THE EFFECT OF AUTOMATED INFORMATION SYSTEMS ON THE KENYA COUNTY GOVERNMENT'S OPERATIONS: A CASE STUDY OF KIAMBU COUNTY GOVERNMENT

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DECLARATION AND RECOMMENDATIONS

Declaration

This project is my original work and has not been submitted to any other institution of higher learning.

Signature ..... Date …….

Muraya Brenda Wairimu

CM11/62549/15

Recommendations

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

Signature ..... Date …….

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DEDICATION

I dedicate this project to The Almighty God and my mother, Josephine Ruguru, for her love and continued support.

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I wish to sincerely thank The Almighty God for good health, sound mind and for His continuous guidance in my academic journey. Secondly, I appreciate Egerton University for offering me the opportunity to undertake my masters degree with them and there facilitation during the entire process. Thirdly, I greatly appreciate my supervisor, Dr. Richard Bitange Nyaoga, for his patience, time and effort in ensuring the success of this project and for his quality, knowledgeable and applicable guidance and always challenging me to think beyond my current scope which has continuously helped to build this project. I would also like to appreciate Mrs. Jerotich Sirma for her advice and guidance with regard to information systems as well as Mr. Benard Muma for his continuous guidance and criticism throughout the project. I also sincerely appreciate the Kiambu County Government staff for their patience and cooperation. Additionally, I thank my friends, for their comments and criticism throughout the study most especially, my business partner Francis Kihara. Finally, I sincerely thank and greatly appreciate my family John Gitara, Josephine Ruguru, Fridah Gathoni, Mercy Mwihaki and Angela Thuguri for their encouragement and support throughout this project.

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LIST OF ABBREVIATIONS

AIS:	Automated Information Systems
CFSP:	County Fiscal Strategy Paper
CKRC:	Constitution of Kenya Review Commission
E-Commerce:	Electronic Commerce
E-Governance:	Electronic Governance
ERP:	Enterprise Information Portal
E-Payment:	Electronic Payment
GDP:	Gross Domestic Product
GPS:	Global Positioning System
GPRS:	General Packet Radio Service
ICT:	Information and Communication Technology
IFMIS:	Integrated Financial Management Information Systems
IS:	Information Systems
KCB:	Kenya Commercial Bank
NFC reader:	Near Field Communication reader
POS:	Point Of Sale
ROK:	Republic of Kenya

ABSTRACT

Information and Communication Technology (ICT) is a very dynamic field. Throughout many centuries it has evolved and improved greatly. The use of the internet has globally received great acceptance. This has led to various organizations, businesses and governments embracing Electronic Practices (E-Practices). Governments have embraced this emerging trend and have automated their processes with the aim of better serving their citizens. Kenya is a growing economy and the global pressure has forced it to embrace E-Governance practices. Primarily, the objective is to improve the welfare of citizens through the provision of public services and infrastructure through the Local and National Government. As a result, ways to improve their operations are being discovered. Hence, they implemented the Automated Information Systems (AIS) at the county level to simplify their various operations. This study aimed to establish the effect of implementing AIS on the County Government's operations. Their operations were classified in terms of transparency and record keeping as well as supervision while the AIS was operationalized in terms of the Zizi System, the County Pro System and the IFMIS. It employed complete enumeration survey method whereby, the population under study was Kiambu County and data was collected from all twelve sub-counties in Kiambu. The researcher targeted the (Information and Technology) IT manager, Finance Officer and the Revenue Officer in each of the twelve sub counties giving a total population of 36. Descriptive research design was used and the study used primary data to test the hypotheses under study. The researcher distributed structured questionnaires through a 'drop and pick' method. The data from the questionnaires was then screened and entered in readiness for analysis using the (Statistical Package for the Social Sciences) SPSS software. Multiple regression was later used to test predictability of the variables given the others. This study determined that the implementation of the Integrated Financial Management Information Systems (IFMIS) has had an insignificant low positive effect on the county government's operations. However, the implementation of the County Pro System and Zizi System has had a significant positive effect on the County Government's operations. Therefore, this study established that, there is a significant positive effect on the county government's operations as a result of implementing the Automated Information Systems. However, it is recommended that the county government should increase awareness of the systems; increase the use of IT to heighten operational performance; level up the use of the IFMIS; and level up the implementation levels of the AIS in the counties.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The current national agenda at the county levels is to automate all public revenue collection (Atsiaya, Wanyama, and Douglas, 2014). The 2010 Kenyan constitution required that most of the public services be devolved to the county governments (Ndunda, Ngahu, and Wanyoike, 2015). That has the effect of transferring some level of independence and accountability to the county level in Kenya. However, power, functions and responsibilities to deliver services were transferred from the Kenya National government and to the Kenya County Government in 2013 (Kenya National Council of Law Report, 2013). Hence, given the current aim of modern governments, the integration between the provision of what citizens want and cost cutting while achieving high performance levels, the use of IT comes in in a beneficial manner. The Constitution of Kenya Review Act 2000 required the Constitution of Kenya Review Commission (CKRC) to put into consideration the participation of people (Mwikali and Wafula, 2015).

ICT in itself plays a key and leading role in national development efforts, underpinning the recognition by the Government that efficient and adequate ICT infrastructure is a prerequisite for sustainable ICT sector growth (Kinuthia and Akinnusi, 2014). The Kenya ICT Authority secured funding to support their readiness to provide services, and strategic Information Systems for counties and it was supported by a thirty million dollars funding by the World Bank. The recognition of the need for the implementation and use of IS has globally risen (Lipaj and Davidavičienė, 2013). This is due to the great solutions they are capable of presenting. They are used in dealing with not only internal but also external tasks related to day to day operations and decision making (Pabedinskaite, 2010). Within different parts of an organization, IS support work coordination (Basahel and Irani, 2010).

1.1.1 Automated Information Systems

Computer data that is often collected and stored information is the basis of information systems. The best IS is described as one that can collect, process, store and disseminate information using the least possible cost in an effective and efficient manner (Berisha-shaqiri, 2015). Through the use of Business support systems (BSS), users at all levels within an organization can acquire

work related information. BSS have the capability to not only generate information that is needed to manage and control business processes but also analyze data by the Transaction Processing Systems (TPS) (Al-mamary, Shamsuddin, and Aziati, 2014). The systems provide broad information that is based on the several operations dimensions in an organization therefore making them capable of achieving superior performance levels (Trivellas and Santouridis, 2013). Both internal and external information, to an organization, from all sources are handle by the AIS (Sharma, Tripathi, and Gupta, 2010).

1.1.2 Automated Information Systems and the Kenya County Government's Operations

The Kenya ICT Master Plan, 2008-2012, aimed at achieving the following objectives: enhancing Kenya's economic competitiveness through utilization of abundant human resources in Business Process Outsourcing (BPO); developing a knowledge-based society and thereby enhance the quality of life for ordinary citizens; ensuring universal access to ICT for sustainable development through Digital Villages throughout the country; and strengthen Kenya's learning opportunities and thereby developing capacity to meet future technological challenges (Kinuthia and Akinnusi, 2014). The strategic business objectives the county aims at achieving through the implementation of the AIS are customer and supplier intimacy, operational excellence, better decision making and new business models (Nguli, Gicaci, Kahiu, Kamau, and Mungai, 2016). For the successful designing and implementation of an information system, there is the great need to understand what the operations and the processes within an organization are (Masa'deh, Alshurideh, and Obeidat, 2012).

The Kenya county government is associated with the collection of funds which are later used to provide services and give revenue that can be used for devolution (Ndunda et al., 2015). In order to avoid the misappropriation of funds, operations linked to revenue collection need to be supervised to ensure they yield the highest output level possible. Hence, the heightened need to keep organized and frequently updated records reducing the risk of manipulation. With the aim of promoting accountability and transparency, the Kenya County Government implemented the E-Practices such as Automated Information Systems. However, this technology has so far been fully implemented in nine out of the forty seven counties in Kenya: Nairobi, Kiambu, Mombasa, Kisumu, Nakuru, Meru, Bomet, Baringo and Embu.

The first county to adopt the AIS in Kenya was Nairobi (Okiro, 2015). The implementation of AIS is mostly due to their capability to improve productivity, quality, innovation and flexibility of services and ultimately leading to higher work related outcomes (Trivellas and Santouridis, 2013). The systems are able to reflect both electronic payments and cash related payments inputted into the system as data. The aim of their implementation in the Kenya County Government was to eliminate or significantly reduce corruption, simplifying the procedures in payment ensuring transparency and accountability, efficiency, effectiveness, and convenience to citizens (Okiro, 2015).

