

Assessment of Information Communication Technology Adoption for Performance of Selected Small and Medium Enterprises in Nairobi County, Kenya

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Abstract

The SMEs are regarded as the backbone of economy growth for developed and developing countries principally Kenya. The dynamics in the state of conducting business has necessitate many organization to align their business in order to survived and compete in the global market. Moreover, ICT is one of propelling force of change which has pose unique opportunities to most of SMEs enabling them to compete in the global market. However, from various literatures review it reveals that despite SMEs being engines for growth globally, the ICT adoption by SMEs in Kenya has been reported to be comparatively low. Therefore the study embark on the assessment of ICT Adoption for Performance of SMEs so as to achieve an insight into the various factors that affects the adoption of Information and Communication Technology for performance of SMEs in Nairobi county Kenya. The study used descriptive design. The targeted population was 4560 SMEs registered by the Ministry of Trade and Industrialization within Nairobi County. The sample size of 367 SMEs was used. The stratified random sampling was used in selecting the sample. The data was collected using structured questionnaire. The administering was on a “drop and pick-later” basis. The questionnaires return represented an approximately 70% of the sample population. The data analysis was conducted using both descriptive and inferential statistics with the help of SPSS. Moreover, the result was presented using pie charts, bar charts and tables. From the findings ICT infrastructure, ICT user skills, ICT services, and government policies as licenses showed statistical significance in relation to ICT adoption on performance.

Keywords: Gross Domestic Product, Information Communication Technology, Small and Medium-Sized Enterprise(s), Technology Acceptance Model, Technology-Organization-Environment

1.0 Introduction

The ICT concept is an innovative development adapted as a result to world dynamics of which has transformed the modes of performing stuffs ranging from government services, trade, commerce, agriculture, and manufacturing (Olusola & Oluwaseun, 2013). Today the adoption and use of InformationCommunicationTechnologyby theSmall and Medium Enterprises has rapidly change way transaction and operations are conducted especially for the developed nations. In the global perspective the SMEs have empowered nations in both economic development and growth. Alam& Noor (2009) agreed that Information communication technology application currently has greatly impacted enterprises worldwide among many businesses which have extensively change global yield, business procedures among customers and enterprises.

The SMEs are known to be a backbone and driving force in alleviating poverty through economic growth and job creation and thus have boosted the private sectors eminently (Higon, 2011). According to Ongori (2009) he supported the fact that ICT adoption will create dynamism in business bureaucracy, quality service delivery, and competitive advantage at this time of globalization. Irefin, Abdul- Azeez and Tijani (2012) stated that most type of organizations are using the ICT globally to facilitate better service for customers ,efficiency as well as reduced cost of operation. Kazi (2007) stated that among developing countries as United Kingdom as well as Australia SMEs is accounting to more than half of all business and employment. However as the world moved on with increase integration of ICT, create more opportunities as SMEs participate in regional and international markets. According to Akunyili (2010) he defines ICT as an umbrella term that process and communicate information technically. Ashrafi and Murtaza, (2008) also term it as a technology which capture, transform, transmit and allow communication of information. This involved technology in computers, portable hand held devices. Wireless and wired internet enables devices, data storage, application software's and security product and services.

The adoption of ICT has transformed the manner in which business and enterprises transaction and information processing is carried out. Consequently this have not only applies to larger organizations but also SMEs have not been left behind. Apulu (2012) state that ICT is use in a wide range of areas in organization and plays a key role in the present knowledge based economy. The ICT adoption makes SMEs to have outstanding communication with their customers, improve customization and market awareness, escalation in loyalty of customers, marketing costs reduction, increased sales capacity and profitability (Harrigan, Schroeder, Qureshi, Fang, Ibbotson, Ramsey & Meister, 2010). The adoption has advantage the SMEs and the government to alleviate poverty, innovation and sustainable development, hasten economic growth and enhance integration of voluminous countries into the global economy (Ajayi, 2014). Today the ICT has enormously acted as a chief catalyst and promoter of organizational change (Hazbo, Arnela& Chun-yan, 2008).

Moreover, the informal sector aspects a lot of challenges as lack of skills, limited access to markets and finance, lack of awareness concerning new trends and changing technologies. The reduction in income disparities realization among the sectors should be through embarking on global technological changes within the environment. This can be realized by investing on required ICT infrastructure, skills acquisition and awareness (Olusola & Oluwaseun, 2013).

According to Gikenye, (2014) Kenya has taken part in a spirited role in the growth and economic empowerment through employment opportunities provision to the population where 70% of employment in 2008 which encompasses 18% GDP was the informal sector. Consequently, the main source for the millions of Kenyan population livelihood is significantly contributed through the informal sector.

The SMEs as faced a number of neglects and poor public image for long where they have survived aggravation from government agents and authorities, but though so far efforts from government to instill ICT policies and installing fund agencies to boost SMEs development and growth such as youth ,women and UWEZO fund (Gikenye, 2014). But still most activities of the SMEs are extremely vulnerable as a result of self-support reliant independently of modern institutions and thus lack enough fund to invest on the robust ICT infrastructure and innovation that can boost their performance and as a result most SMEs thereby continue to lag behind and remain small in terms of performance, operations, growth and productivity (Apulu, 2012).

Bearing in mind the significance of ICTs incorporation in business activities, the SMEs lack of enough funds, awareness, skills and interest in the innovation keeps the SMEs production, incomes and profits relatively low and thus unable to breed beyond persistence of competitiveness in the global market and large organization due to lack of required access to relevant business information (Djatikusumo, 2014). Therefore, they are unable to create strong opportunities and thus could not afford the new dynamics of technology, creativity and innovation.

However, in developing countries especially Kenya studies reveal that SMEs are still to gain the full benefits of adoption and use of ICT as equated to the developed countries. Though the significance of SMEs' as impacted many countries' economy, it is realized that those in developing countries still far behind and for any SMEs to stand competition within the environment they should use ICT more effectively to reach to expected level of competitive (Apulu, 2012). According to Gholami et al, (2010) argues that SMEs are consisting of a low annual turnover with few employers and assets compared to big firms as multi-national companies. He commented that major decisions as ICT adoption singly and centrally made by high authority personnel as managers.

Despite the advocacy of Kenya's government commitment at enacting ICT policy to support the growth of small enterprises through ICT adoption, it progress is still unsatisfactory. It is quite at a slow pace as compared to countries like the United States and United Kingdom (Lal, 2007).

There has been much affirmative relationship between SMEs growth and development economies among various nations that are developed (Golding, Donaldson, Tennant, and Black, 2008). Moreover, comparatively not much has been done with this relationship among developing nations. Therefore, this study is significant among the SMEs in Kenya to comprehend the factors affecting SMEs ICT adoption for performance. The various studies have revealed these factors as: ICT Services, ICT Infrastructure, ICT User skills, Management support and Government policy (Makau, Wawire and Ofafa, 2013; Alam and Noor, 2009; Raravi, 2014; Kabanda, 2011).

