ASSESSMENT OF FACTORS INFLUENCING E-PROCUREMENTADOPTION BY SMALL AND MEDIUM-SIZED ENTERPRISES IN NYERI COUNTY – KENYA

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DECLARATION

I declare that this dissertation is my original work and that it has not been presented to any university for any merit or award.

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This dissertation has been submitted with our approval as university supervisors for the degree of Master of Business Administration.

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DEDICATION

This research is dedicated to my beloved wife Caroline Wambui and the entire Gitonga's family for the love, encouragement and prayers they accorded throughout the scholarly journey. May the almighty God reward each one of you abundantly.

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LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
DIT	Diffusion of Innovation Theory
IT	Information Technology
ICT	Information and Communication Technology
ITC	International Trade Center
MSME	Micro Small and Medium Enterprises
MSE	Micro and Small Enterprise
PPDA	Public Procurement and Asset Disposal Act
KES	Kenya Shillings
TOE	Technology-Organization-Environment
SMEs	Small and Medium Sized Enterprises
DAAD	Deutscher Akademischer Austauschdienst; German Academic Exchange Services

DEFINITION OF OPERATIONAL TERMS

1. **E-procurement** – Carrying out procurement activities by usage of technological means likeIT systems and the internet in order to accomplish procurement related processes.
2. **Medium enterprises** – Organizations that have sales of Kes 5 – 50 Million in a year, has 51-100 employees and has invested Kes 20-50 Million as capital.
3. **Small Enterprises** – Firms that have yearly sales of Kes 500,000 to 5 Million, engages 10-50 employees and has invested Kes 5 million to 20 Million as capital.

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ABSTRACT

Worldwide, SMEs have been seen as catalysts of economic growth and empowerment more so in emerging economies such as Kenya where they constitute more than 80% of all business entities. Growth in technology and huge technological advancements led to innovations such as e-procurement which is the application of information systems and usage of electronic means such as internet in carrying out procurement activities and process leading to numerous benefits. However, previous studies have shown that SMEs in unindustrialized nations have not fully adopted e-procurement or there is no adoption at all. Similarly, there is little literature on implementation of e-procurement by SMEs in emerging economies. Objectives of the study were assessment of organizational, technological and environmental factors as factors that influence e-procurement adoption by SMEs in Nyeri county as well as establishing the moderating effect of government policies on the relationship between factors affecting e-procurement adoption and the adoption of e-procurement by SMEs in Nyeri County. The study was premised on Diffusion of innovation thery and the Technological Organizational Environmental (TOE) adoption framework theory in assessing e-procurement implementation by SMEs. This study applied inferential statistics so as to inference the population and enable generalization of the research findings. Descriptive statistics were used to measure variability and provided data summaries and results presented in tables. The study sampled 195 respondents from a target populace of 377 firms by use of stratified sampling method. Data gathering was by use of questionnaires where 128 responses were gotten from the sample. SPSS system was used for data analysis. A pilot study was conducted to test the validity and reliability of the study which yielded a Cronbach's Alpha coefficient of 0.72 (72%) with an internal consistency of 99.2% hence the tools of data collection was deemed reliable. The study through logistic regressions analysis found that organizational, technological and environmental factors had no significant relationship on adoption of e-procurement. It also found that government policies had no moderating effect on independent variablesthat influence acceptance of e-procurement by SMEs. The research concluded that e-procurement implementation by SMEs was still very low and recommended that SMEs should be sensitized and encouraged to use e-procurement. It also recommended further studies to establish barriers that could still be hindering adoption and also the best forms of e-procurementtechnologies that SMEs can comfortably adopt.

CHAPTER ONE

INTRODUCTION

1.1 Research background

Worldwide, firms are budgeting huge sums of money for procuring raw materials, goods and services so as to sustain efficient business operations in comparison with other expenditures which in some instances, is totaling to over a third of the budget. Procurement plays significant role in ensuring firms meet their operational goals and overall objectives. Procurement process encompasses purchasing of raw materials and even covers outsourcing of non-essentials services (Oteki, 2019; Fernandes & Vieira, 2015; Osir, 2016). Many firms have occasionally used technological innovations such as e-procurement aiming at reducing some costs, rationalization and optimization of their supply chains, building efficiency and effectiveness within the organizations structure (Mgidlana; 2013)

According to Adebayo & Evans (2015), other than lowering costs, adoption of these technologies more benefits that include improved business growth, they build efficiencies and increase competitiveness. These technologies have also improved direct relations with business partners and suppliers, lessened the amount of paperwork and reduced other procurement related overhead costs and also shortened the purchasing cycle. The acceptance and usage of these technological inventions ushered in the concept of e-procurement that encompasses conducting procurement activities such as identification, requisition, purchasing, stores management, payments, and supplier relationship management electronically, that is, using the internet, computer networks and IT systems (Kasaine, 2016; Oteki, 2019; Marei et al., 2021).

