

**INFORMATION AND COMMUNICATION TECHNOLOGY AGILITY AND
PERFORMANCE OF ELECTRONIC-COMMERCE SMALL AND MEDIUM-SIZED
ENTERPRISES IN KIAMBU COUNTY, KENYA.**

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**A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF BUSINESS IN
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DECLARATION

I, the undersigned hereby affirm that this project is my authentic work and has not been presented in part or in totality to any other institution of learning for the award of any degree or examination.

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Signature.....

Date

Supervisor.

I hereby affirm that this research project was undertaken by a student who was under my supervision

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DEDICATION.

I dully dedicate this project to my loving mother without whom I would not be able to come this far.

ACKNOWLEDGEMENT

All the glory to God whose divine grace and guidance has aided me to complete my master's program efficaciously. Sincere thanks to Dr. Josphat kyalo for his professional guidance, advice, and support throughout. Lastly appreciation to my colleagues and friends who have made this journey easier.

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OPERATIONAL DEFINITION OF TERMS.

ICT Agility- This is a measurement of the efficiency of ICT infrastructure in an organization. It also symbolizes the effectiveness of successful change or ability to generate a new opportunity. It ultimately becomes a section of the culture of the company when viewed as a whole mindset.

E-SME's - These are small and medium-sized enterprises that employ the usage of electronic commerce in its daily business operations. The businesses have to employ ICT infrastructure and networking in order to run efficiently.

Performance of SME's- This is the success or failure of the business when weighed by different determinants such as marketing, entrepreneurial skills, working environment and resources and infrastructure available.

ICT in Service Delivery- This is the process of employing technology to increase productivity and effectiveness of the process of providing services. In this process, the cost of services are reduced and creation of additional revenue that is service related.

ICT Innovation - This mainly explains the process of coming up with new ideas, assisted by technological advancement. This is a fundamental element in any business enabling emerging economies to withstand economic growth in the future.

ICT infrastructure- Fundamentals of any technological business that act as building blocks. This include hardware, software, networks, firmware and other platforms such as company websites.

ICT literacy- Capacity to use digital technology, communication elements and networks. This facilitates integration, evaluation, creation, and communication of information in an ethical manner, legally and also provides ability to function in a knowledgeable society.

Government Policy- This is basically a set of decisions made by the law- makers of a country in order to influence, change or outline the workings of any business.

LIST OF ABBREVIATIONS

- SME's** - Small and Medium-sized enterprises
- TAM** - Technology acceptance model.
- UTAUT** - Unified Theory of Acceptance and Use of Technology.
- ICT** - Information and Communication Technology.
- IOT** - Internet of Things.
- KIPPRA** - Kenya Institute for Public Policy Research and Analysis
- OECD** - Organization for Economic Co-operation and Development.
- SAP** - Systems Applications and Products.
- ANOVA** - Analysis of Variance
- NACOSTI-** National Commission for Science Technology and Innovation.
- WTO** - World Trade Organization

ABSTRACT

Small and medium-sized enterprises (SME's) are commercial entities that operate in cooperation with formal and informal sections cutting on all segments of the economy. They have immensely contributed to the economic growth, social structure and prolific source of employment in Kenya. The Inclusion of E-commerce has consequently become a re-known term in business and industry, especially over the last decade. ICT creates a platform that provides for not only the efficient running of businesses but also the dissemination of the global users at profound speeds and relatively cheap means. However, its application to SME's has been scanty and short of depth. This research project intends to find out the challenges that affect E-Commerce SMEs in Kiambu county Kenya. The research was fueled by three major theoretical theories that are the Technological Acceptance Model, Unified theory of Acceptance and Use of technology and finally Information systems success model. The Empirical review looked at Service delivery, infrastructure, innovations and literacy on the performance of E-commerce SME's. The general objective was to determine the effect of ICT agility and the performance of E-commerce SME's in Kiambu County. A sample of 503 E- Commerce SME's was identified in Kiambu County. The study narrowed down to 50 E-Commerce SME's chosen through the method of stratified random sampling. The data collection methodology was the semi-structured questionnaires which was distributed to various E-Commerce SMEs serving in the region. The drop and pick up later technique was employed in the questionnaire distribution. Statistics were employed and descriptive methods to examine the data. Descriptive included the percentages, mean and standard deviation while inferential involved linear regression. Analysis was done by the use of qualitative data and procedure of context analysis and inferences realized thereof. Findings revealed that an increase in service delivery, infrastructure, innovation, literacy and government policy resulted to an increase in performance of E-commerce SME's. Therefore, this study has demonstrated that for ICT agility to be quick paced, service delivery must be enhanced, better ICT infrastructure, more advanced ICT innovation, better skills in the ICT field and finally enhanced government support.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Information and communication technologies have turned into a necessary aspect of business framework. Theoretical plus empirical studies done have exhibited the necessity in gaining positive outcomes which include reducing cost while increasing the revenue, therefore, improving the profitability of the businesses. As stated by Tarute and Gatautis (2014), most of the companies globally are enacting ICT in its day to day operations. The assumption of ICT by organizations needs an effective business environment that can enact interoperability and standardization while providing an openly competitive environment that embodies trust and security (Deichmann, Mathhias 2015).

The use of technology in business has taken a remarkable upsurge especially in the history of man. A look at the old times, business processes were run in a very dawdling manner, and this is because of the lack of tools that are efficient for faster business transactions (Mckinsey & company 2013). The inventions that came to be in the preceding years are rather simple but their ripple effects have been used to transform the business world to what it is today. Multiple segments of the economy have evolved to enact ICT in its business processes. This goes to show that coping with change is imperative for one to reap the benefits that come with employment of technology in business.

1.2 Information and Communication Technology Agility

Growth and development of SME's can be attributed to the escalation of information and technology (ICT). SME's can benefit from the adoption of technology in production, incorporation of different business models, access to new markets and specialization (Kiplangat, Asienga & Shisia 2015). As said earlier business processes in the earlier days were run in a fickle manner due

to the lack of tools. Multiple segments of the economy have evolved to enact ICT in the business process (Mckinsey & Company 2013). This shows that coping with change is imperative for one to reap the benefits that come with the employment of technology. ICT has completely revolutionized the universal business environment. In 2015 for example, global firms and governments used up about 3.4 trillion dollars on hardware, software, information systems and telecommunications facilities. Besides, they used up an additional 544 billion on commercial together with management consulting in addition to facilities much of which was directed to reforming the firm's business processes to incorporate the emerging technologies (Gartner 2016; IDC 2016; Shumsky 2016). Moreover, several of the business significance of the technology's investments comes from the organizational cultural and management variations that are within the firm (Saunders and Brynjolfson 2016). In simple terms, the technology is at a constant change. Globalization has also aided the advancement of innovative expertise which means that there is an unearthing each day (Joensuu –Salo, Sorama, Viljamaa & Varamaki 2018). ICT is the innovative platform for establishment of more employment opportunities, with networking locations aiding people to network via innovations (Roztock, & Weistroffer Roland 2011). ICT innovations bring opportunities while provide fundamentals for the original business undertakings (Koissai & Pigget 2014).

The evolution of technology influence has significantly affected business by changing the infrastructure in the industries and creating a competitive environment for the organizations that have taken up ICT in business processes. This has led to the emergence of a theory that states that technologies have created a new economy. Alam and Noor (2014) agree that information communication technologies have currently caused an impact on enterprises worldwide amid

many businesses and this has expansively changed the global revenue and affected the business processes among the customers and enterprises. A study done recently finalized that the worth of information exchange amongst countries has developed 45 times ever since 2005 and the worth of information present surpasses that worth of goods and finance traded (McKenzie 2016). Service delivery has clearly outlined the interface amid providers and clients whereby the business provider proposes a service, be it information or a duty and the client either discover significance or misses value as an outcome.

1.3 E-Commerce and Small Medium Enterprises in Kenya

Different countries have different definitions of SMEs. This is according to their level of economic progression (Berisha and Paul 2015). The recognized values for the description of SME's, as explained, are businesses whose sale amount to a maximum of Kshs 500,000 a year, has Ksh 5,000,000 invested in it and has between 1-9 employees. E-Commerce is additionally made up of four modes, Business to Business i.e. (B2B), followed by Business to Consumer i.e. (B2C), Consumer to Consumer (C2C), and finally Business to Government (B2G). These organizations are necessary for sustainable growth, In Africa, SME's account for over 60% of jobs, and as a result of this, majorities of countries have stepped up their budgetary allocations towards the same (Iddris 2012). E-commerce, therefore, offers a platform for evolving countries to play favorably in the world company. In Kenya, the government has gone ahead to integrate internet connectivity and ICT as a driving force for the socio-economic progression and growth by forming the customer service centers and E-citizen portal and to reorganize the segment that houses customer services (Kevin, Sonny, Tigineh & Sriram 2017). They have also created a platform for businesses to register their work online.

SMEs are identified as the driving force of any growing economy (Bradford, Johnson, *et al* 2012). They are referred to as enablers of other sectors. Dealing more directly with the customers, therefore, allowing them to meet their requirements more accurately and offer an extra precise, individualized service. SMEs are the main employment source in Kenya and act as the major contributors to value creation. They are key players and they take on a significant role in the wider eco-systems of firms. Aiding them to adapt and flourish in a more enabling environment and active participation in digital renovation is essential for the boost in economic advancement and delivering more comprehensive globalization. Changing technologies have facilitated SMEs to strengthen their comparative advantage while reducing its structural disadvantages which stems from resource constraints and the ability to reap economies of scale (Fred, Kolfshoten 2012). Focus on E-commerce SMEs, the industry has completely changed the competitive market. Not only has it redefined relationships with the customers, but it has also provided avenues for new distribution channels, payment, and various delivery methods. These companies are always looking for better innovations to upsurge sales and create various opportunities in the market place.