The research study was based on Nairobi County. The target population was 4560 SMEs and the selected strata to be sampled among senior, mid-level and low level management in order to have a sample size of 367 SMEs.

1.2 Statement of the problem

The SMEs has no universal term to define because of numerous sectors which are diverse. According to Mwarari (2013), he defines to the small enterprises to consist of 11 -50 employees while the medium enterprises range from 51- 100 employees in Kenya both in informal and formal sectors.

Moreover the enterprises are belief to span around the all sectors in creating employment, reduced poverty and source of income (Rok, 2009). The SMEs contribute about 80% of the total employment and in Kenya the sector has shift the GDP from 13.8% in 1993 to almost 40% as of 2008 (Rok, 2009). Studies has been carried out which have recognized the various role of economies played by SMEs.

Despite SMEs being engines for growth globally, the use of ICT within SMEs in Kenya perceived to be low and thus cannot coped with the competitive environment in delivery of service (Apulu and Latham, 2009). Ihua (2009) stated that SMEs still lag behind due to various factors that hinder their development and growth in customer satisfaction and quality services.

The ICT adoption by SMEs has been largely documented based on benefits, growth, challenges by a number of research (Ongori and Migiro, 2010; Apulu and Lathama, 2009; Manuere, Gwangwawa, and Gutu, 2012). These studies yet did not, focused on the assessment of factors affecting adoption of ICT on performance perspective of SMEs in most developing countries (Ndiege, Herselman, & Flowerday, 2014). Moreover the few studies have match relationship that exist between variables but with growth context on relatively big businesses among developing countries but little especially SMEs in Kenya (Kiveu, 2013; Alam and Noor, 2009; Olusola and Oluwaseun, 2013).

However, there being little literature that based on establishing the link between variables of ICT adoption and performance at the SMEs context. The study will thereby provide a thin body of knowledge to the variety of stakeholders through assessment of factors affecting ICT adoption for performance of Kenyan SMEs' and, more, trying to find if there is relationship between the variables and the SMEs' performance.

The ICT adoption by SMEs in Kenya has been reported to be comparatively low. Taking into consideration on low level of ICT adoption (Kuteyi, 2009; Apulu and Lathman, 2009) in developing countries especially in Kenya .It was therefore necessary to investigate the assessment of ICT Adoption for Performance of SMEs so as to achieved an insight into the various factors that affects the adoption of Information and Communication Technology for performance of SMEs in Nairobi county Kenya

1.3 Objective of study

- i. Determine the effect of ICT infrastructure on the adoption of ICT for Performance of SMEs in Nairobi County, Kenya.
- ii. Assess the effect of ICT Services on ICT adoption for performance of SMEs in Nairobi County, Kenya.
- iii. Examine the effect of ICT user skills on ICT adoption for performance of SMEs in Nairobi County, Kenya.
- iv. Establish the effect of management support on ICT adoption for performance of SMEs in Nairobi County, Kenya.
- v. Investigate the effect of government policy as an intervening variable on ICT adoption for performance of SMEs in Nairobi County, Kenya.

1.4 Research questions

- i. What is the effect of ICT infrastructure on the adoption of ICT for Performance of SMEs in Nairobi County, Kenya?
- ii. What is the effect of ICT Services on ICT adoption for performance of SMEs in Nairobi County, Kenya?
- iii. How do ICT user skills affect ICT adoption for performance of SMEs in Nairobi County, Kenya?
- iv. How does management support affect ICT adoption for performance of SMEs in Nairobi County, Kenya?
- v. What is the effect of Government policy as an intervening variable on ICT adoption for performance of SMEs in Nairobi County, Kenya?

2.1 Theoretical Review

2.1.2 Technology Acceptance Model (TAM)

The model was developed by Davis (1989) and is considered most use in the acceptance of technologies in most of the literatures. The theory was effective in that it stated that decision of adoption and use of a given technology introduced in an environment is in the hand of individual which is influence by number of things as perceived ease of use and usefulness (Manueli, Latu, &Koh, 2007).

The theory has been criticized for failing to account for the influence of the external factors in the environment as economic factors, competition from customers and suppliers (Manueliet al, 2007). The model project various view of users perceptions regarding the ease of use and usefulness of the technology (Davis, 1989).

i. The Perceived ease of use of technology

This is a key determinant in the use of technology as perceived by users and customers in the organization. The technology or innovation is much adopted by users when they consider the use of technology as easier (Okechi & Kepeghom, 2013).

ii. The Perceived usefulness of technology

Davis (1989) argues that the users can perceived the benefits expected from the system by making use of it.

2.1.3 Technology-Organization-Environment Model (TOE)

Tornatzky & Fleischer (1990) stated that innovation adoption depends on technological, organizational and environmental factors. There are a number of research studies as Borgman, Bahli, Heier and Schewski, (2013); Scott (2007); Ifinedo (2011), have adopted the model in the adoption process and used of the technology. Moreover, the model incorporates the three qualities of the technology, organizational factors, and macro-environment factors (Okechi & Kepeghom, 2013). Ifinedo (2011) reveal from his studies based on the TOE framework factors that affects e- business acceptance and usage in small and medium enterprises included variables as organizational readiness, top management support, financial resources, perceived cost of deploying ICT.

The model adopts three perspective which affects ICT adoption, this involved technological, environmental, and the organization perspective.

i. Technological Perspective

According to Okechi & Kepeghom, (2013) the organization should demonstrate understand of the ICT innovation characteristics which help in redesigning and aligning of business activities to be integrated in the ICT service applications and current systems to boost SMEs performance. There should be installation and integration of ICT with the existing business services which meets the end users requirements.