In the last decade, Kenya has witnessed tremendous growth in technological advancements and internet infiltration which has enabled both the public and organizations to access unparalleled high-speed internet connectivity as well as mobile internet accessibility.

According to Mukulungui (2016), in spite of the technological growth and high ICT infrastructure developments, adoption and utilization of ICT and related innovations such as e-procurement is still very low, more so in third world countries like Kenya. Further, Annuar (2015) agrees and emphasizes that numerous enterprises, particularly SMEs are yet to engage in e-procurement notwithstanding the advantages and huge opportunities it presents hence hampering full integration of e-procurement within firms. It is further argued that e-procurement growth in developing countries is still at infancy stage and only used to carry out administrative duties (Kabanda, et al., 2019; Maleki, et al., 2017; Ramdani, 2013).

Worldwide, SMEs have popularly been championed as the drive engines of economic growth and development because of their role in job creation, generating products and services, enhances innovation and also develop competitive edge (KBA 2016; Mafini, et al., 2021; Katua, 2014; ITC, 2019). Further to this, they have been regarded as significant players in realizing the United Nations 2030 agenda on Sustainable Development goals, for example, Goal 1 which aims at eradicating poverty globally in all its manifestations; Goal 8 of enhancing comprehensively sustainable economic development that guarantees sustainable and productive decent labor for every person; Goal 9 that aims at creating a robust infrastructure, stimulate sustainable and responsive industrialization that supports environmental sustainability and nurture innovations. As a result of the significant roles, governments worldwide have considered SMEs as focal points of industrialization and manufacturing where national policies and strategies regarding economic development are largely based around these SMEs.

There is no unanimously acknowledged definition of SMEs because of their diverse dimensions and nature, thus their description varies depending on the economic segment, location, economy status and their life span (KBA, 2016; Katua, 2014). As a rule of thumb, definition of an SMEs relies on three thematic bases; number of people employed; yearly sales and capital invested and the enterprise can be legally registered in accordance with the

provisions of Kenya national small business Act and MSE Act of 2012; a definition that the study adopted.

1.1.1 E-procurement

Procurement has been described broadly as the means of determining and procuring of materials, products and services that are required in ensuring that organizations meet their objectives (Mambo, et al, 2015; Ibemi, et al., 2016). The PPDA 2015 defines procurement as "the acquisition by purchase, rental, lease, hire-purchase, license, tenancy, franchise, or by any other contractual means of any type of works, assets, services or goods including livestock or any combination and includes advisory, planning and processing in the supply chain system." Additionally, Masudin et al. (2021) describes procurement as a means through which business acquire raw materials and supporting services that enable them meet their needs.

The procurement process begins at the needs determination stage and comes to an end when the contract has been fully executed and the required products or services have been successfully delivered. Kasaine (2016) indicates that procurement has four phases: needs evaluation; negotiation phase; payments and settlements stage and contract management. Fernandes & Vieira (2015) outlined core functions of procurement as making sure that right products and services, are available at the right place, right time, obtained at the right price and efficiently manner.

Procurement procedures and processes have been subjected to numerous transformations where technology has been fused in some steps and in some instances, the entire process has been digitized. Therefore, when technology (IT) assists in conducting procurement activities, the process is then denoted to as e-procurement (Anuar, 2015; Nyakundi 2018; Fernandes & Vieira, 2015; Marei et al., 2021). This is the application of information systems in the procurement process with an aim of automating some of the activities and in some instances, the entire process which is seen as a strategic tool for improving the entire procurement process (Kabanda et al, 2019).

E-procurement has been referred to as the usage of electronic means such as internet in carrying out procurement activities like establishing organization requirements, purchasing, processing of payment, stores, issuance and distribution administration and contract management with an aim of building supplier relationships (Mambo, et al., 2015; Maleki et al., 2017). Additionally, Masudin (2021), indicated that e-procurement also involves integrating communication systems on web-based platforms in order to perform procurement activities. It can therefore be concluded that e-procurement is a technology created to abridge the traditional procurement activities by use of web-based networks such the internet, Electronic Data Interchange, s and computer networks and application to fulfill procurement activities.

