

**FACTORS AFFECTING THE PENETRATION AND UTILIZATION
OF ICT IN LOCAL AUTHORITIES IN KENYA:
ICT POLICY, REGULATORY AND STRATEGY SOLUTIONS**

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**Factors Affecting the Penetration and Utilization of ICT in Local
Authorities in Kenya:
ICT Policy, Regulatory and Strategy Solutions**

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**A thesis submitted in partial fulfillment for the Degree of Master of
Science in ICT Policy and Regulation in the Jomo Kenyatta University
of Agriculture and Technology**

2010

DECLARATION

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

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Boniface Mwirigi Kiula

This thesis has been submitted for examination with my approval as the University Supervisor.

Signature:..... Date:.....

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DEDICATION

All glory and honour be to the Lord God Almighty who has seen a peasant/carpenter's son without assurance of going beyond primary school at age fifteen to miraculously sail through high school, attain the dream of a first degree and even pursue a masters degree at age thirty.

To my wife Angela Karema Mwirigi, daughters Prudence Makena and Marjorie Mukami I say thank you and may God richly bless you for the companionship, understanding and encouragement through the tough days of my course work and research.

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LIST OF ABBREVIATIONS

ALGAK	Association of Local Authorities of Kenya
CCT	County Council of Thika
DSS	Decision Support Systems
ERP	Enterprise Resource Planning Systems
ICT	Information and Communication Technology; The definition of ICT herein adopted defines ICT as the technologies, including computers, telecommunication and audio-visual systems, that enable the collection, processing, transportation and delivery of information and communication services to users as per the Kenya ICT Sector Policy Guidelines. ICT penetration and utilization herein refers to the presence of, access and use of ICT or the extent of ICT infrastructure, its access, use and value addition to the organization.
IFMS	Integrated Financial Management System
Job Scale	The position on a scale of 1-20 where an employee belongs and which determines the salary received by the employee; with job scale 1 being the highest.
KLGRP	Kenya Local Government Reform Programme
LAIFOMS	Local Authorities Integrated Financial and Operational Management Systems
LASDAP	Local Authorities Service Delivery Action Programme

LATF	Local Authorities Transfer Fund
MCM	Municipal Council of Murang'a
MCT	Municipal Council of Thika
MIS	Management Information Systems
SMS	This herein includes the short messaging system as well as multimedia messaging system; encompassing the ability and process of sending and receiving written messages via the mobile, the computer or any other ICT tool.

ABSTRACT

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 service delivery. Effort must be made to identify the factors responsible for the slow penetration and utilization of ICT in the local government and develop practical solutions for improvement. This study sought to find out whether the institutional management systems; ICT policy, regulation and strategy; managers' attitude, awareness and skill and ICT resources affect ICT penetration and utilization and make recommendations towards improvement in local authorities. Three councils were purposively selected for this study. Stratified random sampling was employed to obtain respondents within the councils. Eighty respondents were obtained with a ratio of proportional allocation being used to allocate proportionate samples to the councils and their departments based on the respective staff populations. An ICT penetration and utilization index was developed based on a custom-made weighting. Pearson Moment of Correlation Coefficient and test of statistical significance were used to compare the strength of linear relationship between the index and the independent variables with descriptive statistics being used to analyze the results.

ICT penetration and utilization was found to have a significant linear relationship with ICT resources, ICT awareness, attitude and skill as well as the level of education, age, length of service and the job scale of staff. ICT policies and institutional management systems were found to have no significant linear relationship with ICT penetration and utilization. Great investment in ICT resources, ICT awareness, attitude and training as well as better educated staff with the government playing its policy role effectively were recommended towards improved ICT penetration and utilization in local authorities.

CHAPTER ONE

1 INTRODUCTION

This chapter outlines the background, statement of the problem, the general objective, the specific objectives, research questions, justification, scope and limitations of the study.

1.1 BACKGROUND

The Kenya Vision 2030 (GOK, 2007) recognizes the need to enact and operationalize reforms in policy, legal and institutional frameworks to enhance public service delivery in open and accountable manner. Coincidentally, the core services such as land registries, environmental planning and governance, water supply, sewerage, security and disaster management among others are within the jurisdiction of the local government.

ICT penetration and utilization in the public service is a critical element in the information age where citizens' demand efficient and effective services. The citizens are better informed about their rights and responsibilities (Reilly *et al*, 2003). The public is also informed through their interaction with the private sector (for example banks) on the value-addition of technologies towards greater business advantage (Khamula, 2004) and improved services.

The public sector in general and the local authorities in particular utilize ICT in basic operations such as word processing, spreadsheets and e-mail access. Value-adding penetration and utilization and the benefits therein comes when such institutions use

integrated management information systems (MIS), decision support systems (DSS), web portals and the overall enterprise resource planning systems (ERPs) (Harwood, 2003) that support a wide range of internal and customer based services. This in turn supports better quality service, focus on the citizen, efficient and effective work practices and improved decision-making processes.

When the level of penetration and utilization of ICT reaches such levels as the use of MIS, DSS or ERPs, among other customer-oriented systems, services become more effective and efficient while internal interactions between subsystems of the agency gain greater transparency. The real penetration and utilization of ICT in the information age advances from the traditional word processing, spreadsheets and basic e-mail where the institution gains and uses ICT to leverage its management, business and service delivery systems; harnessing system-wide integrated systems (Khamula, 2004).

The current state of management systems in the local authorities may enhance or impede the penetration and utilization of ICT. For instance, in agencies where customer-oriented and service delivery processes, support processes and management processes (KEBS, 2008) are not clearly understood the implementation of ERPs may be encumbered by process uncertainties and inconsistencies as well as unclear and incomplete user and system requirements (Pressman, 2005). With respect to the management systems in the local authorities, a number of questions arise. Do the local authorities have clear customer service, support and management processes? Does each process convert a

definite set of inputs to a complete and satisfactory output? Do the set of process outputs yield a satisfactory service to the customer at the queue? How clear are the roles and responsibilities of each employee in the local authority and how do they value their duty towards achievement of the expectations of the public and the government? How much attention has been given to customer satisfaction, quality of service and continual improvement?

The existing and continued improvement of the policy, regulatory and strategy environment plays an important role (GOK, 2006) in the penetration and utilization of ICT. In the absence of clear cut policy, regulatory and strategy directions, the implementation of projects and systems that yield to a greater level of utilization of high-end value-adding ICT systems such as enterprise resource planning systems that are institution-wide and geared towards wholesome support and improvement of the customer (citizens) services may be haphazard, waste enormous resources, squander the desire for quality services, lose time and make the effort to achieve the desired outcomes a mirage. The prevailing ICT policy, regulatory and strategy space needs to be investigated including its availability, adequacy and coverage, the level of communication, the effectiveness of its implementation and impetus to remain focused until the desired outcomes are achieved in the local authorities.

The level of skills, awareness and attitude of the management on technology in an institution is critical. The management is responsible for policy and strategy direction as

well as resource allocation, communication of policies, strategies and values to the staff and the general conduct and management and institution operations. The senior management may thus play a vital role in the enhancement or impediment of the penetration and utilization of ICT in the public agencies. It is, therefore, important to investigate the level of awareness, skill and attitude towards ICT, their appreciation on the role ICT can play to enhance service delivery in the local government, their level of support for the utilization of ICT for basic and advanced ICT services and the amount of resources committed to enhancing the utilization of ICT.

With effective institutional management, business and support processes; appropriate ICT policy, regulatory and strategy environment and a management with the requisite skills, awareness and attitude, the public agencies may still not be able to achieve the desired level of ICT penetration and utilization without a foundation of adequate and effective ICT resources including secure networks, Internet bandwidth, hardware and software, power supply, skilled ICT human resource and appropriate financial support. There is, therefore, need to assess the availability of ICT resources and consequently their relationship with the prevailing level of ICT penetration and utilization.

1.2 STATEMENT OF THE PROBLEM

Many local authorities in Kenya are dominated by manual operations, unclear or cumbersome service delivery systems and little or no regard for the customer; the citizens. In cases where ICT technologies and tools have been employed, it is done merely to replace some manual operations without any regard to high-end value-adding

systems (Khamula, 2004) such as management information systems (MIS), decision support systems (DSS) and database driven web portals among others.

However, the extent to which the ICT technologies and tools have penetrated and utilized varies across institutions, economic sectors, levels of social economic development, private and public institutions and, consequently, the value obtained from ICT in the aforesaid areas. Unlike the private sector and non-governmental organizations, public agencies such as the local authorities do not leverage their service delivery systems with effective use of ICT. Under such circumstances, it is difficult to turn ICT into business advantage towards efficient and effective services; diversification and innovation of the services availed to the public or satisfy the public.

ICT, which touches nearly every sector with innovative, personalized and efficient solutions, has evolved into an intelligent, adaptive and highly innovative whose impact can be felt at both the micro and macro economic levels (WEF, 2009). It is a vital tool (Oladapo, 2007) that has injected impetus to traditional services and provided a platform for new services. A cross-sectional analysis of sixty countries reveals that ICT is strongly linked to economic growth in developed countries and thus success in encouraging innovation and effective ICT use has a large impact on the economy's ability to reap greater economic growth and productivity gains (McCauley, 2004).

Lack of ICT access and use in the public service and especially in the most essential points of interaction between the government and the public hinder the efficiency, effectiveness and quality of service delivered to the citizens (GOK, 2006). The local government forms one of these most critical points of interaction and service delivery between the government and the public.

The level of ICT penetration and utilization in the local government is thus critical if the government is to give effective service to the public and fulfill its obligations to the taxpayers; improve the quality of life of the citizens and help in the development and sustenance of a stable socio-economic status in a globally competitive environment.

It is imperative that consistent effort is made to find out and address the factors that curtail the penetration and utilization of ICT in the local government and, in so doing, provide effective solutions towards effective service delivery to the citizens, improvement of the quality of life and spur economic growth.

1.3 GENERAL OBJECTIVE

The general objective of this study was to investigate the factors affecting the penetration and utilization of ICT in the local authorities in Kenya and make relevant ICT policy, regulatory and strategy recommendations.

1.4 SPECIFIC OBJECTIVES

The specific objectives of the study were as follows:

- 1) To review the status and establish the level of penetration and utilization of ICT in local authorities.
- 2) To investigate whether the state of an institution's management systems affect the penetration and utilization of ICT in local authorities.
- 3) To investigate whether the current ICT policy, regulation and strategy has affected the penetration and usage of ICT in the local authorities.
- 4) To investigate the role of local authorities' managers' attitude, awareness and skill on the level of ICT penetration and utilization in the local authorities.
- 5) To investigate the influence of ICT resources on the penetration and utilization of ICT in local authorities.

1.5 RESEARCH QUESTIONS

This research sought to answer the following questions and, in so doing, assist in the acceleration of ICT penetration and utilization in the local government:

- 1) What is the current state of local authorities in ICT penetration and utilization?
- 2) Does the internal state of an institution's management system affect the extent of ICT penetration and utilization?
- 3) How has the current state of ICT policy, regulation and strategy affected the current levels of ICT penetration and utilization?

- 4) Does the level of managers' ICT attitude, awareness and skill play a role in the penetration and utilization of ICT in the local government?
- 5) Does the state of ICT resources in the local authorities play a role in the level of ICT penetration and utilization?

1.6 JUSTIFICATION

The local authorities forms a critical point at which the government and the public converge; with the government providing basic and essential services and the public consuming these services and giving essential feedback as to the extent of satisfaction. The local government offers critical services including those related to the democratic process and taxation as well as those related to the direct needs such as refuse collection, street lighting, social services, schools, planning and building regulations (Black, 2008) and business permitting.

ICT offers means towards achieving effective service delivery by the government to the citizens. It has a great impact in enhancing efficiency, accountability and transparency of processes in the public domain (ITU-WTD, 2003). ICT is essential for efficient business practices, improving living standards, literacy and trade (Kallol & Godwin, 2007) hence its ability to improve the process of delivering services by the local governments.

The level of penetration and utilization of ICT in the local government has a great relationship with the extent to which the essential ICT technologies and tools can be used to deliver effective services to the satisfaction of the citizens. Any factor that may

limit the level of ICT penetration and utilization in the local government ought to be established and resolved to ensure adequate levels of ICT penetration and utilization are achieved and sustained.

The results of this study were expected to benefit the target councils in specific and all the 175 councils in general, the Ministry of Local Government and its collaborating agencies, the Ministry of Information and Communication and the Government of Kenya and other researchers in:

1. Identifying and focusing on resolving the factors that impede effective penetration and utilization of ICT in the local government.
2. Raising the case for the review of management structures in the local government towards quality management systems that easily lend themselves to value-adding automation.
3. Informing the Government on the need for clear cut ICT policies, regulations and strategies that are well communicated and customized in the local government.
4. Confirmation or ruling out of some of the factors under investigations as possible causes of low levels of ICT penetration and utilization.

1.7 SCOPE

This study explored the factors affecting the penetration of ICT in the local government and made relevant ICT policy, regulatory and strategy recommendations. It was focused on the local government with survey, data collection and analysis of the Municipal

Council of Thika, the County Council of Thika and the Municipal Council of Murang'a.

1.8 LIMITATIONS

The following limitations were encountered in the course of this project:

1. The study was based on an accessible urban population given that there are 175 county, municipal and city councils in Kenya which are spread out in the near and remote corners of the country.
2. The availability of adequate resources including transport, stationery and the related upkeep during the research period.

CHAPTER TWO

2 LITERATURE REVIEW

2.1 INTRODUCTION

Several factors may be responsible for the slow penetration of ICT in the public service; both national and local government. This chapter covers the review of available literature on the possible factors affecting ICT penetration and utilization in public service institutions with a specific focus on the local government.

2.2 ICT PENETRATION AND UTILIZATION

Accurate definition of ICT penetration and utilization may be difficult to obtain. Two methods have been suggested for the estimation of ICT penetration (Repkine, 2008). The level of ICT penetration can be computed in terms of the physical units such as the number of computers, telephone headsets or mobile phones per a defined number of people, staff or students. However, this approach does not give a picture of the quality thereof. The second method is the use of monetary value which makes better economic sense since the equilibrium market prizes represents the economic agents' willingness to pay for the intrinsic value; accounting for both quality and quantity. The downside to this approach is that the quality of ICT equipment has been increasing while the cost has been decreasing. This study is based on the first approach.