Kiambu County is one of the forty seven counties in Kenya. There are twelve sub-counties in Kiambu County: Kiambu, Ruiru, Lari, Thika, Gatundu North, Gatundu South, Juja, Limuru, Kiambaa, Kabete, Githunguri, and Kikuyu which are further subdivided into 60 wards. Kiambu, Gatundu North and South have four wards while all the rest have five wards except Ruiru which has eight wards. One of the strategic ICT objectives listed by Kiambu county is the progressive development and upgrading of the ICT connectivity and infrastructure within the county (Ndirangu, 2015).

Before the Kiambu County was a county, its Sub-Counties were municipals which had been using the manual operations for many years (Chege, 2015). This caused the absence of transparency and accountability, a lot of paperwork as well as the performance of unnecessary processes and work related activities. Receipts were issued to the citizens which had to be purchased and kept in stores. Some of the receipt books had standardized amounts written on them; some were printed out after payment at the offices while the rest allowed the collectors at the field to enter the amount. This gave room for manipulation and collusion between the collector and the citizen and increased paperwork. The underlying difficulty however is that, many routes were travelled by financial messages before they reach their destination hence, there was the need to guarantee the information was not modified while in transit (Okiro, 2015).

Therefore, there was a necessity to adopt more appropriate operations in the County Government in order to improve the economic welfare of the country. The adoption of internet supported transactions has greatly influenced the growth of businesses and shows a potential in its capability to reduce cost and improve operational efficiency (Arias-Aranda, Ghobakhloo, and Benitez-Amado, 2011). The use of AIS has the potential to provide these advantages of

operational efficiency, cost reduction and boost growth (Ensour and Tareg, 2014) in the counties. Their implementation is meant to make information more readily available regarding all county revenue transactions and provides a summation of the revenue as per the need of the county official. All records are therefore available at all times regarding any day. Hence, more funds are reported as manipulation becomes harder, inefficiencies are reduced, record keeping is automated, supervision becomes easier and the common conflict between the revenue collectors and the payers is reduced. Despite this potential advantage however, out of the forty seven counties in Kenya, AIS are yet to be fully implemented in all counties in Kenya.

Automation in Kiambu County commenced in 2014 (Nguli et al., 2016). On April 07, 2014, Strathmore University in collaboration with Namu and iPay implemented a pilot in Gatundu North and South Sub-Counties in Kiambu County. It enabled residence to make online applications for single Business Permits and receiving electronic Single Business Permits as the county official track application status through the AIS. It also allowed online property registration, property transactions, land rate and arrears payments, on the ground revenue collection through the Point of Sale (POS) terminals monitored using the AIS as well (Nguli, Gicaci, Kahiu, Kamau and Mungai, 2016).

Users of the Kenyan payment system can make payment using mobile money, debit cards, over the counter payments which are all reflected by the AIS. The KCB group launched a Kiambu county Digitika Program which was aimed at boosting revenue collection and management. This solution was an initiative that was provided in order to enhance service delivery to citizens in the ongoing devolution process by the use of Huduma cards (Ndirangu, 2015). Through the AIS, the county's citizens' payment transactions and payments made to suppliers by the counties are monitored and supervised online, as well as the movements of the field agents. In Kiambu County, the AIS are categorized into three. The first provides information regarding payments made by citizens on their own or at the county offices using mobile money, E-Wallet or cash which is the County Pro System by Strathmore, Namu, and iPay. The second gives information regarding all transactions made using the Point of Sale (POS) terminals, which is a Riverbank solution known as Zizi, where citizens can make payment using mobile money, debit/credit/visa cards, E-Wallet or cash. The final is the IFMIS which was first implemented in the National Government then the County Government. It is used to create transparency in the procurement

processes within the government. Hence, this means that the Kiambu county government evolved from using the manual systems to automated systems (Nguli et al., 2016).

On a general outlook, when E-Practices are being implemented in a Sub-County, an enforcement team is usually provided once the system is launched in a county. They are tasked with the responsibility of ensuring awareness is created to both citizens and officials and successful implementation. The payment systems have a 24-hour Call Centre to try and boost customer service. The systems are monitored by two teams; the financial officers, who check the real-time updates for the system and ensure the full amount reported by all departments is accounted for, and the technical experts, who ensure the system is running continuously (Ndirangu, 2015).

1.2 Statement of the problem

Manual systems, required so many intermediaries and required great resources for operations to be performed (Ndunda et al., 2015). The financial officer who would be in-charge of all financial transactions would have to depend and trust that what was presented to them at the end of the day was the actual amount received and paid out by the county. The revenue officers had to physically go to the field to ensure that the county officials spent their days at their work stations. Receipts, invoices and purchase orders had to be counter checked, manually processed and the amounts manually summed up making the possibility of errors high. The procurement processes were subject to manipulation and collusion between the suppliers and procurement county officials (Kahari, Gathogo, and Wanyoike, 2015). This made the manual procedures long, tedious and open to unethical practices. The manual systems were therefore slow in providing the services to the clients or citizens and information gathered was bulky. They were time-consuming, costly, space demanding and required a large personnel size. Annual internal and external auditing was also lengthy, tedious and expensive making audits unreliable to some extent (Okiro, 2015). Consequently, fewer funds were reported at the end of the each day, slow customer and supplier service, absenteeism and presenteeism, dishonest practices and hence customer and supplier complaints were more each day. Hence, the county government was unable to perform efficiently its function of improving the welfare of the general public through devolution. As a result, it caused a negative effect on the citizens and country in general. This is since the economic growth and development of the nation was slow and at times stagnant (Maina, 2015). The key to the development of different sectors in the Kenya counties is through

the infrastructural development of facilities, as it boosts the ease in moving goods, services, and people. This has the ultimate effect of facilitating agriculture, trade, and commerce (Nguli et al., 2016). This would ultimately require the reduction of inefficiencies in the county government. Therefore, this study established the effect the implementation of the Automated Information Systems has had on the Kenya County Governments' operations.

1.3 Objectives

1.3.1 General objective

To establish the effect of AIS on the Kenya County Governments' operations: A case study of Kiambu County.

1.3.2 Specific objectives

i. To determine the effect of County Pro systems on the County Government's operations.
ii. To determine the effect of Zizi systems on the County Government's operations.
iii. To establish the effect of IFMIS on the County Government's operations.

1.4 Hypotheses

The study tested the following hypotheses;

H_{01}: County Pro System has no significant effect on the County Government's operations.

H_{02}: Zizi System has no significant effect on the County Government's operations.

H_{03}: IFMIS has no significant effect on the County Government's operations.

H_{04}: AIS have no significant effect on the County Government's operations.

1.5 Scope of the study

The study focused on the Effect of Automated Information Systems on the Kenya County Government's operations. However, due to the different terminologies used to refer to this systems, the research was limited to Kiambu County since it was ranked as the best p0erforming county after the implementation of the AIS in 2016 (Nguli et al., 2016). The researcher further targeted specific respondents in Kiambu County. This included the Financial Officer, the Revenue Officer and the ICT Officer. County operations were investigated in terms of supervision, record keeping and transparency.

1.6 Justification of the Study

County Government: The study highlights the pros and cons of the Automated Information Systems. This is beneficial to the counties, yet to implement the systems, as they can draw inferences in developing the AIS to take advantage of the benefits it offers and, to those already using them, they can use the recommendations and findings to improve the systems for better performance.

Policy makers can obtain information and an understanding of the behavior of the Automated Information Systems and its impact on performance which enables them to come up with the appropriate policies and formulate legal frameworks that encourage growth in the country through the use of the system by protecting the interest of both the citizen and the government.

Researchers: The study highlights areas for further research and also contributes to the body of knowledge. It is of value to researchers as a basis for future empirical research.

Citizens: The study provides information that creates awareness of the AIS made available to the citizens and how using them can be of benefit to them, hence encouraging their use.

1.7 Operational Definition of Terms

AIS	An Information systems that has most of the operations being performed automatically with little human control and handling.
E-Commerce	The electronic exchange of business information using network-based technologies.
E-Governance	The use of the internet and other proprietary networks to deliver services to the citizens and bring in transparency between the government and its citizens.
E- Payment	A form of financial exchange through electronic communication systems that takes place between a buyer and seller.
Information Systems	Interrelated components that support decision making, control, analysis and visualization in an organization through the collection, storage and dissemination of information.

Online Transaction	It involves the exchange of one thing for another, for example goods or services for cash, through the use of the internet.
Operation	All the creation activities that are performed in an organization to provide a good or service.
Process	The business and production activities of a company.
Process technology	Any method, procedure, tool or equipment that is used to produce a good or to render a service.
Technology	The application of scientific discoveries to operations with an aim of making them easier, more efficient and effective.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter concentrates on the literature provided by other researchers, surveys, and authors that apply to this study. It focuses on the various operations theories and perspectives that depict what the Kiambu County is doing, in an operations management perspective, by implementing the Automated Information Systems. Also, the chapter includes empirical literature review of what previous researchers have done in relation to this study. Finally, a conceptual framework that shows the relationship between the variables of interest is provided.