Some of e-procurement activities include B2B (business to business) exchanges, B2C (business to customers) interactions and C2C (customer to customer) engagements and also the activities within the organizational which when combine, they ensure e-procurement is carried out successfully (Kasaine, 2016; Khanuja & Jain, 2019; Anuar, 2015; Oteki, 2019). Under e-procurement, the supply-side related processes are acknowledged as thematic areas where information technology applications and empowered innovations have yielded significant benefits and created competitive edges for enetrprises (Marei et al., 2021; Masudin et al., 2021). Various enterprises have implemented e-procurement due to its numerous benefits that include market expansion, reduction in cost, higher productivity, lower inventories, higher transaction speeds, improved clients service and experience as well as increased efficiency (Fawcett, et al., 2011; Smadi & Ababneh, 2018; Masudin et al., 2021). It has also resulted in efficient operation processes, improved data accuracy, enhanced partner's relationships as well as made procurement more competitive. E-procurement has also enabled businesses to build efficiencies in their payments processing systems hence improving their chances of accessing recognized financial services which they currently lack (Marei et al, 2021; Nyamu, 2014).

Similarly, e-procurement has made the service industry players for example, financial institutions and SMEs accessible and inexpensive to their customers.

This implies that ICT can help Nyeri County achieve its objectives of enhancing basic infrastructure that will guarantee services to the public are offered efficiently and on a timely manner and also encourage sustainable growth of the economy and creation of more job opportunities in the county, as outline in the county integrated development plan 2018-2022 (Nyeri County Integrated Development Plan 2018-2022, 2018). In most cases, the expected results are not always gotten more so in unindustrialized nations like Kenya where technology adoption and usage is still very low.

1.1.2 Factors influencing adoption of e-procurement by SMEs

Notwithstanding the countless advantages and opportunities allied to usage of e-procurement technologies, most enterprises, more so SMEs, have not yet adopted this technological innovation (Achuora & Arasa, 2012; Mafini et al., 2020; Fernandes & Vieira, 2015; Mukulungui, 2016). Such cases of non-adoption are prevalent in emerging economies where adoption levels are still low or it does not even exist (Kabanda et al, 2019). It has been believed that e-procurement is still at its formative stages in developing countries. The study therefore aimed at assessing the factors influencing SMEs' implementation of e-procurement in Nyeri County as formulated under the Technological Organizational and Environmental (TOE) technology implementation model that comprises of organizational, technological and environmental factors as key implementation factors.

Organizational factors are a key factor that encourage firms to implement e-procurement under the TOE adoption model. These are the operational factors that enable or inhibit resource accessibility and usage by a firm and they are usually descriptive in nature (Ramdani, et al., 2013; Khanuja & Jain, 2019). The size of an organization can generally indicates the amount of working resources at the disposal of a firm and previous literature has established that it positively and significantly influences enactment of e-procurement (Badi, et al., 2021; Manuel & Duarte, 2015).

Structure of a firm, employees training, their educational levels and knowledge on IT applications are influential in determining whether e-procurement adoption will be successful or not (Ibemi, et al., 2016; Mukulungui, 2016). Directors, owners or management teams with advance educational levels have a higher likelihood of driving adoption of IT inventions like e-procurement within their enterprises (Vladimirov, 2014). Poor and insufficient knowledge in IT and IT related innovations, for example e-procurement, is identified as the main challenge facing implementation of IT innovations such as e-procurement across the world (Oliveira & Martins, 2010). E-procurement adoption relies heavily on top management team commitment in supporting the entire adoption process. They are required to commit not only the financial resources but also the managerial skills that are required to guide and ensure it is successfully implemented (Mgidlana, 2013; Mukulungui, 2016).

Technological factors have also been identified as major influencers of adoption of e-procurement. They include; resources at the disposal of an organization both internal and external (IT infrastructure, specialists in IT as well as support from system developer), relative advantage (anticipated innovation, benefits and influence), compatibility of the new IT application with the prevailing one and complexity of the application (how easily the system can be used) greatly influences success or failure in embracing of technological inventions like e-procurement by organizations (Chadra & Kumar, 2015; Mukulungui, 2016; Hassan, et al., 2017; Adeye, 2016; Giotopoulos et al, 2017 Ramdani, et al., 2013). IT infrastructures enables users to engage with each other, communicate and share information on real-time basis. Knowledge on the internet capabilities provides the soft skills while ICT technical knowledge provides the operators with the hard skills that helps in improving and running the IT systems (Awa et al., 2015; Chong & Olesen 2017). E-procurement system security, usually described as the systems' capability of safeguarding users' transactional data and other static information when carrying out transactions, plays a critical part in advocating for acceptance of IT innovations such as e-procurement (Osir, 2016).