The computer platform has transformed drastically with inclusion of institution of devices that are aided by mobile computing. Began with iPod in year 2001 trailed by the iPhone in year 2007 and also the iPad in year 2010. Globally 2 billion people are capable of access and use of smartphones, and therefore it is referred to as consumer-driven device (World trade report 2010)

The effective performance of an ICT system heavily relies on the sustenance of a functional telecommunications system. In the case of E-commerce SMEs, appropriate ICT infrastructure can have a very significant role in helping build business opportunities and handle pressure that comes

from competition. It also helps in augmenting their internal processes, enhancing their communication channels with their customers and enhanced promotions and distribution of their yields through online presence. This therefore means that ICT bears the capability of improving essential purpose of the SMEs in various levels of the business progression.

In Kenya, poor communication set-up results in limited admittance and higher prices. Outdated machines and state-owned monopolies frequently result in increased prices and restricted coverage. This therefore, discourages the SMEs from efficient adoption and widespread enactment of ICT facilities. Moreover, more innovative ICT products are created for larger firms and not SMEs. ICT companies tend to aim larger enterprises since they have a bigger budget and are ready to pay more for these services.

According to the world trade report (2004), a better infrastructural layer ensures advanced digital services and admission to local, regional and global resources in an economical manner. The infrastructure stated above, with building, electronic devices and machines make it conceivable to accommodate extensive variety of electronic services.

The use of Internet in Kenya is truncated and this therefore means that E-commerce is still in its primary stage. Different studies have highlighted that there is a snowballing benefit of awareness that stems from E-Commerce. Additional study in Kenya's Capital Nairobi, discovered that whereas E-commerce was created to make available strategic significance to developers, It became eminent that various SME's had not fully incorporated the expertise. 43% of all the organizations in the survey had no operational websites and 31% of the firms were shown to have static websites. On average 22% of the companies bore a robust and functional website which provided a

cooperative platform (Mutua *et al* 2013). It was discovered that a majority of administrators were not content in the use of E-commerce applications in companies they managed. Various firms use E-commerce by employing emails alone. Some of the factors that up till now hinder the complete rollout of E-commerce include data security, network reliability, citizen's income, and education among others. While the negative factor remains, there is a gradual process that includes sectors such as the banking system and payment. Numerous E-commerce remunerations have been accomplished by establishments in advanced countries, though a lot of cynicism in the significance of E-commerce and its aids (Odedra –Straub 2013). This study will concentrate on Kiambu County, Kenya. It will seek to determine the quickness of e-commerce SMEs to enact ICT innovations in its operations and what the users' perception is, concerning the businesses. E-Commerce SMEs specifically has revolutionized the entire service industry and enabled new business models while employing ICT. It has enabled innovations through information capturing and organization as well as knowledge processing (Fabritz 2015). No other business has proved to be more operational than marketing communications.

The online platform has given marketers innovative methods of ascertaining and interacting with many potential customers at prices which are lesser compared to that of the traditional media, comprising of recommender systems, data mining, search engine marketing and target emails. The internet has facilitated long-tail marketing. In earlier times, before this ICT method came up, getting a great view was costly and marketers were forced to base their attention on enticing the highest number of the customer with common Hi produces. Enhanced communication channels have come to be as a result of ICT. In contrast, this method of conducting business has allowed pushers to find prospective customers for products whereby there is low demand. Constantly, there

is a form of demand for nearly any available product. When a thread of these sales that are long-tailed is collected, the result is a trade that is very profitable (Nduati *et al* 2015).

1.4 Statement of the Problem

SME's have various diverse sectors. According to the Standard Digital online platform 2019, online trading is an indispensable proposition in the growth of the SME sector. However, the policies around the enterprise have made it difficult for enterprise existence, supporting only 30% of the available ventures. Factors such as sector taxes and fees that come into action in the business transactions, presence of high prices for data in some markets has been worsened by the generally low-income levels. Facilities such as the broadband internet are not affordable by many users and this eventually results in low overall service quality despite the digital demand being high.

Nielsen consumer confidence (2019), states that one in every four consumers in Kenya browse for products and services online. In general, online shopping accounts for 36% of sales in the retail sector. Many e-commerce SMEs have not yet realized how much of a growth spurt they can have by implementing all aspects of online businesses which is done over the internet. The choices available to these businesses are diligently related to the value of institutions, organizations, and markets available which establish the business environment. The SMEs lack cues in learning new ways of operating businesses, comparing the competitive characteristics that come into play in this sector. Making the decisions to invest is also a major factor to consider which includes the introduction of various innovations into the business strategy. Many E-commerce SME's have also failed to progress to surpass the business life cycle levels (Amankwa-Amoah 2018.) Previous studies show that ICT implementation among SME's is slower compared to big corporations (Ntwoku, Negash & Meso 2017). According to Albar and Hoque (2017), key challenges in ICT

implementation comprise of inadequate management backing, resistance to change, innovation deprivation, deficiency of skilled labor and lack of efficient infrastructure together with an upsurge in the digital boundary amongst the still evolving and already evolved countries (Apillu et al. 2011). The studies that concentrate on the effect of IT innovations on SME behavior in the perspective of developing nations is intermittent.

The performance of E-commerce SMEs has been majorly affected by various factors which include inadequate ICT infrastructure, poor service delivery, absence of ICT innovations, follow up of customer trends, and lack of proper marketing preferences. There is low ICT literacy of the SME managers due to low skill inexperience and lack of enhanced training.

It is therefore in contrast to this context that this study pursues to determine ICT dexterity in the E-commerce business enactment.

1.5 Objectives of the Study

The general objective of this study was to analyze the effect of ICT agility and the performance of E-commerce SME's in Kiambu County.

1.5.1 Specific Objectives

The study was based on the subsequent specific objectives.

- i. To determine the role of service delivery and performance of the E-commerce businesses in Kiambu County.
- ii. To assess relevance of ICT infrastructure and performance of E-commerce SME's in Kiambu County.

- iii. To evaluate the effect of ICT innovations and performance of E-commerce SMEs in Kiambu County.
- iv. To investigate the influence of ICT literacy and performance of E-commerce SME's in Kiambu County.
- v. To determine the effect of government policy as a moderating variable and performance of SME's in Kiambu County.

1.6 Research questions

- i. What is the influence of ICT agility and performance of E-commerce SMEs in Kiambu county Kenya?
- ii. How is service delivery affecting the performance of E-commerce SMEs in Kiambu County?
- iii. What is the relevance of ICT infrastructure and performance of E-Commerce SME's in Kiambu County.?
- iv. How are innovations through ICT affecting E-commerce SMEs in Kiambu County?
- v. What is the impact of ICT literacy and performance of E-commerce SME's in Kiambu county?
- vi. Has the government policy had any effect on inaction and operations of E-commerce SMEs in Kiambu County?

1.7 Significance of the Study

Numerous studies have discovered that SMEs have been constantly in pursuit of suitable solutions and procedures of fast implementation and integration of E-commerce in their business processes. (Kartiwi and McGregor 2010). According to Abebe (2014), E-commerce assumption generally

bears an important, affirmative effect on SMEs regular transactions advancement. This study was beneficial to SMEs in the country. With the increase in competition through globalization, the findings and the recommendations acted as a guide to the businesses on how to operate especially with the enactment of ICT in its operations. It directed the business owners on which type of ICT innovation to adopt and how it was beneficial to the performance. It also shows the challenges that come together with the implementation of various ICT concepts while revealing why the available model is not performing to the expected standards. This study therefore, helped solved business challenges that E-commerce experience in market penetration and operation. The resulting outcome may be put to use in ICT policy enactment and overall strategic decision-making process.

1.8 Scope of the Study

This study was limited to organizations that use E-commerce business platforms in Kiambu County. Application was restricted to the exploitation of ICT to enhance communication, information processing and incorporation of businesses in the E-commerce SMEs. The sample was taken and questionnaires distributed. The results sought to determine how viable it is to operate or transact using E-commerce platforms. The research purposely focused on E-commerce transactions and interactions that aid existing business relationships and platforms for online businesses.

1.9 Limitations of the Study

There might be reluctance in providing information from the respondents which may be termed as a way of determining their business transactions. To overcome this, the respondents were reminded that all the materials ruffled will be confidential and only be applicable for research work. Data

collection also proved to cause another challenge. Having an introductory letter from the university was also beneficial in creating trust with the respondents.

The respondents also were not capable of completing the questionnaires on given time. This was caused by busy schedules and pressure from work and their activities. To overcome this, the researcher engaged the 'drop and pick up later' technique. It enabled respondents to answer the questionnaires during their free time.

1.10 Organization of the Study

The study was prepared as follows. Chapter one had an Introduction and goes on to look at the background to the study. It is trailed by the statement of the problem. The objectives are subdividing into two i.e. objectives that are general and specific. This formulate the research questions. Researcher goes on to analyze the scope of the study followed by limitations and organizations of the study. This study was arranged as follows. Chapter two presented the Literature review. Theories are subdivided into two i.e. the theoretical and Empirical review. The Conceptual framework was then well documented. Chapter three introduced the research methodology and the researches focused on research design, followed by target population, the sampling techniques also sample size, data collection method, validity and reliability of the instrument and the data collection procedures. The data analysis and presentation followed up. Ethical considerations were also enlisted. Chapter four focused on the research findings and Conclusions and recommendations built up Chapter five.

CHAPTER TWO. LITERATURE REVIEW.

2.1 Introduction

This section argues diverse subtopics that involve the theoretical literature review followed by empirical literature review. The chapter also enlists a summary of the research gaps and finally the conceptual framework

2.2 Theoretical review

The theoretical framework is the configuration that can sustain a research study. It entails concepts, combined with their definitions and existing theory/theories that relate to the specific study. This outline demonstrates an indulgent of theories and concepts that are applicable to the topic of the research paper. The theories useful in this study include (TAM) Technological Acceptance Study, (UTAUT), Unified theory of acceptance and Use of Technology and Information Systems Success model.