2.2 Theoretical Review

2.2.1 Technology Determinism Theory

The theory originated from an American Sociologist and Economist, Thorstein Veblen (Ellul, 1967). It theory implies that within a society, technology is an independent force that drives change. Hence, it seeks to explain the interaction between technology and society. It is a reductionist theory which implies that the development of structures and cultural values within a society are influenced by technology (Veblen, 1899). Due to the need to enhance technology, the concept of space has been eliminated with virtual extensions of our extremities. Just like the book is an extension of the eye, every technological invention is an extension of human faculty (Mcluhan, 1964). What this means is that technology inventions are made to enhance the performance of a certain aspect, task or thing. Mcluhan (1964) stated that; the phonetic alphabets, the printing press and the telegram are the crucial inventions that changed human life.

With technology improvements at the job floor, productivity improves and increases with time (Cohen, 2001). The theory is both in hard form; where the changes brought by technology advancement are inevitable and soft form; where technology is an influencing factor of change. However, Kline (2015) stated that the theory is under the assumption that all the interactions, between technology and society, must take place in an economy which is governed by a market and the driving force is profit. This is referred to as the economic milieu. Self-determination brings about the intrinsic of technology which results in an impact on society which shapes it. This view takes society to be a self-organizing system (Kline, 2015).

2.2.2 The Sandcone Model

The originality of the Sandcone Model was developed in the 1990s by Ferdows and De Meyer (Saufi, Rusuli, Tasmin, & Takala, 2012). It explains what should happen when an operation is designed and its activities planned and controlled. According to the Sandcone theory, there is the best sequence for improvement (Slack, Chambers, & Johnston, 2010). It requires the movement from one priority to the next in a sequential but cumulative manner. These priorities include: quality, dependability, speed of internal throughput, flexibility to response and cost. It requires that once you proceed to the next priority, focus on the previous should not be dropped. Hence it is not only a sequential process but also a cumulative one. The first priority is to ensure quality has reached a minimum acceptable level. Then achieve a critical level of dependability that provides some stability to operation as the quality is still being improved. Thirdly, improve the speed of internal throughput which is more effectively done by concurrently improving flexibility to response. Again, this is done as quality and dependability are improved. Cost is then tackled head-on after the first four have been tackled. These five are known as the operations objectives (Slack et al., 2010). Hence, the Sandcone theory can provide a system that can be used during improvement initiatives.

2.2.3 Technology Acceptance Model (TAM)

TAM was first introduced by Davis in 1986 and is a known and tested theory in the field of Information Systems (Alharbi & Drew, 2014). TAM theory addresses the users' issues and their attitude towards using technology and the actual usage. It also aims at finding the reason to why information technology is accepted or rejected (Sharma & Chandel, 2013). Essentially, there are two cognitive beliefs that surround this theory. The first is the perceived usefulness of the technology and the second is the perceived use (Park, 2009). Davis later refined it and hence currently, according to TAM, the use of technology system by a person is influenced directly or indirectly by the intentions, attitudes, perceived usefulness of the system, and perceived ease of the system. It also proposed that external factors affect the intentions and actual use through mediated effects on perceived usefulness and perceived ease of use (Park, 2009).

Davis (1989) defined the perceived usefulness as the prospective subjective probability of a user that when they use a specific application system, there job performance will increase, within an organizational context. It is the extent to which the user of the technology believes that the use of

that technology will boost their job performance. Perceived ease of use is the extent to which it is expected that the target system is free of effort by the prospective user (Davis, 1989). The behavioral intention is the extent a person consciously devised a plan whether or not to perform some specific future behavior (Davis, 1989; Fathema, Shannon, & Ross, 2015). The actual use of a system is explained by the behavioral intention and hence has a direct relationship with technology acceptance. Together, the attitude towards the use as well as the perceived ease of use, jointly influence the behavioral intention which is directly affected by the perceived ease of use. The perceived usefulness is directly influenced by the perceived ease of use while both the perceived usefulness and the perceived ease of use directly affect the attitude towards use (Alharbi & Drew, 2014). If the user of the technology finds the technology easy to use, then they find it to be useful.

2.2.3.1 Theory of diffusion of innovations to explain technology acceptance

Based on the theory of diffusion of innovations, Rogers referred to technology as innovations. The theory explains the invention, implementation and use of technology(Everett Rogers, 2003). According to the theory, the innovation-decision process is a key prerequisite of the theory. It is a process from the point of knowledge innovation, to the forming of an attitude towards the innovation and to the decision on whether to adopt or reject the technology. This then paves way for the implementation of the innovation; therefore the confirmation of the decision.

However, the acceptance of the technology is based on whether it is relatively superior to the previously used methods; it is compatible with the organization's values, skills and work; its perceived ease of use and use; and trialability. Using the Integrated Acceptance and Sustainability Assessment model (IASAM), the technology should be sustainable. Its sustainability is based on the quality of the technology, the domain development, management and acceptance.

In terms of acceptance, IASAM is first based on the fact that the technology needs to provide relative advantage. This means it needs to provide economic profitability to the user, the initial cost needs to be relatively low. This is in relation to the opportunity cost. In addition, it should decrease discomfort, save on time and effort, provide immediate reward and increase prestige. Secondly, it should be compatible with the social/cultural values and beliefs of the organization, previously introduced ideas and with the client's needs. Third, the technology should be easy to

use. Forth, the technology should have the ability to be piloted or tried. Finally, its results should be easily traceable.

2.3 Automated Information Systems

2.3.1 Zizi System

Each of the systems have solutions that it presents to the Kiambu County Government. Through the Zizi System, the field agents are able to use advanced POS terminals which have distinct components that have their own distinctive capabilities and perform specific functions. First is the barcode reader which authenticates the receipts that are made and certificates that are issued once payment is made. This allows information regarding each transaction made on the field to be easily accessed online. The GPS is able to track the movement of the county officials; the GPRS allows the recalling of an official when the need arises. Another component is the camera which is used to take photographs as evidence in court when conflict arises during the field agent's interaction with the citizens. Finally, the Near Field Communication (NFC) reader provides a platform for the payment of parking fees, utility bills, licenses, land rates among others. This makes the supervision of what the field agents are doing easier. Hence, the field agents become more transparent and accountable for their actions (Maina, 2015).

2.3.2 County Pro System

The County Pro Systems on the other hand are used by the county officials at the offices. It allows them to be able to track online applications for single Business Permits, track application status, track online property registration, property transactions, land rate and arrears payments. This simplifies their record keeping and retrieval procedures and makes them provide certificates and permits in a more speedy fashion (Okiro, 2013). This allows all records to be accessible to the citizens themselves through the county portal. The County Pro system therefore also increases the transparency of the county and helps reduce the collusion between citizens and officials as transactions are immediately accessible at the portal (Ndirangu, 2015).

2.3.3 Integrated Financial Management Information System

The IFMIS has been implemented in the National treasury, Ministry offices and county government offices. It helps to attain a unified financial management system (Ochieng, 2014). This has contributed to the heightened transparency and accountability within the functions of

the government. The initiators for IFMIS project plan are the Office of the Auditor General and the Ministry of Finance and National Planning. The implementation of IFMIS in the County Government was therefore supported by the National Government in Kenya (Kahari et al., 2015). The main components of IFMIS include: reviewing business processes to improve financial management; linking planning to budget allocation through the policy objectives; automate the supply management function; auto-reconcile revenue and payments; record and report to the Central Bank of Kenya on financial position (Kamenyi, 2016). According to Nguli, Gicaci, Kahiu, Kamau and Mungai (2016) Kiambu County continuously uses this technology to gain a tight grip in expenditure controls and ensure timely reports.