E-procurement applications users are less likely to interact with the system in advanced levels because of security worries and access matters; more than often, the users always leave website pages hurriedly whenever they are requested to provide their personal data. Therefore, security risk can be considered as one of the most vital challenge facing implementation of ICT applications such as e-procurement (Molinillo & Japutra, 2017; Zheng et al., 2011; Hassan, 2017).

Environmental factors, both internal and external to an organization, signifies opportunities and threats facing an organization and also the strengths and weakness (SWOT) inherent to an organization and they usually need strategic planning since they influence an enterprise capacity to invent and accept technological advances (Lai, 2017). Some of environmental factors are; competitive pressure, government policies and legislations, supplier forces, market forces, system vendor support, pressure from trading partners and sometimes customers themselves (Chong & Olesen 2017; Badi, et al., 2021; Anuar, 2015; Odhiambo, 2013; Ramdani, et al., 2013). Prevailing literature has established that a positive relationship exists amid e-procurement acceptance and senior management insight on powers of market rivalry, industry pressure, suppliers and buyer's consumption behavior and the industry trading methods (Kabanda, et al., 2019; Anuar, 2015; Huy, 2012). Studies have established that competitive pressure has a positive and significant association on successful implementation of e-procurement (Lai, 2017). Further, it has been established that if an invention directly influences a competitor, making them obtain a competitive advantage in the market, other competing firms will also be under pressure to adopt the technological innovations (Mgidlana, 2013; Odhiambo, 2014).

Government policies and rules majorly and always impact on other factors that influence successful acceptance of e-procurement besides them likewise having a significant effect on the SMEs themselves. Government of Kenya has created regulations that directly govern SMEs.

They include MSE Act (2012), bestowed with the responsibility of growing and developing MSMEs in Kenya, the vision 2030 agenda that portrays the roles SMEs can play in developing Kenyan economy, the Kenyan Government Big Four Agenda paper that identifies the importance of SMEs in accelerating economic growth, Kenyan Government Third Medium-Term Plan 2018–2022 labelled 'towards achieving Kenya Vision 2030' which still emphasizes roles SMEs play on accelerating economic growth of Kenyan economy (ITC, 2019). Governments also enacts regulations from time to time that also have a bearing on other autonomous factors, hence affecting how organization adopt innovations such as e-procurement.

Over time, e-procurement has become a very popular and successful technological application which has been implemented by many firms who seek improved processes (Eai, et al, 2012). It is a very comprehensive and strategic application that can even reorganize an entire procurement process to bring efficiency and effectiveness by connecting firms with its business partners and still manage all the interactions. Therefore, the fore mentioned factors were applied in assessing e-procurement implementation by SMEs in Nyeri County.

1.1.3 SMEs in Kenya

Globally, SMEs have been regarded as foundations of the modern world economy since they fulfil vital roles both economically and socially more so in emerging world economies such as Kenya (Koirala, 2019). They are also the majority businesses in all developing economies (ITC, 2019; Koirala, 2019). Report from Kenya National Bureau of Statistics (2017) shows that SMEs make up to 98% of Kenyan enterprises and they have employed over 80% of Kenyans who directly earn their everyday income from them. According to Kenya National Bureau of Statistics (2016), there were estimated to be 1.56 million licensed and 5.85 unlicensed MSMEs in the Kenyan economy who were projected to have contributed 34% of the annual GDP.

According to ITC (2019) report, SMEs, despite generally being informal, are significant job creators where they create more than 80% new employment opportunities every year. For example, findings from a 2014 study on job creation showed that a huge 80% of the 800,000 jobs formed that period was from the informal segment which is known to be controlled by SMEs (Uonlibrary.uonbi.ac.ke, 2018: KBA, 2016). Kenya National Bureau of Statistics (2016) basic report showed that almost 14.9 million people in Kenya are employed by MSMEs directly or indirectly.

SMEs cut across all economic segments extending from wholesale and retail trading, manufacturing and extractive industry, service industries (Financial sector, hospitality, medical) and agribusiness (Kenya National Bureau of Statistics, 2016). SMEs are significant contributors of job formation, industrial development, economic empowering and inclusivity, which agree with outlines of Kenya vision 2030 (Nyamu, 2014; Mukulungui, 2016; Odhiambo, 2013; ITC, 2019; Kenya Vision 2030 Report). Actually, the Government of Kenya Third Medium-Term Plan 2018–2022; 'towards achieving Kenya Vision 2030', recognizes SMEs as crucial enablers of achieving economic growth and development. This recognition compliments the United Nation's 2030 Agenda of Sustainable Development that encourages world economies to promote formalization and improvement of MSMEs worldwide (ITC, 2019).