2.2.1 Technology Acceptance Model

Technology acceptance model is first applied in the section of information technology (Awa *et al.*, 2011; Urieto, & Inyang, 2011; Benbasat & Barki, 2007; Silva 2007). This entails by what means users emanate to assent and consume technology. It facilitates a background for understanding effects of exterior variables on adoption verdicts with its rudimentary hypothesize quiescent strongly on practical and economic grounds. Complexity in the adoption of these new technologies was popularized in the early 1980s by Rogers 1983, who summarize the key influence as user acceptance behavior to include, complexity, compatibility, trial-ability, and observability among others (Davis 1989). Basic intention of TAM is to illuminate the determinants of technology reception that are able to explain user actions ranging from wide spectrum of the end-user expertise and influence on the population. The model goes on to suggest that when a new technology is

presented to users, several factors come into play on when and how they should habituate it outstandingly. Perceived usefulness and perceived ease of use. Humanists are generally more receptive to technology as long as it illustrates the effectual data sharing and preservation is influenced by the practices (Dutton and Meyer 2018). They further noted that that has been a positive upsurge directed toward the role of e- research. TAM has further presented researchers and practitioners a relatively modest and cost-efficient manner in predicting the ultimate result of a system's success.

Delving much into this theory, the perceived usefulness concentrates on the level to which an individual trusts the system will be of benefit. It also analyses how the productivity that will be achieved by the use. It has a direct effect on the attitude and behavioral objective directed towards the system. The perceived usefulness of a given system is one that a user believes has a more positive image to the performance relationship. Perceived ease of use, alternatively concentrates with the ability of a user to determine that the enactment of a specific system shall be free of effort (Dutton and Meyer 2018). An application which is considered stress-free to use will often be preferred by the users. In one way, the former affects the latter.

This model however, has been criticized by past researchers. Segars and Grover postulated a different perspective. They emphasize effectiveness, usefulness and ease of use. The findings conversely, lacked replication but some of the findings were analyzed and braced by a researcher named Workman in 2007. He separated the dependent variable into information use contrasted with technology use. It was also suggested that TAM be protracted to comprise variables that account for the change process. This includes compatibility, relative advantage, and complexity.

The TAM theory summarizes that an individual behavioral objective influences the ability to adapt a specific section of technology, is decided by an individual's attitude towards a given technology. Assertiveness, in turn, is affirmed by the elimination of threats. TAM goes on to suggest that perceptions and beliefs are very fundamental when evolving attitudes which shall direct to system operation behavior.

2.2.2 Information Systems Success Model

The prototype seeks to determine success of an incorporated system. It identifies, describes and tries to determine the relationship between six of the peak important scopes of success beside which information systems are often assessed. This has been considered among the greatest significant theories in contemporary information systems study created by Ephraim, William (1992). The dimensions include information quality which denotes the ability of a system to store, retrieve and deliver as expected. This has two angles, the user's aims and user satisfaction. It seeks to determine if a system can yield benefits for the individual or the organization.

System quality is another dimension that determines the cohesion between meditational relationships. Is it able to deliver according to the aims and satisfaction constructed? Service quality together with information quality and systems quality evaluates service delivery. It has a direct affiliation with the usage intentions and the satisfaction which cumulatively affects the overall net benefits. Systems use are affected by former derivatives. System use is conjectured to affect the contentment of the operator which in turn influences user intentions. User satisfaction and net system benefits are directly linked to each other. The user is pleased because the system

can deliver. All these categories are interconnected and mutually dependent therefore providing an inclusive analysis of information systems success.

Delone and McLean's model informed several subsequent research studies done on the same. Delone *et al.* (2003) conducted various reviews that determine the results of the original success model. The review disclosed that several relationships based in the model have received a fair share of positive and negative support. The most comprehensive meta-analysis was done by Sabharwal (2006) and this has been very contributory in fusing the quantitative research relating to the information systems success. In matters E-commerce the model analyzed the systems at various levels. This includes the system, the individual and the organization. Various researchers have focused on different aspects of E-commerce systems that entail the usability aspect, the satisfaction of users and customer interaction with the systems among others. Each of the studies made a significant contribution but there was less emphasis on the integration of the various independent variables. There was a lack of systematic criteria that is used in analyzing use and user satisfaction in E-commerce systems. Difficulties that arose from substituting customer satisfaction from users' satisfaction whereas the former is an extremely necessary condition for the success of any organization.

Extensive academic research can be found in marketing, organizational and management literature. They mostly tend to focus on the dynamics that have been put out on interpersonal interaction between the customers and the relevant service provider. There has been much a lesser amount of research on customers' interfaces with e-commerce systems (Sabharwal 2006). The concept of

customer interaction has to be well defined to make the suggested model tractable. This means that there is a fissure in the prevailing research for an all-inclusive E-commerce model.

2.2.3 Unified theory of Acceptance and Use of Technology

This was conveyed by a researcher named Venkatesh besides other investigators in the user acceptance of information technology. This theory works around four important constructs which include expectancy in performance, effort expectancy, social influence and simplifying situations. These primary three dimensions' work around the user intentions and behavior while the fourth determines various factors including user behavior, age, experience, gender among others. This was as a result of earlier research that consolidated the constructs of the eight models that intended to explain the information systems usage behavior (Venkatesh *et al.* 2003) Performance in this regard is demarcated as the extent to which technology will be beneficial in the performance of certain actions. Effort deals with a degree of ease that is related with the customer's interaction with technology. Social influence focuses on perception of consumers on whether they should use a particular technology. Lastly enabling conditions focuses on the discernment of the users on the resources and support that is available to undertake a certain task.

This theory has been undertaken by many researchers, for example, Koivumaki *et al* (2003) undertook research in Northern Finland that determined whether mobile services and technology affected user's perceptions. The major discovery was on familiarity with the devices which had a key impact on their opinion. Curtis *et al* (2006) employed the same to the employment of social media in the United States by on-profit companies. It was discovered that organizations that have employed a robust public relations department are highly susceptible to adopting social media

technologies to realize the set objectives. Females were discovered to be more open to the benefits of social media while men displayed more confidence in their use. All these applications and generalization of the prototype in an organizational setting have funded the fortifying of its general outlook (Venkatesh *et al* 2003).

An evaluation and merging of eight models which prior examinations have employed to explicate information systems utilization conduct was enacted to advance this model. This comprises the concept of social cognitive theory, coherent action, technology acceptance model, dispersion of theory of innovation and motivational model, theory of planned behavior and cognitive theory. Succeeding validation by Venkatesh *et .al* of UTAUT in a longitudinal examination, discovered it to make up for in striking 70% of the modification in behavioral target and around 50% in definite use (Venkatesh *et al* 2003).

Just like any other model UTAUT has had its fair share of criticism. Bagozzi stated that it has added to the learning of technological adaption realizing “a stage of chaos” This is because of the disparity amid the dependent and independent variables. He instead came up with, a unified theory that brings together several fragments of information to explain decision making. Johns (2006) states that new contexts can bring up new alterations in theories, for example, causing an original theorized relationship to be less significant, altering or changing the magnitude and direction of new knowledge. In this specific case of UTAUT which was initially developed to study technology and acceptance, it is perilous to determine whether technology use weakens or limits the strength of behavioral intention on customer’s perceptions.

The importance of UTAUT in this work is aligned with the assumption of E-commerce among SMEs which is greatly subjective to performance expectation, social influence, effort expectancy, and facilitating conditions. Performance expectancy often matches with PU and is apprehended by assertive features in this specific research. The UTAUT model having brought together moderating variable which involves age, experience, gender and voluntariness of practice which aid in moderating four key constructs knowledgeable habit of moderating factors which include change, risk, knowledge and uncertainty to temperate the effect of some obstacles on the different stages of E-commerce acceptance presented in the research (Johns 2006).

2.3 Empirical Review

This is research founded on experimental and phenomena which mostly stems information originating from experience other than theory. In this research, there is more concentration of ICT applications in various sectors of business and development. This section discusses ICT Service Delivery, ICT infrastructure and performance of SMEs, ICT innovations and performance of SMEs and ICT literacy and performance of SMEs.

2.3.1 ICT in Service Delivery and Performance of E-commerce SME's

According to Curtis (2015), most prototypes in the business and customer evaluation of services majorly concentrate on the perceived performance versus the comparative judgment of expectation. This therefore results in the two major evaluative judgments which is the perceived quality and customer satisfaction. A good case in point, customers weigh service delivery by associating with the expectations they had before the service encounter. Customers also develop

different viewpoints during the service delivery process, and then later compare their perceptions with the actual problem received.

Customer service can therefore be divided into two that is the high touch and high tech services (Gronross 2011). High touch comes independently. They are not associated with the people offering the services. It also includes physical resources and systems that are technology based which are succeeded and integrated into the service progression in a customer oriented manner. High-tech on the other hand are principally based on the use of automated systems. ICT has completely revolutionized the global business environment. Electronic services include both high touch and high tech. High tech services include online pay, ATM machines, online billing, and other platforms while high touch include instructions and personnel assistance in using the services.

Businesses are employing ICT to send and answer to speedily evolving customer request. This is also aimed at plummeting registers to the deepest level and achieving great heights of functioning efficacy. The supply chain has also, in turn, become extra fast-paced with companies concentrating on just-in-time inventory that shrink the respective overhead costs and therefore arrive at the markets quicker. Internet advertising and global E-commerce have continued to enlarge. These variations in ICT and systems, consumer behavior and trade have slurred yearly development of overall information digitally to above 5 Exabyte's every few days, coarsely same to the libraries in actuality (Pappas 2016). Current study determined that the importance of information flowing amongst countries has developed 45 times from 2005 and the worth of information now surpasses that value of goods and finance substituted (McKenzie 2016). Service delivery has demarcated the

interface which is present between the customers and the providers whereby the provider suggests a service, be it a task or information and the customer either catches worth or misses' worth as a result.