ii. Environmental Perspective

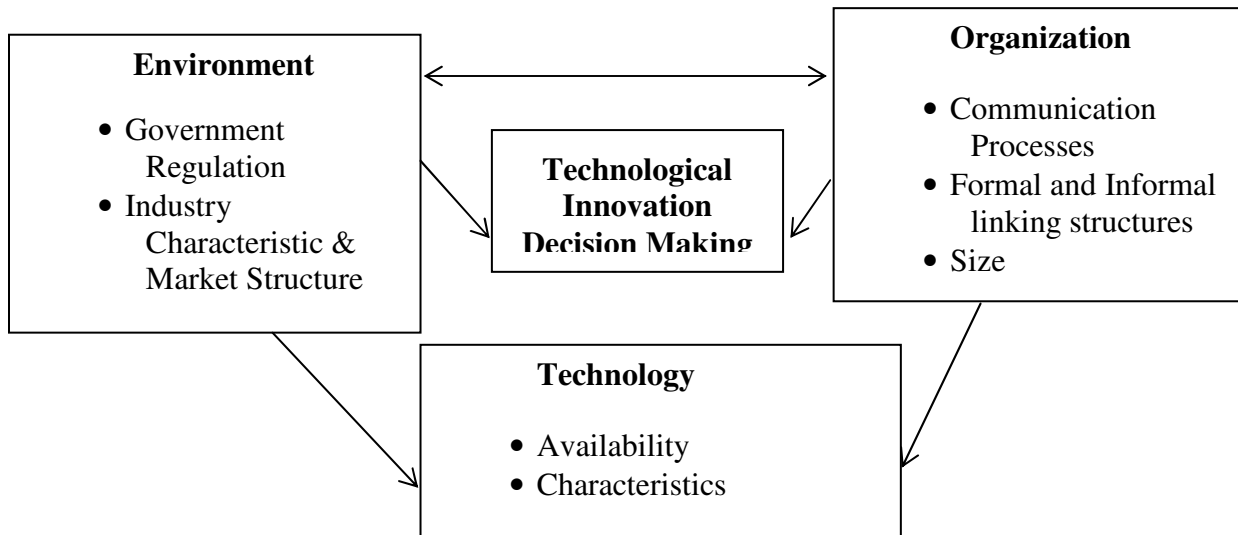
Raravi, Shrinivas.N., & Timmanagoudar, (2014) pointed out that environmental perspective involves influences surrounding the business such as the government policies. Angeles, (2013) reveals that these external factors affect the way SMEs interprets the need for innovation and deployment where they can either support or deny technological innovation. The government regulation can affect SME's activities where costs of production can rise due to mandatory regulations policies criteria's.

iii. Organizational Perspective

There is wide range of characteristics as firm size, managerial structure complexity and managers support. The top executives can strengthen the organizational growth by enhancing and collaborating a distinct image of the SMEs ,goals, strategies and core values and facilitating consistent linkages within and outside on ICT interaction (Angeles, 2013).

The TOE models are significant to the study in that it is able to bring out the independent variables which do underpinned the study. These include manager's support, government regulations and policies, ICT services and ICT infrastructure.

Figure 2.1: Technology, Environment, and Organization framework



Source: Adopted from Oliveira and Martins (2011).

2.2 Empirical Review

This section presents a review of the relevant studies related to the problem under study. It reflects on SMEs performance, ICT infrastructure, ICT user skills, management support, government policy and research gap and conceptual framework.

2.2.1 Empirical Studies

Moreover, SMEs face comparable challenges with respect to adoption and implementation of technological innovations and use of ICT (Salamzadeh *et al.*, 2011; Ifinedo, 2012). Additionally, Irefinet *et al.* (2012) supported that global economy progressively relies on implementation of ICT to obtain, process, and disseminate information. In developing countries, it forms a substantial part of its developing economies, from which they still benefit from ICT services.

Golding, Donaldson, Tennant, and Black (2008) perceived that there are variants concerning ICT adoption by developing and developed nations where developing countries lag behind as a result of factors hindering them. Considering the rampant dependence on information systems and invention of new technologies in conducting varied transactions, the acceptance of technology remains a significant matter (Zarea and Salamzadeh, 2012). However, Idemiet *et al.* (2011) from his paper found that lack of ICT user skills and training, cost, inadequate infrastructure, lack of management support, policy and institutional framework are among factors that hinder the utilization of sophisticated ICT effectively in Nigerian SMEs.

A number of SMEs faces numerous challenges in adoption and implementation of ICT due to insufficient or limited resources and skills, lack of physical infrastructures about information systems (Bruqueet *et al.*, 2007; Achimugu, Oluwagbemi, Oluranti and Afolabi, 2009). According to Irefinet *et al.* (2012) argues that there are set variables such as management support, ICT infrastructure, ICT services, government support, ICT user skills and, cost, which affects adoption of ICT among SMEs.

2.2.2 SMEs Performance

According to Chowdhury & Wolf (2003) the ICT are both use in transaction and production processes in capturing and distributing data inputs. The SMEs performance can be boosted by increasing labour production and saving indirect cost (labour cost) and direct cost (information cost). Moreover the ICT can impact both long and short run term as market niche growth and redesigning of both transaction and production processes. This increases quality of output and services and thereby increasing sales volumes and thus high revenues and profits.

According to Ongori and Migiro (2010) stated that SMEs help not only to boost the of people's living standards but also bring about income and capital growth to attained high levels of production capacity and performance. SMEs are progressively recognized as a key means of viable industrial diversification realization by many nations and therefore the SMEs serve as major drivers for economic growth and development. The ICT is referred as an umbrella term that surrounds all technical means for capturing processing and communicating information (Olise, Anigbogu, Edoko, & Okoli, 2014) where the convergence of Information Technology and Telecommunication originate to ICT (Akunyili, 2010). Therefore the digital innovation include dimensions as computers, mobile, internet, telephone systems as well as online electronic applications and broadband technologies as broad.

The explosion of ICT adoption by SMEs as posed a great benefits in promotion of economic growth as from a number of studies. Therefore a number of SMES in developing countries are adopting ICT due to many benefits that come with it (Irefinet *al*, 2012). Commonly, ICTs has posed plentiful benefits across a broader range of business services, transactions, operations and performance. Most of SMEs are slowly appreciating the positive results of ICT as increased sales due to internet presence, better communication and linkages via electronic mail and efficient practices hence improves coordination, optimization and utilization (Olise, Anigbogu, Edoko, & Okoli, 2014).

Harriganet *al*. (2010) reveals that ICT adoption has made SMEs to have effective communication with their customers, improve customization, market awareness, marketing costs reduction, escalation in loyalty of customers, increased sales capacity, profitability and performance. These however create customer based, competitive advantage and boost growth of enterprises.

2.2.3 ICT Infrastructure

According to Sessional Paper No. 10 (2012) it point out that economic, social and political are key pillars of Kenya Vision 2030 which can be anchored on by macroeconomic stability, enhanced equity and wealth creation opportunities, infrastructure technology and innovation. According to Salehet *al*, (2009) stated that most of developing nations still remain behind as compared to developed nations in ICT infrastructure such as easy access of internet, phones and other infrastructure since they are well situated; also argued that despite the use of the internet by some SMEs they still fear to use it for transactions due to perceived security and privacy issues. Some of technological factors involved reliability, technology availability, capabilities, security and attitude regarding technology compatibility, relative advantage, and complexity issues (Elbeltagi, Sharji, Hardaker, & Elsetouhi, 2013).

To boost the business's markets reach and enhance operation effectiveness and efficiency ICT technologies and innovations such as internet services are more critical to performance of SMEs, but SMEs are not able to invest on such ICT infrastructure as servers, fiber optics and other applications due to their complexity, availability and cost (Djatikusumo, 2014).

