To enhance service delivery by providing the citizens with services those are cheaper, more efficient and faster.

Electronic services have the advantage of enabling the citizens to obtain information and to carry out transactions 24 hours a day, seven days a week, and are particularly suitable for simple administrative transactions, such as requests for permits, or submissions of tax files. To foster citizen consultation and participation in policy-making, by providing new possibilities for citizen involvement (Gholami *et al.*, 2008). A significant example on the use of ICTs for civic consultation is the “Today I decide” (TOM) portal launched by the Estonian government in 2001. TOM provided an opportunity for citizens to become involved in policy-making and to comment on draft laws that are published on the portal (Hashemi, 2013). The public can also submit their own proposals for laws or policies, which are taken into consideration by the government (environmental condition), and technological innovation and firm efficiency (Jacobsen *et al.*, 2008).

## **2.7 Research Gaps**

Information technology in revenue collection has been investigated by a number of researchers over a long period and from different viewpoints. Despite their limitations, these studies have contributed to the existing knowledge and understanding of how ICT improves revenue collection by governments. Otieno *et al.* (2013), on the study of the effect of information systems on Revenue Collection by Local Authorities in Homabay County, Kenya, found out that investment in ICT is very important in Local authorities because it has positive effect on revenue collection however the level of uptake and cost of a fully delivering services via a technology platform was challenging.

Mburugo and Gekara (2016) did a study on determinants influencing revenue collection on the performance of Kenya revenue authority. Findings from the study showed that organization resources corporate governance and ICT adoption were the key determinants in influencing revenue collection performance at the Kenya Revenue Authority. The study failed to explore the influence of key ICT tools in the revenue collection process.

This study widely considers cloud computing, mobile phone technology, e-wallets and e-government as major contributing factors on the influence of ICT adoption on revenue collection process, however there was little literature available that gives these factors the weight they carry when it comes to influencing revenue collection process. Little or none has been captured in the previous studies on the influence of key ICT tools in the revenue collection process. This study therefore adds to the literature by establishing the influence of ICT adoption on Revenue collection process by the government of Kenya, a developing country, hence filling the study gap.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter outlines the methods that were used for the study and adopted the following structure: research design, population and sample, population description, data collection methods, research procedures and data analysis and methods.

#### **3.2 Research Design**

According to Tustin *et al.* (2005), research design articulates what data is required, what methods are going to be used to collect and analyze data and how this is going to answer the research questions. The study adopted a descriptive survey design in an attempt to explain the contribution of ICT in the revenue collection processes of the County Government of Nairobi. Kothari (2009) recommends descriptive survey design for its ability to produce statistical information about aspects of education that interest policy makers and researchers.

Descriptive survey research designs are used in preliminary and exploratory studies to allow researchers to gather information and summarize, present and interpret data for the purpose of clarification Orodho (2003). According to Mugenda and Mugenda, (2003) the purpose of descriptive research is to determine and report the way things are and it helps in establishing the current status of the population under study. The design

was used for this study due to its ability to ensure minimization of bias and maximization of reliability of evidence collected.

### **3.3 Target Population**

Target population as described by Borg and Gall (1989) is a universal set of study of all members of real or hypothetical set of people, events or objects to which an investigator wishes to generalize the result. The target populations of this study was 244 employees of the ICT department of the County Government of Nairobi. The study population is however stratified into three stratum depending on the hierarchy and the ability to make decisions. The study population is presented in table 3.1 below;

**Table 3.1: Target Population**

<b>Percentage</b>	<b>Frequency</b>	<b>Percentage</b>
Top Management	20	8%
Middle level	98	42%
Low Level	126	50%
Total	244	100%

### **3.4 Sampling Frame**

The sampling frame defines a set of elements from which a researcher can select a sample of the target population (Orodho, 2013). The purpose of sampling frame is to provide a means for choosing the particular members of the target population that are to be interviewed in the survey Kothari (2009). For the purpose of the study the sampling

frame constituted of top management staff, middle and lower management staffs who deal directly with the day to day operations at the ICT department.

### **3.5 Sample Size and Sampling Technique**

A sample is a section of the part that represents the larger whole Saunders *et al.* (2009). The sampling plan describes the sampling unit, sampling frame, sampling procedures and the sample size for the study. The sampling frame describes the list of all population units from which the sample was selected Cooper and Schindler (2003). For the purpose of this study, a total sample of 151 respondents was taken with the help of slovin's formula:

$$n=N/(1+Ne^2).$$

Where;

n=sample size

N=total population i.e. 244 employees e=Error tolerance. The study confidence level was 95% which gives a margin error of 0.05

The sample size was calculated

as follows;  $n=244/(1+244*0.05^2)$

$n=244/1.61$  n=151

The study employed stratified random sampling technique in selecting sample size from the three strata (top management staff, middle and lower management staffs). Stratified random sampling is unbiased sampling method of grouping heterogeneous population into homogenous subsets then making a selection within the individual subset to ensure representativeness. The goal of stratified random sampling is to achieve the desired representation from various sub-groups in the population. In stratified random sampling subjects are selected in such a way that the existing sub-groups in the population are more or less represented in the sample (Mugenda & Mugenda, 2003). Stratified random sampling method was used to select respondents from each subgroup, and then simple random sampling method using proportionate stratified sampling formula ( $n_1 = n/N * N_1$ ) to select respondents sample from various strata.

Where;

$$\text{Top Management} = 152/244 * 20 = 12$$

$$\text{Middle Management} = 152/244 * 98 = 61$$

$$\text{Low Level} = 152/244 * 126 = 78$$

**Table 3.2: Sampling and Sample Size**

	<b>Frequency</b>	<b>Sample Size</b>
Top Management	20	12
Middle Level	98	61
Low Level	126	78
<b>Total</b>	<b>244</b>	<b>151</b>

### **3.6. Data Collection Instrument**

A research questionnaire was used as the main instrument for data collection which is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from the respondents. The study relied on data collected through a questionnaire structured to meet the objectives of the study. The questionnaire was carefully designed and tested with a few of the target population members for further improvements. According to Mugenda and Mugenda (2003) questionnaires are commonly used to obtain important information about a population under study.

### **3.7 Data Collection Procedure**

The study collected both primary and secondary data. Primary data was collected from respondents using a questionnaire that was distributed to the respondents by providing access to the online survey form by sending out notification emails as well as hand delivery. The two methods were chosen because not all county officers have email

accounts. Secondary data was obtained from published documents or materials such as journals and magazines to supplement the primary data received from questionnaires.