2.3.2 ICT Infrastructure and Performance of E-commerce SME's

According to Turban (2010), the changeover of commerce traditionally to commerce electronically hang on the stage of digitization of services of products vended, progression and delivery method. Websites, Internet, E-mails Intranet, Electronic Data Interchange (EDI), Electronic Funds Transfer (EFT), and barcode are some of the rudimentary E-commerce expertise which are deemed significant for any SME. Danie and Wilson (2002), stated that E-commerce expertise aid SME's in a wide variety of actions which include giving information that involves the organization, giving statistics about the services or the goods offered, receiving and giving orders, accepting payments, after sale services among others. The extent of E-commerce employment in commerce undertaking soften reflect the extent of E-commerce assumption with the greater use of E-commerce.

Sahelet (2009) specified that most of the developing countries are stagnant as likened to other nations due to limited access to the internet, phones and other necessary infrastructure. Some of the technological services include computing platforms that are used by the employees, customers, and suppliers in an intelligible digital environment. Telecommunications services also come in handy in providing data, video and voice connectivity. There also needs to be the presence of data managing and application software services. Management of physical facilities also needs to be set up to advance and accomplish the systems essential for data management services, telecommunication and computing. Besides, services with IT management need to be in place to strategize and develop the infrastructure while the IT standards services are responsible for coming

up with policies that determine the timing and usage of these resources. Educational Services provide training in the system used in planning and managing IT investments. The presence of research and development services is also fundamental in weighing out the potential future IT projects and investments.

2.3.3 ICT Innovations and Performance of E-commerce SME's

Shemi, karkaya, and sheya (2012) cited that active managers usually transform SMEs' objectives and corporate structure to progress the organization further. When the organizational heads do not escalate the need for ICT innovation, usually there is presence of sultry evolution in the business. Kiplangat, Shisia, and Asienga (2015) exhibited the outcomes of Kenyan SMEs, ICT innovative expertise among employees having the most momentous influence on the assumption of E-commerce firms. Macharia (2009) also found out that the truncated level of computer literacy and technical skills among managers and employees influence the general adoption of SMEs in Kenya. OECD defines innovations as, operationalization of an innovative or considerably enhanced creation, process, workplace organization or external relations. ICT remains to be a very valuable part of the business. This is because they can provide substantial efficiency gains. In general, ICT helps in reducing transaction costs while at the same time improving business processes. It also enables efficient harmonization with the suppliers, fragments procedures along the value chain, which includes horizontal and vertical movements along with various geographical movements and also plays a major role in increasing diversification. Greton (2004) goes ahead to describe why business employment of ICT in its day to day operations encourages innovation.

ICT is an indispensable platform upon which other productivity-enhancing changes can be based. For example, a business that sets itself up with a functional website creates a platform for process

innovations such as direct communication with the clients. Other functions such as delivery services, the ability of the customers to give feedback and recommendations can be easily developed. Secondly, the spillover effect of ICT usage that includes network economies come to play. These can be a source of productivity gains. A case example being staff who are actively involved in business and have adopted a broadband internet can associate with the wider network and other researchers. By keeping abreast of these activities, there is a scrutiny of the current customer trends and developments of various innovations. This poses a challenge to them. To keep up with this market and the already developed organizations, the learning company can emulate these technologies and better their business processes. This is therefore, the spillover benefits because the efforts of other researchers in the collaborative group can be appropriated by all.

Collaboration through ICT has also been made possible in today's business world. Nearly all the exploration on this topic has been subjective. However, there is presence of the general belief among academic communities and businesses that the more the commercial firm is collaborative, the more effective it sure will be (Zhu and Kraemer, 2015). A universal survey of information systems executives established that reserves in cooperation technology fashioned organizational developments which refunded further four times the extent of asset, with the highest profits of marketing, sales, research and development functions. McKinsey and company professionals foresee that social technologies cast-off within and across the enterprise could theoretically increase the efficiency of interface employees by 20 to 25% (McKinsey Global Institute 2012). Some of the latest innovations that have facilitated business processes include Email and instant messaging which have been a key communication and collaborative tool for interface jobs.

2.3.4 ICT Literacy and Performance of E-commerce SME's

Higgins and Moseley (2011) state that adoption and use of IT in business require skilled staff and visionary leadership. Business managers need to know about the potential that ICT has while conducting business. One of the major challenges recognized in many evolving countries concerning the implementation and use of ICT is that there isn't sufficient qualified staff with enough skills and/or qualifications. To effectively harness business purpose requires sustained investments in supporting staff training to create an efficient working environment. For successful transformation in the business world, users need to develop positive attitudes toward innovation. Wachira, Muturi and Sirma (2014) assessed the alleged importance of ICT on the enactment of Kenyan Sacco's. The work discovered, ICT knowledge and skills was able to critically upsurge adoption of ICT and employment therefore ultimately coercing performance. The work suggested that there is need to enhance training to be accessible to the staff to sustain ICT skills in the organization. The ministry of planning and National development acknowledged prerequisite to enhance education as a platform for arming the country with expertise in ICT useful in sustenance supportable development in the economy.

Kurnia *et al* (2009) and Molla and Licker (2005) goes ahead to confirm that decision to reject or accept E-commerce may come from entrepreneurs comfort of handling E-commerce applications and the external organizations or other business associates. The influence of adopting a new technology depend on the owner/ manager skill-set on software applications and whether the peer organizations are adopting the same in order to remain competitive.

2.3.5 Government Policy on Performance of E-commerce SME's

Several government factors that affect action and performance of SME's comprise of regulatory issues, unequal adjustments in tax policies, licenses, procedures and stated rules (Prasanna Raravi *et al.* 2014). According to Kiveu (2013), Features such as national policies on taxes, regulations, prices and labor are more or less the inhibiting factors that deter the employment of ICT in businesses. These obstinate government policies, rickety tax regulations and unsuitable inspection procedures occasionally performed by the government generate discomfort and dishearten the growth of ICT adoption.

Jones and Kozma (2013), note that ICT policies employed nationally can aid numerous significant functions. First, ICT policies offer a basis, set of objectives and a methodology of business works when ICT is presented. Secondly, ICT policies are meant to guide so that the businesses are sustainable. Moreover, individual exertions are less likely to have an effect across the county unless there is a shared apparition presented by the policy.

In Kenya, SMEs have constantly faced difficulties linked to access credit. Commercial banks are brokering with the matter of security. As a result of restricted land ownership position present in Kenya (Property Rights in Kenya), entrepreneurs are incapable of providing essential collateral desired for loan requirements. A report from ILO published in 2008: 'Factors affecting Women Entrepreneurs in Micro and Small Enterprises in Kenya, female gender composes of approximately part of all SME proprietors and a percentage of almost 40 of smallholder farm administrators. However, they possess a percentage of 10 of the accessible credit besides a lesser amount of 1

percent agricultural credit. Irrespective of the situation that some requirements have been formed concerning mainstreaming of gender, there is a lot that may perhaps be organized.

2.4 Summary of Research Gaps

This section has a summary of each of the acknowledged factors for ICT agility in E-Commerce. Therefore, this study will fill the research gaps by judging the factors that affect ICT agility in E-commerce SME's essential to incorporate missing literature. Examples include

Table 3.1 Research Gaps

Author	Focus	Design	Findings	Section filled and the effect on the current study.
Avlonitis and Karavanni (2010),	Extent of ICT adoption using internet usage across many ICTs applications	Survey	Employment of ICT enhances performance.	The study concentrated on many ICT applications. The present study will focus on E-commerce SME's
WTO (2012))	Habit of ICT in purchasing and selling practices	Survey	Purchasing and selling practices has over the years been disregarded by several establishments	The study was done in E-Commerce Sme's while the current study concentrated on SMEs thus outlaying conceptual and contextual gaps that were occupied by the current study
International Development	Examination of many	Survey	Limited people have access to libraries or study	Thestudy focussed on households while

Research Centre (2014)	households in the area		rooms and post offices therefore there is a need to teach local people how to access information by use of simple gadgets like mobile phones	the present study concentrates on E-commerce SMEs,thus outlaying a conceptual gap.
Waverman, Meschi, and Fuss (2015)	ICT and income of developing countries	Cross sectional	ICTs have proven to have a clearly positive outcome on income advancement in both developing and developed countries	The study focused on ICT and revenue of the country. This presents conceptual and contextual gap

Source: Author (2020)

2.5 Conceptual Framework

This theorizes the interdependence amongst variables in this study. The conceptual framework exemplifies the interaction between the independent and dependent variables in the study. This is presented in the figure below