2.4 County Operations

The county government operates in an open system. Their inputs are obtained through the services delivered by the County government and the result expected in the process below would be either satisfied or dissatisfied citizens. According to the IASAM, technology has the effect of improving performance, which is greatly dependent on several factors (Aizstrauta & Ginters, 2015). The Kenya County Government's operations mainly lead to the undertaking of different projects mainly aimed at improving social welfare and the provision of services to the citizens. Examples of county government projects and services include: building sheds for motorbike operators, providing safe parking spaces to matatu operators and private vehicles, cleaning the market places, and providing a healthy environment for them to operate, building of infrastructure (like roads), building hospitals, providing cleaning services to the counties like garbage collection, firefighting services and many others. The county government's operations can be summarized using the figure below:

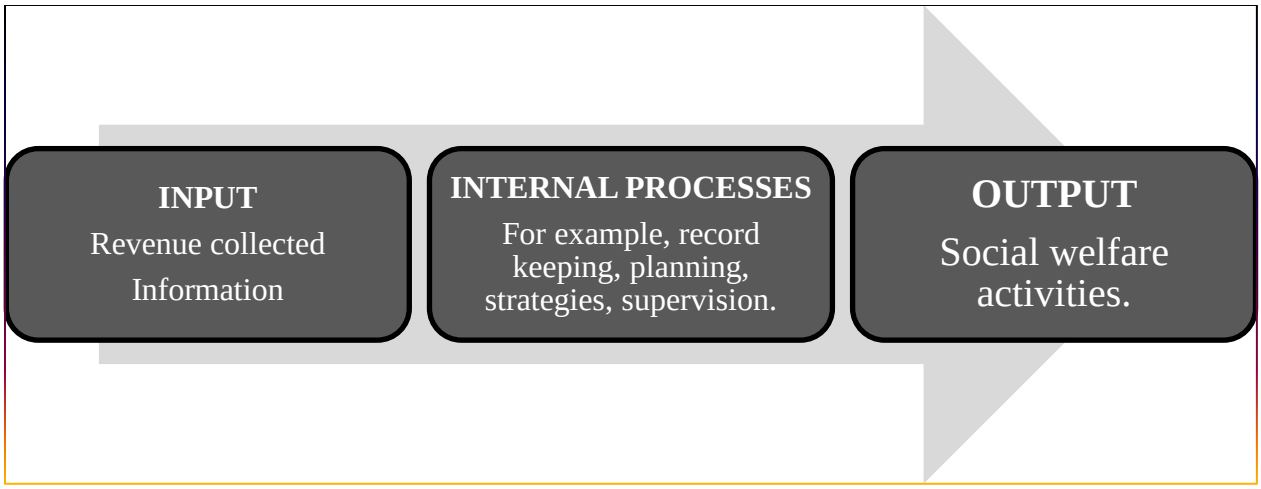

Figure 2.1: County government operations

Source: Researcher

Ndunda, Ngahu and Wanyoike (2015) highlighted that, the county governments get their revenue from taxation, permit fees, license fees and other sources. This amount is collected both in the field and in the county offices. The amount is then used to source for supplies to perform devolution processes and also procure county daily utilities and supplies. Hence, supervision of transactions linked to the funds received and paid out is of great importance to ensure optimal output. Transparency and accountability was made possible as all payment transactions were reflected by the county government's AIS making the county operations simpler. This includes supervision as all transactions could be monitored and all field agents' movements could be monitored using the Zizi System. Another area affected is record keeping and retrieval. This is since all records regarding payment were made available online once the transaction is done and a receipt issued or invoice received. This made the county government's operations to be more transparent as all revenue within the county can be monitored making those involved with the collection of revenue more accountable.

2.5 Empirical Studies

When Information and Communication Technology (ICT) is applied to different forms of relationship between governmental authorities and the citizens they serve, it can: facilitate the low-cost access to information; allow discussion groups to be created and feedback to be collected through surveys and; above all, it permits the real-time interaction between them, as a result promoting active participation of the citizens (Atsiaya et al., 2014).

According to the conclusion made by Berisha-shaqiri (2015), several countries are moving to the knowledge economy hence better creation, accumulation and dissemination of knowledge. MacGregor (2011) explain that online transactions increase sales, increase productivity and economies of scale across the operational processes of business. Countries are taking advantage of E-Commerce to open up their economies and diffuse internet technology (Waghmare, 2012). The systems are designed to help individual customers and companies as well as the banks to eliminate or reduce some of the problems inherent in the settlement and payment process (Sumanjeet, 2009). They have the potential to yield great results in the long run as technology advances in processes have the capability to yield higher performance by increasing quality, lowering costs, increasing productivity and escalating capability of processing (Slack et al., 2010).

Atsiaya et al., (2014) argued that E-governance was bringing in Total Quality Management (TQM) practices into the County Government. Maina (2015) found a positive correlation between the automation of financial services and the county government's financial competitiveness as they directly influence their operations. She however, acknowledged that employee goodwill is very important for the success of the systems in providing the desired output levels. Hence, employee involvement was highlighted as being very crucial as they are the ones performing the necessary operations. Based on her respondents, automation of all operations has the capability to enhance the competitiveness of a county since efficiency as well as optimal service delivery will be heightened.

Sumanjeet, (2009) explains that generally, IT used for payment allows individuals to perform financial transaction electronically which reduces the lines and other hassles. This gives individuals the freedom to pay their taxes, licenses, fees, fines and purchases at unconventional locations. Therefore, the implementation of these systems in Kenya has the potential to at least reduce the long queues that have been very common in the County Council halls.

A study done by Okiro (2015) on the effect of e-payment system on revenue collection in the Nairobi City-County Government found that the e-payment system significantly influenced revenue collection performance positively, such that increased adoption of e-payment system increases revenue collection performance. According to the (Nguli et al., 2016), the automation project of 2014 has been a huge success and has had a great impact on Kiambu County's revenue

performance. The achievements led to the County winning awards for its adoption of ICT and the generation a lot of interest, at this moment almost all counties in Kenya have gone for benchmarking missions in Kiambu. The success was attributable to the combined team effort of not only the Finance Department but also the technical competence of staff in the Department responsible for ICT under the championship of His Excellency the Governor.

The technology of E-Commerce has developed over time and has helped customers in terms of convenience and accessibility (Singh, Singh, Shahazad, Chandra, & Khan, 2012). Another advantage by (Sumanjeet, 2009) is that the customers can easily make their payments without going to the bank premises and the transactions can be remotely confirmed. The most common form of mobile money in Kenya is Mobile "Pesa" (M-Pesa), of which "pesa" is Swahili for money. It is an electronic payment and store of value system that is accessible through mobile phones (Mas & Radcliffe, 2010). It allows the users to exchange cash for Electronic Float ("E-Float") on their phones, to send E-Float to another cellular or Electronic Bank enabled bank account user and to exchange E-Float back into cash (Mbiti & Weil, 2014). The number of M-Pesa outlets are nearly five times the number of Post Bank branches, Post offices, Bank branches and ATMs in Kenya (Mas & Radcliffe, 2010).

In the county government, the desired features of mobile parking described by Muema, Kyambo, Kyambo, Kirichu and Senagi (2014) include real-time parking and mobile payment information which will ensure efficiency and effectiveness. They stated that mobile parking would make it easier and faster to work, boost the performance and productivity of work and provide more control over work. This is since the system is easy to use and that there is the increased use of Mobile Banking in Kenya hence the necessary infrastructure is available.

Sharma, Tripathi, and Gupta (2010), argued the MIS minimize information overload, encourage decentralization, bring in co-ordination and make control easier. They added that MIS cater for financial needs, information gluts, constant change, web services, user expectations, time shortages, automation, demand of users as well as staff and the control on information production. Edelhauser and Dima (2012) argued that competitiveness can be achieved by the use of IT and their application in operational management.

A study done by Al-mamary, Shamsuddin, and Aziati (2014) concluded that MIS play a strategic role. It provides appropriate information, in the right place and time to facilitate management

functions. They keep track of business activities hence directly affect decision, plans and staffing. They are used in all business functions making them business imperative. The competitive advantages offered by the MIS argued by (Masa'deh et al., 2012) are both financial and economic in nature.

Shamsuddin, Hasan and Aziati (2011) highlighted that MIS improve information quality, decision making and performance of management functions. The ways MIS provide competitive advantage is through cost reduction and innovation (Berisha-shaqiri, 2015). A study by Srinivas (2014) concluded that the incorporation of numerous sustainable factors in organizational plans are dependent on the MIS design and architecture for fast and accurate data processing. MIS brings forth more the effective use of resources as it allows innovation and productivity.

Yusuf, Mohammed and Kazeem (2014) argued that the possible benefits of MIS are possible clerical cost reduction, better processing due to heightened accuracy, benefits that are intangible and better working environment and job satisfaction. As argued by Odinioha and Chukwuma (2013) the integration of information by the MIS help support structured decisions at both operational and tactical levels. This is as they provide reports that are summarized and easier to understand as compared to the TPS.