### **3.8 Pilot study**

A pilot study was conducted using the questionnaires on 10% of respondents working in the different job levels in The County Government of Nairobi in Kenya. According to Mugenda and Mugenda (2003) a sample of 10% of the population is considered adequate to make decisions on behalf of the population. Cooper and Schindler (2003) point out that a pilot study may give advance warning about where the main research project could fail, where research protocols may not be followed, and whether proposed methods or instruments are inappropriate or too complicated. After the pilot testing the main survey followed. The respondents were conveniently selected since statistical conditions are not necessary in the pilot study. The purpose will be to refine the questionnaire so that respondents in the major study would not have any problem in answering the questions. The questionnaire was hand delivered and administered at the respondents' place of work to ensure objective response and reduce non-response rate. The results of the pilot study were not included in the actual study.

#### **3.8.1 Validity of Instruments**

Yin (2003) validity refers to whether researchers see what they think they see. To increase the construct validity, the researcher made use of different sources of evidence to achieve the so-called triangulation of results. The research instrument used for this

was self-administered questionnaires. According to (Borg and Gall, 1989), validity shows whether the items measure what they are designed to measure. Pre-testing was conducted to assist in determining accuracy, clarity and suitability of the research instrument.

### **3.8.2 Reliability of Instruments**

This is the dependability, consistency or trustworthiness of a test. The reliability of a research instrument concerns the degree to which the instruments yield the same results on repeated trials in order not to compromise with the quality of data (Carmines & Zeller, 1979). The research instrument used for this was self-administered questionnaires. This was done by using two different but equivalent forms of an instrument to the same group of people or research object during the same time period. Although the items (questions) are different, they sampled the same content and they were constructed separately from each other. Questions were pretested before the actual study to ascertain their appropriateness and relevancy to the study.

Having a multiple likert scale in the questionnaires as a measure of the levels of which the respondents agree on the said variables, Cronbach's alpha was most suitable as a measure of reliability.  $\alpha = \frac{k \times c^-}{v^- + (k-1)c^-}$  ; Where k refers to the number of scale items,  $c^-$  refers to the average of all covariances between items and  $v^-$  refers to the average variance of each item.

According to Cronbach's Alpha, the resulting  $\alpha$  coefficient of reliability ranges from 0 to 1 in providing an overall assessment of the measure of reliability. For the purposes of this study, the research instrument scored a score of 0.8 on the Cronbach alpha scale which is considered adequate since the recommended threshold is 0.7. The research instrument therefore was considered statistically reliable for the study.

### **3.9 Data Analysis and presentation**

According to Kothari (2009) Data analysis is the process of data clean-up and organizing the raw data collected from the field for ease of presentation, inference and decision making. The raw data collected first checked for any errors and omissions then coded and entered into The Statistical Package for Social Sciences (SPSS) which generated descriptive statistics (Frequencies, percentages) and inferential statistics (Means, variances and standard deviations) that were used to describe the characteristics of the data collected. The software was used to ensure accuracy and scientific verifiability. The data was presented using pie charts, bar graphs and tables for ease of interpretation. Content analysis was used to analyze qualitative data gathered using open-ended questions in the research instrument.

#### **3.9.1 Inferential Analysis**

The study used correlation analysis to measure the degree of relationship between dependent variable and independent variables, regression analysis was used to determine the amount of variation on dependent variable explained by the independent

variables, it helped to estimate the strength and direction of the relationship between dependent variable and independent variables, analysis of variance (ANOVA) to for comparing (testing) three or more means (dependent variable and independent variables) for statistical significance and coefficient analysis to show the extent of variability in relation to the mean of the. These tests were conducted to verify existence of the relationship between the independent variables and the dependent variable and to test the level of significance. The multiple regression model was used to test the relationship between the dependent variable and the independent variables. The regression model was intended to test the null hypothesis that the introduction of cloud computing, mobile phone technology, E-wallets and the E-government portal by the County Government of Nairobi had a positive impact on the revenue collection processes.

The model was given as follows;

$$Y_s = B_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e.$$

Where:

$Y_s$  = Successful Revenue collection process (Dependent Variable)

$B_0$  = Constant coefficient

$X_1$  = Mobile phone technology

$X_2$  = E-Wallet

$X_3$ = Cloud

Computing  $X_4$ =

E-Government

$e$ =Error of

Regression

$B_1 \dots B_4$ = Regression coefficient of the four variables

## **CHAPTER FOUR**

### **DATA FINDINGS, ANALYSIS AND DISCUSSION**

#### **4.1 Introduction**

This chapter presents data analysis and results of the study. It begins by describing the response rate and the demographic information of the participants. The chapter then presents the findings as guided by the items in the questionnaire in line with the specific objectives of the study. The objectives included: to find out the influence of Cloud Computing on revenue collection process in Nairobi County government; to establish the influence of Mobile Phone Technology on revenue collection process in Nairobi County government; to find out how E-Wallets influence revenue collection process in Nairobi County government; and to analyze the influence of e-government on revenue collection process in Nairobi County government.

#### **4.2 Response Rate**

Questionnaires were distributed to top management staff, middle and low level management staff and responses were distributed as indicated in Table 4.1. A total of 12, 61 and 78 staff were targeted from top, middle and low level management respectively translating into a total target number of respondents 151. However, the duly filled and collected questionnaires were 7 (58.3%), 43 (70.5%) and 63 (80.8%) from the top, middle and low level management staff respectively. Comparatively, this indicates

that the low level management had the highest response rate (80.8%). Overall, the total responses were 113 which is a response rate of 74.8%.

**Table 4. 1: Distribution by Response Rate**

<b>Categories</b>	<b>Total Targeted</b>	<b>Total Collected</b>	<b>Response Rate (%)</b>
Top management	12	7	58.3
Middle level management	61	43	70.5
Low level management	78	63	80.8
<b>Total</b>	<b>151</b>	<b>113</b>	<b>74.8</b>

### **4.3 Pilot Testing**

A pilot study was done and the results used to test the reliability of the data collection instrument. The results as presented in Table 4.2 indicates that the obtained data was reliable since the Cronbach’s alpha value for all the independent variables was between 0.731 to 0.859 which was above the 0.7 threshold required. The reliability of the data collection instrument was measured using the internal consistency technique in which case Cronbach's alpha was computed using SPSS version 21. This was computed from the data collected in the pilot study. An alpha coefficient higher than 0.70 indicates that the gathered data had relatively high internal consistency and could be generalized to reflect opinions of all respondents in the target population on influence of ICT adoption on revenue collection process by government of Kenya.