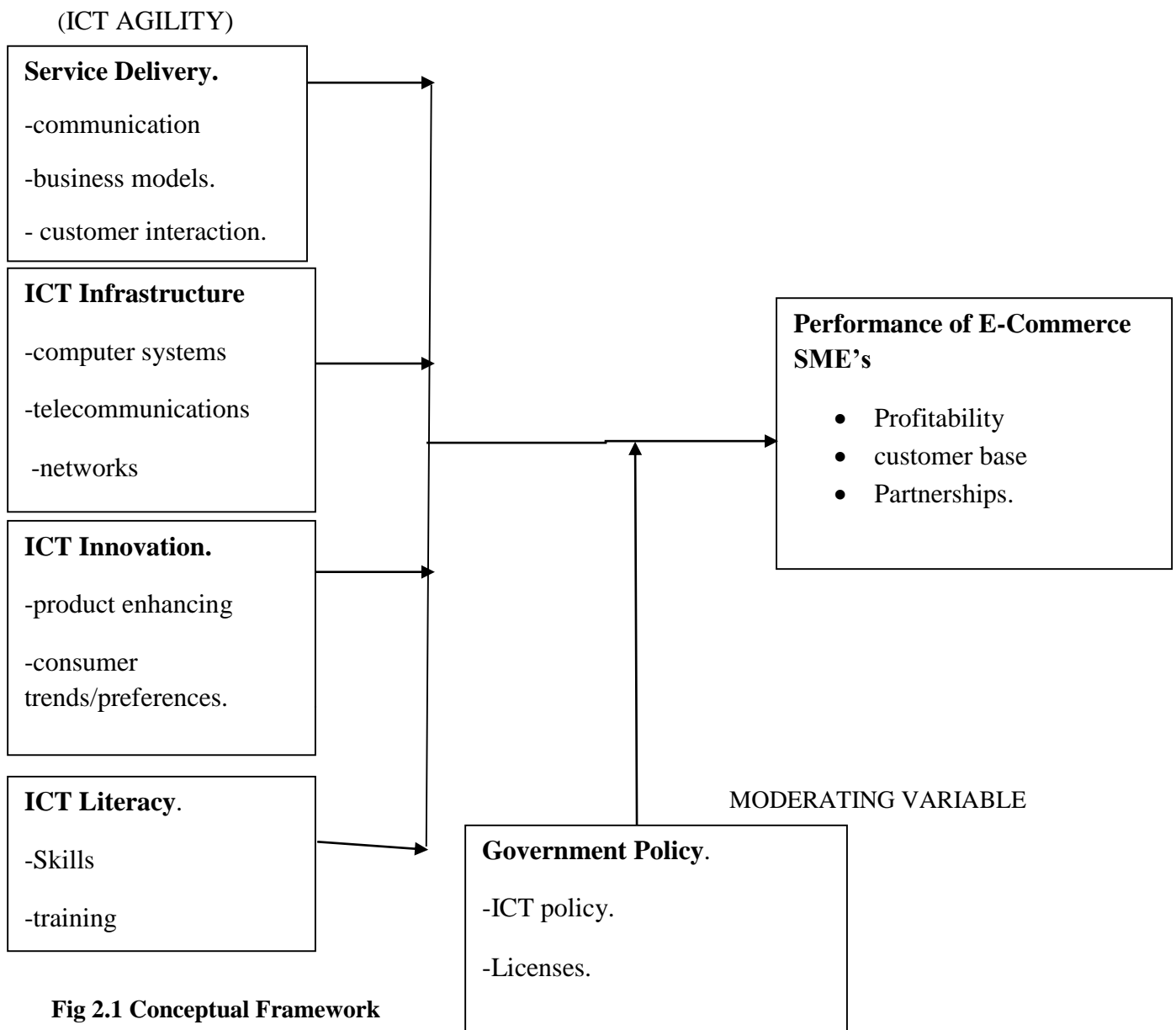


Fig 2.1 Conceptual Framework

Source: Author (2021)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter focused on the practice of conducting the study. It involved the research design, sampling design, target population, research techniques and instruments sources and categories of data, the data analysis and finally the presentation and discussion of findings.

3.2 Research Design

This is an outline which allows the researcher undertaking the work to derive solutions to challenges and also acts as a guide in the numerous stages of research. Mugenda (2008) describes research design as a strategy, structure or approach of investigation which is comprehended to get responses to research questions or problems. This work employed a descriptive research design that acted as a method of gathering data from the respondents believed to be a representative of the stipulated population. This is essential since it made the study appropriate and helped answer enquiries of the existing status while describing the form of existing conditions of the subject being studied. It also employed the use of an instrument composed of an open and closed structured questionnaire.

3.3 Target Population

This involves an extrapolation gotten from a model that defines the population from an appropriately designated sample. A population is explained as the overall assortment of essentials about which researches use to adopt conclusions (Mugenda and Mugenda 2008). It's unreasonable to choose a representative sample from the target population because it is problematic to categorize individual members. The population of interest was the E-commerce SME's in Kiambu County

Kenya. The delimitation used was the consideration of Kiambu County trading licenses and only the SME's that have these certifications was captured in this study. Kiambu County has about 55,300 registered SMEs. However, the study targeted 503 E-commerce SMEs.

3.4 Sampling Techniques and Sample Size

Sample denotes an assortment of elements taken from an all-inclusive population. This subset is selected to perform as a sincere demonstrative of the population under study. The purposeful sampling permits focusing of participants who possess some specific qualities representing the widest varied perspective within the possible range (Willis 2016). 10% of cases per group of individuals or objects will be essential for the research. Stratified random sampling was employed to choose the trial. It ensured more precision and a higher representative sample from a comparatively homogenous population. Stratification generally helped in reducing errors by conditioning some control over variance. The SMEs selected acted as the different strata of the population.

Table 3.1 Sample Size

SME category	no of SME's	Sample size	Percentage
General Merchants	143	14	28%
Informal traders	110	11	22%
Transport business	113	11	22%
Agricultural producers and processors	67	7	14%
Dispensing Chemists	70	7	14%
Total	503	50	100%

3.5 Data Collection Method

This data was composited by employment of a structured questionnaire that included both open ended and closed questions. The closed questionnaire assisted the researcher in accumulating quantitative data meanwhile the open section allowed the respondents to speak their minds freely (Mugenda and Mugenda 2008). The structured questionnaire was adopted because it helped the respondents candidly understand the simple, well-defined and decisive queries and therefore allowed a relaxed set-up without any form of pressure to enable the collection of reliable information. The variables in the conceptual framework was imperiled to conceptual analysis operationalization. This will therefore be further fragmented into scopes, indicators and elements. The indicator will be revolved into questions in the questionnaire. Questionnaires were hence distributed vigorously involved in E-commerce businesses which consumes the internet while steering all or most of their businesses. Suitable respondents were individuals, managers or owners in each organization who are competent to express their views about the business's general activities that involve e-business.

The respondents were asked to react to the items in the questionnaire. The first part comprised of dichotomous questions. Second section used a Likert scale that requires the respondents to rate the level to which they agree or disagree by means of the itemized difficulties of E-commerce.

3.5.1 Validity of the Instrument

According to Willis (2017), Validity generally denotes the extent to which the explanation of a phenomenon or the conclusions of a study equal the realisms of the world. It is the soundness of the results of a study or the soundness of the conclusions that can be grasped from the results of a study. It is most importantly based on the truthfulness of the study. To evaluate the validity of a

questionnaire, a pilot test was done. This is to ascertain the sustainability, relevance, clarity and accuracy of the given instrument. The respondent aided in checking whether the questions used were relevant in capturing reliable information to address the subject area. The researcher, with the help of the supervisor, checked the validity of the content of the research instrument by critically assessing the questionnaires to avoid ambiguity. Only the items which met the threshold were used in completing the tool.

3.5.2 Reliability of the Instrument

Reliability is clearly illustrated as constancy over time and constancy over rates and is generally apprehensive of the uniformity and replicability of study results. A reliable study should be able to produce impartially similar results if done repeatedly, presumptuous of course, that there is no change in information amid successive studies. This was established in the questionnaire by measuring using the internal consistency method of Cronbach Coefficient alpha. This is mostly used when the items are not dichotomous such as mixed texts. The Coefficient usually varies from 0 to 1. If the Cronbach alpha's coefficient is 0.6, the item reliability on the scale is better. The internal consistency lists the level to which all the items in a test measures a related concept of the construct. (Tavakole & Dennick 2011).

The reliability of the study was attained by running or overseeing the instruments. The researcher also broadened the sample questions to include closely related questions to enhance the consistency of the report about the area in the study. The questions in the research instrument was also specific to address the prevailing scenario under study.

3.6 Data Collection Procedure

This refers to the methodology and the instruments that the researcher made use of during the data collection method (Kothari, 2008). The study pursued to collect data E-commerce SMEs in Kiambu County. An introductory letter was first gotten from the University and questionnaires distributed to the respondents.

The researcher individually governed the questionnaires. In cases where the respondents were not able to fill immediately, the respondent administered the ‘drop and pick up method.’ A deadline was also customary for the questionnaires to be ready in good time. To confirm increased response rates, understandings of some segments of the questionnaire was prepared to the respondents to confirm that questions are entirely comprehend before answering.

3.7 Data Analysis and Presentation

According to Willis (2017), data analysis is a procedure of conveying direction, and connotation to the build of information ruffled. The data poised by questionnaire had to be revised, coded and passed into a Statistical Package for Social science (SPSS) to assist in data analysis. The given work generated both qualitative and quantitative data, therefore descriptive and inferential statistics had to be employed for the study. Descriptive analysis comprised of the frequency distribution tables and the measures of central tendency (the mean) and measures of validity (standard deviation). The inferential analysis also included an element of the relationship between variables and this is by using the linear regression model. Multiple linear regression equation took the subsequent form

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Whereby

Y = Performance of E-commerce SME's)

β_0 = Constant term.

β_1 - β_5 = Coefficients of variables.

X_1 = ICT Service delivery

X_2 =ICT Infrastructure

X_3 = ICT Innovation

X_4 = ICT Literacy.

ε = error item.

3.8 Ethical Considerations

According to Willis (2017), Ethics involves making a verdict against true or false behavior founded on the rules that govern human conduct that may have a weighty impact on human welfare. The researcher had to acquire an authorization letter from Kenyatta University to guarantee information confidentiality and enhancing confidence that went a long way in determining the genuineness of the data collected. Protection also enhanced and It mostly encompassed privacy, safety, and risk involved in the data gathering. The respondents were informed of their data protection and rights in the involvement of the exercise and anonymity ensured. Willis (2017) also insists on alerting the respondents on the purpose of the research, so that they can understand the nature of the study and its likely impact on them. The duration and procedure undertaken in the study are also important. The respondents were also aware of any unforeseen risks that arose so that they can realistically assess what to anticipate in the study. The respondents were notified of whether any benefits were accrued from the study and the extent of privacy and confidentiality. NACOSTI

licensing will also be put into consideration. License for Masters Research was taken and was applicable for a year during the time of the research.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter outlays the data analyzed in replying to the study objectives of the topic discussed. The section includes several sections that include specific and demographic research objectives. The collection of primary data was done by use of a structured questionnaire. Data analysis was based on the objectives of the study and subsequent findings are listed in this chapter.