There are major factors that inhibit ICT adoption as lack of technical supports in ICT, telecommunication infrastructure, high cost of internet access, lack of online payment processes; lack of access to computer hardware, and other software, lack of telecommunication at a reasonable cost and security concerns of ICT (Manuere, Gwangwava&Gutu, 2012). According to Farhoomand (2009) on his studies on ICT Adoption in Hong Kong SMEs found that most SMEs are not using the Internet nor create and use website due to cost and lack of interest as they do not help advance their businesses. This suggested that a lack of the business need and awareness of the benefits of Internet are prompting not to adopt internet since they feel that so far they have been managing successfully without PCs or other technologies.

2.2.4 ICT Services

The development of cost effective ICT services as communication and information sharing is essential in promoting and creating conducive environment for SMEs enhancement of competitive advantage and the rapid technological innovation in production of ICT services involving customize applications and programs has greatly contributed the economic and GDP growth (Development, 2007). The SMEs are regarded reluctant in conducting their business with ICT applications thus making them not to cope well within dynamic and competitive environment hence incur more costs (Makau, Wawire, & Ofafa, 2013)

Apuluet *al.*, (2013) reveals that the overall, maintenance, and training cost are some of the issues for non-adopters and there is reluctant upgrading of their systems and other sophisticated ICT service applications due to fear of high cost of adoption. According to earlier studies most of SMEs do not completely adopt ICT to enhance transaction and support to customer's services (Harrigan, Schroeder, Qureshi, Fang, Ibbotson, Ramsey, & Mesiter, 2010). This is a result of cost of implementing ICT innovation and services and also inability of the SMEs to access aid from financial institution and could not afford to adopt applications as customer relationship management (Djatikusumo, 2014).

The integration of ICT services are under a paradigm shift from technology-based products to commercial-based products which employs new applications of ICT. The development of niche products, software's , modern data storage as cloud computing with other ICT services had enable global communication, information access and sharing and thereby impacting SMEs production and decisions (Development, 2007). But most SMEs as not take this advantage to invest on such ICT services and applications due to their complexity, cost, availability and security issues (Djatikusumo, 2014).

However, Kabanda(2011) stated that low adoption of ICT by SMEs is as a result of their small size, lack of capital and inability to obtain competitive opportunities, and thus unable to cope with dynamics of technology .The major reasons why SMEs are most perceptive on cost is that a number of financial institution have low expectation from smaller businesses which make them focus more on large businesses ,making the business unable to invest on more sophisticated technologies and applications that could boost their transactions (Djatikusumo, 2014).

2.2.5 ICT User Skills

According to Olusola & Oluwaseun (2013) study reveals that at the moment most technologically radical economies are greatly skills based where nations globally are adopting knowledge economy rather than an industrial economy to make, gather and distribute knowledge. However Apulu *et al*, (2011) pointed out from his studies that deficiencies in ICT user skills are one of factors that have hindered adoption or effective utilization of ICT among many SMEs.

The lack of ICT userskills is one of the issues that are faced by adopters and non-adopters in the use of computers and internet (Apulu, Lathama, & Moreton, 2013). Moreover, the most SMEs experience difficulty such that unable to get supported from internal and external expertise responsible for ICT control, management and organizing. (Harrigan *et al*, 2010) and Alam & Noor (2009) agrees that lack of required managerial and technical personnel's with basic ICT expertise is one the hindrance for adoption of ICT by SMEs thus affects the successful technology implementation.

A study done by Manuere, Gwangwava, & Gutu (2012) point out that the lack of ICT user skills and awareness among owner/manager requires training and education for them to address the lack of readiness of SMEs in using and adopting their electronic business potentials. However in spite of the informants' knowledge on the copious benefits of adopting ICT, it is realized that a number of SMEs still make use of paper-based memos in their operations, and thus suggest that SMEs are still reluctant to change the manual way of conducting business with ICT applications making them to incur more costs (Makau, Wawire, & Ofafa, 2013).

Therefore to cope with dynamics and competition in the knowledge economy, the SMEs are required to have strong IT literate skills which can innovate and adapt quickly to environment with large organizations which have not been the case (Olusola & Oluwaseun, 2013).

2.2.6 Management Support

Management support is the extent to which the management is believes to be committed to successful use and implementation of a system (Gono *et al*, 2013) where is known to be a crucial determinant in the adoption of ICT by SMEs (Duan, Deng & Corbitt, 2012; Jeyaraj, Rottman and Lacity, 2006) though limited resources as well as technical expertise are usually allocated for in the new technology adoption by management.

Elbeltagi, Sharji, Hardaker, & Elsetouhi (2013) identifies in his study that ICT adoption and implementation are based on manager's innovativeness, active participation, experience and knowledge of ICT plays a significant role. Therefore, the manager must own a sensible working knowledge on the new technology.

The top manager's level of IT knowledge, accompanied by a favorable attitude towards IT, increases the level of IT investment (Harrigan *et al*, 2010). Consequently, the owner/managers play crucial part in decision making within the SMEs; the owner's lack of knowledge on how to use of ICT technology and perceived benefits with the low computer literacy is a key barrier to adoption of ICT. Therefore Most of the SMEs are in business to create profit and consequently the owners are interested on return on their investments rather than concern on ICT support (Manuere, Gwangwava, & Gutu, 2012).

Alam & Noor (2009) reveals that the SMEs CEOs or owners relied on ICT decisions making based on ICT adoption which relatively related to firm size. Therefore it is essential for SMEs to evaluate employee's skills and or knowledge on ICT SMEs as to effectively influence the performance of SMEs.

According to Warue & Wanjira (2013) reveal from their studies that most managers among the SMEs do shy away from training their staff for refreshing courses or short programs as they fear of their job takeover by their subordinates. These usually become worst if the managers have no requisite qualifications to match their position in management.

2.2.7 Government Policy

The government policies which can limits foreign entry may greatly impact on the SMEs availability of credit in the developing nations and thereby its restrictions have strong effects on competition (Berger & Udell, 2004).

Raravi *et al*,(2014) argues that there are a number of government factors that have effects on the operation and performance of SMEs. These include regulatory issues, irregular changes in tax policies, procedures and rules and moreover if there can be stability in government policies the SMEs production capacity, growth and performance could greatly improve.

According to Kiveu (2013) he stated that factors as regulations, prices, national policies on taxes, labour and trade are some of the government interventions that hinder most of SMEs in adoption of SMEs. These inflexible government policies, unstable tax policies and inappropriate inspection procedures, issues in regulatory of ICT infrastructure and services sometimes conducted by government authorities create discomfort and discourage growth of ICT adoption by this SME's (Raraviet *al*, 2014).