2.6 Conceptual Framework

According to the technology Determinism Theory, social pressure influences the adoption of new technology (Chandler, 1995). This is since, every entity or organization operates in a market. The global use of E-Governance practices has therefore caused the adoption of such technologies in Kenya. In the County Government, there is the adoption of the Automated Information Systems with an aim of improving their operations. The TAM argues that technology needs to be easy to use and increase the ease of the work done. This is as per the Technology Acceptance Theory by Davis. However, after adopting this new technology, it needs to be superior to the previous, hence heighten performance. Hence, under the conceptual framework (Figure 2.3 below), the independent variable is the AIS, the dependent variable includes the county governments operations. The independent variable in this study has been operationalized by the use of the County-Pro System, Zizi System and IFMIS. On the other hand, the dependent variable has been operationalized in terms of record keeping, transparency and supervision. According to Theory of Diffusion of Innovations, when inventing a new technology,

it has to provide relative advantage, it needs to be compatible, with little complexity, trialability which basically involves educating or experimenting and noticeable outputs. Therefore, the intervening variables include the AIS being compatibility with the county government's operations, adequate training to improve its ease of use and internet connectivity as the technology cannot work efficiently if there is no internet.

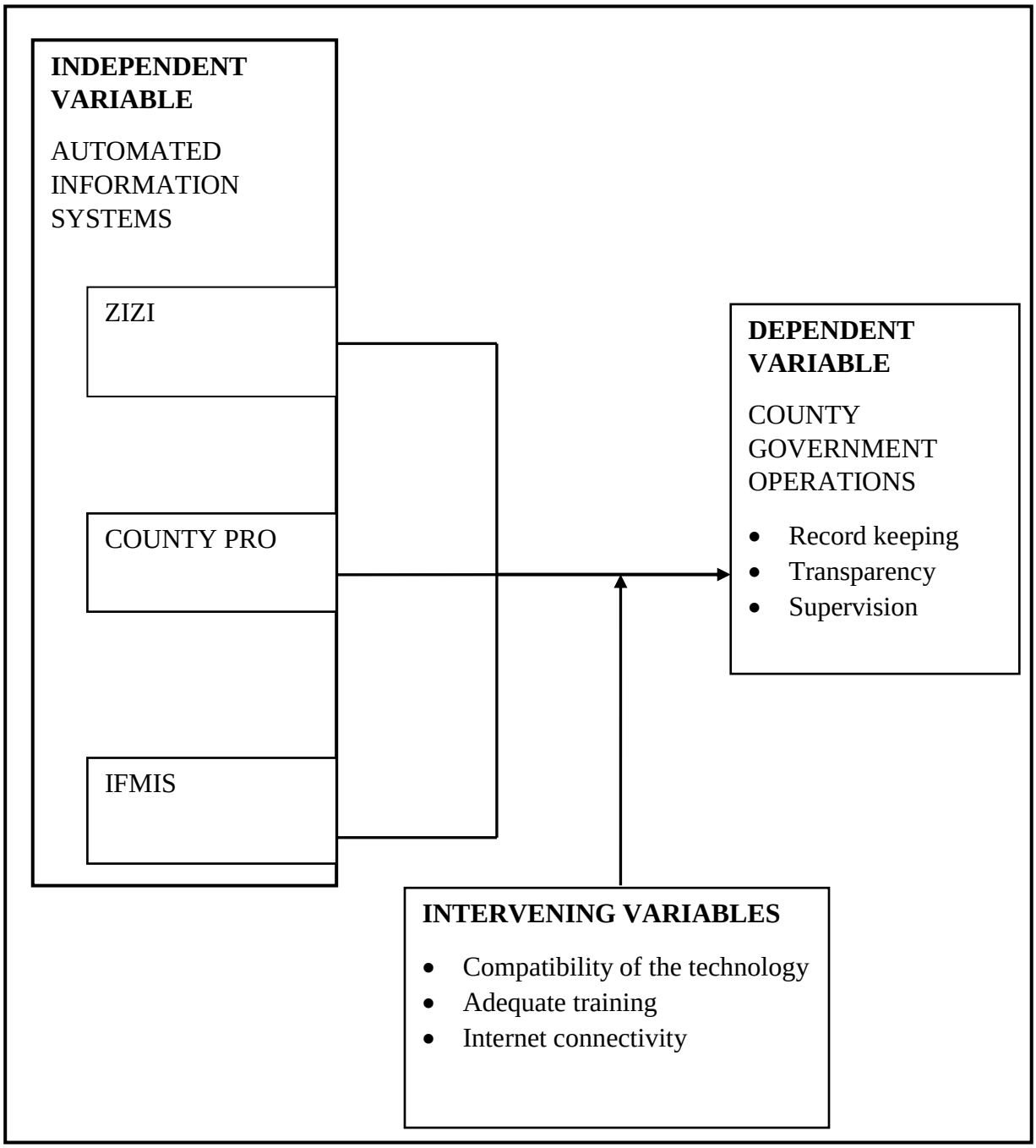

Figure 2.2: A Conceptual Framework

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter describes the population of interest and the tools and techniques that will be used to gather and analyze data from the sample population in the study.

3.1 Research Design

The study employed descriptive research design. Descriptive research design aims to bring out what a certain norm is, given the situation under study (Walliman, 2011) hence, making this research design more appropriate.

3.2 Target Population

The study employed complete enumeration survey method where the target population of this study included 36 respondents from Kiambu County. This is since it was ranked the best performing county after the implementation of the systems in the year 2016 (Nguli et al., 2016). Data was collected from all twelve sub-counties in Kiambu. The study targeted the IT Officer, Financial Officer and the Revenue Officer in each of the Sub-Counties. This is since the IT manager was better placed to provide information related to the general systems and there implementation. The financial manager had the knowledge required to provide information on the impact it has had on their operations in terms of transparency and accountability in financial transactions. Finally, the Revenue Officer who is in-charge of the field agents, were targeted as they had information on the ease brought forth by the systems in terms of record keeping and supervision. Hence, the total population under study as illustrated in appendix three was 36.

3.3 Data Collection Procedures and Research Instruments

Primary data was collected to test the three hypotheses. The researcher distributed structured questionnaires through a ‘drop and pick’ method. A letter of introduction accompanied the questionnaires explaining the purpose of the study and also assuring the respondents of confidentiality and anonymity of response.

3.4 Validity and Reliability

3.4.1 Validity

Validity is the ability for property to logically draw conclusions and correctly form an argument (Walliman, 2011). This is where the results of the research should correctly reflect the real and actual situation in the entire population. The research instruments were distributed within the normal life setting within normal life conditions and the questions targeted to bring out the relationship between the variables under study. To test validity, the researcher sought the expert opinion from the supervisor, other lecturers, finance officers, revenue officers and IT officers in the sub-counties.

3.4.2 Reliability

Reliability is concerned with the degree to which the researcher will be able to yield the same results when the study is conducted over and over again. The researcher intends to use the measure of internal consistency to test the reliability of the findings. This is since a retest method or an alternative form method will be undesirable due to the potential impatience by respondents since it will have to be conducted in the same county. This is because the level of implementation is different in each county and the systems implemented, that is; County Pro and Zizi, differ from county to county but still perform the same functions. The measure of internal consistency is represented by Cronbach's Alpha (Carmines & Zeller, 1979). The acceptable value of alpha from the various reports ranges from 0.70 to 0.95 (Tavakol & Dennick, 2011). In this study, a value of 0.7 and above was accepted. The findings from reliability analysis were as presented in table 3.1

Table 3.1: Reliability Analysis

Variable	Cronbach's Alpha	Number of Items
County Pro	0.737	5
Zizi	0.805	7
IFMIS	0.721	5
County Operations	0.914	9

Table 3.1 shows that the researcher's findings were reliable as all values are greater than 0.7. This is since County Pro $\alpha = 0.737$, Zizi $\alpha = 0.805$, IFMIS $\alpha = 0.721$ and County Operations $\alpha = 0.914$.

3.5 Data Analysis Techniques

The data from the questionnaires was screened and entered in readiness for analysis using the SPSS software. The data was then carefully analyzed and tabulated appropriately. Descriptive statistics was used to analyze the data and bring out any observable trends and patterns of the findings.

Multiple regression was used to test whether the county operations can be predicted based on the use of the IFMIS, County Pro system and Zizi System. The equation used was;

$$\gamma_c = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3$$

Where, Y_c = Estimated value of the county operations,

β_0 = Intercept on the Y axis,

x_1 = County Pro Systems

x_2 = Zizi Systems

x_3 = IFMIS

β_1 = Corresponding change in the county operations as a result of the x_1

β_2 = Corresponding change in the county operations as a result of the x_2

β_3 = Corresponding change in the county operations as a result of the x_3

3.6 Ethical Considerations

Working with people while carrying out a study brings about the issue of Ethics (Walliman, 2011). It's concerned with the appropriate behavior of the researcher in data collection. The researcher assured the participants of confidentiality and anonymity through the cover letter that accompanied the questionnaires. The names of the participants were not revealed on the questionnaires.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents data analysis and results of the analysis pertaining to the data collected for this research study. Results are presented in tables accompanied with discussions. Descriptive statistics was used to describe research variables while correlation and multiple regression analysis were used to test the relationships between variables.