4.2 Response rate

In overall, 50 questionnaires were dispersed. 46 questionnaires were duly completed and handed back which represented a response rate of 92%. These instruments, therefore, were regarded as responsive hence forming the base for data analysis. Mugenda (2008) outlines that a response rate suitable for reporting and examination is 50%. 60% is commonly good and above 70% is remarkable. This is reiterated by Babbie (2010) who considers a response rate of above 70% as outstanding. Accreditation to the high response rate is given to data collection measures that are in use.

4.3 General Information

This section gives the results of the bio-data as shown below.

Table 4.1 Responses on Bio-data

	Category	Frequency	Percentage
Gender	Male	33	72%
	Female	13	28%

Age	18-25	3	6.5%
	26-30	8	17.4%
	31-35	12	26.2%
	36-40	14	30.4%
	41-50	6	13.0%
	50 years and above	3	6.5%
Level of Education	None	0	0%
	Primary	0	0%
	Secondary	2	4.3%
	Technical	9	19.6%
	qualification	29	63.4%
	Undergraduate	6	13%
	Postgraduate		
Role in the Business	Owner	11	23.9%
	Manager	35	76.1%
Duration of Existence	0-5 years	7	15.2%
	5-10 years	16	34.7%
	10-15 years	14	30.4%
	15 years and above	9	19.5%

Source: Survey Data (2021)

From the findings that entail gender, 72% were male while 28% were female. This therefore illustrates that the study was not gendered since both genders were well represented. This is in line

with Gbedomon (2016), who discussed that in order for inclusivity in economic development, there is a fundamental need of supporting women's access to ICT in Africa.

Age results showed that 6.5% were between 18-25 years, 17.4% were between 26-30 years, 26.2% were between 31-35 years, 30.4% were between 36-40 years, 13% were between 41-50% and finally only 6.5% were above 51 years of age. This study, therefore, was able to achieve age representation which is well illustrated by the spread of respondent's age across the age brackets presented. This also shows that most of the respondents were middle-aged and still energetic and therefore able to handle rapid technological advancements.

The findings on the level of education revealed that most of the respondents were educated. None of the respondents were below the primary school level. Only 4.3% had finished school at the secondary level. 19.6% had technical qualifications. 63.4% completed their studies at the graduate level while 13% had attained the post-graduate qualifications. This therefore shows that most of the respondents were knowledgeable and therefore understand the workings of the business. This is reiterated by Higgins and Moseley (2011) who state that acceptance and use of IT in business require skilled staff

In the part played in the business, 23% were owners while the remaining 76% were managers. This shows that they were in a position to fully understand how the business operates. In the duration of existence, 15.2% of the businesses were in existence for at most 5 years, 34.7% for 5-10 years, 30.4% had operated for a period of 10-15 years and only 19.5% had been in operation for at least 15 years. This therefore shows that most of the businesses had experience in the E-commerce business environment. The finding was in line with Khan (2016) and Franco, Regi,

(2016) who stated that, in order to attain much greater and more fundamental rights, a gradual and continuous process was necessary from implementation to operation.

4.4 Service Delivery and Performance of E-Commerce SME's

Results of the analysis on Service delivery were as presented in table 4.2 below.

Table 4.2: Responses on Dimensions of Service Delivery

Statement.	Strongly Disagree	Disagree	Moderate	Agree	Strongly agree	MEAN	SD
Has delivery of services been made easier by the use of ICT	4%	13%	22%	35%	26%	3.36	1.15
Are the customers technology savvy	2%	10%	22%	33%	33%	3.52	1.271
Has complaints and conflict resolution been made easier by the use of ICT	0%	22%	24%	39%	15%	3.04	1.327
Do your encounter technological challenges when trying to deliver goods and services	0%	30%	39%	26%	5%	2.80	1.04

Aggregate mean						3.18	
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Source: Survey data (2021)

From the findings in table 4.2, all sections had a higher percentage of respondents in agreement positively. This shows that ICT has an affirmative impact on service delivery. 35% agreed that delivery of Services has been made easier by the use of ICT, and 26% highly reiterated this fact. However, some dimensions such as conflict resolution and technological challenges when delivering goods (0%) show that not all customers are technologically enabled in the E-commerce field, and the business people do not lack challenges in a way. Overall, with the technology savviness of the customers being at a high of (33%), and a (2%) low and a mean of 3.52, shows a moderate extent of the ICT knowledge in customers but also symbolizes that a lot has to be done. This is in line with Hoffman and Bateson (2012) who discovered that services incorporate an extent of interactivity as consumers take responsibility for the services they receive. Advantages can be gained by the provider of services if they increase the consumer participation in the service experience hence lower costs.

Respondents in the open question of aiding service delivery were of the view that training of customers' needs to be done which will facilitate the easiness of maneuvering through the E-commerce platforms and also enhance easy communication and payment. This will in turn boost the business.

4.5 ICT Infrastructure and Performance of E-Commerce SME's.

Results of the analysis of E-commerce SME's are illustrated in Table 4.3 below

Table 4.3 Responses on dimensions of ICT infrastructure

Statement	Strongly Disagree	Disagree	Moderate	Agree	Strongly agree	MEAN	SD
Does the business have enough ICT software and hardware	0%	4%	35%	39%	22%	3.48	1.17
Does the business have a well-structured computer network	0%	24%	30%	26%	20%	2.94	1.05
Are the people employed to handle the infrastructure have the necessary and up-to-date expertise in handling the infrastructure	0%	11%	39%	24%	26%	3.36	1.212
Aggregate mean						3.26	

Source: Survey data (2021)

From the findings, a majority of respondents concurred that they are versed with ICT infrastructure in a particular way 39% admitted that their businesses have enough ICT infrastructure, the least percentage being at 0%. This section had a mean of 3.48 with an SD of 1.17. 30% moderately

responded that the businesses have a well-structured computer network. 39% also moderately responded that the people employed to handle the infrastructure have the necessary up to date expertise in this field of study. It makes the business authentic to environment in which it operates and also goes to show that the respondents understood the fundamentals of the business. The responses were mostly average at an aggregate mean of 3.26, which illustrates that work has been done in terms of availing infrastructure to these businesses, but there is a need for additional input to eventually increase the efficiency of the ICT infrastructure in the businesses. This was supported by Turban (2010), who stated that the transition from traditional commerce to electronic commerce depends on the digitization level of the products and services sold. Therefore, for an E-commerce business to thrive there needs to be a high level of products/ services technological advancement.

In aiding the acquisition of ICT infrastructures by the businesses, most of the respondents were of the view that the hardware should be cheaper and easier to access, Government should also aid in reducing taxes in ICT hardware and software and therefore make it easier for the common person to easily acquire these. This will encourage people to do business with the infrastructure obtained.

4.6 ICT Innovation and Performance of E-commerce SME's

Results of the analysis of Innovation and Performance of E-Commerce SME's are as shown below.

Table 4.4 Responses on dimensions of ICT innovation

Statement.	Strongly Disagree	Disagree	Moderate	Agree	Strongly agree	Mean	SD
Technological context							

Availability of Technology.	4%	18%	22%	30%	26%	3.28	1.743
Compatibility of technology with organizational needs.	7%	20%	30%	30%	13%	2.98	0.793
The complexity of available technology.	7%	24%	13%	44%	12%	2.71	1.56
Aggregate Mean						2.99	
Organizational context.							
The size of the organization.	20%	13%	22%	30%	15%	2.84	1.53
Management Support.	2%	9%	26%	33%	30%	3.5	1.822
Financial resources	0%	11%	35%	33%	21%	3.36	1.93
Aggregate Mean						3.23	
Environmental context.							
Competitive pressure.	2%	2%	20%	20%	56%	3.92	0.853
Government support.	13%	9%	22%	33%	23%	3.18	1.957

Industry in which the organization operates.	11%	9%	22%	29%	29%	3.44	1.21
Average Mean						3.51	

Source: Survey data (2021)

From the findings of table 4.4, a majority of the respondents approved, ICT innovation heavily relies on the availability and compatibility of technology. This can be shown by 30% agreeing and 26% greatly agreeing to this fact. This was also coupled up with a 3.28 mean and a 1.743 SD. However, in the complexity of the technology, the respondents had varied opinions with 44% agreeing to its complexity. The size of the organization also had varied responses which in a way symbolized that that a small organization can have the necessary prerequisites in running a business 22% were moderate to the fact that size influences the innovation while 30% agreed. Management and Financial support had a big role in the business process as shown by the respondents with the lowest percentage being 0% and 2%. 35% moderately agreed that financial resources are essential for innovation while 33% greatly supported this fact. This is supported by Shemi, karkaya, and sheya (2012) who cited that active managers usually transform SMEs' objectives and corporate structure to develop the organization further. From the environmental context also, the competitive factor was a major issue in the innovations of a business. 56% greatly agreed that competition highly affects innovation, with a mean of 3.52 and an SD of 0.853. This illustrates the healthy pressure that E-commerce businesses face when they see their competitors progressing. This is supported by Porter (2000), who says that the competitiveness of nations depends on their economic creativity. Government support had varied responses also. 22% moderately confirmed that government supports innovation while 33% greatly agreed to this fact.