Underscoring the importance of ICT penetration in the local government, it is noted (Kanamugire, 2004) that the local government was the lowest ranked on the networked and intensive ICT indicators based on a scale of non-ICT, communications technology,

basic ICT, networked ICT and intensive ICT.

ICT penetration and utilization have very closely related indicators. ICT penetration focuses on issues such as the number of computers, printers, telephone headsets, laptops and mobile phones among others, the amount of bandwidth, presence of intranets and the connection to the Internet. ICT utilization, on the other hand, focuses on the use of the ICTs such as e-mail, use of computer applications, frequency of use, purpose of use as well as the effects of the presence/absence of ICT on service delivery in the organization (Hafkin & Huyer, 2008).

The possibility that the use of ICT would improve service is notable. The OECD Science, Technology and Industry Scoreboard 2007 report (OECD, 2007) reckons that the use of the Internet has become standard practice with over 90% of institutions with 10 or more employees using Internet and 25 out of 28 OECD countries having Internet. It is indicated that there is a positive correlation between institutions that use ICT and the improvement in service delivery and further that institutions are increasingly using ICT to improve competitiveness and productivity, supply chain relations and e-commerce (Arzu et al, 2008).

ICT infrastructure and access to it are essential prerequisites to benefiting from ICTs. Therefore, ICT infrastructure and access to it forms a key starting point for statistical indicators with the people, businesses (institutions) and governments being the core actors (Robert, 2005). Thus, access and use of telephone, computer, mobile, where this

access is possible (at home, work...), frequency of use, purpose of use, age, gender, occupation and education level become critical elements for consideration.

A 10% increase in the share of employees using computers was associated with 3.8% increase in labour productivity (Robert, 2005). This increase in productivity would consequently improve service delivery and customer satisfaction.

However, the availability of ICT infrastructure is not, in itself, sufficient (Robert, 2008) because it is not ICT as such that makes the bulk impact on the economy and society but they are used to transform organizations, processes and behaviors. There should be a radical convergence between governance structures and technology in order transform public service delivery and the citizens' experience of the services (Reilly *et al*, 2003).

The conceptual views on ICT are critical on its penetration and utilization. The extent of success or failure of ICT interventions to enable development depends on how public agencies conceptualize on development, and consequently service delivery, on its use, how it is viewed and how it impacts development (Harindranath & Sein, 2007). For instance it could be used to support activities as a tool and have the impact of improved service delivery.

2.3 CONCEPTUAL FRAMEWORK

The Government of Kenya indicates that there is need for institutional reforms towards improved service delivery (GOK, 2007) and thus lays emphasis on the improvement of institutional management. The Government further notes the inadequacy of the existing policy, legal and regulatory framework and thus seeks to fill the gap by developing appropriate policy, legal and regulatory framework (GOK, 2006). The need for improvement in the policy, regulatory and strategy environment has been identified (Wafula & Wanjohi, 2004). The Kenya Vision 2030 (GOK, 2007) and the ICT Sector Policy Guidelines (GOK, 2006) identify the lack of adequate ICT infrastructure as one of the major impediments to effective delivery of services. ICT skills are considered a critical element in the effective penetration and utilization of ICT in institutions (Cleary, 1998).

To find out the effect or influence of some of the possible factors, this study analyzes four hypothesized factors including the institutional management systems in the local authorities; the ICT policy, regulation and strategy environment; the level of managers' ICT attitude, awareness and skill as well as the state of the ICT resources in the local authorities.

These hypothesized factors are represented in a conceptual diagram as follows.

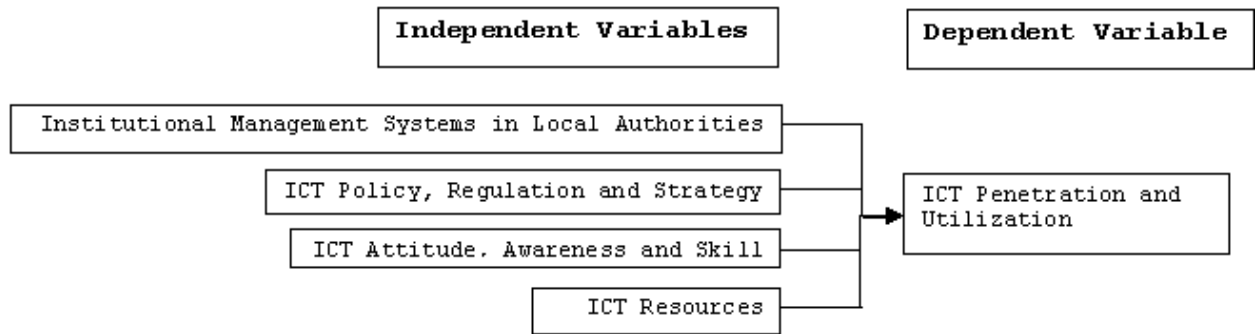


Figure 1: Conceptual Framework

The next sections of this chapter are devoted on the exploration and review of literature on the four factors above.

2.4 INSTITUTIONAL MANAGEMENT SYSTEMS AND ICT PENETRATION AND UTILIZATION

The status of an institution in the way in which it views itself; is structured; its thrust towards quality service delivery; its focus on customer satisfaction and its ingrained culture play a great role in the service delivery regime. The potential benefits of automation of the public service can only be maximized through restructuring of the way in which government operates including re-engineering of existing processes and practices and the integration of information systems (Reilly *et al*, 2003).

The Local Authority Business Process Efficiency reported (Julian *et al*, 2006) that local authorities are coming under significant pressure to realize efficiency and effectiveness improvements besides being required to fundamentally re-look at what they do and how they do it. Consequently, a comprehensive set of processes to provide an excellent foundation for efficiency gains in the local authorities must be delivered.

For instance, the World Health Organization (WHO) in its internal assessment report: *Delivering Effective Services Efficiently: A Service Delivery Model Supported by Global Management System* (WHO, 2007) takes a critical look at the way in which it works, the division of tasks, how the tasks are carried out and how the work is done and goes ahead to assess how it uses technology and modern business practices towards continual improvement of managerial and administrative services that support the mandate of the WHO.

The focus across the world is for organizations to streamline operations, accomplish the same set of objectives with fewer people and save costs (Interwoven, 2004). Many institutions are turning to business process automation to ensure that processes are executed efficiently and effectively in line with best practice, regulation and legislation. Manual processes by which documents, information and task assignments can be automated according to business rules or requirements resulting in reduced operating costs, improved productivity and efficiency, enhanced quality, faster processing times, ability to monitor and review cost, time and quality as well as enhanced opportunity for continuous improvement (Upside, 2004).

For effective service delivery, quality management systems must be put in place and maintained. These systems must have a clear focus on the customer, defined processes for effective service delivery and seamless integration of all the processes into lean system. The resulting quality management system includes (Holger & Thomas, 2001) an

established quality policy, overall quality-related intentions and goals of the organization; quality planning, setting quality objectives, specifying the processes and allocating the resources necessary to achieve these objectives; quality control, executing processes to fulfill quality requirements; quality assurance, providing confidence that quality requirements will be fulfilled and quality improvement, increasing the ability to fulfill quality requirements.

The momentum for rationalization of institutions, functions and refinements towards performance improvement has been rising in the public service in Kenya with the implementation of the results based management (RBM) and the practice of service delivery surveys, service delivery benchmarks and service charters (Mitullah & Waema, 2005).

In a policy brief based on a case study of Debrebham and Nazareth municipalities in Ethiopia (Ayenew & Bekele, 2003) it is argued that there was need to make the new municipal management and governance structure effective and institutionalize transparent and responsive urban management in order to strengthen the institutional capacity of the municipalities.

For local government to be considered reliable it should guarantee minimum conditions for reliability for the processes that are necessary to provide all the services needed by its citizens in a consistent and reliable manner (ISO IWA 4, 2005). It states that all local

government processes including management, core, operational and support processes should constitute a single integral, quality management system.

ISO 9001: 2008 standard, on the other hand, provides a tried and tested framework for taking a systematic approach to managing the organizational processes so that they consistently turn out products (services) that satisfy customers' expectations (ISO, 2008). It is also noteworthy that ISO 9001: 2008 reinforces the role of top management in the provision of appropriate policies and resources, communicating to its employees and guiding institutions to meet customer, and stakeholder, expectations.

Reinforcing the orientation of the organization towards an integrated focus on satisfying the customer it is noted (Narine, 2005) that institutions which try to comply with the expectations of various stakeholders and try to provide stakeholder value where possible will be healthy in the long-term and, further, that information systems are not only useful for strategy development but also for strategy execution towards providing this stakeholder value.

2.5 ICT POLICY, REGULATION AND STRATEGY AND ICT PENETRATION AND UTILIZATION

ICT is viewed as one of the most important tools in wealth creation and poverty reduction strategy and, thus, appropriate and effective ICT policy, regulation and strategy should be put in place to support the social, economic and political development of the country and the integration into the global information society (Khamula, 2004).

The enactment and operationalization of a policy, legal and institutional framework is key to enhanced public service delivery (GOK, 2007). The necessary ICT policies, regulations and strategies need to be put in place to fuel ICT penetration and utilization. The need for clear policies, legislative frameworks and ICT standards are considered a key research priority (Mitullah & Waema, 2005) because they create a legal framework and creative economic and social environment that encourages further investment in ICT infrastructure, public awareness of benefits and wider use (Zlatko & Dragan, 2008).

Rwanda identified eight pillars in its plan to implement the national ICT policy including facilitating government administration and service delivery, deployment and spread of ICTs in the community, development of ICT infrastructure and the development of legal, regulatory, provisions and standards among others with the government acting as the ICT champion (Kanamugire, 2004).

Governance framework is evolving with new roles for the top and the bottom tiers of the government with a shift from the command and control role to that which facilitates knowledge pooling and shared decision-making with the government playing an enabling role (OECD, 2008).

Under ICT policy, regulation and strategy are critical issues concerning the availability of an ICT policy, allocation of resources for the ICT function, the level of the head of ICT in the management ranking (how senior the officer is), the frequency of skills upgrade for ICT staff and the alignment of the ICT operations to the overall strategic

direction of the organization (Kashorda et al, 2007).

The Government of Kenya had the intention to mainstream ICT into government operations and, among other things, review the legal framework to encourage the adoption of e-commerce and, consequently, the Kenya E-Government Strategy was designed to achieve the delivery of government information and services to citizens and promote productivity among public servants (Wafula & Wanjohi, 2004).

The Ministry of Information and Communication, in its strategic plan for 2008-2012 identifies the weak and obsolete policy, legal and regulatory framework for the sector as one of the key weaknesses that has to be dealt with and thus sets out to formulate or review policies governing the ICT sector with the objective of keeping pace with the changing technology environment (KGroup & GOK, 2008). This is given more impetus with the government committing itself to develop and implement policies that can attract greater investment into the sector and thus enhanced national prosperity (GOK, 2008).

Further underscoring the importance of ICT policy, regulation and strategy, the Republic of Mauritius in its National ICT Strategic Plan 2007-2011 (PricewaterhouseCoopers, 2007) identifies as one of its five strategies the maintenance of a consistent policy, legal and regulatory framework that is aligned with the needs of the ICT industry and promotes increasing uptake of ICT in economy and society through high levels of trust and confidence.

2.6 ICT AWARENESS, ATTITUDE AND SKILL

Business leaders and managers must be aware of the potential benefits and risks of new technologies while, on the other hand, ICT-related management skills are one of the key enablers to the penetration and utilization of ICT (McCauley, 2004).

The senior management of institutions is responsible for making key policy, strategy and resource allocation decisions. If such managers and leaders do not have the skills and experience to turn technology into business and effective service delivery advantage their institutions' ability to accept and utilize ICT for improved service delivery is also curtailed. Underscoring this, India developed an information technology enabled management to improve management executives understanding of technology developments, awareness of ICT tools, appreciation of the capability of technologies to improve efficiency as well as the implementation of technology solutions among others (Moustafa & Mehdi, 2003).

Whereas Kenya has skilled personnel in the IT profession (2006 Kenya ICT Strategy) including computer programmers, software developers, hardware maintenance specialists, systems analysts and telecommunications engineers among others, it requires strategic level managers who can harness ICT to add value to effective service delivery. This is especially the case for the public service for which the local government is a key segment.

The attitude towards ICT varies by age and level of academic qualification (Alastair & Didier, 2005). The attitudes can affect the level of confidence, the ease, enjoyment and the importance associated with ICT in the organization. It is thus important to find out whether the managers have the ability to use ICT for their work, have the confidence to work with computers, find computers easy to use, considers ICT useful and important. A survey on the role of ICT in public services revealed (Alexandra & Jones, 2005) that over two thirds of frontline workers agree that technology makes their jobs easier.

2.7 STATE OF ICT RESOURCES

As a result of the limited resources allocated to most of the local authorities (2006 Kenya ICT Strategy) and their inability to generate sufficient revenue flows, most perform at the minimum even though the responsibility vested upon them in terms of public service delivery is enormous. It is noted that ICT infrastructure is essential to develop and implement e-government projects (Reilly *et al*, 2003) of which local authorities form an indispensable part.

The Kenya Vision 2030 considers infrastructure development as a key enabler of economic, social and political development of the nation (GOK, 2007) while admitting that the country lacks adequate ICT infrastructure (GOK, 2006). The country therefore set out to develop a robust infrastructure. This momentum in infrastructural development includes power, road, rail, air and water transport, Internet backbone across all towns and telecommunications installations among others. The availability of ICT infrastructure is key to accelerated run towards the achievement of an information

society status (ITU-WTD, 2003).

It is noted that any additional dollar invested into the purchases of ICT capital per individual in Latin America, developing Asian or African countries increases efficiency (and consequently service delivery) by almost ten times (Repkine, 2008).

This picture is replicated in the developed countries with every one dollar of broadband investment in the US yielding up to ten times while faster deployment of broadband in Europe is expected to create over one million jobs in Europe by 2015 (WEF, 2009). Thus, improving ICT infrastructure in Kenya would be expected to improve economic development and service delivery tremendously.

ICT plays a critical role in the success of e-government projects. It is argued that Arab countries must take actions to increase the penetration of e-government projects to reach the objectives of the Arab world (Ibraheem, 2008).

However, the acquisition of information systems, including computers and related hardware and software systems may not offer sufficient service delivery results. People are as important as technology and listening to workers' views about how ICT could improve the quality of public services delivery would help public services use of ICT more efficiently and effectively (Alexandra & Laura, 2005). It is thus critical that workers are involved in making decisions in the process of acquiring ICT infrastructure;

be it software, hardware or human resources.