The MSE Act (2012) generally bases the description of SMEs in relations to size, number of workers, annual sales and size of capital size. However, the Act is not clear on the definition of a Medium sized enterprise. Commonly, SMEs are described as enterprises which are formally registered, have sales revenues of between Kes five hundred thousand and Kes fifty million annually with capital of between Kes five million to fifty million and a labor force of 10 to 100 employees. Generally, number of employees is the mostly acceptable classification of a firm either as a small or medium sized enterprise.

1.2 Problem statement

Enterprises that fail to deliver superior goods and services have higher chances of encountering backlash such as poor reputation since majority of firms are embracing technology with an aim of providing their clients with modest high-quality products and services (Nyakundi, 2018). Successful embracing of technological innovations like e-procurement has fortified and allowed enterprises to contest on international markets as well as strengthen their position in the regional marketplace. Therefore, it is imperative for SMEs to implement IT inventions like e-procurement with an aim of enabling them to have a foot print and competitiveness in both international and domestic marketplace. Successful embracing of e- procurement similarly boosts firms marketing plans, invigorate operations and processes, improve communications and other activities efficiently (Adeyeye, 2016; Chadra & Kumar, 2015).

Globally, technology has significantly changed the way things were done more so in procurement. Generally, firms have progressively changed their production policies, work-flow procedures and trading practices by applying competitive approaches that e-procurement offer so as to expand and acquire more business as well as retain the old ones by maintaining good supplier relationship (Masudin et al, 2021; Eei et al, 2012; Fernandes & Vieira, 2015; Nyamu, 2014). Additionally, a lot of procurement departments are slowly moving towards e-procurement so as to support their assignment of availing high-quality products that are also competitive and guarantee that value for money is obtained in the procurement process (Annuar, 2015). E-procurement systems implementation requires investment in resources like time, money and other business possessions hence, organizations should first understand what influences successful adoption and execution of e-procurement beforehand in order to ensure that maximum benefits will be reaped from the new system.

SMEs fulfill critical roles emerging economies where they foster growth of the by providing employment opportunities, means of creation wealth and empowerment, foster innovation since they form close to 98% of all businesses in these countries (ITC 2019). Expectations are that SMEs should be at the center stage in adoption of technological inventions like e-procurement which integrates majority of the organizational operation processes and offer a chance of refining performance and efficiencies but it has been established that majority of the SMEs have not yet fully harness this potential in comparison with large organizations more so in developing countries (Marei et al, 2021; Nyamu, 2014; Katua, 2014). Additional, government of Kenya created the National ICT Policy (2019) whose aim is to create an enabling environment where firms can secure the advantages of utilizing ICT innovations such as e-procurement. It has not been fully established the level to which Kenyan SMEs will benefit from such an undertaking bearing in mind the low levels of adoption of ICT innovations (Kagumba & Wausi, 2018).

In spite of all these benefits, different studies have observed that levels of e-procurement adoption among SMEs in emerging world economies like Kenya are very low even though there has been growth in technological advancement (Mukulungui, 2016; Adeyeye, 2016; Koirala, 2019; Mafini et al., 2020; Eei et al., 2012). In comparison with big enterprises, SMEs adoption of e-procurement is still low. This suggests that there are some challenges facing SMEs when they try adopting ICT innovations like e-procurement in their business operations. Some SMEs are still doubtful on the probable e-procurement benefits mainly because of unskilled human resources and constrained financial muscles whereas lack of all-inclusive technology development processes and implementation standards further complicate the likelihood of adoption (Mukulungui, 2016).

Previous studies; Mukulungui (2016); Achuora & Arasa, (2012); Kasaine (2016) have not considered government policies and guidelines as a factor that stimulate implementation of e-procurement by SMEs in their study variables inform of independent or moderating factor.

These researches have not considered a serious factor that can dictate failure or success of SMEs. Therefore, in this research government rules and regulations were incorporated as a moderating factor. Majority of the studies conducted on evaluation of e-procurement implementation in Kenyan setting have focused on procurement in the public sector and government agencies with minute consideration being levied on SMEs (Amemba et al, 2013; Mambo& Ombui, 2015; Arasa & Ochora 2012; Osir, 2016).