This may illustrate the faith that the E-commerce business owners and managers have in their current government and the level of support they receive when they want to innovate and go to higher levels of their businesses. The Industry in which the organization operates was also an influencing factor that had varied opinions by the respondents. 22% moderately confirmed that this fact supports innovation and there was an overall 29% of the respondents who agreed and highly agreed to this notion with a mean of 3.44 and 1.21 SD.

The common factor in additional ways of innovation to the businesses was Government support. This will create a conducive working environment with the fees of operation being low. Business owners and managers will be able to create more profit and also this field can enhance employment of the jobless people in the country.

4.7 ICT Literacy and Performance of E-Commerce SME's

Results of the analysis of Innovation and Performance of E-Commerce SME's are as shown below

Table 4.5 Responses on dimensions of ICT literacy

Statement	Strongly Disagree	Disagree	Moderate	Agree	Strongly agree	MEAN	SD
Do you have enough training on ICT.	0%	13%	48%	24%	15%	3.14	1.52

Are you able to access the latest information on ICT and related ideas that aid in running the business.	2%	17%	46%	20%	15%	3.02	0.975
Generally is the cost of ICT infrastructure expensive.	0%	9%	41%	17%	33%	3.36	1.24
Aggregate Mean						3.17	

Source: Survey data (2021)

From the findings in table 4.5, all respondents have a bit of ICT training. There was a 48% moderate response to training on ICT with a mean of 3.14 and an SD of 1.52. This shows that there is an understanding of the business basic concept that facilitates E-commerce transactions. Access to information resources was also seen to be possible to the respondents, with a moderate response of 46% and a mean of 3.02 and an SD of 1.52. This may be due to internet penetration in the country. This supports research done by Nielsen consumer confidence (2019) who states that one in every four consumers in Kenya browse for products and services online and online shopping accounts for 36% of sales in the retail sector. The cost of infrastructure elicited a unanimous response. 41% moderately confirmed that the cost of infrastructure is expensive, with a mean of 3.36 and an SD of 1.24. This was deemed moderately high by the respondents,

The respondents also majorly suggested more training of ICT to the general public in schools and high levels of education. This will encourage people to be open-minded and shift from the traditional ways of performing activities (Nielsen consumer confidence 2019). There will also be increased innovative ways of performing E-commerce businesses and the country will be able to compete with international standards.

4.8 Government Policy and Performance of E-commerce SME's

Results of the analysis of Government Policy and Performance of E-Commerce SME's are as shown below.

Table 4.6 Responses on Dimensions of Government policy

Statement	Strongly Disagree	Disagree	Moderate	Agree	Strongly agree	Mean	SD
Are there enough government policies directly affecting your business.	0%	8%	37%	35%	20%	3.18	1.954
Are these policies stringent on the business.	0%	4%	13%	39%	44%	3.88	1.75
Does the government follow up on the	22%	17%	13%	20%	28%	2.82	1.09

implementation of these policies.							
Do these government policies support business growth.	39%	20%	7%	17%	17%	2.42	0.849
Aggregate Mean						3.075	

Source: Survey data (2021)

From the findings in Table 4.6, Government policies were shown to have a serious influence on E-commerce business. 37% had a moderate view on whether there were government policies directly affecting the business while 35% agreed that there were present. These policies were seen to have more negative than positive impacts on the businesses with an aggregate mean of 3.075. The respondents had mixed responses on whether the policies were affecting business growth or not but a whopping 39% said that the government policies do not support business growth with a mean of 2.42 and an SD OF 0.849. Only 17% agreed that these policies support businesses. This is a worrisome trend and a fact that should be researched at length. It symbolized that the business owners and managers do not have faith in the government to support their businesses. This supported research done by Kiveu (2013), who found out that factors such as inflexible taxes and fees are some of the deterring elements that discourages employment of ICT in businesses.

The respondents were of the agreement that government should create more supportive policies to enhance business growth and review taxes which mostly affect small businesses.

4.9 Regression Analysis

Multiple linear regression analysis was done to find association amongst variables. This concentrates on determining the affiliation between dependent and independent variables.

Table 4.7 Table on Regression Analysis

Model	R	R-SQUARE	Adjusted R square	Std. error of the Estimate
1	.453 ^a	.612	.101	.84086

- a. **Predictors** (Constant), ICT Service delivery, ICT infrastructure, ICT infrastructure, ICT innovation, and ICT literacy.

Source: Survey data (2021)

The outcome of the regression analysis showed that 45.3% effect explained by variables under study. 61.2% symbolized the model fitness and therefore it was a good representation of the cause- effect sought in the study. This results were adjusted to 10.1% to higher error margin.

4.9.1 Analysis of Variance

Further analysis of the ANOVA as shown in the table below shows that the F statistics of 4.218 was significant at a 6% level of confidence. This illustrates that the model employed was fit to give explanations of the affiliation between the performance of E-commerce SMEs and the listed ICT variables. The significance of F explains the importance of the regression model.

Table 4.8 Analysis of the Variance

Model	Sum of squares	Df	Mean structure	F.	Sig.
1 Regression	15.124	6	3.437	4.218	0.01 ^b

Residual	102.144	263	.653		
Total	117.268	269			

- a. Dependent Variable: Performance of E-Commerce SME's.
- b. Predictors: (Constant), ICT Service delivery, ICT infrastructure, ICT infrastructure, ICT innovation, and ICT literacy.

The ANOVA analysis for individual factors affecting ICT agility and Performance of E-commerce SMEs is presented above. This symbolizes that the variables were independent of each other and thus have unique effect to the performance.

4.9.2 Regression Co-efficient results

The following table illustrates the coefficient of variables.

Table 4.9 Regression Co-efficient Results.

Model	Unstandardized coefficients		Standardized Coefficients,	T	Sig.
	B	Std. Error	Beta		
Constant)	1.261	.465		2.163	0.11
Service delivery	.221	.101	.182	2.323	.021
ICT Infrastructure	.139	.141	.084	.942	.032
ICT Innovation	.256	.113	.213	.236	.024
Literacy	.046	.136	.038	.318	0.01

- a. Dependent variable: Performance of E-Commerce SME's.

Source: Survey data (2021)

Therefore

Performance of E-commerce SME's₁ = 1.261 + 0.182 Service Delivery + 0.084 ICT Infrastructure + 0.213 ICT Innovation + 0.038 ICT Literacy

The coefficients of the individual factors affecting ICT agility are presented in table 4.8 above. ICT in service delivery ($p=0.21$), ICT infrastructure ($p=0.032$), ICT innovation ($p=0.024$), ICT literacy ($p=0.01$), Government policy ($p=0.000$) exhibited that all the predictor variables were significant elements that had an effect on ICT agility and Performance of E-commerce SME's.

From the results, an increase in one unit of in service delivery will consequence in a .221 increase in ICT agility and performance of E-commerce SME's. Service delivery is an important cause of ICT agility as shown by the p-value of 0.21 that is less than 0.05. Therefore, this illustrates that Service delivery impacts ICT agility. This agrees with studies done that depict assurances of Service delivery in demanding conditions that are constantly increasing and timeframes that are ever shortened with resources optimized. This needs enhancing efficient strategies, for example, operations automation.

The results also depict that an increase in one unit in ICT infrastructure will consequence in a .139 upsurge in ICT agility and performance of E-commerce SME's in Kiambu County. ICT infrastructure is an important element of ICT agility as indicated by the p-value of .032. This shows that there is a positive significant relationship between ICT infrastructure and ICT agility and Performance of E-commerce SME's in Kiambu County. This therefore agrees with (Duncan 2015) who explained that many startup enterprises present even in already developed nations have had challenges in ICT agility due to the prices of hardware and software facilities.

The results show that a unit increase in ICT innovation will result in a .256 increase in ICT agility. Due to this finding, ICT innovation is a significant determinant of ICT agility and Performance of E-commerce SME's in Kiambu County as shown by the p-value of .024, which is less than 0.05. This shows a positive important association. This agrees with (Greton 2014) who illustrates that

the employment of ICT innovation in day to day running of the business creates product-enhancing changes such as direct communication with clients, service delivery among others and serves as a source of productivity gains.

On the literacy levels, a unit increase in ICT literacy will result in a .046 increase in ICT agility. Reacting to these findings, ICT literacy is a significant predictor of ICT agility. This is reinforced by a study done by Ongori and Migiro (2011) who explained that when the employees of an enterprise are proficient in ICT functions, agility is enhanced. They also described that lack of proficient ICT skills is one of the major setbacks in the reception of ICT by SME’s globally.

Table 4.10 Regression Co-Efficient Results on Moderating Variable

Model	Unstandardized coefficients		Standardized Coefficients,	T	Sig.
	B	Std. Error	Beta		
Constant)	1.018	.421		2.231	0.10
Government Policy	1.012	.253	.432	-1.743	.000

a. Dependent variable: Performance of E-Commerce SME’s.

Source: Survey data (2021)

Therefore

$$\text{Government Policy}_2 = \alpha_0 + \alpha_1 \lambda_1$$

$$= 1.018 + 0.432 (\text{Government Policy})$$

The above table shows that an increase in one unit of government policy results in a 1.012 increase in ICT agility in Kiambu County. This illustrates that government policy is a significant predictor of ICT agility as shown by the p-value of .000. This is also sustained by a study done by Jones and

Kozma (2013), who noted that National ICT policies can help in numerous functions such as offering a rationale on how the business should operate while guiding sustainable businesses.

In summary, all variances were discovered to be statistically substantial with an affirmative effect to the performance of SME's, implying that increase of effect on a variable will automatically result to the increase in performance of E-Commerce SME's in Kiambu County.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS.

5.1 Introduction

This chapter offers the outline of the summary, conclusions and recommendations. The research focused on E-commerce SME's in Kiambu County with the exertion of looking for factors that affect ICT agility. The study's main objective was to analyze the effect of ICT agility and the performance of E-Commerce SME's in Kiambu County, Kenya. It also highlights the challenges experienced and suggestions for further studies. This would contribute extensively to the knowledge body in this study environment and assist policymakers in making decisions.