**Table 4. 2: Reliability Analysis**

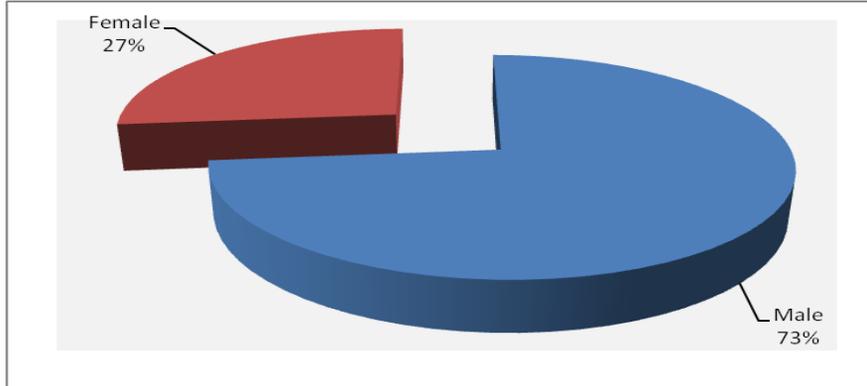
<b>Constructs</b>	<b>Cronbach's Alpha Values</b>	<b>No of Items</b>	<b>Comments</b>
Cloud Computing	0.731	17	Accepted
Mobile Phone Technology	0.833	6	Accepted
E-Wallets	0.859	9	Accepted
e-government	0.805	9	Accepted
Revenue collection process	0.752	4	Accepted

#### **4.4 Demographic Information**

The general information pertaining to the respondents that was examined entailed the respondents' gender, age bracket, highest education level and working experience.

##### **4.4.1 Gender of the Respondents**

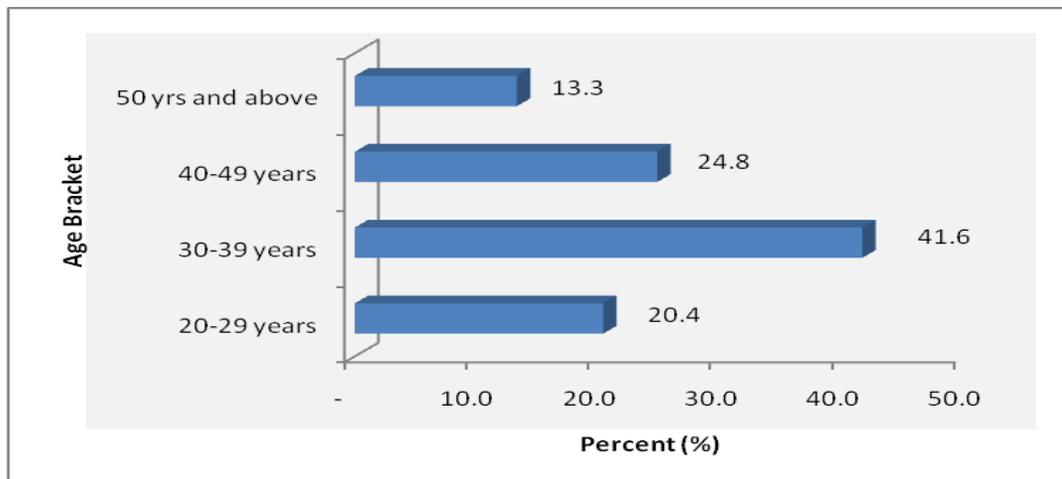
Pertaining to the respondents' gender according to figure 4.1, majority of them were male (73%) with females being 27%. This implies that, there are more men than women among the County Government of Nairobi staff.



**Figure 4. 1: Respondent’s gender**

#### 4.4.2 Age of the Respondents

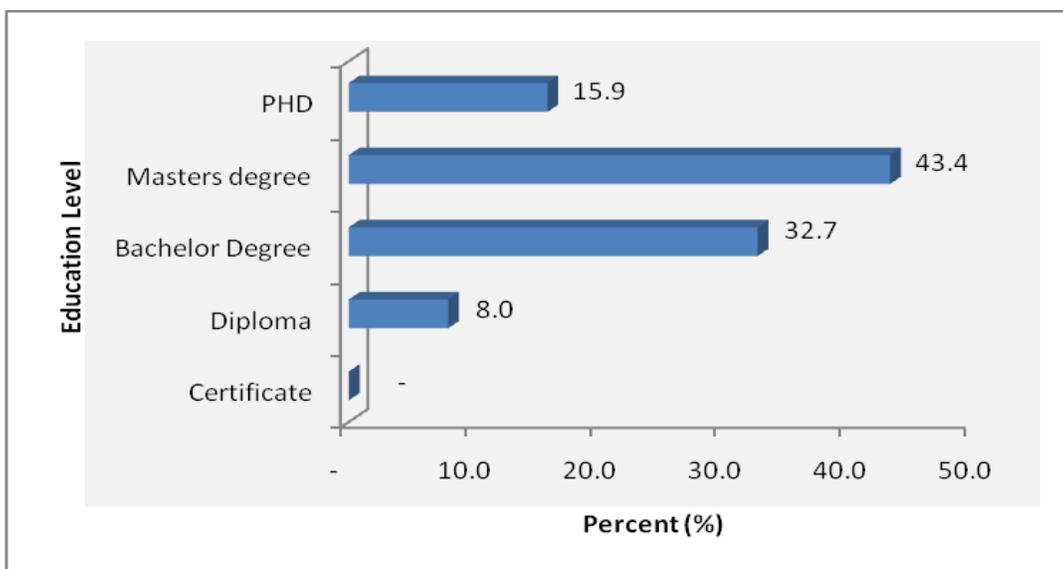
On age bracket, it was revealed that 41.6% of the staff were aged 30-39 years while 24.8% were 40-49 years old. There were 20.4% aged 20- 29 years with a few (13.3%) aged 50 years and above. This implies that in Nairobi County Government, majority of the staff are aged 30-39 years.