4.2 Study Response

The study targeted three respondents, the Finance Officer, Revenue officer and IT officer, for each of the twelve Sub-Counties in Kiambu County giving a total of 36 respondents. All the 36 respondents successfully filled the questionnaires leading to 100% response rate. According to Walliman (2011), 100 % response rate is classified as very high and hence the data is representative of the population under study and all areas of data collection were covered as well.

4.3 Background Information

The study sought to establish respondents' gender, position and duration worked. Position held and duration worked was important in establishing the respondents' ability to respond to the research items. The findings are as presented in table 4.1

Table 4.1: Background Information of Respondents

		Frequency	Percent
Gender	Male	24	66.7
	Female	12	33.3
	Total	36	100.0
Position	Finance Officer	12	33.3
	IT Officer	12	33.3

	Revenue Officer	12	33.3
	Total	36	100.0
Duration	0-1 year	4	11.1
	2-3 years	12	33.3
	4-6 years	5	13.9
	Over 6 years	15	41.7
	Total	36	100.0

As presented in table 4.1, 66.7 of the respondents were male while 33.3 were females. This implies that a majority of the IT, Finance and Revenue officers in Kiambu County are male. It also implies that the one third gender rule is upheld in the county. Within each Sub-County, there is a Finance Officer, IT Officer and Revenue Officer as provided for in the county regulations. Majority of the respondents, 41.7%, had worked in the county for over 6 years. This implies that many employees were absorbed from the initial Municipals into the County Government. 41.4 % of the respondents had worked in the county for less than 4 years. These are the employees that were employed by the County Government after devolution.

4.4 Descriptive Analysis

The study assessed the use of County-Pro, the use of Zizi and the use of IFMIS (Independent variables); and how they had an effect on the county government's operations (dependent variable). The study analyzed data on individual variables using means and standard deviations and the findings presented in table 4.2 to 4.6.

4.4.1 Descriptive Statistics on Automated Information Systems.

Descriptive analysis on the implementation, use and applicability of AIS gave the results presented in table 4.2, 4.3, 4.4 and 4.5

Table 4.2: Implementation of A.I.S.

Statements	N	Minimum	Maximum	Mean	Std. Deviation
Training of staff was done before the implementation of the AIS	36	2.00	5.00	4.3611	1.01848
Reliable internet connection	36	1.00	5.00	3.6389	1.07312
Valid N	36				

Based on table 4.2, (M=4.3611; SD=1.01848) implies that before the implementation of the Automated Information Systems in Kiambu County, most of the staff, directly involved in the use of the systems, were trained in most of the sub-counties. These findings are consistent with the argument of Pabedinskaite (2010) that, for implementation of new technology, such as AIS to be successful, training of the staff is key.

M=3.6389 and SD=1.07312 implies that the county has averagely reliable internet, which is used to perform operations relating to the AIS. The use of the AIS is greatly dependent on the use of the internet. This is as the data is accessible to all officials, through the AIS, on a network which connects them (Masa'deh et al., 2012).

Table 4.3: Descriptive Statistics on County Pro System

Statements	N	Minimum	Maximum	Mean	Std. Deviation
County pro was successfully implemented	36	3.00	5.00	4.7222	.51331
County office payments are accessed on county pro	36	4.00	5.00	4.8611	.35074
Citizen awareness of the County Pro System	36	1.00	5.00	4.0000	1.01419

The monitoring of county officials' transactions can be done through the County Pro System	36	4.00	5.00	4.8889	.31873
Popularity growth level of County Pro System	36	3.00	5.00	4.6111	.64488
Valid N	36				

Table 4.3 gives a description on the implementation of the County Pro System and how they are used in the Kiambu County Government. M = 4.7222 and SD = 0.51331, shows that the system was successfully implemented in most sub-counties in Kiambu County. In addition, all respondents agreed that the County office payments are accessible through the use of the County Pro System and that transactions in Kiambu Sub-County offices are monitored through the use of the systems. M= 4.0 with a minimum value of 1.00 and SD = 1.01419, shows that citizens in Kiambu county are not well informed about the County Pro System; M= 4.611 and SD= 0.64488 means that the popularity of the County Pro system is however growing.

Table 4.4: Descriptive Statistics on Zizi System

Statements	**N**	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
The Zizi System was successfully implemented	36	3.00	5.00	4.5833	.55420
Field agents' revenue receipt are accessed through the Zizi System	36	3.00	5.00	4.6111	.54917
Transactions made through POS are accessed through the Zizi System	36	3.00	5.00	4.6944	.52478

There is citizen awareness about the POS terminal	36	1.00	5.00	4.3333	.92582
Field agents' movements are monitoring through the Zizi System	36	4.00	5.00	4.7222	.45426
Field transaction records are accessed on the Zizi System	36	4.00	5.00	4.7222	.45426
Growth in the popularity and use of the Zizi System	36	3.00	5.00	4.5278	.65405
Valid N	36				

Table 4.4 provides information regarding the use and the implementation of the Zizi System. M= 4.5833 and SD= 0.55420 indicates that the Zizi system was successfully implemented in all the various Sub – Counties in Kiambu County. M= 4.6111 and SD= 0.54917 indicates that what the county's field agents collect is reflected on the Zizi System. In addition M=4.6944 and SD= 0.52478 is an indication that transactions made on the POS terminals can be accessed on the Zizi System as well. M= 4.3333 and SD= 0.92582 shows that citizen awareness in the various counties still has room to be improved. However, M= 4.5278 and SD= 0.65405 indicates that there is growth in the popularity of the system in the County. All respondents however agreed that the field agent's movements are monitored using the system and the field transaction records are also accessed on the Zizi System.

Table 4.5: Descriptive Statistics on IFMIS

Statements	**N**	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Payments by suppliers reflected on IFMIS	36	2.00	5.00	3.1667	.84515

IFMIS is used to perform budget planning	36	1.00	5.00	2.5556	.93944
Citizen awareness about IFMIS	36	3.00	5.00	4.4444	.65222
Procurement reports accessed on IFMIS	36	1.00	4.00	2.7778	.72155
Growth in IFMIS popularity	36	1.00	4.00	2.5000	.81064
Valid N	36				

Of the three AIS, IFMIS is the one that is not fully functional in Kiambu County as indicated in table 4.5. M= 3.1667 and SD= 0.84515 is an indication that not all supplier information is reflected on the system. M= 2.5556 and SD= 0.93944 shows that budget planning is not done in Kiambu County with the use of the IFMIS System. M= 2.7778 and SD= 0.72155 is an indication that procurement reports are not all accessible on the IFMIS system in the County. M=2.5000 and SD= 0.81064 indicates that the popularity growth of the system is low. However, M= 4.4444 and SD = 0.65222 shows that citizen awareness of the System in the County is high.

4.4.2 Descriptive Statistics on County Operations

The results for descriptive analysis on the effect the AIS have had on the County's operations are presented on table 4.6. The general response to the improvement in the county operations was however positive.

Table 4.6: Descriptive Statistics on County Operations

	N	Minimum	Maximum	Mean	Std. Deviation
Improved record retrieval practices	36	4.00	5.00	4.6944	.46718
Accounting for the Sub–Counties' staff working hours	36	4.00	5.00	4.6667	.47809

Better staff supervision of those handling revenue	36	3.00	5.00	4.6111	.54917
Transparency and record management has improved	36	3.00	5.00	4.6111	.54917
Produce more accurate reports	36	1.00	5.00	4.5556	.77254
Better monitoring of revenue that comes in and goes out	36	3.00	5.00	4.3889	.68776
Higher accountability of transactions and operations	36	3.00	5.00	4.3889	.64488
Better management of citizen and supplier records	36	2.00	5.00	3.7778	.68080
Faster and more efficient operations in the county	36	4.00	5.00	4.6944	.46718
Valid N	36				

Based on table 4.6, all respondents agreed that the AIS have improved record retrieval practices, the supervision of staff working hours and has brought faster and more efficient operations in the county. M= 4.6111 and SD= 0.54917 demonstrates that there is better supervision of staff members handling revenue and improved transparency and record management. M= 4.5556 and SD= 0.77254 indicates that through the AIS, the County Government is able to produce more accurate reports. M= 4.3889 and SD= 0.68776 indicates that the County is able to better monitor the revenue that goes in and comes out. M= 4.3889 and SD= 0.64488 shows that there is better accountability for the transactions and operations in the County. However, M= 3.7778 and SD= 0.68080 illustrates that the management of citizen and supplier records is low. This supports the finds of Al-mamary, Shamsuddin and Aziati (2014) who argued that information systems provide appropriate information, in the right place and time to facilitate management functions.