5.2 Summary of the Findings

A descriptive research design was employed. This is because of its aptness in portraying a specific profile of events, situations and affected persons. The study was anchored on three theories i.e. Technology Acceptance Model, Unified Theory of Acceptance and Use of Technology and the Information Systems success model. The study targeted the 503 E-commerce SME's Kiambu County as documented by the Kiambu County Government. Stratified Random sampling was employed to factor in the data heterogeneity. 10% from each stratum was used, making up a total of 50 respondents. Semi-structured questionnaires were utilized to collect primary data. The Drop and pick-up method was also employed in the collection of data. Most of the respondents were male aged between 31-40 years and were degree holders. Most of the businesses in the studies had been in operation for more than 5 years.

The research has shown how ICT agility is influenced by several factors. The study investigated how Service Delivery, ICT infrastructure, ICT innovation, ICT literacy and government policy affect the agility and performance of E-commerce SMEs in Kiambu County.

5.2.1 ICT in Service Delivery and Performance of E-Commerce SME's

The study discovered that service delivery is a major factor that affect ICT agility and performance of E-Commerce SME's in Kiambu County, as it was shown that an increase in Service Delivery resulted in increased ICT agility. Furthermore, it was revealed that enhancing efficient strategies such as process automation would enhance ICT agility. Internet advertising, just-in-time inventory are some of the service delivery factors, which would be most beneficial to the E-commerce SME's when employed efficiently.

5.2.2 ICT Infrastructure and Performance of E-Commerce SME's

The ICT infrastructure is another very important factor that influences ICT agility in E-commerce SME's. The results revealed a positive significant association, whereby increased ICT infrastructure would result in increased agility. This agrees with many studies. Investments in ICT, even though was expensive are an indispensable factor in ICT agility experience by the businesses that were under the study.

5.2.3 ICT Innovation and Performance of E-Commerce SME's

The findings of ICT innovation were shown to affect ICT agility and performance of E-Commerce SME's. The study revealed that an increase in ICT innovation would automatically increase the agility. This was also in line with several studies that have been conducted in this segment. When the spillover of network economies happens, there are overall productivity gains and this can only be possible with innovations in the industry.

5.2.4 ICT literacy and Performance of E-Commerce SME's

ICT literacy was also seen to be a very important factor influencing ICT agility. The results exhibited that this factor had a positive impact on E-Commerce SME's. It was therefore clear that a unit increase in ICT literacy, increased ICT agility in the E-commerce SME's. This therefore means that, if employees concentrated on increasing their skill set in the given field, the likelihood of ICT progression increases and thus, they are to put up a competitive front compared to other businesses.

5.2.5 Government Policy and Performance of E-Commerce SME's

Lastly, government influence had a serious influence on ICT agility in E-commerce SME's. A unit increase in government policy had a positive impact. In explanation, this elicited a clear sign that if the policies are favorable to the business owners, businesses will thrive. Regulation of taxes and policies need to work in favor of the businesses. This will enable the owners and managers to work coherently and also provide employment opportunities in this field of work.

5.3 Conclusion

This study has investigated ICT agility in E-commerce SME's in Kiambu County. One of the objectives was to analyze the effect of ICT agility and the performance of E-commerce SME's. By breaking this down, the researcher looked at four specific objectives. One was service delivery. It was discovered that this was a significant predictor of ICT agility in E-commerce SME's. Specifically, the analysis recognized that a unit increase in service delivery forecast an increase in ICT agility in the given SME's. More attention given to this objective would result to the progression of agility to the customers and people who rely on the businesses.

ICT infrastructure was also seen to be a significant predictor of ICT agility. In conclusion that a unit increase in related infrastructure would lead increased ICT agility. This illustrates that ICT infrastructure is positively and significantly related to ICT agility. Therefore, infrastructure needs to be a keen sector to concentrate on to ensure that the SME's progress and can attain their mission and vision in the ICT business environment.

ICT innovation was depicted to be a significant predictor also of ICT agility. As seen, a unit increase in innovation would increase agility. This was influenced by many factors such as management support, Finances, government support among others. Innovation is key to a progressive business environment and as seen this was a major influence on the SME's agility,

ICT literacy was also a major factor. A unit increase in literacy increase in agility. This shows how important skills in this field of work is. The managers and employees need to have the know-how in running the hardware and software facilities. This therefore means that education needs to be promoted in this sector to enable growth and progression in E-Commerce SME's.

Finally, Government Influence was seen to be an important factor in ICT agility. A unit increase would automatically increase the agility. The government cannot be left out, especially in running a business and its support is of an utmost key in growth and progression. If the sector policies and taxes are favorable, it means that these businesses will thrive.

The study established the significant effect of ICT agility. Both Empirical and statistical evidence proved this variable to be imperative. Therefore, this study demonstrated that for ICT agility to be quick-paced, service delivery must be enhanced, better ICT infrastructure, More advanced ICT innovation, better skills in the ICT field and finally enhanced government support.

5.4 Recommendations

The study endorses that the government renders its support to the SME's. This can be by regulating sector fees and taxes. Implementation of both policies and laws that govern this sector needs to be well articulated by the government. ICT infrastructure also needs to be provided such as network infrastructure. This will create a strategy of enticing E-Commerce SME's. It will be able to contribute to the GDP of the county and the country.

There needs to be skills training to enable personnel gets the required know-how in running the business. Refresher courses need to be put in place because technology is at a constant change. There also needs to be an encouragement to innovate and come up with new business ideas and strategies. This will enable businesses to thrive and find new ways of conducting business. This will increase the competitive advantage of the businesses.

5.5 Suggestions for further research

This should be done directed towards analyzing how profitable the E-Commerce SME's are and how they can impact the community. This was not comprehensively undertaken in this study and it would be essential to investigate how viable these businesses are.

Primary data was also solely used in this study. Alternative research can be incorporated to approve or disapprove the current research findings. Descriptive, correlation and aggression analysis was used in this specific research. Additional research can integrate other analysis methods such as cluster and discriminate analysis.

The study was also a bit restricted in its capacity to sample respondents from other regions of the country due to financial and time constraints. Therefore, it is recommended that the study be carried out in other regions to get diverse opinions and different elements in varied concepts.

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Appendix 1: Questionnaire

This questionnaire is an attempt to establish ICT agility in E-Commerce SMEs in Kiambu County, Kenya. Kindly give a response to the questions honestly and carefully in accordance to all the instructions given. The responses will be important for research purposes. Your identity will be termed confidential.

SECTION 1: Biodata.

1. Gender

Male [] Female []

2. Age (Years) 18- 25 [] 41- 50 []

26-30 [] 50 Years and above []

31-35 []

36-40 []

3. Level of Education. None [] Primary [] Secondary [] Technical qualification []

Undergraduate [] Post graduate []

4. Name of business

.....

5. Please indicate your role in the business

Owner [] Manager []

6. Location of the business

.....

7. How many full-time employees does the business have?

.....

8. How long has the business been in existence?

.....

SECTION TWO: ICT in Service Delivery

Kindly indicate the extent of Service delivery influence E-commerce SMEs as follows.

1. Strongly Disagree 2. Disagree 3. Moderate 4. Agree 5. Strongly Agree

Statement.	1	2	3	4	5
Has delivery of services been made easier by the use of ICT?					
Are the customers technology savvy?					
Has complaints and conflict resolution been made easier by use of ICT?					
Do your encounter technological challenges when trying to deliver goods and services?					

In your view what can be done to aid service delivery with the incorporation of ICT.?

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SECTION THREE. ICT Infrastructure

Kindly indicate the extent of ICT infrastructure influence E-commerce SMEs as follows.

- 1. Strongly Disagree 2. Disagree 3. Moderate 4. Agree 5. Strongly Agree**

Statement	1	2	3	4	5
Does the business have enough ICT software and hardware?					
Does the business have a well-structured computer network?					
Are the people employed to handle the infrastructure have the necessary and up-to-date expertise in handling the infrastructure?					

In your view, what can be done to aid the acquisition of ICT infrastructure by E-commerce SME's.?

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SECTION 4: ICT Innovation

To what extent does each of the following aspects of ICT adoption influence innovative activities within your business?

1. Strongly Disagree 2. Disagree 3. Moderate 4. Agree 5. Strongly Agree

Statement.	1	2	3	4	5
Technological context					
Availability of Technology.					
Compatibility of technology with organizational needs.					
The complexity of available technology.					
Organizational context.					
The size of the organization.					
Management Support.					
Financial resources					
Environmental context.					
Competitive pressure.					
Government support.					
Industry in which organization operates.					

In your view what should be done to further encourage innovative activities in your business.

.....

.....

.....

SECTION 4: ICT Literacy

Indicate the extent of ICT literacy influence E- commerce SMEs as follows

- 1. Strongly Disagree 2. Disagree 3. Moderate 4. Agree 5. Strongly Agree**

Statement	1	2	3	4	5
Do you have enough training on ICT.?					
Are you able to access latest information on ICT and related ideas that aid in running the business.?					
Generally is the cost of ICT infrastructure expensive.					

In your view, what should be done to encourage ICT literacy in business?

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SECTION 5: Government Policy

Kindly indicate the extent of government influence E-commerce SMEs as follows.

1. Strongly Disagree 2. Disagree 3. Moderate 4. Agree 5. Strongly Agree

Statement	1	2	3	4	5
Are there enough government policies directly affecting your business.?					
Are these policies stringent on the business.?					
Does the government follow up on the implementation of these policies.?					
Do these government policies support business growth.?					

In your view, how should the government support E-commerce SME's in its business through the policies?

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THANK YOU FOR YOUR PARTICIPATION.