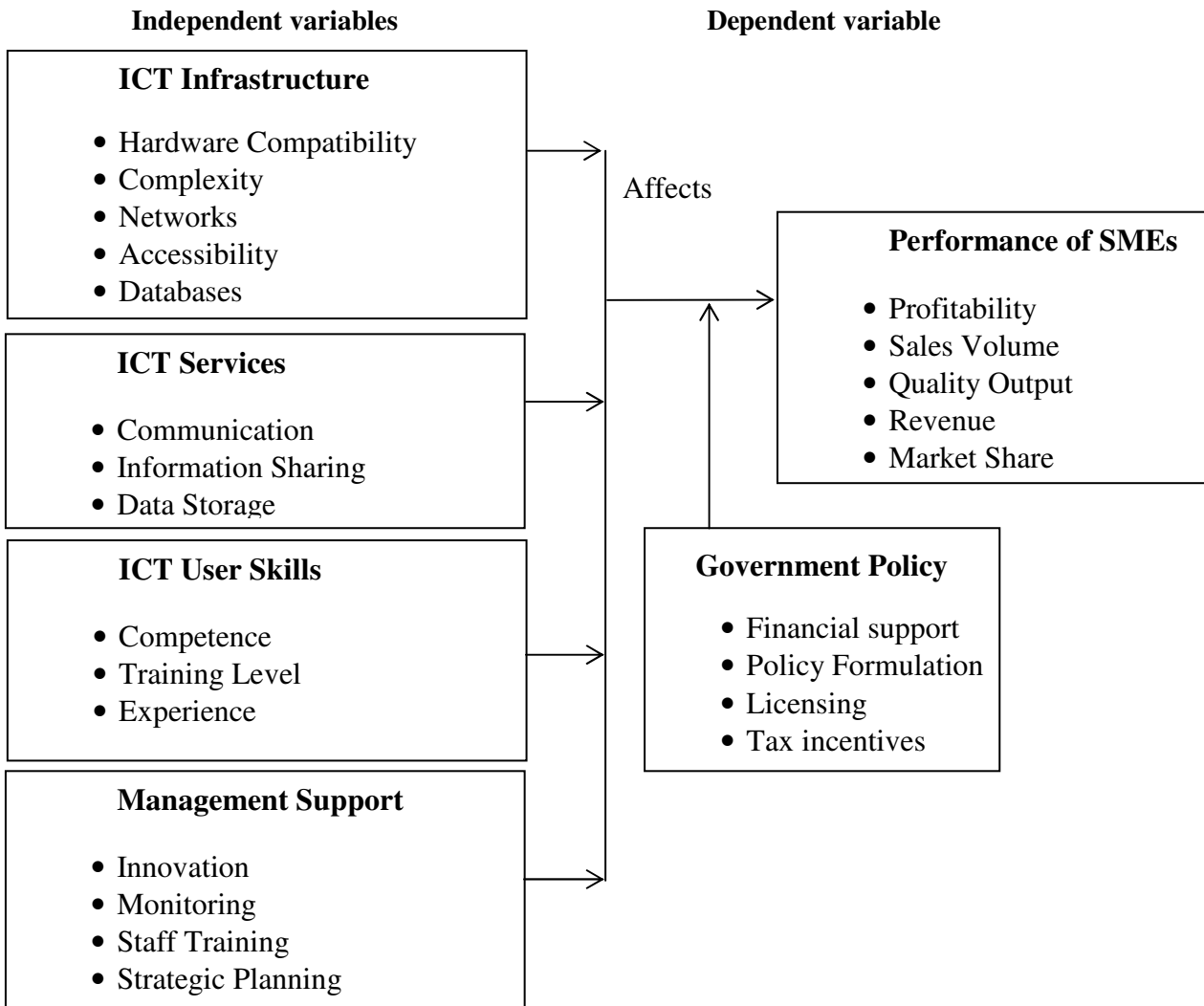
2.3 Research Gaps

The various literatures from empirical have given insights on the various factors that affect ICT adoption of SMEs from various point of view and perspectives. This includes management support, ICT infrastructure, ICT services, ICT user skills of which affects adoption of ICT. Most of the researches have point out determinants, benefits and factors affecting ICT adoption by SMEs. Therefore much has not been assess from the perspective of the performance. This gap hence requires to be filled.

However, the study will fill the gap by appraising the factors that affect ICT adoption for performance of SMEs which are essential to incorporate missing literatures.

2.4 Conceptual framework

The Conceptual framework brings a clear understanding on the four independent variables which influence ICT adoption as discussed from empirical review. These include ICT infrastructure, ICT services, ICT user skills, and Management Support. The dependent variable was Performance of SMEs and the Government Policy was the intervening variable.



Source: Author, (2015)

3.0 Methodology

This chapter describes the methodology of carrying out the study. It involved the research design, sampling design, target population, research techniques and instrument, sources and types of data, data analysis, presentation and discussion of findings.

3.1 Research Design

The study used descriptive design. This is a research method that collect information of a given subject under study by observing the environment and describing their behavior as it is to demonstrate a relationships that exist between them. The design is importance in that it helps to gain more insight about subject of study and define relationship between the variables. Therefore the descriptive design is adapted to describe the variables hindering ICT adoption and their relations to performance in the selected SMEs within Nairobi County.

3.2 Target Population

The researcher targeted 4560 SMEs which is regarded by Ministry of Industrialization and Ministry of Trade (2011) as registered within the Nairobi County which involve 1500 trading SMEs, 2500 manufacturing SMEs and 560 service sectors (Rok, 2012). According to Mugenda and Mugenda (2003) define a population as the entire groups of individuals or objects having some common observable characteristics which is to generalized the study.

The target population is an inference taken from a sample which defined only the population from a properly selected sample (Banerjee, 2007). However, Griffiths (2009) stated that a sample refers to a selection of elements extracted from an entire population and is chosen to act as subset and legitimate representative of the entire population under study.

The researcher administered 367 respondents both employees currently working in the small and medium enterprises and the managers/owners. The target population shall include the three management team, which comprise of:

Table 3.1: Target Population

Sections	Population	Percentage %
Human Resource Manager	80	22%
Accountants	100	27%
Clerks	187	51%
Total	367	100%

Source: Author, (2015)

3.3 Sampling Design

The study used the sampling technique. A proportionate sample of 367 SMEs was selected by using a stratified random sampling. The sampling was conducted among the SMEs stratified within the sectors as service, trade, and manufacturing.

3.4 Sample Size

The Cochran’s (1977) formula was essential in estimating sample size :

$$n = \frac{N}{1 + N(d)^2} \dots \dots \dots \text{Eq. 1}$$

Where n=Sample Size, N=Population Size, d=0.05 or 5% level of statistical significance.

$$n = \frac{4560}{1 + 4560(0.05)^2}$$

$$n = \frac{4560}{1 + 4560(0.0025)}$$

$$n = \frac{4560}{1 + 11.4}$$

$$n = \frac{4560}{12.4}$$

$$n = 367$$

3.5 Data Collection Methods

The data was collected using structured questionnaire that use likert type scale on primary data sources. To allow the responded speak their mind freely, the researcher used both open ended and closed questions. The structured is adopted because can help the responded candidly understood to the simple, well define and purposeful questions and hence allowing a comfortable environment without intimidation and therefore reliable information is achieved.