This elicited the scholar's interest and therefore sought to evaluate how the recognized factors influence e-procurement acceptance by SMEs. Insufficient studies and study findings on e-procurement embracing by SMEs in third world countries has resulted in failure to correctly appreciate how established factors such as technological, organizational and environmental impact implementation of e-procurement by SMEs. Consequentially, consequences of government policies and regulations in relation to acceptance of e-procurement has not been fully studied.

The study also extensively examined the factors that impact e-procurement approval by SMEs in Kenya, an emerging economy, in order to identify how these factors, influence adoption levels as well as establish whether they have a hand on the witnessed low implementation levels and also suggest strategies that can improve adoption of ICT inventions in general. As such, the research was on evaluating factors influencing SMEs' adoption of e-procurement in Nyeri County.

1.3 Research Objectives

The study had general and specific objectives as discussed in subsequent sections;

1.3.1 General Objective

The general objective was to evaluate factors that influence e-procurement adoption by SMEs in Nyeri County – Kenya

1.3.2 Specific Objectives

The study aimed at achieving the following four specific objectives:

i) To evaluate organizational factors that influence e-procurement adoption by SMEs in Nyeri County.

ii) To assess technological factors that affect e-procurement adoption by SMEs in Nyeri County.

iii) To study environmental factors that affect e-procurement adoption by SMEs in Nyeri County.

iv) To examine the moderating effects of Government policies on the relationship between organization, technological and environmental factors and adoption of e-procurement in SMEs in Nyeri County.

1.4 Research Hypotheses

The research tested the following null hypotheses

Ho_1 Organizational factors have no significant relationship on e-procurement adoptions in SMEs in Nyeri Country.

Ho_2 There is no significant relationship between technological factors and adoption of e-procurement in SMEs in Nyeri County.

Ho_3 Environmental factors have no significant relationship on the adoption of e- procurement in SMEs in Nyeri County.

Ho_4 There is no significant moderating effect of government policy on the relationship between organization, technological and environmental factors and the adoption of e-procurement in SMEs in Nyeri County.

1.5 Significance of the study

Results from the research work are expected to extend knowledge on factors impacting e-procurement adoption and its subsequent implementation by SMEs especially in third world countries such as Kenya.

The research was also expected to enlighten more on why e-procurement implementation levels by SMEs are still very low as witnessed by previous studies and perhaps identify why SMEs are yet to completely incorporated e-procurement in their business processes.

SMEs owners together with their managers can also benefit from the research findings because they shall be informed on utmost factors that ensure successful acceptance of e-procurement. They will be educated on why it is necessary to have appropriate procedures and strategies within their business and they will be guided on the most appropriate e-procurement adoption methods that guarantee successful adoption. They will also be enlightened on the advantages, risks and barriers that hinder successful e-procurement implementation and the best approaches to take in order to guarantee fruitful adoption and usage of this ICT innovations. They will also be enlightened on the major pitfalls to avoid and the key requirements of the adoption process. The verdicts of this research will also help intellectuals and policy makers as it will help in building knowledge on e-procurement adoption in general and also outline shortages in e-procurement acceptance works where additional studies may be conducted for example on breadth, degree of e-procurement utilization and depth. The research will also act as a reference point for fellow academicians and researchers when carrying out their research works, policy makers can refer from it when formulating policies, government bodies and agencies can also leverage on the findings of this study when developing regulations.

1.6 Scope of the study

The study intended to assess factors that influence e-procurement implementation by SMEs operating within Nyeri County. The specific objectives of the study were; to evaluate organizational factors that influence e-procurement adoption by SMEs in Nyeri County; to assess technological factors that affect e-procurement adoption by SMEs in Nyeri County; to study environmental factors that affect e-procurement adoption by SMEs in Nyeri County and to examine the moderating effects of Government policies on the relationship between organization, technological and environmental factors and adoption of e-procurement in SMEs

in Nyeri County. The firms within Nyeri County who met the set definition standards of SMEs were selected in this research study.

The study was conducted in Nyeri County due to its economic growth and it is traditionally recognized as the commercial hub and gateway to the vast area of central Kenya where various firms have set up their business in order to tap into the rich and vast local marketplace. This area is populated by SMEs ranging from agribusiness, manufacturing and service industry (financial sector, wholesale and retail, tourism and hospitality) hence they provided a well-balanced population which was relied on in conducting this research work.