**Figure 4. 2: Respondent’s age bracket**

#### 4.4.3 Highest Education Level

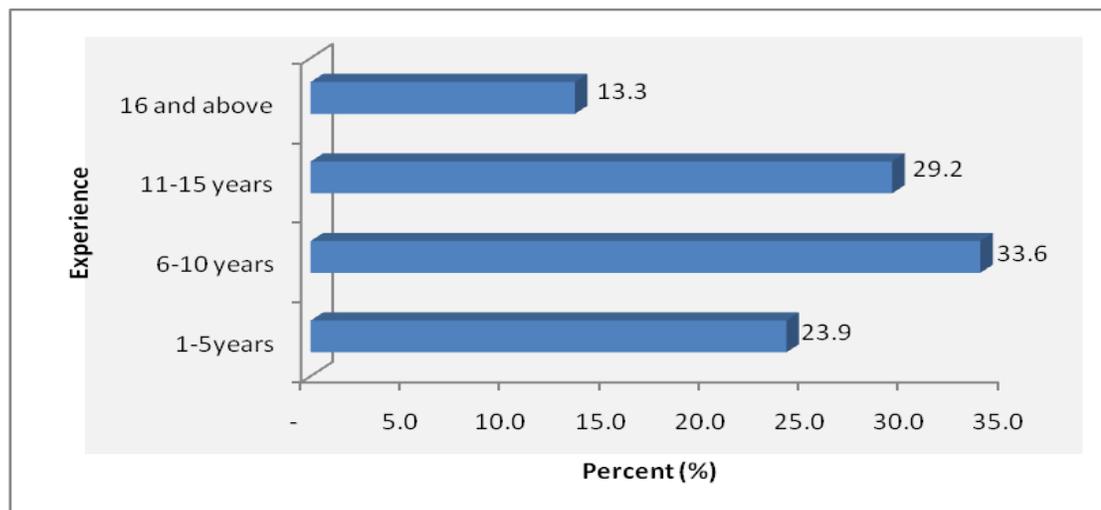
With regard to the highest education level, 43.4% had a Master degree while 32.7% had a Bachelor's degree. There were 15.9% with PhDs with only 8% having diplomas and none with certificate. This is an indication that the staff of The County Government of Nairobi are highly educated.



**Figure 4. 3: Highest education Level**

#### 4.4.4 Working Experience

On work experience, 33.6% of the staff had an experience of 6-10 years while 29.2% had an experience of 11-15 years. Those with an experience of less than 5 years were 23.9%; the rest (13.3%) had a work experience of more than 15 years. This implies that most of the staff in The County Government of Nairobi have a work experience of six to ten years.



**Figure 4. 4: Respondent’s working experience**

#### **4.5 Descriptive Statistics**

To measure the extent of the effect of the various ICT elements (including Cloud Computing, Mobile Phone Technology, E-Wallets and E-government) on revenue collection process in line with the objectives, descriptive statistics were used. The staffs were provided with a set of statements for each variable to rate on a scale of 1 to 5. The statements proposed possible positive effects. A score of 1 indicated the lowest extent of effect while 5 indicated the greatest extent of effect. The mean and standard deviation (Sdv) were then computed and used to compare the effects. As given in the Table 4.3, the higher the mean, the greater the influence on revenue collection and vice-versa. Standard deviation showed the extent to which the scores on the particular effect were dispersed from the mean. A low Sdv indicated a low dispersion (a high consistency in the rating) and vice versa.

### 4.5.1 Revenue Collection Process

According to Table 4.3, the influence of ICT in general on revenue collection, the effect was rated at a mean of 4.0 with a standard deviation of 0.7. This is an indication that ICT generally exerts a great influence on revenue collection process in Nairobi County government. The staff asserted that it highly enhances the effectiveness of the revenue collection process (mean=4.3,

Sdv=0.6) as well as its efficiency (mean=4.2, Sdv=0.6). They however doubted the ICT's ability to ensure greater accountability in the process (mean=3.4, Sdv=1.0). The relatively high Sdv (1.0) nonetheless implies that, there was quite a significant number of staff who rated its ability in enhancing accountability differently.

**Table 4. 3: ICT aspects and Revenue Collection Process**

<b>Statement</b>	<b>Mean</b>	<b>SDV</b>
ICT improve efficiency in revenue collection process	4.2	0.6
ICT enhance effectiveness in revenue collection process	4.3	0.6
Use of ICT ensure there is greater accountability in revenue collection process	3.4	1.0
<b>Average</b>	<b>4.0</b>	<b>0.7</b>

#### **4.5.2 Effect of ICT on effectiveness in revenue collection process**

According to the staff, ICT has had a positive impact on the cost of revenue collection process. The implementation of ICT was asserted to have significantly helped to ease the burden of overstaffing. Majority of the staff opined that with the implementation of ICT, there has been faster processing of information and data, requiring fewer resources and reducing the cost of collection.

#### **4.5.3 Effect of ICT on efficiency in revenue collection process**

The staff described various ways that that ICT has increased efficiency in revenue collection process. They asserted that it has increased services to taxpayers (for example, by providing a range of e-services and e-payment options). They highly pointed out that the process of paying taxes/fees has become simpler, faster and easier to understand for the citizens. To them, this could have resulted to the increased voluntary compliance in the County compared to the previous years before ICT was implemented.

#### **4.5.4 Effect of ICT on accountability in revenue collection process**

According to most of the respondents, ICT has to some extent improved accountability but it is still yet to achieve the expectations. There were assertions that it has increased transparency and to some extent succeeded in tackling corruption and reducing the opportunities for bribery in certain points in the revenue collection process. It was

further alleged that using ICT to compile a database of information has also enabled the County government to identify and address noncompliant taxpayers.

#### 4.5.5 Effect of Cloud Computing on Revenue Collection Process

The influence of cloud computing on revenue collection process was rated at a mean of 4.3 with a standard deviation of 0.5. This implies that cloud computing has exerted a major effect on the process. Majority of the staff confessed that cloud computing improve the process performance (mean=4.2, Sdv = 0.5) and information accessibility in the process (mean=4.3, Sdv = 0.5).