4.5 Correlation Analysis

The general objective of the study was to determine the effect of the implementation of the AIS on the Kenya County Government's operations. Pearson Correlation measures the strength of linear association that exists between two variables (Landau & Everitt, 2004). Table 4.7 shows the results on the correlation analysis between the three AIS used in this study and county operations.

Table 4.7: Correlation Analysis between County Pro system and County Operations

		County Pro	**Zizi**	**IFMIS**	**County Operations**
County Pro	Pearson Correlation	1	.522**	-.190	.510**
	Sig. (2-tailed)		.001	.133	.001
	N	36	36	36	36
Zizi	Pearson Correlation	.522**	1	-.058	.765**
	Sig. (2-tailed)	.001		.369	.000
	N	36	36	36	36
IFMIS	Pearson Correlation	-.190	-.058	1	.225**
	Sig. (2-tailed)	.133	.369		.093
	N	36	36	36	36

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.7 shows that; there is a significant ($0.001 < 0.01$) positive and moderate ($0.5 > .510 < 0.7$) linear correlation between county operations and the County Pro Systems. This means that, any positive influence on the implementation of the County Pro System, moderately improves the county's operations.

Secondly, according to table 4.7, there is a significant (0.000<0.01) positive and strong (0.765>0.7) linear correlation between County Operations and the use of the Zizi System. This means that, any positive influence on the implementation of the Zizi System, greatly improves the county's operations.

Lastly, table 4.7 shows that; there is a no statistically significant (0.093 > 0.01) linear correlation between County operations and the IFMIS. However, there is a positive but low relationship (0.225<0.5).

4.6 Multiple Regression Analysis

This study tested the predictable relationship that exists between the independent variable (County operations) as a result of the dependent variable (AIS).

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.832[a]	.692	.663	.26711

a. Predictors: (Constant), IFMIS, Zizi, County-Pro

From table 4.8, there is a strong positive linear correlation of 83.2% between the AIS and the County Government's Operations. This means that the AIS have significantly improved the County's operations. However, 66.3% of the total variation in the County Government's operations can be explained by the positive linear relationship between the AIS and the County's operations. The remaining 33.7% of the variation in the County's operations was caused by other factors.

Table 4.9: Coefficients[a] and Hypothesis Test

Model	Unstandardized Coefficients		Standardized Coefficients	z	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF

(Constant)	-.625	.619		-1.009	.320		
County Pro	.200	.107	.219	4.867	.001	.702	1.425
Zizi	.747	.129	.669	5.809	.000	.726	1.378
IFMIS	.255	.084	.305	3.053	.005	.962	1.040

a. Dependent Variable: County Operations

As per table 4.9, the Variance Inflation Factors (VIF) for the three variables is satisfactory. The VIF indicates if the variance of the weight coefficient is inflated (Tyrrell, 2009). Hence, the degree to which the weight is correlated with either of the predictors in this model is low. This is since the VIF for the County Pro System = 1.425 (<5); of the Zizi System= 1.378 (<5); and of the IFMIS= 1.040 (<5).

4.7 Hypothesis Testing

The literature review and theoretical reasoning led to the belief that Zizi, County Pro and IFMIS as types of AIS used and have the effect of heightening operations in the County Government. A z-test (n >30) was used in the study at a 0.05 level of significance to test the three hypotheses in this study. The findings were as presented in this section;

4.7.1 Hypotheses testing on the effect of County Pro System on County Operations

The first hypothesis was; H_{01}: County Pro System has no significant effect on the County Government's operations. From the test, the results presented in table 4.9 were; z=4.867 and p=0.001 (<0.05). The findings indicate that County Pro System has a significant effect on the County Government's operations, the first hypothesis was therefore rejected and conclusion made that County Pro System is a significant determinant of the Kiambu County Government's operations.

4.7.2 Hypotheses testing on the effect of Zizi on County Operations

The second hypothesis was; H_{02}: Zizi System has no significant effect on the County Government's operations. The results on the test of this hypothesis are shown on table 4.9, where z = 5.809 and p = 0.000 (<0.05) which indicates that the Zizi System has a significant effect on

the County Government's operations. Therefore, the second hypothesis was also rejected. Consequently, the conclusion made was that the Zizi System is a significant determinant of Kiambu County Government's operations.

4.7.3 Hypotheses testing on the effect of IFMIS on County Operations

The final hypothesis was; H_{03}: IFMIS has no significant effect on the County Government's operations. From the test, the results shown in table 4.9 were obtained. As per table 4.12, z = 3.053 and p = 0.005 (<0.05) which indicates that the IFMIS has a significant effect on the County Government's operations. Therefore, the third hypothesis was also rejected. Subsequently, the conclusion made was that the IFMIS is a significant determinant of Kiambu County Government's operations. However, based on table 4.7, the positive relationship is significantly low.

4.7.3 Hypotheses testing on the general effect of AIS on County Operations

Table 4.10: ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.131	3	1.710	23.973	.000[b]
	Residual	2.283	32	.071		
	Total	7.414	35			

a. Dependent Variable: County Operations

b. Predictors: (Constant), IFMIS, Zizi, County Pro

ANOVA was used to test for statistical significance of the overall effect of AIS on County Operations as illustrated on table 4.10. Significant value of .000 (<0.05) from table 4.10 shows that the effect is significant. This indicates that model (i) below is a useful linear model in this study.

From table 4.9, the following multiple regression model was developed for the study

$\gamma_c = -0.625 + 0.2x_1 + 0.747x_2 + 0.255x_3$ …….. (i)

Where, Y_c = Estimated value of the county operations,

x_1 = County Pro Systems

x_2= Zizi Systems

x_3 = IFMIS

From model (i), -0.625 is the Y intercept of this model, indicating the level of performance achieved in Kiambu County without the adoption of AIS. The rate of change caused by the County Pro System on the County's operations is 0.2; by Zizi System is 0.747; and by the IFMIS is 0.255. Since the values are all positive, it implies that the implementation of the AIS causes an improvement in the county operations. Hence, we reject the fourth hypothesis and conclude that the AIS have had a significant effect on county operations.

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Discussed in this chapter is the summary of the findings, the conclusion in this study and the recommendations based on the later and former. Highlighted in this chapter as well are the research gaps that the researcher felt further research should be done to bridge them. The study objective directed the development of the conclusion as well as the recommendations.

5.2 Summary of Findings

This section presents a summary of findings based on the study objectives.

5.2.1 County Pro System and Kiambu County Government's operations

This study set out to determine the relationship between the County Pro System and County Government's Operations. It aimed to determine how the use of the County Pro System has affected the County's supervision, record keeping practices as well as transparency levels. Therefore, the study established that County Pro System has a significant effect on county operations. This is because, the implementation of county pro has improved the record keeping practices and heightened transparency in the County offices. This can be attributed to its record keeping capabilities for all data regarding transactions that occur between the county officials and the county citizens. The record keeping process is automated hence; the retrieval of records regardless of the duration has been simplified. This has also increased transparency at the County offices as the documents are easily accessible and the destruction of documents can be easily traced. This is since information is accessible on a network, meaning all officials with authorization can access all transaction data. In addition, all county documents can be supervised from the head office in Kiambu. Every transaction made is documented which is traceable to the individual who made it. Therefore, the County Pro System has also improved supervision.

5.2.2 Zizi System and County Government's operations

Establishing the relationship between the Zizi System and County Operations was the second objective in this study. Though the correlation and regression of the Zizi System with County operations a positive significant relationship between the two variables was revealed. A significant effect on county operations therefore due to the implementation of the Zizi Systems.

The revenue collected in the field, such as the market, bus-park, parking of personal vehicles and the business premises, is recorded using the POS terminals which are connected to the county offices through the Zizi System. Hence, this information is accessed by the supervisors at the county offices through the Zizi System. This makes sure that all transactions done in the field can be accessed in the county offices making their record keeping practices easier and transparent. In addition, the POS terminals track the movements of the county field agents since it has a GPS system. This makes supervision easier as the county officials are able to track the movements of the field agents while using the Zizi System. This also increases transparency as the field agents know that their work hours can easily be monitored.

5.2.3 IFMIS and County Government's operations

This study aimed to determine the relationship between the IFMIS and the Kiambu County Government's Operations. It set out to determine how the use of the IFMIS has affected the County's supervision, record keeping practices as well transparency levels. Therefore, the after correlating and regressing IFMIS with County operations, it was revealed that the system has a significant effect on county operations. However, the correlation revealed that the relationship between the two variables was positive but low. This may be attributed to the fact that it is still not performing its function. This is as supplier records are still manual in most of the counties and hence, transparency of the procurement process is low. This therefore makes the supervision of the officials directly interacting with suppliers not to be easy and tedious.