It is noteworthy that prior to the Kenya E-Government Strategy most local authorities outsourced computer generated accounts, budgets and reports and as of 2004 there were plans to acquire own personnel and computer systems (Wafula & Wanjohi, 2004).

The KLGRP was thus formed with the aim of improving local authorities' financial management and revenue mobilization by spearheading the development of an Integrated Financial Management System (IFMS).

CHAPTER THREE

3 RESEARCH METHODOLOGY

3.1 INTRODUCTION

This Chapter deals with the description of the methods applied by the researcher in carrying out the research. It covers the research design, research site, and population of the study, sample design, data collection and data analysis.

3.2 RESEARCH DESIGN

This is the plan that was followed to complete the study on the factors affecting ICT penetration and utilization in local authorities.

Survey research was used for this study because of its capability to describe a population that is too large to observe directly (Mugenda & Mugenda, 2003) given that the research was conducted in three councils spread apart and a population of 803 employees. It was also used because of its ability to help study existing conditions and relationships (Kothari, 2004). Further, the survey involved the collection of data from a selected subgroup involving 3 out of 175 councils across the country and 80 respondents out of 803 employees in the 3 councils and the data collected has been analyzed and used to draw conclusions and make statistical inferences about the councils (Tannenbaum & Anold, 1998).

A quantitative approach was used to obtain quantifiable data (Mugenda & Mugenda, 2003) on the variables in the study. Pearson Moment Coefficient of Correlation and

tests of significance were computed and used to analyze the strength of linear relationship between the dependent and independent variables.

3.3 RESEARCH POPULATION

The accessible population for this research included staff in the purposively selected two municipal and one county council situated along the Nairobi-Thika-Murang'a highway. The target population in this research was the set of all the 803 staff in the top, middle and supervisory levels of management as well as operators in the Municipal Council of Thika, County Council of Thika and the Municipal Council of Murang'a.

3.4 SAMPLE AND SAMPLING TECHNIQUE

Three councils were purposively selected for the study out of the 175 councils in Kenya. A sample of eighty respondents was drawn for the entire study. To ensure a fair representation for the three councils and the respective departments a ratio of proportional allocation was used (Kothari, 2004) as shown below.

Ratio of proportional allocation used: $n_i = n \frac{y}{x}$ Where n_i is the strata sample

size, n is the overall sample size, y is the strata size and x is the total population.

Stratified random sampling was used for the study given the heterogeneity of the target population (Kothari, 2004). Samples were drawn randomly from the respective departments in each of the three councils.

Using this ratio the eighty respondents were allocated to the councils as shown in Table 1 overleaf.

Table 1: Sample Size by Council

COUNCIL	TOTAL POPULATION	SAMPLE SIZE
Municipal Council of Thika	503	50
County Council of Thika	187	19
Municipal Council of Murang'a	113	11
TOTAL	803	80

Similarly, the respective departments within each council were allocated a number of respondents as shown in the following Tables 2, 3 and 4.

Table 2: Municipal Council of Thika Sample Size by Department

DEPARTMENT	TOTAL POPULATION	SAMPLE SIZE
Town Clerk	81	8
Town Treasurer	90	9
Engineering and Works	70	7
Water and Sewerage Services	102	10
Public Health and Environment	104	10
Social Services	22	3
Education	34	3
TOTAL	503	50

As noted in Table 2 above MCT has seven departments with the clerk's department

being responsible for the administration of the council, the treasurer’s department being charged with revenue collection functions. The other departments are responsible for overseeing engineering, works and maintenance, provision of water and sewerage services, public health, inspection and enforcement of safe environment standards, overseeing social services and supervision of educational centers under the council’s jurisdiction.

Table 3: County Council of Thika Sample Size by Department

DEPARTMENT	TOTAL POPULATION	SAMPLE SIZE
Town Clerk	38	4
Town Treasurer	89	9
Engineering and Works	20	2
Public Health and Environment	36	3
Social Services	4	1
TOTAL	187	19

As noted in Table 3 above CCT has all the departments as is the case with MCT except the water and sewerage and education departments because it does not provide the respective services being a county council.

It is noteworthy that unlike in MCT and MCM, the social services and the education departments in the CCT are combined with a total of four staff.

Table 4: Municipal Council of Murang'a Sample Size by Department

DEPARTMENT	TOTAL POPULATION	SAMPLE SIZE
Town Clerk	32	3
Town Treasurer	39	4
Engineering and Works	22	2
Public Health and Environment	6	1
Social Services	2	1
Education	12	1
TOTAL	113	12

MCM has all the departments as MCT except water and sewerage because it does not provide the service within its jurisdiction.

The departmental allocation for the MCM was one more respondent than the total allocated for the council because the Social Services and Housing Department had two employees whose proportionate allocation was less than half a percentage and consequently allocated one whole respondent.

3.5 DATA COLLECTION INSTRUMENTS

Primary data was collected as per the sample design. Two instruments were used as follows:

a.) Structured Questionnaire

The researcher used a structured questionnaire which was researcher-administered (administered face to face with the respondent) to cushion the inability of the respondents to easily interpret some specialized questions (Mugenda and Mugenda, 2003). The questionnaires consisted of majority closed and a few open-ended questions.

b.) Interviews for Specific ICT Resources

Interviews were used to obtain information on specific ICT resources including bandwidth, number of computers and printers and ICT budgetary allocations to complement the questionnaires in the research. The interviews were conducted during the same time period with the administration of the questionnaires.

3.6 PILOT TEST

The questionnaire for the study was pretested towards its improvement (Mugenda and Mugenda, 2003). A total of six questionnaires were administered for the pretest, two questionnaires each for the Municipal Council of Thika, the County Council of Thika and the Municipal Council of Murang'a. Two departments were selected purposively from the three councils as shown in Table 5 overleaf except in the Municipal Council of Murang'a where both respondents were from the Treasurer's Department, Accounts Section.

Table 5: Pilot Test Results

COUNCIL	DEPARTMENTS	NO. OF RESPONDENTS
Municipal Council of Thika	Computer Section	1
	Public Health & Environment Department	1
County Council of Thika	Finance Department	1
	Administration Department	1
Municipal Council of Murang'a	Accounts Department	2
Total		6

The observations, responses and results obtained after the pilot study were utilized to improve the questionnaire.

3.7 DATA COLLECTION

Recognizance visits were made to the three councils, meetings held with the respective town clerks, the letter of introduction of the researcher presented and permission granted to conduct the research. A staff guide was assigned by the town clerks of the respective councils to guide the researcher through out the institution during the data collection.

The questionnaires were administered within each department (stratum) in the respective councils based on simple random sampling of respondents as per the sample and sampling design. These questionnaires were administered directly by the researcher to ensure clarity of technical ICT terms to the respondents and maximum return of the

questionnaires. The overall response rate for the three councils was 75 questionnaires against an expectation of 80, representing 93.75% as per Table 6 below.

Table 6: Response Rate by Council

COUNCIL	EXPECTED SAMPLE SIZE	ACTUAL RESPONSE	PERCENT.
Municipal Council of Thika	50	46	92.00%
County Council of Thika	19	19	100%
Municipal Council of Murang'a	11	10	83.30%
TOTAL	80	75	93.75%

The response on the questionnaires per council and department was as shown in the following Tables 7, 8 and 9.

Table 7: Municipal Council of Thika Response Rate by Department

DEPARTMENT	EXPECTED SAMPLE SIZE	ACTUAL SAMPLE SIZE	PERCENT.
Town Clerk	8	8	100%
Town Treasurer	9	9	100%
Engineering and Works	7	6	85.70%
Water and Sewerage Services	10	10	100%
Public Health and Environment	10	6	60%
Social Services	3	3	100%
Education	3	4	133%
TOTAL	50	46	92%

One more respondent than planned was administered with a questionnaire being a civic leader and the chairperson of the Education Department for which it was deemed important to administer a questionnaire.

Table 8: County Council of Thika Response Rate by Department

DEPARTMENT	EXPECTED SAMPLE SIZE	ACTUAL SAMPLE SIZE	PERCENT.
Town Clerk	4	4	100%
Town Treasurer	9	9	100%
Engineering and Works	2	2	100%
Public Health and Environment	3	3	100%
Social Services	1	1	100%
TOTAL	19	19	100%

A response rate of 100% was achieved for the County Council of Thika although it involved getting samples away from the Council offices including the field revenue collection offices in market centers and quarries.

Table 9: Municipal Council of Murang’a Response Rate by Department

DEPARTMENT	EXPECTED SAMPLE SIZE	ACTUAL SAMPLE SIZE	PERCENT.
Town Clerk	3	3	100%
Town Treasurer	4	4	100%
Engineering and Works	2	1	50%
Public Health and Environment	1	0	0%
Social Services	1	1	100%
Education	1	1	100%
TOTAL	12	10	83%

The valid results obtained per council expressed in percentage are as per Table 10 below:

Table 10: Percentage of Valid Results per Council

	Council	Frequency	Valid Percent
Valid	MCT	46	61.3
	MCM	10	13.3
	CCT	19	25.3
	Total	75	100.0

3.8 DATA ANALYSIS

Coding and data entry were done using SPSS. Descriptive tools were used to analyze the data collected. This included frequency distribution tables, measures of central tendency including the mean, median and percentiles as well as percentages (Mugenda & Mugenda, 2003). An ICT penetration and utilization index was developed (as shown in Section 3.8.1 below) while correlation was used to analyze the strength of linear relationship between the index and the independent variables.

3.8.1 WEIGHTING OF ICT PENETRATION AND UTILIZATION INDICATORS

OECD provides guidelines on organizational ICT indicators and comparable statistics on access and use of ICT but it does not give recommendations on the use of a particular type of sample frame, sampling methodology, processing of collected information, imputation and weighting of data (Robert, 2005).

However, weighting is important noting that the various elements of ICT do not have equal contributions to ICT penetration and utilization (such as the high prevalence of telephone extensions which would give a false high level of ICT penetration).

For the purpose of this study an ICT penetration and utilization index was developed based on the perceived contribution by each element to ICT penetration and utilization.

Access weights of range 1 to 10 were allocated to the elements as shown in Table 11 below.

Table 11: Access Weighting

ELEMENT	WEIGHT ALLOCATED
Direct Telephone Line	2
Telephone Extension	1
Computer	10
Mobile Phone	4
Personal E-Mail Address	3
Institutional E-Mail Address	10

Under this weighting the possession and use of an institutional e-mail address (@mct.go.ke, @mcm.go.ke or @cct.go.ke) carries greater weight than personal e-mail address (@yahoo.com, @hotmail.com...) because the presence of an institutional e-mail has an implied message that the institution has a mail server, website, local area network and, perhaps, ICT staff to maintain these facilities.

Usage weights were allocated on a scale of 1 to 5 based on the perceived level of sophistication of the user on the given ICT tool and the level of investment (skill effort and finance) to reach that level of usage as shown in Table 12 overleaf.

Table 12: Usage Weights

USE	TELEPHONE	COMPUTER	MOBILE
Calls	1	5	1
E-Mail	3	4	2
Internet	3	4	2
SMS	4	5	1
Word Processing	2	3	5
Data Processing	2	3	5

The usage of mobile phones for word and data processing is considered a higher level of usage sophistication than the use on calls and SMS. Similarly, the use of the computer for calls and SMS represents a usage which finds the deeper value of computer utilization than the traditional aspects of word and data processing.

Using the weights earlier allocated, an ICT penetration and utilization index is developed using the formula shown below:

$$\bar{x}_i = \frac{\sum w_i x_i}{\sum w_i} * 100$$

Figure 2: Formula for the Computation of Weighted ICT Penetration and Utilization Index

Where w_i is the weight allocated to item i , x_i is the value of item i , while $\sum w_i$ is the sum of weights.

3.8.2 CORRELATION

The ICT penetration and utilization index obtained was correlated with the independent variables outlined in the literature review to reveal the strength of linear relationships using the Pearson Moment Correlation Coefficient (McClave & Dietrich, 1994) value, r , and statistical significance value, p , with the assumption of linear relationship between the independent and dependent variables and the presence of a large number of independent causes operating in both variables to cause normal distribution (Kothari, 2004).

Positive values of r , with r ranging between -1 and $+1$, indicate positive linear relationship between the variables under consideration while negative values indicate negative linear relationship. Values close to or equal to 0 are construed to mean weak linear relationship while values close -1 or $+1$ were construed to mean strong linear relationship. A test of statistical significance value, p , is used with the degree of significance set at 5% .

Therefore, correlations with p values below 0.05 and r values close to ± 1 are accepted as denoting a significant linear relationship.

CHAPTER FOUR

4 FINDINGS AND DISCUSSION

4.1 INTRODUCTION

This chapter presents the general characteristics of the sample, data analysis and presentation of findings. It proceeds from presentation of the general characteristics of the sample by gender, level of education, status of employment and distribution of the respondents by department and then delves into the presentation of the results with regard to ICT penetration and utilization and the independent variables in the study.

4.2 DATA ANALYSIS

4.2.1 GENERAL CHARACTERISTICS

GENDER REPRESENTATION

The findings indicate that the councils have a fair gender representation in employment with male and female employees representing 60 and 40 percent respectively as per Figure 3 overleaf.