**Table 4.4: Cloud Computing Factors and Revenue Collection Process**

<b>Statement</b>	<b>Mean</b>	<b>Sdv</b>
Cloud computing improve performance in revenue collection process	4.2	0.5
Cloud computing improve information accessibility	4.3	0.5
<b>Average</b>	<b>4.3</b>	<b>0.5</b>

#### 4.5.6 Other Effects of cloud computing on the revenue collection process

Cloud computing was affirmed to have facilitated great elasticity in provision of services. Through private cloud computing, some respondents indicated that the county has ensured a higher security through enhanced ability to exclusively to handle e-governance application hence avoiding potential attack of the system by hackers.

From the findings, it is apparent that adoption of cloud computing stands to exert a great positive influence on revenue collection process. This is in line with different literatures that points out ICT use to be extremely beneficial; Mugisha (2001) attests that, the use of ICT enhances timely access to accurate and relevant information, which is a prerequisite for good planning, programming, implementation as well as monitoring and evaluation which forms the key component in development. Cloud computing and grid computing are the same when it comes to the vision, which is decreasing the costs of computing while increasing the flexibility, quality and reliability by outsourcing a service to a third party. However the scale of how things were 10 years ago and how things are now, is different (Foster *et al.*, 2008).

#### **4.5.7 Effect of Mobile Phone Technology on Revenue Collection Process**

On the influence of mobile phone technology on revenue collection process, it was rated at a mean of 4.2 with a standard deviation of 4.2. This implies that mobile phone technology also greatly affects revenue collection process in the County government of Nairobi. The staff highly asserted that Mobile phone technology improves flexibility as indicated by the highest mean of 4.4 with a low deviation of 0.5. It was also affirmed to improve services awareness (mean=4.2, Sdv=0.6) as well as enhancing convenience in tax payment (mean=4.0, Sdv=0.7).

**Table 4.5: Aspects of Mobile Phone Technology and Revenue Collection Process**

<b>Statement</b>	<b>Mean</b>	<b>Sdv</b>
Mobile phone improves flexibility	4.4	0.5
Mobile phone technology improves services awareness	4.2	0.6
Mobile phone technology enhance convenience in tax payment	4.0	0.7
<b>Average</b>	<b>4.2</b>	<b>0.6</b>

#### **4.5.8 Other Effects of mobile phone technology on the revenue collection process**

It was revealed that mobile phone technology has greatly facilitated the revenue collection process. Respondents asserted that through the technology, making electronic payments has become easy. There are a handful of options available to the city people including primarily: electronic funds transfer (EFT), mobile money (mobile banking and money transfer), the digitized 'E-Cash' Systems, and the Online/Internet Payments. Users of city parking space can make payments using mobile money. It has also reduced cost on the side of the users since no charges are incurred when making payments through the e-county mobile app and using mobile money.

It is thus apparent from the findings, that the effect exerted by mobile phone technology adoption on revenue collection process is also a major one as reflected in the study findings. The effect as depicted in the study echoes Suluo (2013) who showed that, mobile phone technology usage has lead to high efficiency and effectiveness in organizations. Further, Crede (2008) revealed two facts, first; ICT has the capacity to increase productivity and create more cost effective output with the same or less inputs

and second; Development of ICT applications for business use alter the approach organizations function and eventually, improve their services as well as products. What these scholars are trying to emphasize is that; the spread of ICT use in various sectors brings new opportunities for economic growth and development. New organization design, new markets, new products and improved services are been created which brings with them new sources of revenue.

#### **4.5.9 Effect of E-Wallets and Revenue Collection Process**

With regard to E-wallets, the staff rated its influence on revenue collection process in The County Government of Nairobi at a mean of 4.1 with a standard deviation of 0.6. The findings indicate that e-wallets have a major effect on the revenue collection process in Nairobi County government. In this regard, employees confirmed that E-Wallets facilitates storage of payment information (mean=4.3, Sdv=0.5); enhance increased security in the process (mean=4.1, Sdv=0.6) and enhance ease of access to conducting online payments (mean=4.0, Sdv=0.6).

**Table 4.6: Aspects of E-Wallets and Revenue Collection Process**

<b>Statement</b>	<b>Mean</b>	<b>Sdv</b>
E-Wallets enhance increased security in revenue collection process	4.1	0.6
E-Wallets facilitates storage of payment information	4.3	0.5
E-Wallets enhance ease of access to conducting online payments	4.0	0.6
<b>Average</b>	<b>4.1</b>	<b>0.6</b>

#### **4.5.10 Other Effects of E-wallets on the revenue collection process**

The key advantages of brought by e-wallets in the revenue collection process include: Secure and quick settlement of financial obligations; fast check processing and very low transaction cost. They were asserted to be useful by offering a secure, convenient, and portable tool for online settlement of the financial obligations to the County when they are due. They also store personal and financial information for enhancing accountability.

These findings clearly indicate that revenue collection process can be greatly improved with improved use of e-wallets. The findings support assertions in the study by Harold (2011) that, computer-generated returns, transmitted electronically, generally are easier to process than paper returns; since the information on the forms doesn't have to be keyed in, number by number, by revenue administration staff into the Service's computers hence there is less chance of errors. Electronic transmittal is instantaneous, bypassing the frustrating vagaries of the postal system and the client receives confirmation within a day or two that the return not only was received by the revenue administration staff, but was received accurately. All these imply improved revenue collection process.

#### **4.5.11 Effect of E-government on Revenue Collection Process**

Pertaining to the influence of e-government, its effect on revenue collection process in The County Government of Nairobi was rated at a mean of 3.9 with a standard deviation

of 0.7. This is an indication that its effect is also quite high. It was highly attested that e-government improves quality of service (mean=4.2, Sdv=0.5) and enhance transparency in revenue collection process (mean=4.0, Sdv=0.6). Even so, the staff were hesitant about the ability of e-government to enhance privacy (mean=3.5, Sdv=0.5).

**Table 4. 7: Aspects of E-government and Revenue Collection Process**

<b>Statement</b>	<b>Mean</b>	<b>Sdv</b>
E-government improve quality of Service	4.2	0.5
E-government enhance privacy	3.5	1.0
E-government enhance transparency in revenue collection process	4.0	0.6
<b>Average</b>	<b>3.9</b>	<b>0.7</b>

#### **4.5.12 Other Effects of E-government on the revenue collection process**

It was asserted that the e-government system has effectively replaced paper-based tax administration systems. Respondents mentioned various advantages that it has brought over the traditional manual method. E-government was asserted to facilitate faster revenue collection process, lower costs and increased efficiency. It was affirmed to lighten the workload and reduce operational costs – such as the costs of processing, storing and handling data.