5.3 Conclusion

ICT plays a key and leading role in national development efforts, underpinning the recognition by the government that efficient and adequate ICT infrastructure is a prerequisite for sustainable ICT sector growth. According to Ellul (1967) eventually, all tasks and work activities will be automated. IT evolves in a continuous fashion; whereby new inventions either die off or become so ubiquitous that they have so much room for improvement. A few researchers have examined the trends caused by Information Communication Technology on the Kenyan economy and have in most cases had results of a positive significant relationship. Okiro (2013) for instance concluded that the implementation of Electronic Payment Systems have improved revenue collection in the Nairobi County Government. These findings were later supported by Maina (2015).

From the findings in this study, it was evident that the three AIS have a positive effect on the County government's operations. These operations include; record keeping and transparency as well as supervision. The systems have helped to improve their record keeping practices as they are automated making record keeping and retrieval faster and efficient. This has in turn improved transparency as records are more easily available and all transactions made are immediately recorded and sent to the network within the county. In addition, information on what transaction was made and when it was made is available. Also, through the use of the POS, the officials' movements can be traced.

Therefore, the implementation of the AIS has had the effect of; improving the record keeping practices in the county offices; heightening the transparency of the records and transaction details in County offices; improving supervision in the county offices. This ultimately has led to faster and more efficient operations in the County Government. In general however, the AIS translated into better operations in the County Government as opposed to the use of manual systems. Therefore, the implementation of the AIS should continue to be closely monitored for superior performance which will ensure the desired results are achieved.

Furthermore, only 69.2% variation in the county government's operations was found to be due to the use of Automated Information Systems. Hence, the use of the AIS in the County Government is a great predictor of superior operations.

5.4 Limitations of the Study

The research had several limitations. For instance, the county officials were not always easy to find as they were in meeting most of the time. The respondents were also not always cooperative and found it a bother to fill the questionnaire while others were uncomfortable disclosing the information. The researcher was however patient and persistent in convincing the respondents to fill the questionnaires and assured them that the information provided was to be used for academic purposes only. The researcher also distributed the questionnaires to their fellow coworkers to help pass the questionnaires to the absent officials.

Secondly, there was limited time for data collection and analysis which was further constrained by the attitude of some respondents to the study. The researcher however used the assistance of the cooperative officials to persuade the cooperation of the other respondents to hasten their response.

5.5 Policy Recommendations

The Kenya County Government should ensure that the level of implementation of the automated information systems is matched in each County to level up the performance levels. Hence, structures should be created and diligently adopted in the County Government to ensure uniformity in all Counties.

The County Government should take advantage of Kaizen. They should involve themselves on continuous research and development to constantly identify different ways in which the use of technology can further heighten the Kenya County Government's performance levels.

The County Government should also aim to further increase awareness of the systems to ensure that citizens know the right and relevant information pertaining the use of the A.I.S. for service provision. This will help to increase the use of the systems by the citizens and reduce the queues at the county halls.

In conclusion, as per the TAM theory the perceived usefulness of IFMIS needs to be built upon. This will build the prospective subjective probability of a user to view the system as one that will make their work easier increasing their job performance. This will help the county official achieve superior performance as compared to the current performance level evident through IFMIS.

5.6 Recommendations for Further Study

The study focused on information provided by the county government officials who directly access information regarding operational changes. Hence, there was the isolation of potential respondents who directly interact with the systems such as field agents who could also give relevant information. Hence, further research should be done while targeting this respondents.

The study model only explained 69.2% of the county government's improved operations due to the adoption of the automated information systems. Hence, it is recommended to conduct a similar study and include other variables that may be left out in this study.

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APPENDICES

APPENDIX ONE: LETTER OF INTRODUCTION

EGERTON UNIVERSITY

NAKURU TOWN CAMPUS

FACULTY OF COMMERCE

DEPARTMENT OF ACCOUNTING, FINANCE AND MANAGEMENT SCIENCE

P.O BOX 13357-20100,

NAKURU

TO THE KIAMBU COUNTY GOVERNMENT HEAD OFFICE,

Dear sir/madam,

RE: REQUEST FOR RESEARCH DATA COLLECTION IN THE KIAMBU COUNTY GOVERNMENT

I am a student of Egerton University studying for my postgraduate degree, Master of Business Administration (MBA), Operations Management option. As part of the requirement of the degree, I am conducting a study on "**The Effects of Automated Information Systems in the County Governments' Operations"** using a case study of Kiambu County.

I kindly request for your permission to conduct the study and distribute questionnaires to the Finance Officer, Revenue Officer and IT Officer in each Sub-County within Kiambu County. The questionnaires have been divided into six sections in a manner designed to collect data on this research problem. Please note that participation in this study is with no known risks and no payment provided. The information provided will be treated with a high degree of confidentiality and will be solely used for academic research purpose only.

Your kind cooperation will be highly appreciated.

Yours sincerely,

Muraya Brenda Wairimu

APPENDIX TWO: QUESTIONNAIRE

Please provide the response that best describes your knowledge for each question

PART 1: DEMOGRAPHIC QUESTIONS

Please tick the appropriate answer

1. What is your gender?

    a. Male [ ]
    b. Female [ ]

2. What is your position in the Kiambu Sub - County Government?

    a. Finance Officer [ ]
    b. IT officer [ ]
    c. Revenue Officer [ ]

3. For how long have you been an employee of the Kiambu County Government (including the municipals)?

    a. 0 – 1 year [ ]
    b. 2 – 3 years [ ]
    c. 4 - 6 years [ ]
    d. Over 6 years [ ]

PART 2: AUTOMATED INFORMATION SYSTEMS

4. The statements below relate to the adoption, implementation and use of the various Automated Information Systems in your sub-county. Using the scale below, rate the level to which you agree or disagree with the following statements as per the scale below;

    Where, 1 – strongly disagree, 2- Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly Agree

No	Statement	1	2	3	4	5
i.	County staff members, directly involved in the use of the Automated Information Systems, were trained.					
ii.	The county has reliable internet services for the					

	use of the systems.					
County Pro						
iii.	County Pro was successfully implemented in your sub-county					
iv.	Payments made by citizens to the county officials in the county offices are accessible through the use of County Pro					
v.	Citizens are informed about the use of the County Pro.					
vi.	County Officials' transaction information are monitored through County Pro					
vii.	The popularity of the use of the County Pro has continuously grown in your sub-county					
Zizi						
viii.	Zizi was successfully implemented in your sub-county					
ix.	Information regarding payment made by citizens to the field agents are accessible through the use of Zizi					
x.	The county relies on Zizi to gain access to information regarding transactions made by the use of POS terminals					
xi.	Citizens are informed about the use of the POS terminals.					
xii.	Field agents' movements and work related activities are monitored through Zizi.					
xiii.	All transactions records made in the field can be					

	accessed using Zizi					
xiv.	The popularity of the use of the Zizi has continuously grown in your sub-county					
IFMIS						
xv.	Payments made by suppliers to the county officials in the county offices are reflected on the IFMIS System					
xvi.	The county relies on IFMIS to perform budget planning					
xvii.	Citizens are informed about the IFMIS					
xviii.	E-Procurement as well as manual Procurements reports are accessible on IFMIS in the county government.					
xix.	The popularity of the use of the IFMIS has continuously grown in your sub-county					

PART 3: COUNTY OPERATIONS

5. The statements below relate to the county's operations given the use of AIS. Using the scale below, rate the level to which you agree or disagree with the following statements;
   Where, 1 – strongly disagree, 2- Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly Agree

No	**Statement**	**1**	**2**	**3**	**4**	**5**
i.	The county experiences improved record retrieval practices					
ii.	Your sub-county officers' working hours can better be accounted for					

iii.	The county experiences better staff supervision involved with handling county revenue					
iv.	The transparency and record management practices within your Sub-County have improved					
v.	The county is able to produce more accurate reports					
vi.	The Sub-County is able to better monitor the revenue that comes in and goes out					
vii.	Accountability of operations and transactions within the county has been heightened					
viii.	Citizens and suppliers records are better managed in your sub-county.					
ix.	The Sub-County is generally experiencing faster more efficient operations					

APPENDIX THREE: LIST OF RESPONDENTS

No.	Sub -County	IT OFFICER	FINANACE OFFICER	REVENUE OFFICER
1.	Kiambu	1	1	1
2.	Ruiru	1	1	1
3.	Lari	1	1	1
4.	Limuru	1	1	1
5.	Kiambaa	1	1	1
6.	Juja	1	1	1
7.	Thika	1	1	1
8.	Gatundu South	1	1	1
9.	Gatundu North	1	1	1
10.	Kabete	1	1	1
11.	Githunguri	1	1	1
12.	Kikuyu	1	1	1
	TOTAL	12	12	12
	GRAND TOTAL			**36**

Source: Researcher