The study employed inferential statistics that enable it to draw conclusion and make inference on the population. Data was collected through questionnaires which were issued to business owners or top level managers. The study took nine months and the findings were presented to The Technical University of Kenya senate for examination and award of a Masters' Degree in Business Administration.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The section presents earlier studies on e-procurement adoption by examining available literature, analysis of different frameworks of e-procurement adoption together with the conceptual framework. It covers theoretical frameworks, literature review, review of variables and their relationships, empirical literature, summary of the research gaps and the conceptual framework.

2.2 Theoretical groundwork

This segment provided an assessment of theories that were adopted by this research. This study was premised on Diffusion on Innovation Theory (DIT) and the technological, organizational and environment (TOE) adoption framework.

2.2.1 Diffusion of Innovation Theory (DIT)

This was fronted by Rodgers (2003) and it contends that the characteristics of an innovation always stimulates its own dissemination and adoption. This theory concentrates on the circumstances which can either increases or decreases the likelihood of a new innovation, idea, product or procedure being adopted by affiliates of a certain culture (Wachinga, 2019; Chandra & Kumar,2018).According to this theory, innovation may be described like a concept or an idea or clue,practice or object, considered as novel by entities and individuals whereas diffusion can be considered as the means through which an innovation is shared over a given period of time among associates of a similar cultural society (Sindi, 2019; Sabraz & Gunapalan, 2015; Odhiambo, 2013; Rodgers, 2003; Wachinga, 2019).

Innovation generally consists of four phases, that is, diffusion, invention stage, consequences and time phase (Wachinga, 2019). Rodgers (2003) also noted that diffusion of an innovation to successfully occur, it depends on the nature of the innovation, how the innovation is shared, duration and type ofthe innovation and the social systems supporting the innovation. Research

studies based on diffusion of innovation theory have tried to expound on factors that influence how and why different users use and adopt new innovations such as e-procurement.

In Kenya, diffusion of innovation can be termed as moderate as evidenced by Wachinga (2019) due to lack of formalknowledge exchange systems as they are characterized by tacit knowledge and informal sharing among the different players. This theory has been used in several research studies to evaluate the degree and categories of technologies assimilated in organizations (Chandra & Kumar, 2018; Odhiambo, 2013; Hassan et al, 2017). DIT principally focusses on interpreting the way in which innovative concepts, ideas and actual innovations are shared among membersand then adopted.

Under DIT, innovation adoption is considered as the dependent factor that can be accepted or rejected. This decision of accepting or rejecting an innovation is influenced by independent factors such as alleged characteristics of the new innovation, social systems factors and personal characteristics of the adopter. DIT theory considers relative advantage, triability, observability, complexity, compatibility, safety and confidentiality of an innovation as the major influencers of adoption of technological innovations by organizations (Wachinga, 2019; Rodgers, 2003; Ibemi, et al, 2016; Hassan et al, 2017). Nevertheless, factors such as relative advantage, compatibility and complexity have been the chief variables that are constantly recognized as major relevant influencers of inventions acceptance (Ibemi, et al, 2016).

The factors identified above as influencers of adoption of new innovations under DIT are in line with the foundations of this study. When these factors are integrated with the TOE factors used in this study, i.e, technological organizational and environment factors, they enable easier prediction of likelihood of adoption of innovations such as e-procurement. It provided evidence and lenses to gauge how firms decide to adopt or not to adopt new technologies. By using this theory to support the conceptual framework, it provided an integrative model that aided in assessing the factors that influence e-procurement adoption by SMEs.

The study integrated DIT with the factors under TOE adoption framework (technological, organization and environmental) so as to strengthen its inherent limitation of how it measures innovation adoption. DIT has been criticized for overlooking the impact of environmental factors, that is, market forces, competition and nature of the industry when facilitating decision making by organizations. Consequently, integrating TOE framework with DIT assisted in addressing and fortifying the theory to enable it predict likelihood of adoption correctly.

DIT further theorized that consumers of technological innovations such as e-procurement are rational and will always aim at maximizing their utilities and that old innovations will eventually be replaced by new one (Wachinga, 2019; Ochola, 2013). This is not usually the case and some firms will end up not adopting the technology hence it is the least understood part in diffusion of new innovation (Hassan, 2017). In some instances, individuals or firms will deliberately avoid adopting an innovation regardless of its benefits while others opt not to acquire similar technologies when they become available while others may discontinue using the technology all together hence diffusion of innovation is neither uniform nor inevitable. Therefore the study aimed at assessing the factors that influence adoption of e-procurement by SMEs by looking at factors that could predict the likelihood of occurrence or not.