The study findings points out that e-government is an aspect that cannot be ignored too if the goal of revenue collection process improvement is to be achieved. Even so, the positive effect from adoption of e-government may be lesser in contrast to other forms

of ICT. This is congruent to assertion by Mensah, et al (2012) that, e-government initiatives goals and objectives in practice are very varied as a result the gained benefits also vary, and the evaluations of the initiatives obviously will vary according to the different stakeholders' perspectives on the value of these benefits. Existing literature also highlights the revolutionary nature of e-government in governments, and provides a basis to investigate the evaluation of this phenomenon from a perspective of citizen derived value and benefits (Atkinson, 2006).

#### **4.6 Inferential Statistics**

According to Kothari, (2009) inferential statistics describes the inferences made about a population from a sample. Inferential statistics describe relationship between variables as well as the causal effect of each of the independent variable on the dependent variable.

##### **4.6.1 Correlation Analysis**

To examine the relationship between the variables in the study, Pearson correlation coefficient ( $r$ ) was used. The coefficient indicated the direction and extent of the relationship between all the variables included in the study. The Pearson Correlation Coefficient indicated that all the variables were positively correlated with each other. There is a strong positive correlation of  $r$  value 0.795 between Cloud computing and Revenue collection process. There is a also strong positive correlation of  $r$  value 0.755 between Mobile phone technology and Revenue collection process. It was further

established that a also strong positive correlation of r value 0.771 exists between E-wallets and Revenue collection process. Moreover, strong positive correlation of r value 0.693 was found to exist between E-government and Revenue collection process

**Table 4. 8: Pearson’s correlation coefficient**

		<b>Revenue collection process</b>	<b>Cloud computing</b>	<b>Mobile phone technology</b>	<b>E- government wallets</b>	<b>E-</b>
Cloud computing	Pearson correlation	0.795(*)	1.000			
	Sig. (2-tailed)	0.02	0.00			
	N	113	113			
Mobile phone technology	Pearson correlation	0.755(*)	0.544(*)	1.000		
	Sig. (2-tailed)	0.01	0.01	0.00		
	N	113	113	113		
E-government	Pearson correlation	0.693(*)	0.537(*)	0.577(*)	1.000	
	Sig. (2-tailed)	0.03	0.03	0.01	0.00	
	N	113	113	113	113	
E-wallets	Pearson correlation	0.771(*)	0.531(*)	0.551(*)	0.562(*)	1.000
	Sig. (2-tailed)	0.02	0.01	0.03	0.02	0.00
	N	113	113	113	113	113

#### 4.6.2 Regression Analysis

From the regression analysis results, the Coefficient of determination (R square) was used to indicate the extent to which any change in revenue collection process was explained by the independent variables collectively. Table 4.9 illustrates the value R

square. Findings indicated that cloud computing, mobile phone technology, e-government and e-wallets collectively influence revenue collection process at The County Government of Nairobi by 69.7% as indicated by the adjusted coefficient of determination (R square). This is also an indication that 29.3% of the change in revenue collection process at The County Government of Nairobi is explained by other factors (except Cloud computing, Mobile phone technology, E-government and E-wallets).

**Table 4. 9: R Square table for the Independent Variables (Cloud computing, Mobile phone technology, E-government and E-wallets) on revenue collection process of Nairobi County government**

<b>Model Summary</b>				
R	R Square	Adjusted R Square	Std. Error of the Estimate	
0.855	0.731	0.697	0.189	
Predictors: (Constant), Cloud computing, Mobile phone technology, E-government and E-wallets				

#### **4.6.3 Beta-Coefficients**

In determining the relationship between revenue collection process and Cloud computing, Mobile phone technology, e-government and e-wallets, Table 4.10 guided

the development of the model for this relationship. The resultant model was therefore estimated as:

$$Y = 0.814 + 0.552X_1 + 0.270X_2 + 0.032 X_3 + 0.113X_4 + \square$$

Where;  $Y_s$ =Successful Revenue Collection Process (Dependent Variable)

$B_0$ = Constant coefficient

$X_1$ = Mobile phone technology

$X_2$ = E-Wallet

$X_3$ = Cloud

Computing  $X_4$ =

E-Government

$e$ =Error of

Regression

In order to achieve standardized coefficients, the variables were analyzed using regression tools. Findings indicated that an increase of a unit of cloud computing leads to an increase in revenue collection process by 0.552 while an increase of a unit of mobile phone technology increases revenue collection process by 0.270. An increase in e-government by one unit was found to positively affect revenue collection process by increasing it with 0.032 while an increase by one unit of e-wallets results to an increase in revenue collection process by 0.113. The constant was 0.814 which means that if

Cloud computing, mobile phone technology, e-government and e-wallets are held constant (at zero); revenue collection process will be 0.814.

**Table 4. 10: Coefficients of ICT on the Revenue Collection Process**

	Coefficients		Standardized Coefficients	t	Sig.
	a) Unstandardize Coefficients	Std. Error			
	B	Std. Error	Beta		
(Constant)	0.814	0.177		4.220	.000
Cloud computing	0.552	0.064	0.576	9.202	.000
Mobile phone technology	0.270	0.380	0.360	3.040	.047
E-government	0.032	0.050	0.041	2.515	.035
E-wallets	0.113	0.047	0.1283	4.53	.000

Dependent Variable: Revenue collection process

#### 4.6.4 Analysis of Variance (ANOVA)

Analysis of variance (ANOVA) was used to generate the F value and hence F test was conducted. ANOVA helped to show the relationship in the variables between and within the measure of the dependent variable. According to the ANOVA results, the probability value for the regression model was 126.6. The overall goodness of fit is summarized by calculating the fraction of total variance explained by the fit which is presented by the R square. ANOVA results indicated that there was goodness of fit of the model, since the level of significance was 0.000, and F-Calculated (126.6) was greater

than  $F_{\text{Critical}}$  (1.692). Given the high R square value of 0.697, it implies that independent variables for this study had a high/significant goodness of fit.

Moreover, the results from the ANOVA imply that the four independent variables (Cloud computing, Mobile phone technology, E-government and E-wallets) are critical in explaining changes in revenue collection process at Nairobi County.