3.5.1 Validity of Instrument

According to Burns & Grove (2007) validity can be define as the extent to which the measurement instrument is able to measures on what it says to measures and the more the valid the instrument is, the less the systematic error. The Internal consistency was established before a test can be conducted which ensure validity for research instrument (Tavakol & Dennick, 2011).

The construct validity is considered as a theory dependent and the estimate of the extent of which the measured variance reflects the variance of the underlying construct (Westenet *al*, 2003).To evaluate the validity of the questionnaire as data collecting instrument, a pilot test shall be done. The researcher administered the instruments on specific objective addressed and assessment be made to ascertain clarity, accuracy, relevance and suitability of the instrument. The respondent was help to checked if question used are relevance to capture reliable information to address the studied scope topic.

3.5.2 Reliability of Instrument

The reliability of the questionnaire was established by conducting reliability analysis where the items internal consistency was measured using Cronbach's alpha (α) coefficient, the coefficient usually ranges between 0 and 1 (Cronbach, 1951).

According to George and Mallery (2003) the formula = $r_k / [1 + (k - 1) r]$Eq. 2 where the k=number of items r=mean of inter item correlations is used to find the size of alpha. If the Cronbach's alpha coefficient is closer to1.0 the reliability of the items in the scale is greater. The internal consistency outlines the extent of which all the items in a test measure similar concept or construct (Tavakol & Dennick, 2011).

The reliability of the research was achieved by administering the instrument with well-trained data collectors who understand the specific objective of the study, who distribute and help the respondent understand the instrument. The researcher broadens the sample questions inclusive of closely related and consistent questions to enhance consistency of the response in relation to studied area. The questions in the research instrument were specific and it addressed the prevailing scenario under study.

4.1 Data Analysis

This is a chapter where data collected, analyse are presented. This involved the analysis of response rate, descriptive analysis of the background information and all the variables involved.

The data was collected using structured questionnaire administered to 367 managers, clerks and accountants of the SMEs among the 9 regions of Nairobi County as shown by Table 4.1. The administering was on a "drop

and pick-later” basis. The questionnaires return represented an approximately 70% of the sample population. The analysis of data was then done using Statistical Package for Social Sciences (SPSS) for the Windows platform version 21.0.

Table 4.1: Business location

Variable	Frequency	(%)
Business location		
Embakasi	19	7.6
Langata	19	7.6
Dagoretti	24	9.6
Westland	90	36.0
Kasarani	25	10.0
Njiru	16	6.4
Madaraka	19	7.6
Kamukunji	16	6.4
Others	14	5.6
CBD	8	3.2
Total	250	100

Source: Survey data, (2015)

4.2 Reliability Analysis

The reliability of the scale was established by conducting reliability analysis where the items internal consistency was measured using Cronbach’s alpha (α) coefficient, the coefficient of which ranges between 0 and 1 (Cronbach, 1951). According to George and Mallery (2003) stated that if the Cronbach’s alpha coefficient is closer to 1.0 the reliability of the items in the scale is greater and thereby Alpha value threshold is at 0.7 According to the table 4.1 reveals that ICT services had the greatest reliability ($\alpha= 0.738$), followed by ICT user skills: ($\alpha=0. 735$) and SMEs performance ($\alpha=0.720$). Therefore it indicates that the variables studied were all reliable as they were within the 0.7 threshold.

Table 4.2: Reliability Statistics

Reliability Statistics		
Variable	Cronbach's Alpha	N of Items
ICT services	0.738	5
User skills	0.735	5
Performance	0.720	5

Source: Survey Data, (2015)

4.3 Demographics Information

4.3.1 Gender of the Respondent

As shown in the figure 4.1 below, the occurrence of the respondents dictates that the participants in the SMEs are usually run across almost all the genders but businesses are dominated by male as its evident where 70% of respondents were male while 30% of respondents were female.

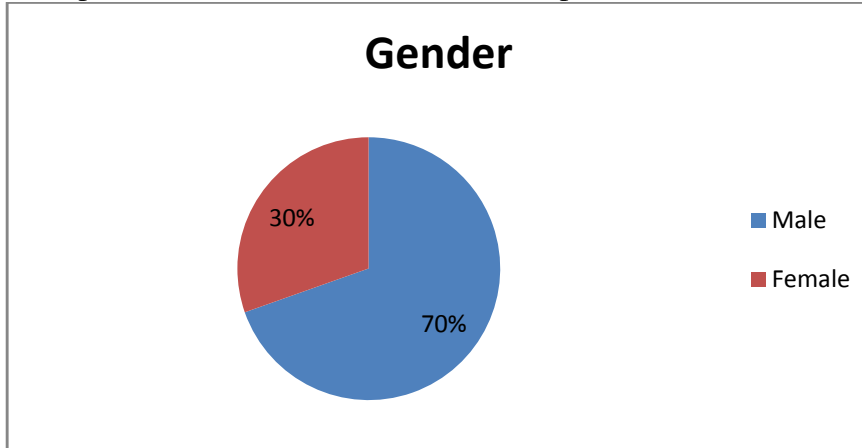


Figure 4.1: Gender of the Respondents

Source: Survey Data, (2015)

4.3.2 Category of the business

As indicated in Figure 4.1, more than half of respondent are running service SMEs which represent 67.2% of SMEs were service, out of these 23.6 % of respondent are operating trading businesses and 9.2% are manufacturing. This was able to identify the common kind of SMEs undertaken within the county. The dominance behind service firms is because respondents do not require a large physical site production, large capital and manpower to conduct the business as compared with manufacturing as its evidence with low percentage of response. The service output involved training, consultancy or maintenance.