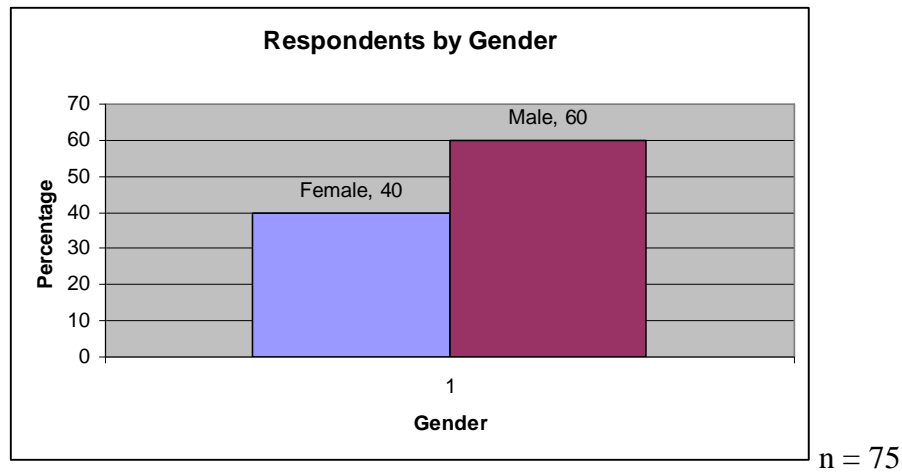
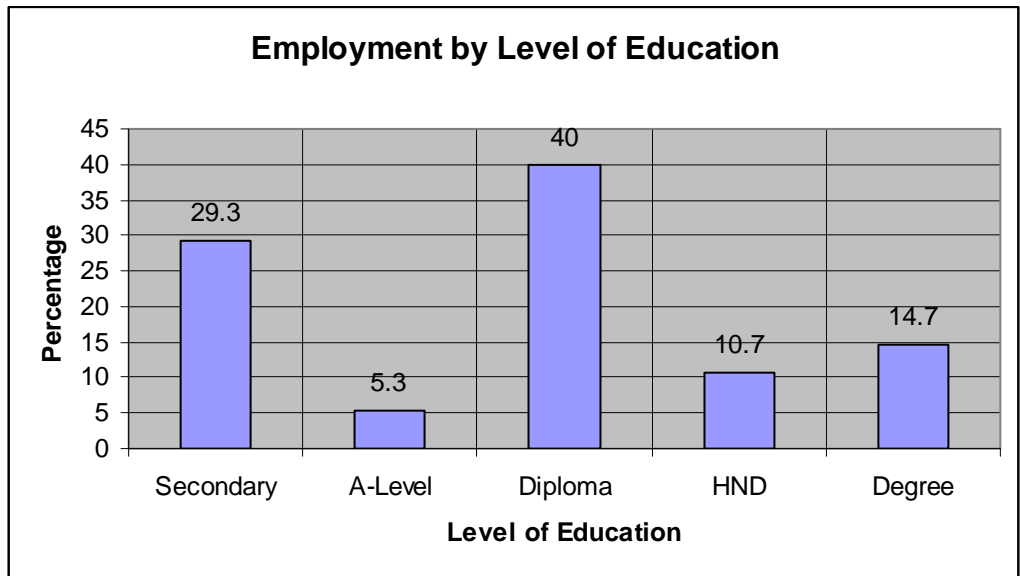


Figure 3: Gender Representation in the Survey

This corresponds well with the commitment to mainstream gender and the effort to make fundamental changes in opportunity and empowerment as well as the attainment of at least 30 percent representation in recruitment, promotion and appointment of women towards the Kenya Vision 2030 (GOK, 2007).

EDUCATION

A simple majority of employees in the councils have diploma as the highest level of education followed by secondary school education with degree and higher national diploma a distant third and fourth in that order as shown in Figure 4 overleaf.



n = 75

Figure 4: Level of Education of Respondents

This status with respect to the level of education implies that while the local authorities are charged with key public services most of the staff lack advanced education with 29.3% being secondary school leavers and over 70% having a diploma or below. Degree holders account for a meager 14.7% of the staff.

STATUS OF EMPLOYMENT

It is noteworthy that most of the public servants in the councils are on permanent employment with only 4.1 and 6.8 percent being on contract and casual terms of employment respectively as depicted in Figure 5 overleaf.

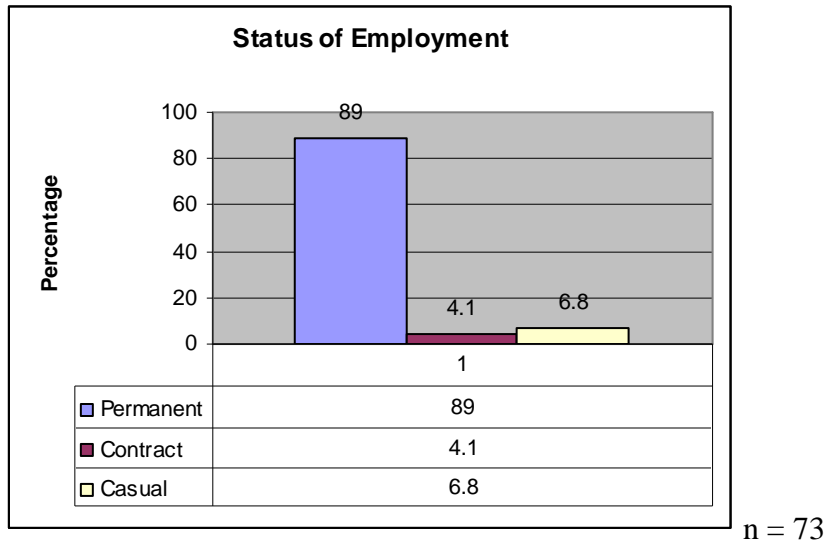


Figure 5: Staff by Status of Employment

DISTRIBUTION OF EMPLOYEES BY DEPARTMENT

The majority of council employees are based in the town treasurers’ department with 22% as indicated in Figure 6 overleaf. The town clerks’ department follows closely with 15% of the entire staff. However, confounding is that the critical departments with respect to service delivery such as education and social services have the lowest size of staff at 5% each.

The most essential and critical services such as public health, water and sewerage, education and social services may lack adequate attention.

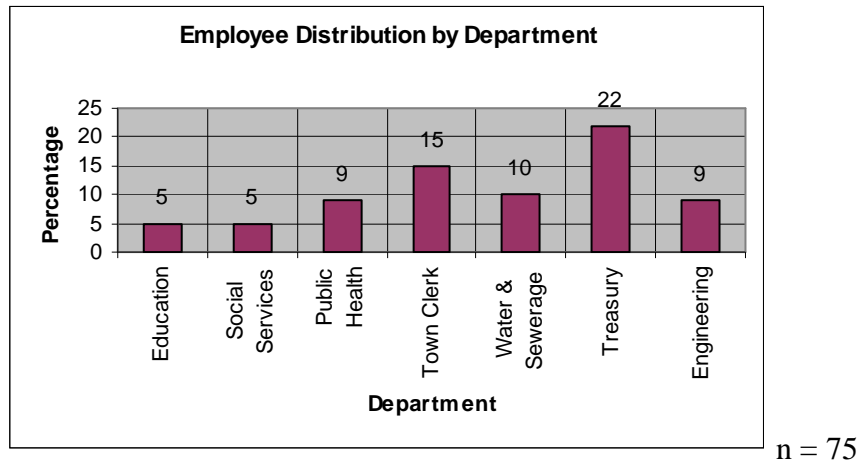


Figure 6: Employee Distribution by Department

4.2.2 STATE OF ICT PENETRATION AND UTILIZATION

LEVEL OF ICT PENETRATION AND UTILIZATION

Using the data obtained in the survey in percentages the level of ICT penetration and utilization obtained was a mean of 43.58% with a standard deviation of 14.96%. However, for the purpose of this study an ICT penetration and utilization index was computed based on custom-made weighting as explained in Section 3.8.1. The analysis herein was based on the computed value of ICT penetration and utilization index.

The councils in the survey recorded mean ICT penetration and utilization levels of 30.12%, 33.13% and 28.66% for MCT, MCM and CCT respectively while the overall mean ICT penetration and utilization for the three councils was 30.15% as shown in Table 13 overleaf.

Table 13: Overall ICT Penetration and Utilization in the Survey

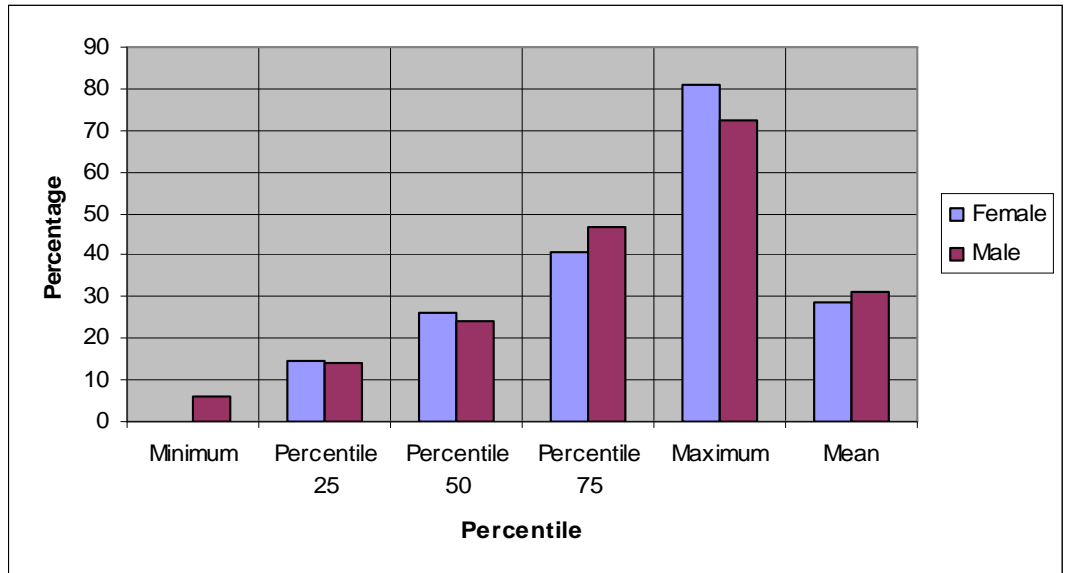
Council	Min.	Percentile 25	Percentile 50	Percentile 75	Max.	Mean	Std Dev.
MCT	6.02	14.46	11.44	18.08	80.72	30.12	17.74
MCM	8.43	11.75	25.6	13.55	61.45	33.13	18.8
CCT	0	10.84	12.05	20.48	72.29	28.66	20.53
Overall	0	14.46	10.84	18.07	80.72	30.15	18.4

n = 75

Table 13 above shows the level of ICT penetration and utilization along the percentiles for the three councils surveyed and the overall level for three councils combined. The uppermost row indicates the level attained at each percentile while the leftmost column indicates the three councils and the overall penetration and utilization level. In the first percentile (1-25%) we have 14.46% level of overall ICT penetration and utilization. In the second (26-50%) and third (51-75%) percentiles we have 10.84% and 18.07% respectively.

Considering the cumulative (sum of current percentile and the previous percentiles) figures across the percentiles, the overall ICT penetration and utilization the indication is that 25% of the respondents are at 14.46% level of ICT penetration and utilization, 50% respondents at 25.3%, and 75% respondents at 43.37%. Assuming that there were no errors in the sampling and sample design then the level of ICT penetration and utilization is quite low in all the councils involved.

There is no indication that the level of ICT penetration and utilization varies with gender. Both male and female staff was found to be at par across the percentiles with respect to the ICT penetration and utilization index as indicated in Figure 7 below:

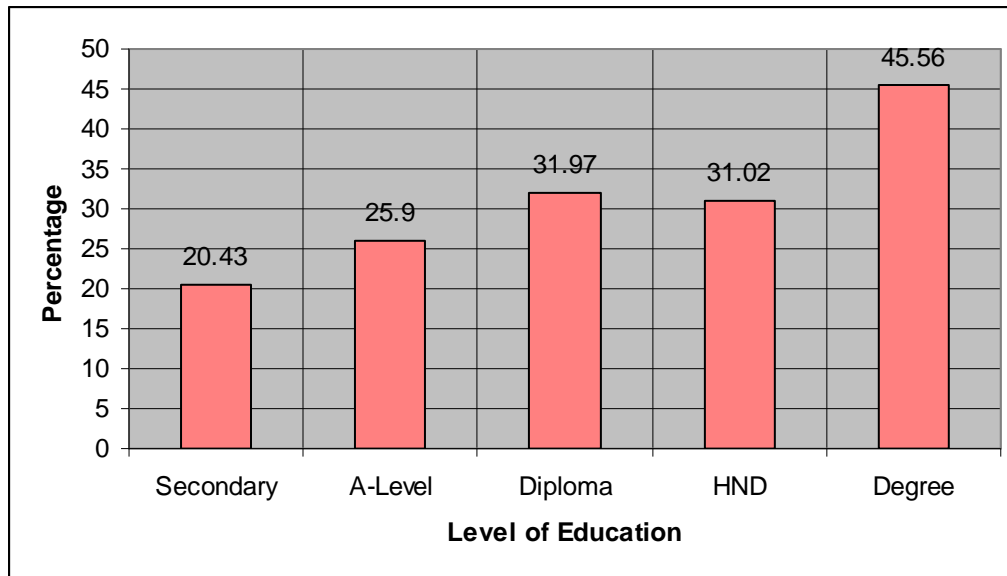


n = 75

Figure 7: ICT Penetration and Utilization by Gender

The level of education, on the other hand, has a strong linear relationship with ICT penetration and utilization. The ICT penetration and utilization is seen to gradually increase with an increase on the level of education from secondary school leavers at 20.43% to degree holders at 45.56% as indicated in Figure 8 overleaf.

An investment in more educated staff is thus pertinent to improved ICT penetration and utilization.



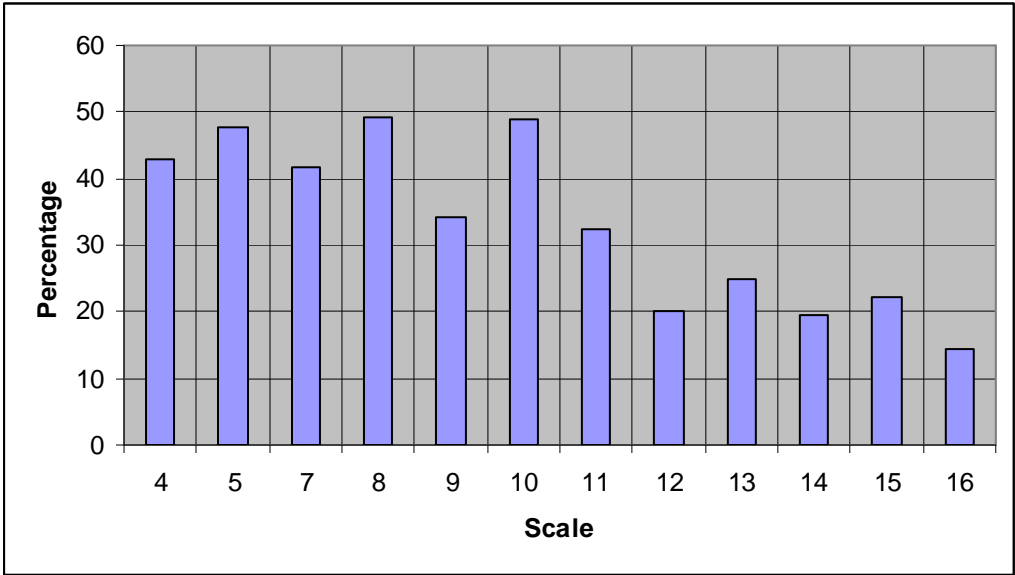
n = 75

Figure 8: ICT Penetration by Level of Education

The above is further confirmed by the Pearson Moment of Correlation Coefficient value, r , of 0.416 and $p < 0.01$ meaning that there is a significant linear correlation between the level of education and the ICT penetration and utilization. This means that a greater investment in better educated staff would be an incentive towards an increased ICT penetration and utilization.