**Table 4.11: Analysis of Variance (ANOVA)**

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	20.256	4	5.064	126.6	0.037
Residual	4.275	108	0.040		
Total	24.531	112			

Predictors: (Constant), Change in Cloud computing, Mobile phone technology, E-government and E-wallets

Dependent Variable: Revenue collection process

#### 4.6.5 Hypothesis Testing

The study tested the null hypothesis that the independent variables (Cloud computing, Mobile phone technology, E-government and E-wallets) had a positive impact on the revenue collection process. The findings from the resultant model ( $Y = 0.814 + 0.552X_1 + 0.270X_2 + 0.032X_3 +$

**0.113**  $\beta_4$  show that all the coefficients ( $\beta$ ) were positive indicating that they had a positive impact on the process of revenue collection. However, cloud computing had the biggest impact (0.552) followed by Mobile Phone technology (0.27) and E-wallet at 0.113. The impact of the E-government was very insignificant and therefore the study can infer that cloud computing, mobile phone technology and E-wallets had the biggest positive impact on the process of revenue collection.

## **CHAPTER FIVE**

### **SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

The chapter provides a summary of the study findings and also gives the conclusions and recommendations of the study based on the findings and in line with the objectives of the study. The general objective of the study was to analyze the influence of ICT adoption on revenue collection process by government of Kenya. The study focused on the case of Nairobi County government.

#### **5.2 Summary of the Findings**

##### **5.2.1 Effect of Cloud Computing**

The findings show that cloud computing had a great influence on revenue collection process. The strong positive correlation between cloud computing and revenue collection process points out that the implementation of cloud computing has a very significant impact on the revenue collection process.

##### **5.2.2 Effect of Mobile Phone Technology**

The findings show that the use of mobile phone technology in the revenue collection process impacted significantly on the efficiency.

### **5.2.2 Effect of Mobile Phone Technology**

The findings show that the use of mobile phone technology in the revenue collection process impacted significantly on the efficiency and accuracy with which the county has been able to consolidate revenue collection. The existence of a well-developed mobile phone industry and a mobile money platform laid a good foundation for the establishment of the e-payment system by the county government of Nairobi. Mobile phones are convenient and eliminate the complexities of handling cash.

### **5.2.3 Effect of E-government**

The findings indicate that the implementation of the E-government portal had the least impact on the revenue collection. This means that the E-government contributed least to the improvement of the revenue collection process. The regression analysis further show that the impact may be insignificant. The study can therefore infer that the establishment of the e-government did not have any significant effect on the process of revenue collection to the County Government of Nairobi.

### **5.2.4 Effect of E-Wallets**

The findings show that E-Wallets played a significant role in the successful implementation of the e-payment system of revenue collection by the County Government of Nairobi. E-wallets. The use of e-wallets would improve revenue collection by developing and deploying an electronic payment platform and a citizen E-wallet service, which will be accessible from mobile phone, internet, Point of Sale

(POS) devices and physical agents. This provided convenience to the service users and safety as well as accountability of money paid to the county government

### **5.2.5 Revenue Collection Process**

From the findings of this study, the revenue collection process improved by 60% as a result of the implementation of the various ICT based e-payment services. This means that revenue collection was highly enhanced and made less costly by the use of technology. The county government initially asserted that the e-payment system highly enhances the effectiveness of the revenue collection process as well as its efficiency. However, the staff did not take it lightly as it was a way of eliminating corruption and ensuring accountability on the part of staff. They however doubted its ability to ensure greater accountability in the process and even at some point tried to sabotage the process. This study can therefore infer that the adoption of ICT exerts a great influence on revenue collection process whereby adoption of various diverse ICT elements can greatly enhance the revenue collection process.

### **5.3 Conclusions**

In line with the first objective of the study, the study found out that the implementation of cloud computing had a very big impact on the revenue collection process. This was indicated by the strong positive correlation between cloud computing and the success of the revenue collection process. The study can therefore conclude that cloud computing

had a very significant influence on the success of the revenue collection process by the County Government of Nairobi.

In line with the second objective of the study, the study found out a significant relationship between mobile phone technology and the success of revenue collection process. The introduction of the mobile money payment service for rent and parking fees cut down the levels of corruption among staff and eliminate fraud by brokers at city hall. The already existing mobile money platform as well as a good attitude towards the cashless payment system by the users contributed significantly to the success of the e-payment service. The study can therefore conclude that the use of mobile technology had a very significant impact on the improvement of the revenue collection process by the county government of Nairobi.

In line with the third objective of the study, the findings show that the introduction of e-government did not impact greatly on the process of revenue collection in Nairobi City County. This is indicated by the low causal effect of e-government on the revenue collection. This study can therefore conclude that the revenue collection process was not significantly improved by the implementation of the e-government portal by the County Government of Nairobi.

In line with the fourth objective of the study, the findings shoe that there exists a significant relationship between revenue collection process and establishment of e-wallets. E-Wallets on the other hand has mainly facilitated storage of payment information and increased security in the process while at the same time enhancing ease

of access to conducting online payments. The study can therefore conclude that the launch of the e-wallet service played a significant role in the success of the electronic revenue collection system

In line with the fifth objective of the study, the findings show that the implementation of ICT had exerted a great influence on revenue collection process of the County Government of Nairobi. In this respect, it has highly enhanced the effectiveness and efficiency of the revenue collection process. However, it is important to note that it is yet to ensure improved accountability in the process. It can be inferred that all the various ICT elements examined including Cloud computing, Mobile phone technology, e-government and e-wallets have had a major positive influence on the revenue collection process. Comparatively, cloud computing has exerted the greatest influence followed by mobile phone technology, e-wallets and e-government in that order. The study can therefore conclude that, collectively, cloud computing, mobile phone technology, e-government and e-wallets had a great influence on the success of the revenue collection process by the County Government of Nairobi.

#### **5.4 Recommendations**

The study concluded that the implementation of cloud computing contributed significantly to the improvement of the revenue collection process by the County Government of Nairobi. This shows that it had it a reliable method of improving revenue collection and therefore the study recommends that the system be implemented in other county governments across the country to boost revenue collection.

The study concluded that the use of mobile phone technology had impacted greatly on the revenue collection process by the County Government of Nairobi. The study therefore recommends that the mobile phone technology and mobile banking platforms available in the country be applied to boost revenue collection in the public and private sectors of the economy.