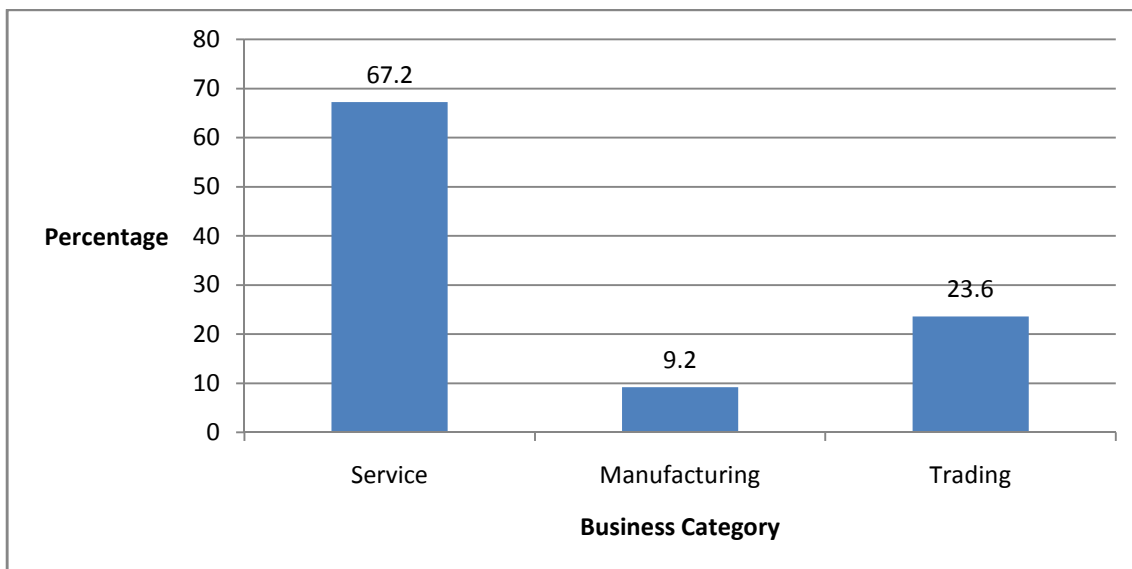


Figure 4.2 Category of the business

Source: Survey Data, (2015)

4.4 Effect of ICT infrastructure on ICT adoption

Table 4.3 Effect of ICT infrastructure on ICT adoption

Variable	Have adopted ICT	Not adopted ICT	P value
Are computers readily available or enough in the market?			
Yes	177 (99.4)	1 (0.6)	0.013
No	53 (93.0)	4 (7.0)	
We have internet access			
Yes	226 (99.6)	1 (0.4)	<0.001
No	4 (50.0)	4 (50.0)	
ICT facilities are user friendly			
Yes	238 (99.2)	2 (0.8)	<0.001
No	5 (62.5)	3 (37.5)	
Have experienced hardware/software compatibility issues			
Yes	218 (100.0)	0	<0.001
No	22 (81.5)	5 (18.5)	

Source: Survey Data, (2015)

According to the table of cross tabulation of ICT adoption and various variables on ICT infrastructure, the correlation proved significant for all the cases (the p values were all less than 0.05). Therefore ICT infrastructure played a role in the ICT adoption as indicated from the findings ,most of the business have enough computers readily available which was agreed by 99.4% with internet connection. These have make most of SMEs to improved efficiency and effectiveness in conducting business transaction. The compatibility issues within the infrastructure as software and hardware are limiting adequate utilization and make SMEs to incur more overall maintenance and training cost as agreed by Apuluet *al*, (2013).

4.5 Effect of ICT Services

4.5.1 Descriptive Statistics

In the table 4.4 below the respondents were asked to rate the various ICT application and programs centred on their customizations. Thereby it’s crucial to note that most applications are not align and customise to meet needs of the SMEs as reflected by 25.2% of respondent disagreement. As well, majority of the respondents agreed to the fact that there is an adequate information sharing, high cost of ICT training and good communication systems available. This supported studies by Djatikusumo (2014) that there is low expectation from smaller businesses to focus largely and invest on more sophisticated technologies and applications that are customize and align to meet SMEs needs, hence results to poor performance due to low revenue.

Table 4.4: ICT services frequency table

Variable	Strongly disagree (%)	Disagree (%)	Undecided (%)	Agree (%)	Strongly agree (%)	Median (IQR)	Mode
ICT application and programs are well customize to meet the business needs	63 (25.2)	38 (15.2)	35 (14.0)	62 (24.8)	52 (20.8)	3 (1.0-4.0)	1
There is secure data storage and management	38 (15.2)	47 (18.8)	15 (6.0)	97 (38.8)	53 (21.2)	4 (2.0-4.0)	4
There is adequate information sharing	63 (25.2)	33 (13.2)	37 (14.8)	75 (30.0)	42 (16.8)	3 (1.0-4.0)	4
Training on the ICT use application is cost effective	38 (15.2)	44 (17.6)	13 (5.2)	95 (38.0)	60 (24.0)	4 (2.0-4.0)	4
There is good communication systems within the business	37 (14.8)	43 (17.2)	15 (6.0)	97 (38.8)	58 (23.2)	4 (2.0-4.0)	4

Source: Survey Data, (2015)

4.6 Effect of ICT User Skills

4.6.1 Regression Analysis

Table 4.9: Model Summary on ICT User Skills

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.465 ^a	.217	.213	4.35046

Source: Survey Data, (2015)

The variable ICT User Skills under study as shown from Table 4.9, its value of the R² is 0.217, thus means that 21.7 % of the total variance in ICT User Skills has exhaustively been explained.

Table 4.10: ANOVA on ICT User Skills

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1297.283	1	1297.283	68.543	.000 ^b
	Residual	4693.773	248	18.927		
	Total	5991.056	249			

Source: Survey Data, (2015)

As indicated by table 4.10, F critical this at 5% level of significance was 18.927. As F calculated is more than the F critical with a value of 68.543 this revealed the significance of the overall model. The p value <0.001 is significant value which is less than 0.05 required and thereby, the variable predictor (ICT user skills) explained the dependent variable variation in SME performance. However if in case F significance value was more than 0.05 thus could have not indicated dependent variable variation by the independent variables.

4.7 Effect of Government Policy

Table 4.4: Cross tabulation of effects of government policy on ICT adoption

Variable	Adopted ICT	Not adopted ICT	P value
Licenses			
Yes	157 (99.4)	1 (0.6)	0.027
No	87 (94.6)	5 (5.4)	
Taxation			
Yes	189 (98.4)	3 (1.6)	0.140
No	55 (94.8)	3 (5.2)	
Training			
Yes	36 (94.7)	2 (5.3)	0.227
No	208 (98.1)	4 (1.9)	
Funding			
Yes	23(100.0)	0(0.0)	1.000
No	221(97.4)	6(2.6)	

Source: Survey Data, (2015)

From the analysis, government policy under licenses showed statistical significance in relation to ICT adoption ($p=0.027$ which is less than 0.05). Taxation, training and funding policies on the other hand had no significance in relation to ICT adoption (p values greater than 0.05). The government policies affect ICT adoption on performance. There should be flexibility in government policies, stability in tax policies, good inspection procedures, quality regulatory bodies for ICT infrastructure and services by government to create enhanced and encouraged growth of SMEs. This is in accordance with study by Raravi *et al*, (2014).

4.8 Multiple Regression Analysis

Table 4.14: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.610 ^a	.372	.359	3.92675

a. Predictors: (Constant), GovtPolicy, ManagementSupport, ICTinfrastructure, ICTUserSkill, ICTservices

Source: Survey Data, (2015)

The variables (ICT services, ICT user skills) explained 37.2% of the performance as represented by the R^2 . The other % represented by other variables.