In addition, the Pearson Moment of Correlation Coefficient value, r , is -0.528 and $p < 0.01$ meaning that there is also a significant linear relationship between the ICT penetration and utilization and the job scale. As we go up the ranks the ICT penetration and utilization increases. In the local authorities the job scale or grades start with 1 the senior-most and end with 20 the lowest hence the negative value of r .

In the data obtained, the senior-most respondent was at scale 4. It is noteworthy that the ICT penetration and utilization index was significantly higher in job scale 4 to 10 than in job scale 11 to 16 as shown in Figure 9 below:



n = 75

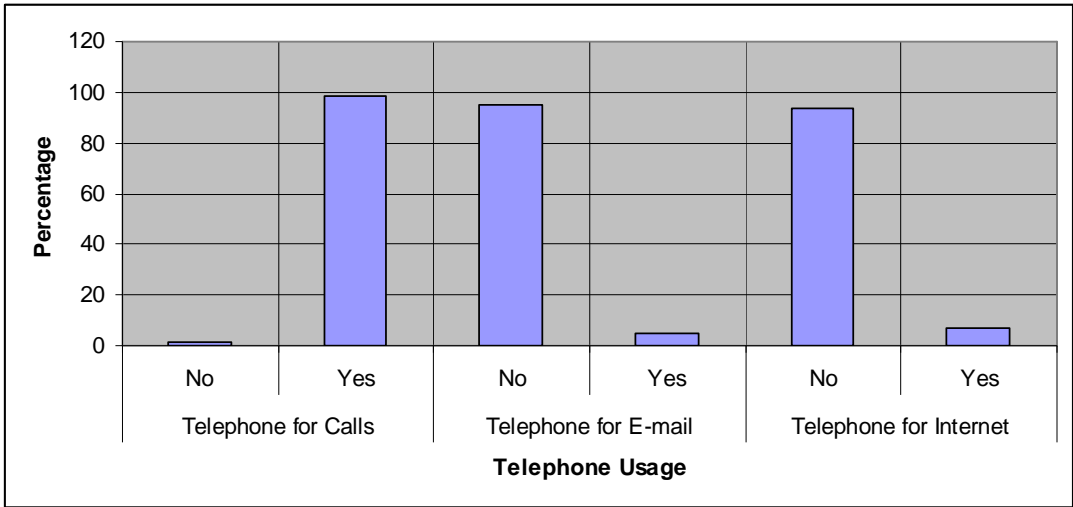
Figure 9: *ICT Penetration and Utilization by Job Scale*

SOPHISTICATION OF USAGE OF ICT TOOLS

Technology has evolved over the time especially in the era of convergence leading to the development of “intelligent multi-functional machines ... capable of performing a whole range of ancillary tasks” (Cleary, 1998, p. 3). The telephone line as was in the history of telecommunications can now serve as a data line with a modem and thus be used to access e-mail and Internet. Similarly, the basic modern computer can support video conferencing with a web-camera, television, radio and telephone among others.

The mobile phone too has evolved in modern times to support banking services, radio and television, data processing and storage, camera as well as support telecommuting through remote access to institutional servers (Ndukwe, 2005). However, it is noteworthy that in this study the use of telephone, computer and the mobile phone is confined to the traditional functions and purposes only.

Figure 10 below indicates that an overwhelming majority use the telephone only for calls.

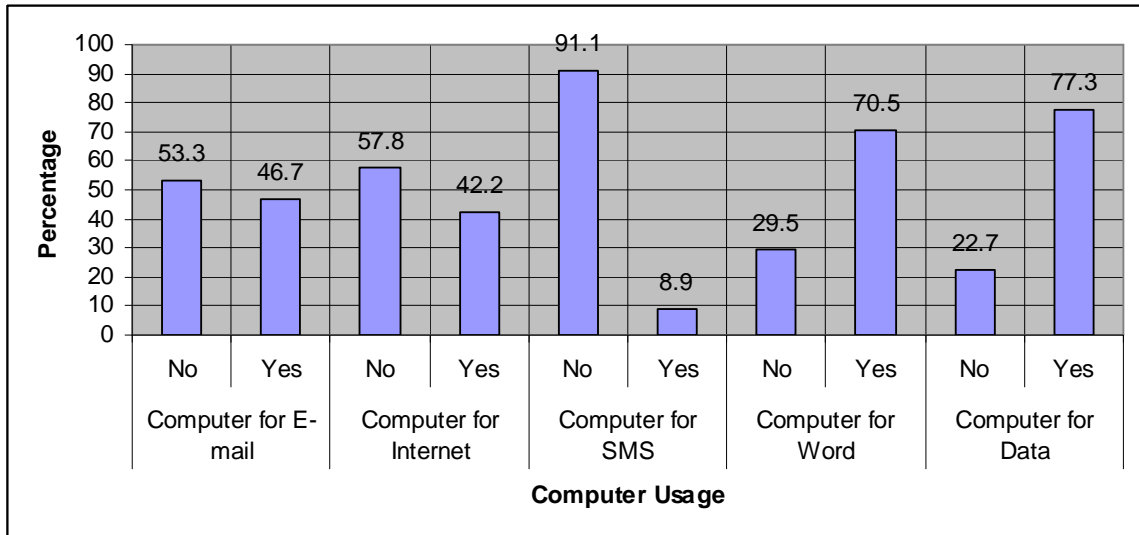


n = 67

Figure 10: Diversity of Telephone Utilization

This situation is also replicated in the use of the computer for word and data processing as indicated in Figure 11 overleaf. Given the rise of portals offering SMS services on the Internet it is quite surprising that the use of the computer for SMS is only an

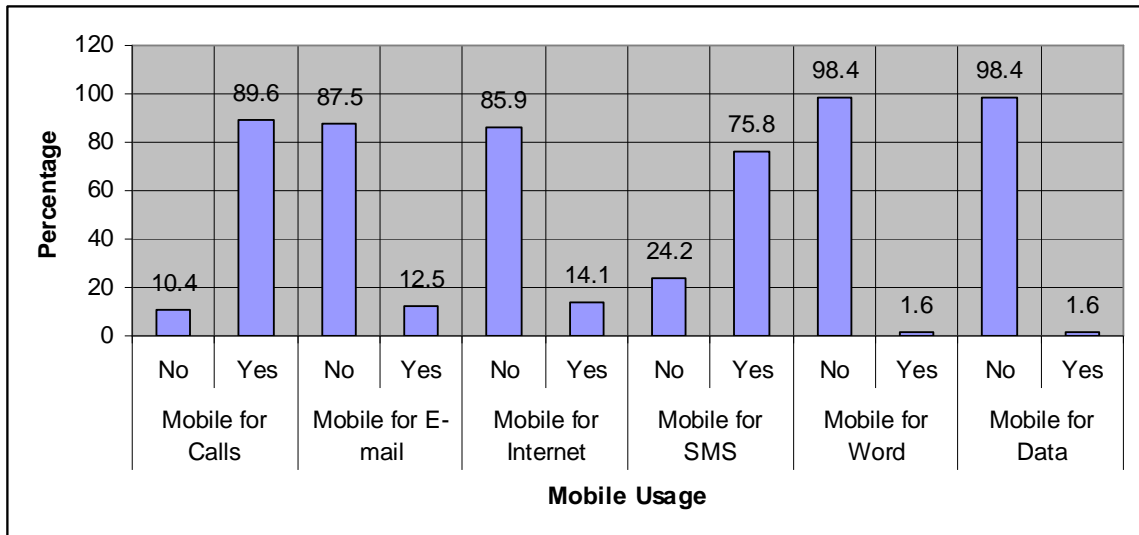
insignificant 8.9%. The percentage of staff utilizing computers for e-mail and Internet and those not using computers for the same is near equal.



n = 60

Figure 11: Diversity of Computer Utilization

It is clearly noticeable that the mobile phone is basically used only for calls and SMS from the Figure 12 overleaf with an insignificant 12.5% and 14.1% using it for e-mail and internet respectively. The low use of mobile phone for advanced purposes may change as more capable mobile handsets set into the Kenyan market and costs go down.



n = 71

Figure 12: Diversity of Mobile Phone Utilization

It is thus clear that the utilization of telephone, computer and the mobile phone is highly confined to the traditional uses and therefore the benefits of convergence are yet to be reaped in the councils.

4.2.3 INSTITUTION MANAGEMENT SYSTEMS

With respect to the management of the local authorities we obtain a Pearson Moment of Correlation Coefficient value, r , of 0.116 and $p=0.323$ which is greater than the statistical test of $p<0.05$. This indicates that there is no significant linear relationship between the ICT penetration and utilization index and the improvement in the quality of local authorities' management system. This, therefore, poses the question of whether an organization can be fairly well managed while still not utilizing ICT in its operations.

However, we note that the KLGRP began its work on the Local Authorities Integrated Financial and Operations Management Systems (LAIFOMS) in the year 2000 but the system could not be implemented within schedule because of the lack of standardized administrative and management procedures (GOK, 2009). On the other hand, it is also noteworthy that the main objective of the implementation of LAIFOMS was to standardize operations of the local authorities in line with the Local Government Act and Financial Regulations to not only provide a financial management system but also monitor other operational activities (GOK, 2009).

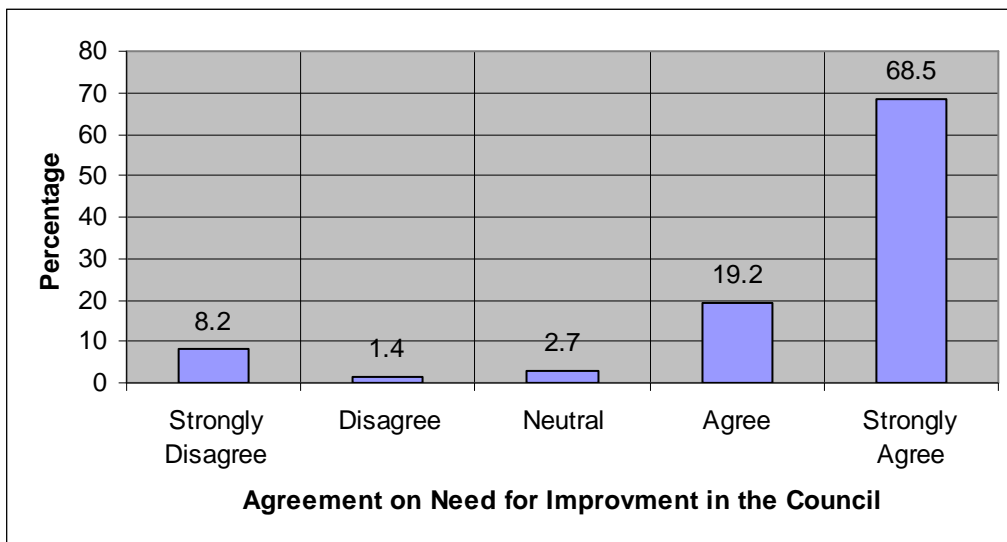
Therefore, the penetration and utilization of ICT, LAIFOMS, and improvement of the local authorities' management systems went arm-in-arm growing mutually.

Thus, while the linear relationship with the ICT penetration and utilization may not be significant, it cannot be overemphasized that quality management of the local authorities is critical.

Some of the indicators of quality management systems are customer focus, continual improvement and factual approach to decision-making (KEBS, 2008). We may then want to ask the questions, “do the council administrations have any room for improvement?” or “have they aligned their processes to achieve excellent customer satisfaction?” or “are council decisions based on facts?”

From Figure 13 below a significant majority of the staff surveyed (68.5%) strongly agreed that the councils needed more improvement in order to deliver improved services.

In addition to the 19.2% that agreed that there was great room for improvement we have an overwhelming majority of over 80% agreeing or strongly agreeing on the need for more improvement in the councils' management systems.

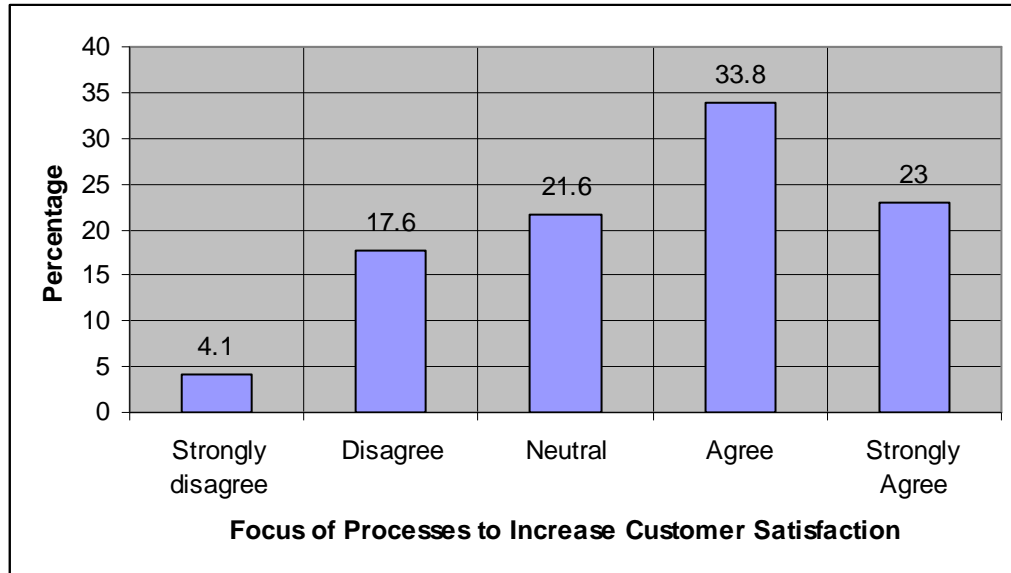


n = 73

Figure 13: Agreement on the Need for Improvement in the Councils

On whether the councils' processes increase customer satisfaction only 23% of the staff surveyed strongly agreed that their processes were geared towards customer satisfaction with 33.8% agreeing. Summed up, it means that only 56.8% agree or strongly agree that the councils' processes focus on increased customer satisfaction leaving 43.2% either