The study concluded that the e-government platform did not contribute significantly to the revenue collection process by the County Government of Nairobi. This study therefore recommends that the county should draft measures to ensure that the e-government platform is tailored to serve both categories of users (the rich and the poor). This will ensure that the system is efficient and usable in all areas where implemented

The study concluded that the introduction of the e-wallet system of payment had a significant impact on the revenue collection process in Nairobi. However, the system did not work efficiently in low income areas. This study therefore recommends that the County Government of Nairobi should ensure that they develop and deploy an electronic payment platforms and citizen E-wallets service accessible to all categories of citizens; from high income earners to low income earners.

### **5.5 Suggestion for Further Studies**

The study concluded that the four independent variables accounted for 70% of the improvements in revenue collections as a result of a deliberate application of ICT in the revenue collection process of the County Government of Nairobi. This study therefore

recommends a further study to establish the other variables that were responsible for the improved revenue collections by the county government.

The study was only conducted in the city of Nairobi. Though Nairobi is the capital city of Kenya, the conclusions and inferences made from this study may not apply in other devolved units of government countrywide. This study therefore recommends a further study on the impact of ICT on revenue collection and service delivery in other counties so as to obtain a comparative approach to the research problem.

The use of the e-government platform by the county government of Nairobi did not yield the expected results as it had a very insignificant impact on the revenue collection process in the county. However, the service has worked under the Huduma Kenya initiative implemented by the national government. This study therefore recommends a further study to establish why the e-government platform failed to yield the expected results when it was implemented by the county government of Nairobi.

The study recommended that the county government of Nairobi should re-engineer the e-wallet platform to include the poor people in the county. This study recommends a further study to establish the reasons for the low uptake of the e-wallet product among the poor population living and working in Nairobi.

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## APPENDICES

### Appendix I: Sample Questionnaire

Please help me to collect data for my Master's program In ICT Policy and Regulation of Jomo Kenyatta University of Agriculture And Technology by taking a few moments to fill out this survey questionnaire. Please tick the most appropriate response to questions that give possible answers and write down your answers in the spaces provide open ended questions.

#### SECTION A: GENERAL INFORMATION

Demographic information

1. Respondent's particulars: Gender

Male

Female

2. Your age pracket

20-29 yrs

30-39 yrs

40-49 yrs

50 yrs and above

3.Highest Education Level

- Certificate
- Diploma
- Bachelor Degree
- Masters degree
- PHD

Any other please specify.....

4.Working Experience

- 1-5years
- 6-10 years
- 11-15 years
- 16 and above

**SECTION B: REVENUE COLLECTION PROCESS**

5. Does ICT influence revenue collection process?

Yes ( )

No ( )

Explain your answer

.....

.....

6. Please state the extent to which you agree or disagree with the following statements regarding influence of ICT on revenue collection. **(1 is Strongly Disagree, 2 is Disagree, 3 is Neutral, 4 is Agree and 5 is Strongly Agree).**

<b>REVENUE COLLECTION PROCESS</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
ICT improve efficiency in revenue collection process					
ICT enhance effectiveness in revenue collection process					
Use of ICT ensure there is greater accountability in revenue collection process					

7. How does ICT influence efficiency in revenue collection process?

.....

.....

8. How does ICT influence effectiveness in revenue collection process?

.....  
.....

9. How does use of ICT influence accountability in revenue collection process?

.....  
.....

**SECTION C: MOBILE PHONES TECHNOLOGY**

10. Does mobile phones technology influence revenue collection process?

Yes ( )

No ( )

Explain your answer? .....

11. Please state the extent to which you agree or disagree with the following statements regarding influence of mobile phone technology on revenue collection process (**1 is strongly Disagree, 2 is Disagree, 3 is Neutral, 4 is Agree and 5 is strongly Agree**)

<b>MOBILE PHONES TECHNOLOGY</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Mobile phone improves flexibility.					
Mobile phone technology improves services awareness					
Mobile phone technology enhance convenience in tax payment					

12. How does Mobile phone influence flexibility in revenue collection process?

.....  
.....  
.....

13. How Mobile phone technology influence services awareness in revenue collection process?

.....  
.....  
.....

14. How does Mobile phone technology influence tax payment in revenue collection process?

.....  
.....  
.....

**SECTION D: E-WALLETS**

15. Does E-Wallets influence revenue collection process?

Yes ( )

No ( )

Explain your answer?

.....  
.....  
.....

16. Please state the extent to which you agree or disagree with the following statements regarding influence of E-Wallets on revenue collection process. **(1 is strongly Disagree, 2 is Disagree, 3 is Neutral, 4 is Agree and 5 is strongly Agree)**

<b>E-WALLETS</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
E-Wallets enhance increased security in revenue collection process					
E-Wallets facilitates storage of payment information					
E-Wallets enhance ease of access to conducting online payments					

17. How does E-Wallet influence security in revenue collection process?

.....  
.....  
.....

18. How does E-Wallet influence storage of information in revenue collection process?

.....  
.....  
.....

19. How does E-Wallet influence access to conducting online payments in revenue collection process?

.....

.....

**SECTION E: CLOUD COMPUTING**

20. Does cloud computing influence revenue collection process?

Yes ( )

No ( )

Explain your answer

.....

.....

21. Please state the extent to which you agree or disagree with the following statements regarding influence of cloud computing on revenue collection process. (1 is strongly Disagree, 2 is Disagree, 3 is Neutral, 4 is Agree and 5 is strongly Agree)

<b>CLOUD COMPUTING</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Cloud computing improve performance in revenue collection process					
Cloud computing improve information accessibility					

22. How does Cloud computing influence performance of revenue collection process?

.....  
.....  
.....

23. How does Cloud computing influence information accessibility in revenue collection process?

.....  
.....  
.....

**SECTION E: E-GOVERNMENT**

25. Does E-government influence revenue collection process?

Yes ( )      No ( )

Explain your answer

.....  
.....  
.....

36. Please state the extent to which you agree or disagree with the following statements regarding influence of E-government on revenue collection process (**1 is strongly Disagree, 2 is Disagree, 3 is Neutral, 4 is Agree and 5 is strongly Agree**)

<b>E-GOVERNMENT</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
E-government improve quality of Service					
E-government enhance privacy					
E-government enhance transparency in revenue collection process					

27. Does E-government improve quality of service in revenue collection process?

Yes ( ) No ( )

28. Does E-government influence privacy of information in revenue collection process?

.....

.....

.....

29. How does E-government influence transparency in revenue collection process?

.....

.....

.....

THANK YOU FOR YOUR PARTICIPATION