Table 4.5: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2228.724	5	445.745	28.908	.000 ^b
	Residual	3762.332	244	15.419		
	Total	5991.056	249			

a. Dependent Variable: Performance

b. Predictors: (Constant), Govt Policy, Management Support, ICT infrastructure, User Skill, ICT services

Source: Survey Data, (2015)

The F critical at 5% level of significance was 15.419. The F calculated is more than the F critical with a value of 28.908 indicating the significance of the overall model. The p value <0.001 is significant (less than p=0.05), the variable predictor (Govt Policy, Management Support, ICT infrastructure, User Skill, ICT services) explained the dependent variable variation in SME performance. But in case F significance value was more than 0.05 it could have not indicated dependent variable variation by the independent variables.

5.1 Finding and Discussion

The data was collected and analyzed using descriptive statistics with help of SPSS software. As indicated by analysis presented the following discussions, conclusion and recommendation can be drawn. The objectives and questions ascribed in the study were guiding the response.

The research study has exhaustively demonstrated empirical details on how SMEs in Nairobi County, Kenya is affected by ICT adoption on performance. Most of the studies done earlier as more relate to only adoption of the ICT and the Growth of the SMEs but not much has been carried out to ascertain effects on SMEs performance. The study as explored how ICT infrastructure, ICT services, ICT user skills, management support, and government policy affects adoption and the performance of SMEs.

The ICT infrastructure is one of factor that influences the ICT adoption of SMEs. When there is sophisticated and enough ICT infrastructure by SMEs, allow ease adoption of which can influence performance .The results of study is in accordance Djatikusumo, (2014) that to boost the SMEs markets reach and enhance operation effectiveness and efficiency ICT technologies and innovations are more critical to performance of SMEs. The SMEs should invest on such ICT infrastructure as servers, fiber optics and other applications to enable improved performance.

From the findings, ICT services were known to most factor in the ICT adoption by SMEs .It’s was noted to be crucial to note that most applications are not align and customize to meet needs of the SMEs thereby inhibiting effective adoption of ICT, besides the fact that there is an adequate information sharing and good communication systems availability there is high cost of ICT training which limits effective ICT services implementation. These are directly affecting the performance of SMEs in Nairobi County.

The ICT user skills was found not to influence ICT performance as ICT training and access to latest information rating on the overall SMEs as per the respondent’s opinion shown a majority in disagreement. Therefore the researcher found not much association existed between ICT user skills and SME performance.

However, awareness of computer application software of help, the utility of web and social platform and the knowledge of various computer brands demonstrated positive relation to performance. Therefore it is accredited to the insufficient capital and funds to invest on personnel training within the SMEs to boost employee's skills. This is in agreement with Apulu et al,(2013) in their findings that lack of ICT user skills is one of the issues that are faced SMEs in the use of computers and internet due to lack of training.

The management support also the findings revealed to be affecting adoption of SMEs which enhanced and boost the production, sales volume, increased revenue and performance. In the study ICT investment and room for new advanced technologies showed statistical significance on relation to ICT adoption. The rest of the indicators for management support on ICT adoption proved not significant .This study found also there is constructive relation with ICT adoption. There is need for managers to support, invest and implement new innovations. This is concur with the findings of Elbeltagi et al,(2013) in his studies that ICT adoption and implementation are based on manager's innovativeness, active participation, experience and knowledge of ICT plays a significant role. Therefore, the manager must own a sensible working knowledge on the new technology.

The government policies as licenses showed statistical significance in relation to ICT adoption but taxation, training and funding policies on the other hand had no significance in relation to ICT performance. The influence of government policies as licenses and initiatives like training support can spur the ICT adoption and performance. This is concurring with Raraviet *al*, (2014) where inflexible government policies, unstable tax policies and inappropriate inspection procedures, issues in regulatory of ICT infrastructure and services sometimes conducted by government authorities create discomfort and discourage growth of ICT adoption by this SME's

5.3 Conclusion

The research study establish the crucial effect of ICT infrastructure, ICT services, ICT user skills, management support and government policy on ICT adoption and performance of SMEs. The empirical and statistical analysis proves the relationships existing with these variables and SMEs performance. The study shown that for effective ICT adoption there must be a manager's innovativeness, active participation, experience and knowledge of ICT facilities as a significant role to enhanced SMEs performance

The ICT services, ICT user skills and ICT infrastructure are powerful factors that boost the ICT performance as revenues, profitability, market share and sales volume. However the researchers found that SME performance was not affected by variables discussed but could be having other forces not examined.

To enhance the business's markets, customer satisfaction, operations, effectiveness and efficiency, SMEs should embark on ICT technologies and innovations as internet services which are more importance to their performance and growth. Moreover, the SMEs are not able to invest on such ICT infrastructure as servers, fiber optics and other applications due to their complexity, inaccessibility, and ICT cost problems. Therefore ICT infrastructure is one of factor that influences the ICT adoption of SMEs and performance there is must be sophisticated and enough ICT infrastructure by SMEs.

The SMEs needs to integrate current ICT services to allow a paradigm shift from what referred to technology-based products to currently commercial-based products that are customize to employs new applications of ICT and in line with business objectives. There should be development of niche products, software's , modern secure data storage as cloud computing, good encryption techniques and system controls to enable global communication, information security ,access and sharing and thereby impacting SMEs decisions ,production, performance and growth.

The insufficient ICT user skills and awareness among all the stakeholders undermine adequate ICT adoption and SMEs performance and thus requires investment in training, awareness and sensitization to enabled effective implementation and integration of required systems within the business environment to give the valid and quality output.

The management support has been found to be affecting adoption of SMEs on performance. Therefore it's crucial for managers to be well informed on various technologies and the dynamics within the business for them to support, invest and implement those new innovations to boost the business processes and decision making. The innovativeness, commitment, active participation, experience and good knowledge of the management enable effective implementation of ICT to realized increased performance

The government policies affect ICT adoption on performance. There should be flexible government policies, stable tax policies, appropriate inspection procedures, good regulatory bodies for ICT infrastructure and services by government to create appropriate environment and encourage growth of SMEs.

5.4 Recommendations

Researcher recommend also for the government to support the SMEs in initiatives as training and more funds to boost most of the business that are not fully utilizing potentials of technology due to insufficient capital. There is need for managers to support, invest and implement new innovations through training, and adequate provision of resources for improves growth and performance of SMEs. The SMEs also need to understand and embarked on the current ICT technologies and innovations that are correctly customized to business goals and best practices.

5.5 Suggestion for Further Research

Future research should be able to explore more factors influence ICT adoption on SMEs performance. There is need to research on appropriate and sophisticated technologies that can help SMEs improved performance. More research also can be conducted to relate between ICT adoption, growth and performance of SMEs.

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