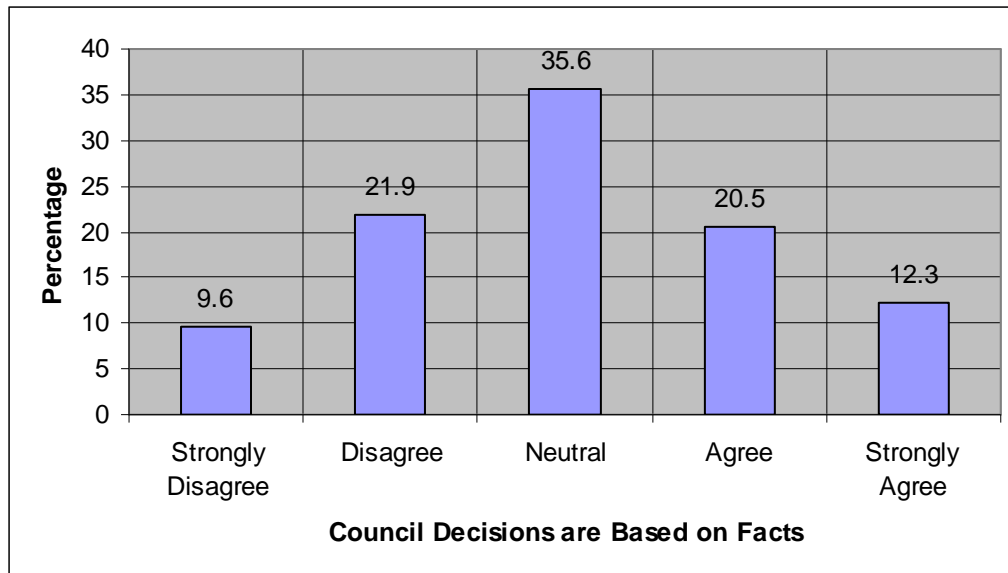
neutral or disagreeing as indicated in Figure 14 below. However, the extent of customer satisfaction is beyond the scope of this study and may be subject to further research to corroborate the information from the customers' perspective.



n = 74

Figure 14: *Agreement Orientation of Processes to Customer Satisfaction*

Figure 15 overleaf indicates that only 32.8% of the staff surveyed agreed or strongly agreed that decision-making processes in the surveyed councils was based on facts with almost an equal percentage (31.5%) disagreeing or strongly disagreeing.



n = 73

Figure 15: Agreement on the Basis of Decision-Making in the Councils

The government reform agenda was found to be catching up in the local authorities. A significant majority of the respondents indicated knowledge of the implementation of the rapid results initiative, the performance contracting and the establishment of quality management systems as seen in the Figure 16 overleaf.

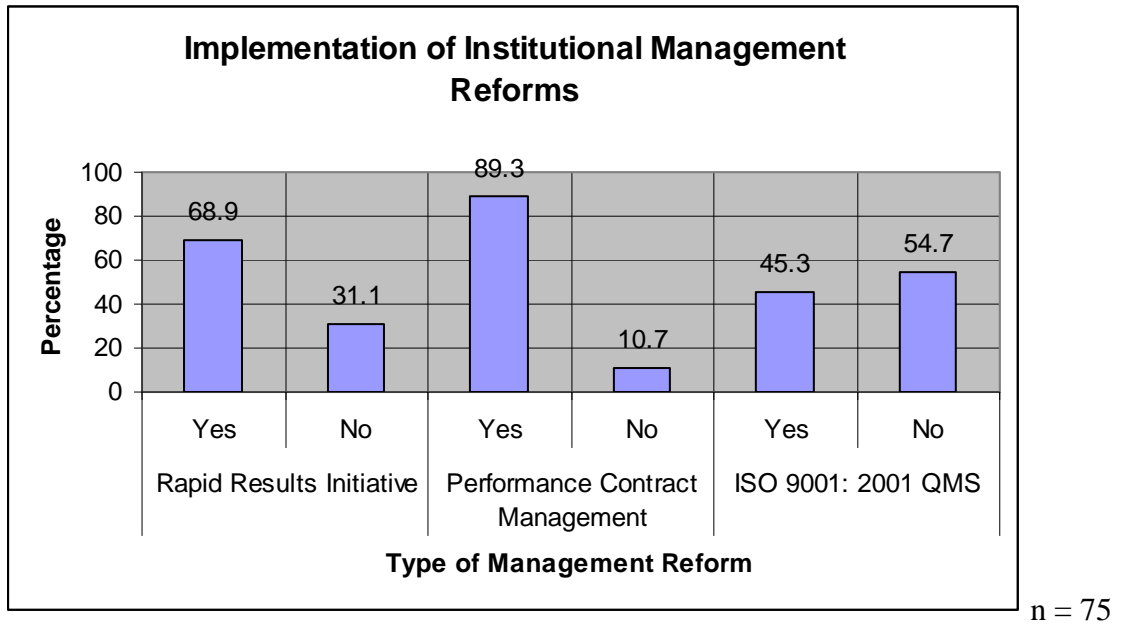


Figure 16: Government Initiatives for Institutional Reforms

The quality of management systems in the local authorities have a need to improve with respect to customer (citizen) focus, orientation of service delivery processes towards the satisfaction of the customers among others and, in tandem, embed ICT and therein gain a greater impetus towards effective service delivery. Institutional reforms are especially critical with a simple majority of 27.3% indicating that the performance contracting policies were responsible for the increased use of ICT in service delivery.

4.2.4 EFFECT OF CURRENT ICT POLICY, REGULATION AND STRATEGY

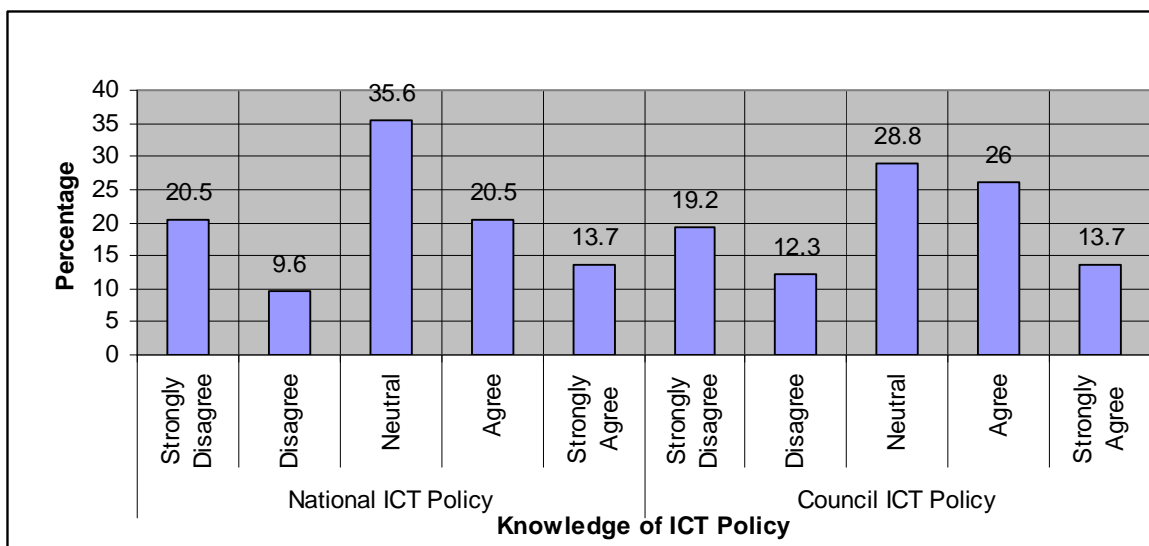
While it is generally assumed that the absence of or inadequacy of a clear policy environment has a great impact on the level of ICT penetration and utilization in public service, the results of this study lead to a different conclusion. The Pearson Moment of

Correlation Coefficient value, r , between the policy environments in the councils surveyed and the ICT penetration and utilization index is 0.115 with $p=0.328$.

As per these findings there is no significant linear relationship between the ICT policy, regulation and strategy environment and the observed level of ICT penetration and utilization. A change in the policy, regulatory and strategy environment may not necessarily lead to significant increases in the level of ICT penetration and utilization.

However, it is noteworthy that in the pre-2004 period (Wafula & Wanjohi, 2004) the local authorities did not have a coordinated approach to the acquisition and utilization of information systems. The environment has greatly changed with the reforms driven by the KLGRP leading to the implementation and use of the Local Authorities Integrated Financial and Operations Management Systems (LAIFOMS) with a simple majority of 76.7% indicating it as one of systems implemented in the previous 3 years. LAIFOMS covers key areas in the councils operations such as revenue management, budgeting and financial management as well as expenditure management (GOK, 2009). This initiative driven by the government through the local government ministry and the KLGRP has borne much fruit with the LAIFOMS being the best implemented project in the local authorities, being operational in 48 councils (GOK, 2009) and being identified as a successful project by about 96% of the staff surveyed. Therefore, government policy and championship can improve ICT penetration and utilization.

From Figure 17 below it is observed that on the question of the staff knowledge of the existence of a National ICT Policy and Council ICT Policy the majority remain neutral while equal percentages either agree/strongly agree or disagree/strongly disagree to the knowledge of the existence of such policies. There is thus need for sensitization at the local authority and national level on the existing and implementation of ICT policies.



n = 73

Figure 17: Knowledge of the Existence of National and Council ICT Policy

However, asked about what laws, policies and regulations positively affected the councils in ICT a simple majority of 27.3% identified the performance contracting policies as the most influential followed by the Kenya Local Government Act at 18.2%. A simple majority of 59.8% indicated that the government was a key driver towards the use of ICT.

On the other hand, a simple majority of 50% identified the requirement for documents to be hand-written such as certificates as causing the most negative influence on the use of ICT in local government.

In addition, a significant majority of 83.4% of the respondents indicated that they agreed/strongly agreed that an ICT policy needed to be part of the strategic plan of the organization underpinning the importance of embedding ICT in the core business of the councils.

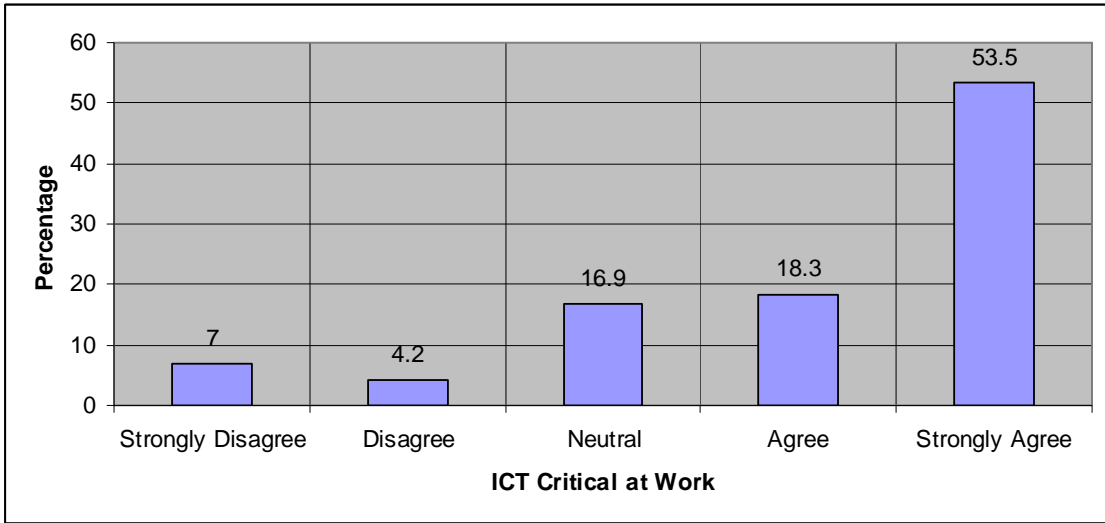
4.2.5 MANAGERS' ATTITUDE, AWARENESS AND SKILL

Attitude, awareness and skill have a strong and significant linear relationship with the level of ICT penetration and utilization in an organization.

From the findings it is noted that the Pearson Moment of Correlation Coefficient value, r , of 0.512 with $p < 0.01$ is obtained. There is, therefore, a significant linear relationship between the attitude, awareness and skill and the achieved level of ICT penetration and utilization. As the attitude, awareness and skill of employees improves the ICT penetration and utilization index increases.

Given that the ICT penetration and utilization index increases as the attitude, awareness and skill increases, and also as seniority increases, it is possible that a higher and more significant ICT penetration and utilization levels could be achieved with greater improvement in the attitude, awareness and skill of the senior employees.

Figure 18 below indicates that the staff has a very positive attitude on how critical ICT is at the work place with 53.5% agreeing strongly that ICT is critical for their work and a significant 81.8% agreeing/strongly agreeing to this.

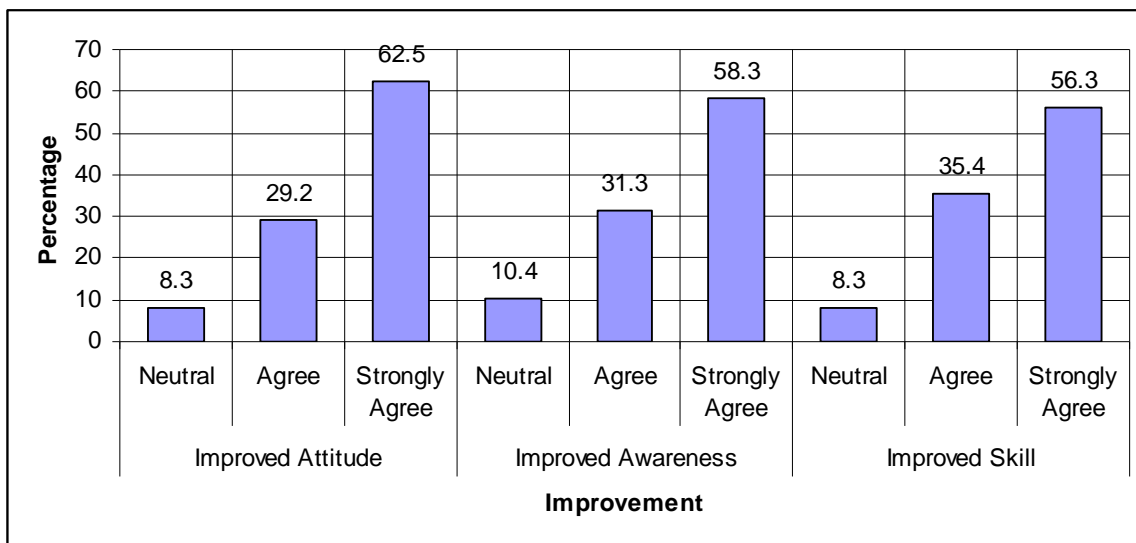


n = 71

Figure 18: Perception on ICT as Critical at Work

Also noticeable is the fact that a significant number of staff indicated that the ICT trainings attended improved their awareness, attitude and skill with 58.3%, 62.5% and 56.3% respectively strongly agreeing and none whatsoever disagreeing as shown in Figure 19 overleaf.

Notice that a simple majority of 58.3% had sponsored themselves for the trainings with only 39.6% having been sponsored by the employer. This is indicative that staff are willing to take the initiative to learn and hone their ICT skills.



n = 48

Figure 19: *Perception on the Improvement of Awareness, Attitude and Skill with ICT Training*

4.2.6 ICT RESOURCES

The local authorities have managed to acquire the basic ICT equipment, allocate funds for ICT utilities and some ICT human resource. In all the three councils the ICT services are not a distinct department but are integrated in the treasury departments.

MCT in the 2008/2009 financial year, for instance, allocated KSh. 1,000,000 for computer and office equipment, KSh. 800,000 for postage and communication (including telephone, internet and postage), KSh. 240,000 for ICT staff skills development and KSh. 1,500,000 for ICT staff salaries and emoluments. In addition,

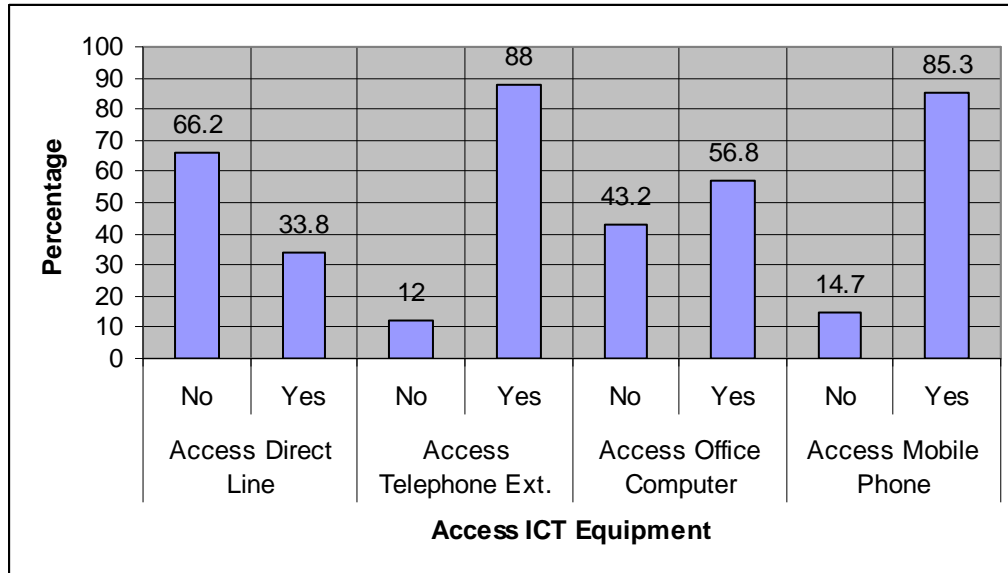
MCT has 40 computers and 21 printers with Internet bandwidth of 256 Kbps. MCT has 7 ICT staff that provides user support, implementation and maintenance services.

CCT, on the other hand, has 20 computers, 1 server and 7 shared printers. It also has a bandwidth of 256 Kbps. It has an ICT staff budget of KSh. 452,000 for the 2008/2009 financial year. In the 2007/2008 financial year it had a budget of KSh. 1,800,000 for ICT equipment. CCT has a specialist systems administrator under the job title of computer programmer and one computer operator.

MCM also has 12 computers and 5 printers. It had an allocation of KSh. 2,000,000 for the 2008/2009 financial year although not broken down to specific ICT elements. MCM does not have specialist ICT staff while access to the Internet is restricted to the top management based on a portable wireless broadband modem.

Correlating the ICT resources and its level of its ICT penetration and utilization it is noted that there is a strong linear relationship between the two. Using the Pearson Moment of Correlation Coefficient value, r , is 0.667 with $p < 0.01$. There is a significant linear relationship between ICT penetration and utilization and ICT resources. ICT penetration and utilization index increases with increased investment in ICT resources in the councils.

Looking at the percentages of staff that have access to basic ICT equipment it is clear that access to a mobile telephone and telephone extension is exceptionally high as shown in Figure 20 below:



n = 75

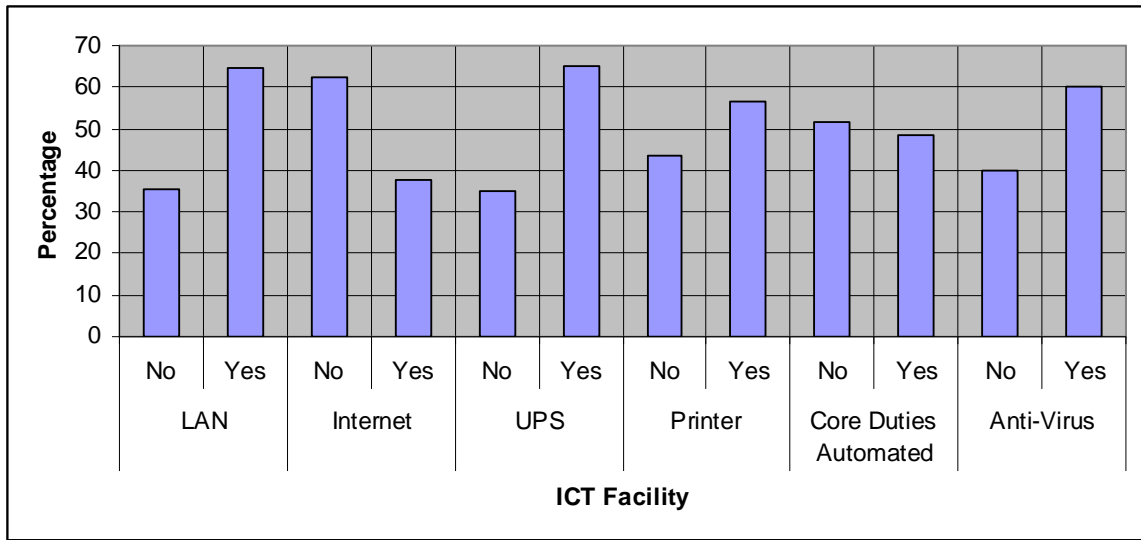
Figure 20: *Level of Access to ICT Equipment at the Work Place*

It is noteworthy that MCT has 40 computers and 21 printers against a staff population of 503 employees; CCT has 20 printers and 7 printers against a staff population of 187 employees while MCM has 12 computers and 5 printers against a staff population of 113 employees. This translates to 7.95 computers per 100 employees in MCT, 10.7 computers per 100 employees in CCT and 10.62 computers per 100 employees in MCM.

Clearly, sharing the meager computer resource against the high number of employees is a gargantuan task to achieve a 56.8% computer access rate for the people surveyed. However, the understanding of how these employees share the little computer resources at their disposal and the level of effectiveness achieved under the circumstances is beyond the scope of this study and may be subject to further research.

It is also important to note that the Pearson Moment of Correlation Coefficient value, r , between the ICT penetration and utilization index and the number of supervised staff with computers is 0.471 with $p < 0.01$ indicating a significant linear relationship. This means that as the number of people with computers being supervised by an officer increases the ICT penetration and utilization also increases (see Roberts, 2005). This confirms the fact that more ICT resources consequently mean more ICT penetration and utilization.

A close look at Figure 21 overleaf reveals an important aspect. It is noteworthy that a simple majority of council employees have access to a local area network (64.7%), uninterrupted power supply system (65.2%), printer (56.5%), and anti-virus protection (60%). However, similar simple majorities have no access to the Internet (62.3%) and automated value-adding systems (51.4%) for their core duties (see Khamula, 2004).



n = 69

Figure 21: Strategic ICT Facilities

The investment in the local area networks, computers, printers, reliable power systems and anti-virus protection may not be able to leverage the local authorities public service delivery advantage if access to information, e-government services and e-business is not availed over the Internet while on the other hand the core duties cannot be performed on the systems because they are not automated. It is thus important that, as noted earlier, the local authorities align ICT with their strategic plans to maximize on the investment in ICT.

4.2.7 SUMMARY OF FACTORS AFFECTING ICT PENETRATION AND UTILIZATION

Generally, the state of ICT resources was noted to exert the greatest influence on the level of ICT penetration and utilization. As the number of staff with access to a computer in a section increased the level of ICT penetration and utilization increased.

Greater investments in ICT resources would thus be expected to improve the level of ICT penetration and utilization.

The level of ICT penetration and utilization was found to have a significant linear correlation with the awareness, attitude and skill of the staff. It also emerged that as the level of education improved and the job scale ranking increased to seniority the penetration and utilization index improved. In addition, it was noted that the ICT trainings for staff significantly improved their awareness, attitude and skill.

It was noted that there was no significant linear correlation between the institutions management and its level of ICT penetration and utilization. It was, however, clear that the LAIFOMS information management system in the councils was driven by a strong championship of the government under the KLGRP and the will to ensure that the system was implemented successfully. LAIFOMS have consequently managed to streamline financial, operational and revenue management processes in the councils.

There was no significant linear relationship between the ICT penetration and utilization and the ICT policy, regulatory and strategy. However, a significant majority of 83.4% of the respondents indicated that they agreed/strongly agreed that an ICT policy needed to be part of the strategic plan of the organization underpinning the importance of embedding ICT in the core business of the councils. The role of government was highlighted with the performance contracting policies being considered a key influence

to the penetration and utilization of ICT in the councils meaning that when the government reinforced the need to deliver effective services, the respective councils would consequently embed all technology tools possible to improve the operations. The government was identified by a simple majority as being a driving force towards the use of ICT in the councils.

The job scale, the level of education, the length of time in public service and the age of the council staff were also found to have a significant linear relationship with ICT penetration and utilization. The job scale, length of service and age of council staff had negative values for the Pearson Moment Correlation Coefficient because as they increase the ICT penetration and utilization decreased.

CHAPTER FIVE

5 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

This study was focused on identifying the factors affecting the penetration and utilization of ICT in the local authorities in Kenya. The researcher outlined five specific objectives and corresponding research questions. A conceptual framework was developed and existing literature reviewed towards deeper understanding of the problem. A suitable research methodology was designed, data obtained, analyzed and results presented. This chapter presents a brief summary of the findings and the recommendations made towards improved ICT penetration and utilization in the local authorities.

5.1.1 OVERALL ICT PENETRATION AND UTILIZATION LEVEL

The survey found out that the mean level of ICT penetration and utilization using the computed ICT penetration and utilization index was 30.15% while the individual councils in the survey recorded mean ICT penetration and utilization levels of 30.12%, 33.13% and 28.66% for MCT, MCM and CCT respectively. It is noticeable that the difference between the lowest and the highest of the three councils is 4.47%, an indicator that the councils are generally within the same ICT penetration and utilization index ranking. It is evident that the sophistication of ICT utilization in the local authorities is biased to the traditional usage of ICT tools with the significant majority using the telephone for calls, the computer for data and word processing and the mobile phone for calls and SMS.

5.1.2 RANKING OF FACTORS AFFECTING THE LEVEL OF ICT PENETRATION AND UTILIZATION

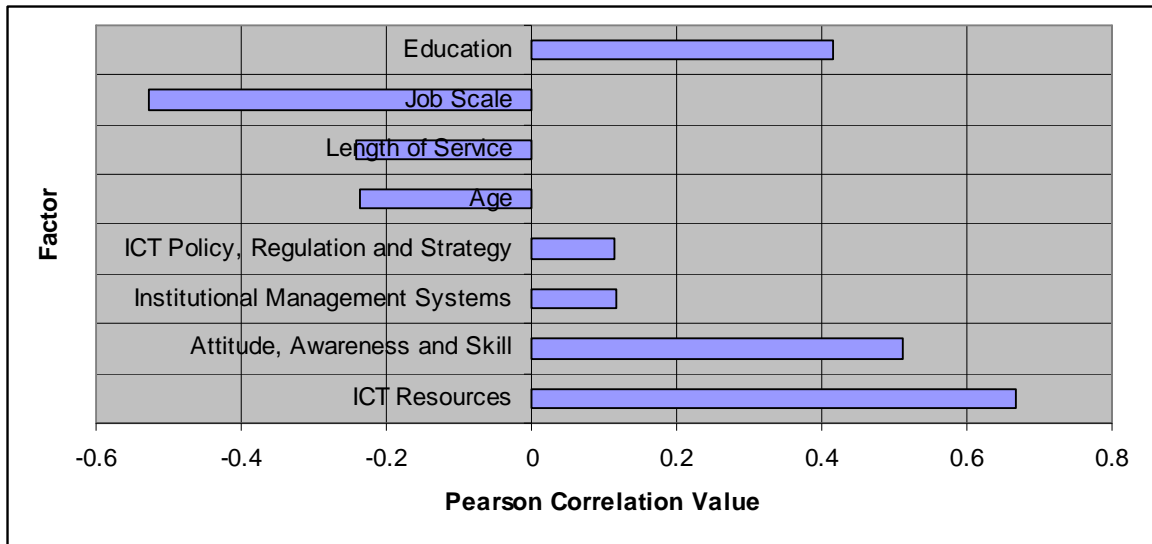
Using the Pearson Moment of Correlation Coefficient as shown in Figure 22 overleaf it was found that there was a positive and significant linear correlation between the level of ICT penetration and utilization with the two hypothesized factors in the following increasing order of strength of linear correlation.

- i. Awareness, Attitude and Skill of Managers
- ii. ICT Resources

There was however no significant linear correlation between the level of ICT penetration and utilization and the following:

- i. ICT Policy, Regulation and Strategy
- ii. Institutional Management

Education, job scale, length of time in service and age were also found to have a significant linear relationship with ICT penetration and utilization.



n = 75

Figure 22: *Relationship between the Factors and the ICT Penetration and Utilization*

5.1.3 SUMMARY OF FACTORS AFFECTING ICT PENETRATION AND UTILIZATION

ICT resources were noted to have a great linear correlation with the level of ICT penetration and utilization with Pearson Moment Coefficient of Correlation $r=0.667$ and statistical significance $p<0.01$. As the number of staff with access to a computer in a section increased the level of ICT penetration and utilization increased. However, the lack wholesome combination of the resources was noted with simple majorities of staff found to have access to ICT equipment but no access to Internet or automated systems for their core duties.

The level of ICT penetration and utilization was found to have a significant linear correlation with the awareness, attitude and skill of the staff with $r=0.512$ and $p<0.01$. In

addition, it was noted that the ICT trainings for staff significantly improved their awareness, attitude and skill.

There was no significant linear correlation between the institutions management and its level of ICT penetration and utilization with $r=0.116$ and $p=0.323$ although it was clear that the LAIFOMS information management system in the councils was driven by a strong championship of the government under the KLGRP and a strong will to ensure that the system was implemented successfully. LAIFOMS have consequently managed to streamline financial, operational and revenue management processes in the councils.

There was no significant linear correlation between the ICT penetration and utilization and ICT policy, regulation and strategy. It was noted that most of the respondents were lukewarm on the knowledge of the existence of both the national and organization ICT policy. However, a significant majority of 83.4% of the respondents indicated that they agreed/strongly agreed that an ICT policy needed to be part of the strategic plan of the organization underpinning the importance of embedding ICT in the core business of the councils. The role of government was highlighted with the performance contracting policies being considered a key influence to the penetration and utilization of ICT in the councils. The government was identified by a simple majority as being a driving force towards the use of ICT in the councils.

5.2 CONCLUSIONS

Leading from these findings we conclude that the most influential factors affecting the level of ICT penetration and utilization in the councils, in order diminishing strength of linear relationship, ICT resources, awareness, attitude and skill of the staff, the job scale, the level of education, the length of time in service and the age of staff. The state of institutional management and the ICT policy, regulator and strategy environment did not, from this study, have significant linear relationship with the observed level of ICT penetration and utilization. However, it was demonstrated that the effects of the government and KLGRP reforms including institutional, administrative, revenue and operational reforms and the consequential automation of the local authorities through LAIFOMS that effective ICT penetration and utilization is achievable through strong ICT championship, policy and strategy drive by the government and its collaborating agencies.

5.3 RECOMMENDATIONS

In view of the outcomes of this study, the following recommendations are made towards the improvement of the level of ICT penetration and utilization in the local authorities in Kenya.

5.3.1 LOCAL AUTHORITIES

1. Observing the high strength of the linear relationship between the available ICT resources and the level of ICT penetration and utilization it is highly recommended that the local authorities should invest more in ICT resources

including human capital, ICT equipment, bandwidth as well as additional training for all staff.

2. The awareness, attitude and skill and level of education were found to have a strong linear correlation with the ICT penetration and utilization the councils. It is therefore imperative that the councils give attention to or facilitate additional ICT training on the job or before hiring, set higher standards for recruitment into the workforce as well as develop incentives to reward innovation in the use of technology.
3. It was found out that a simple majority of the council remained neutral on the knowledge of existence of an ICT policy with equal percentages either agreeing/strongly agreeing or disagreeing/strongly disagreeing. It is therefore recommended that the local authorities put in place suitable ICT policies as part of their strategic plans and disseminate information on the policies in a form suitable to all the staff.
4. It was noted that while simple majorities of the council staff had access to key ICT facilities such as computers, printers, local area networks, anti-virus protection and reliable power supply units an equivalent number had no access to the Internet and automated systems for their core duties. It is therefore recommended that the local authorities align ICT with their strategic plans and that ICT facilities be acquired in combinations that leverage the public service delivery objectives. This way, hardware and software will not sit idle while core duties are performed manually and

access to information, e-government and e-business are curtailed. Consequently, the investment can be maximized to back-up the local authorities' focus on improved service delivery.

5. It was observed that some of the councils did not have suitably qualified ICT staff, or the conversion thereof, which could compromise the quality of the ICT services in the organization. It is thus recommended that staff be sourced on the basis of competence, training and experience.

5.3.2 GOVERNMENT

1. The government reforms in the local authorities under the prefecture of the KLGRP and the LAIFOMS as well as the rapid results initiative, performance contracting and quality management systems were found to have exerted great pressure towards the automation of council processes. It is thus recommended that the government maintains its strong championship in the reform agenda which will, consequently, drive the local authorities to utilize ICT towards improved public service delivery.
2. With ICT resources being identified as having a significant linear relationship with the level of ICT penetration and utilization it is recommended that the government takes steps to make it affordable to acquire ICT equipment; hardware and software, including offering incentives to local authorities to automate key public service delivery processes. For instance, it can annul taxation on hardware and software for local authorities with stringent monitoring, evaluation and control to ensure that these

measures improve ICT resource capacity in local authorities and advance the service delivery needs of the citizens.

3. The survey revealed weakness in the knowledge of the existence of the national ICT policy. It is thus recommended that the government takes steps to disseminate information on the national ICT policy, regulations and strategy in a form suitable to the diverse range of citizens and public servants.

5.3.3 AREAS FOR FURTHER RESEARCH

1. With an average of 10 computers per 100 employees in the councils it was puzzling how an access rate of about 56% was achievable and therefore further research is herein recommended to identify the ICT resource sharing dynamics in the local authorities and its influence on ICT resource requirements.
2. For the purpose of this research it was found that generally the ICT penetration and utilization achieved would be higher if simple averages were used which would be false given that the value of an office extension line as an ICT tool and utility is not comparable to the value of a smart mobile phone. Weights were thus assigned subjectively to the tools and their usage on the basis of the financial investment to acquire the tool, the skill and effort to use the tool and the value addition of the utility and thus an ICT penetration and utilization index obtained and used. It is recommended that further research be conducted on suitable means of weighting the wide array

of ICT tools and utilities, their value addition, cost and the effort required to utilize a given function in the tool.

3. Noting the centrality of e-mail and Internet in modern life it amazing that less than 58% of the respondents were using the computers for e-mail and internet. Further research is needed to investigate the low average utilization of computers for e-mail and Internet.

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APPENDICES

Appendix I: Data Collection Instrument

DATA COLLECTION QUESTIONNAIRE

PART 1 – GENERAL INFORMATION

1. Gender Male Female

2. Year of Birth.....

3. Highest level of education

Primary	<input type="checkbox"/>	HND	<input type="checkbox"/>
Secondary	<input type="checkbox"/>	Degree	<input type="checkbox"/>
Diploma	<input type="checkbox"/>	Masters	<input type="checkbox"/>
Other.....			

4. Employment status

Permanent/Pensionable	<input type="checkbox"/>
Contract	<input type="checkbox"/>
Casual	<input type="checkbox"/>
Other (specify).....	

5. Department.....

6. Occupation.....

7. Grade/Scale.....

8. For how many years have you worked in the local government?.....

9. Do you access to the following in the office? Yes No

Direct telephone line	<input type="checkbox"/>	<input type="checkbox"/>
Telephone extension Line	<input type="checkbox"/>	<input type="checkbox"/>
Computer in the office	<input type="checkbox"/>	<input type="checkbox"/>
Mobile phone	<input type="checkbox"/>	<input type="checkbox"/>
Personal e-mail address	<input type="checkbox"/>	<input type="checkbox"/>
Institutional e-mail address	<input type="checkbox"/>	<input type="checkbox"/>

10. How often do you use? Telephone Computer Mobile

Continuous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More than 3 times daily	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
At least once a week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Never	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. What do you use these for? Telephone Computer Mobile

Calls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SMS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Word Processing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Data Processing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Do you use the following for any official work? Yes No

Personal e-mail address	<input type="text"/>	<input type="text"/>
Institutional e-mail address	<input type="text"/>	<input type="text"/>

13. On a scale of 1 to 5 (1 is strongly agree, 2 is agree, 3 is neutral, 4 is disagree and 5 is strongly disagree) rate the following:

	1	2	3	4	5
I am confident in using computers and related technologies	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Computers and related technologies are easy to use	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
I enjoy using computers and related technologies	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Computers and related technologies are useful at work	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Absence of computers cannot hinder my work	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
With ICT we can exceed customer service expectations	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ICT is not necessary to meet service charter targets	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

14. On a scale of 1 to 5 (1 is strongly agree, 2 is agree, 3 is neutral, 4 is disagree and 5 is strongly disagree) rate the following:

	1	2	3	4	5
My section collaborates highly with other departments	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ICT helps this section to collaborate with others	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
All council operations are documented	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Council objectives/targets are communicated to all staff	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Most internal communication in the council is paper-based	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Computers cannot play a great role in communication	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
We fulfil all customer needs and seek customer feedback	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
All our processes increase customer satisfaction	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
We do not need any service improvements in the council	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Managers would not be effective without computers	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
All major council decisions are based on facts	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Planning, doing, checking, and acting is our norm	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

15. What role do computers and related technologies play in your department?

Communication	<input type="text"/>
Sharing Information	<input type="text"/>
Sharing resources (e.g. printers)	<input type="text"/>
Improving work performance	<input type="text"/>
None	<input type="text"/>

16. What media is used for communication in the council?

Verbal	<input type="text"/>
Paper (memos, letters...)	<input type="text"/>
E-Mail	<input type="text"/>
Storage (floppy/flash/compact disks)	<input type="text"/>
Others (specify).....	

17. Has the council implemented the following?

Rapid Results Initiatives	<input type="text"/>
Performance Contract Management	<input type="text"/>
Quality Management Systems (e.g. ISO 9001: 2001)	<input type="text"/>
Others (Specify)	
.....	

18. What laws, policies and regulations positively affect the council in the area of computers and related technologies?
 (Explain).....

.....

19. What laws, policies and regulations negatively affect the council in the use of computers and related technologies for effective customer service? (Explain)

.....

20. On a scale of 1 to 5 (1 is strongly agree, 2 is agree, 3 is neutral, 4 is disagree and 5 is strongly disagree) rate the following:

	1	2	3	4	5
There is a national ICT policy in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The council has an ICT policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The council top five managers drive ICT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The person in charge of ICT is a senior officer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The council has adequate ICT resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICT policy should be part of the council strategic plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E-mail and soft copy documents are legally acceptable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Government drives use of ICT in councils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICT is very critical for my work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. On a scale of 1 to 5 (1 is strongly agree, 2 is agree, 3 is neutral, 4 is disagree and 5 is strongly disagree) rate the following as hindrances to the full automation of councils services and operations:

	1	2	3	4	5
Lack of ICT policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Resistance by staff and political leaders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of an ICT champion in the council	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost of computers systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of top management support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Political interference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. What proportion of your core duties are now fully automated?

0-25%
 26-50%
 51-75%
 76-100%
 Do Not Know

23. Have you attended any ICT training in the past? Yes No

24. How long ago was the training?.....years ago.

25. How long was the training?.....

26. If Yes in 23 above, what areas did you cover?

.....

27. If Yes in 23 above, was the training related to your skills needs? Yes No

28. Who sponsored you for the training?
Employer Self Other (Specify).....

29. On a scale of 1 to 5 (1 is strongly agree, 2 is agree, 3 is neutral, 4 is disagree and 5 is strongly disagree) rate how the training improved your attitude, awareness and skill in ICT:

	1	2	3	4	5
Attitude	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Awareness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

30. Do you have the following? Yes No

Local area network (networked computers, printers ...)	<input type="checkbox"/>	<input type="checkbox"/>
Internet connection in your office computer	<input type="checkbox"/>	<input type="checkbox"/>
Uninterrupted power supply system	<input type="checkbox"/>	<input type="checkbox"/>
Printer	<input type="checkbox"/>	<input type="checkbox"/>
Automated system for your core work	<input type="checkbox"/>	<input type="checkbox"/>
Anti-virus protection on your computer	<input type="checkbox"/>	<input type="checkbox"/>

31. If you have Internet connection, how fast is the Internet connection?

Very Fast Fast Slow

32. How many people do you supervise?.....

33. How many of the people you supervise have computers at their work stations?.....

34. Does every employee have access to the Internet? Yes No

35. What computer and related technology systems have been implemented in the council in the last three years?
(Specify).....

.....
36. Was it/were they successfully implemented? Yes No

37. Who services faults/bugs on the systems?.....

38. At what point in the implementation process were you or your team involved?

Inception	<input type="checkbox"/>
Procurement	<input type="checkbox"/>
Implementation	<input type="checkbox"/>
Never	<input type="checkbox"/>

39. Who has been the driver/champion of the project?.....

40. Do you have any specialist staff in computers and related technologies in your section?

Yes No

41. If Yes to 40 above, what are their duties?

Computer maintenance	<input type="checkbox"/>
User support/training	<input type="checkbox"/>
Internet services	<input type="checkbox"/>
Computer programming	<input type="checkbox"/>
Others.....	

42. What challenges do councils face towards improved service delivery?.....

INTERVIEW QUESTIONS

1. What is your budgetary allocation for ICT in 2008/2009, 2007/2008 financial years?
2. What is the size of internet bandwidth for this council?
3. How many computers do you have in the council?
4. How many printers do you have in the council?

Appendix II: Research Schedule

Presentations and Evaluations – School for Human Resource Development (SHRD)

ACTIVITY/ MONTH	SEPT. 2008	OCT. 2008	NOV. 2008	DEC. 2008	JAN. 2009	FEB. 2009	MAR. 2009
Proposal Development	x	x					
Proposal Presentation & Corrections			x	x			
Pilot Test & Instrument Fine-tuning				x	x		
Data Collection & Entry					x		
Data Analysis, Reporting & Submission (SHRD Postgraduate Board)					x	x	
Corrections & Submission for Examination						x	x

Examinations and Defense – Board of Postgraduate Studies (BPS)

ACTIVITY/ MONTH	NOV. 2009	DEC. 2009	JAN. 2010
Defense (BPS Examiners Board)	x	x	
Submission of Bound Copies			x

Appendix III: Research Budget

S/NO.	ITEM	SPECIFICATIONS	COST
1.	Transport		
i.	Thika Town (Municipal Council, County Council)	4 Trips (KSh. 300/trip)	1,200
ii.	Murang'a Town (Municipal Council)	2 Trips (KSh. 1,500/trip)	3,000
2.	Stationery		
i.	Printing paper	8 Reams (KSh. 300/ream)	2,400
ii.	Binding	20 Bound Copies (KSh. 80/copy)	1,600
3.	Data collection and entry	80 Questionnaires (Est.) * 100*2	16,000
4.	Others (pens, markers)		500
	TOTAL		24,700