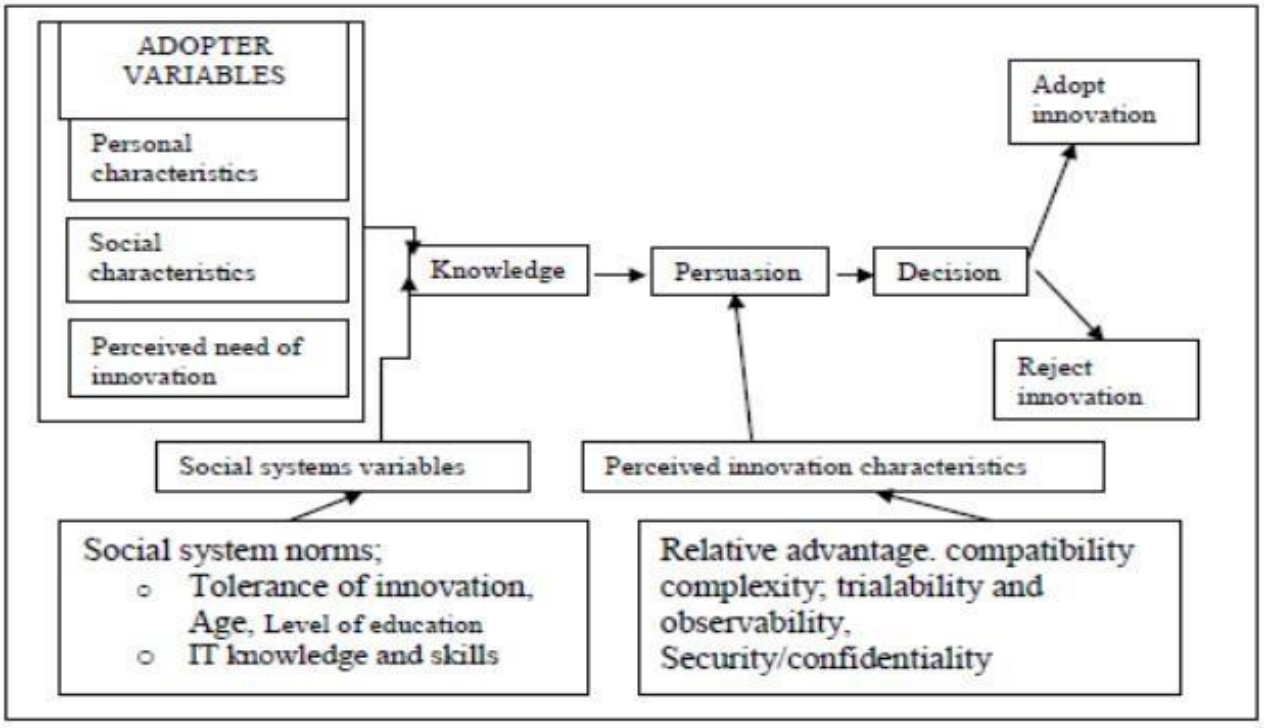

Figure 2.1 Diffusion of Innovation (DIT) 1 Source: Odhiambo (2013); Rogers (2003)

2.2.2 The Technology-Organization-Environment (TOE) Model theory

The TOE conceptual framework which was originally advanced by Tornatzky & Fleischer (1990), presumed an extensive category of factors which could be used in predicting the likelihood of adoption of ICT applications by firms. This framework describes the vital factors that impact on the actual adoption of new innovations in ICT by enterprises as technological, organizational and environmental factors (Hassan, et al, 2017; Badi, et al, 2021; Fu & Su, 2014; Molinillo & Japutra, 2017; Ramdani, et al., 2013, Odhiambo, 2013).

Several research works have employed TOE model in evaluating ICT innovations adoption by organizations (Chandra & Kumar, 2018; Oliveira & Martins, 2010; Hassan et al; 2017). For instance, the model was used to evaluate e-procurement adoption in firms (Hassan et al, 2017; Alkhalil et al., 2017; Molinillo & Japutra, 2017; Mukulungui, 2016; Sabraz & Gunapalan, 2015; Ramdani, et al., 2013; Achuora & Arasa, 2012).

These previous research works have shed light on significant acumens as fronted by TOE model in regards to understanding of how ICT inventions such as e-procurement are adopted by organizations in various economic sectors. Consequently,based on this model, the research stated that the extent to which SMEs determine the use of e-procurement is affected by three key factors: technological, organizational, and environmentalfactors. The above factors were explored in more detail as per the below and were used in formulating the study's conceptual framework.

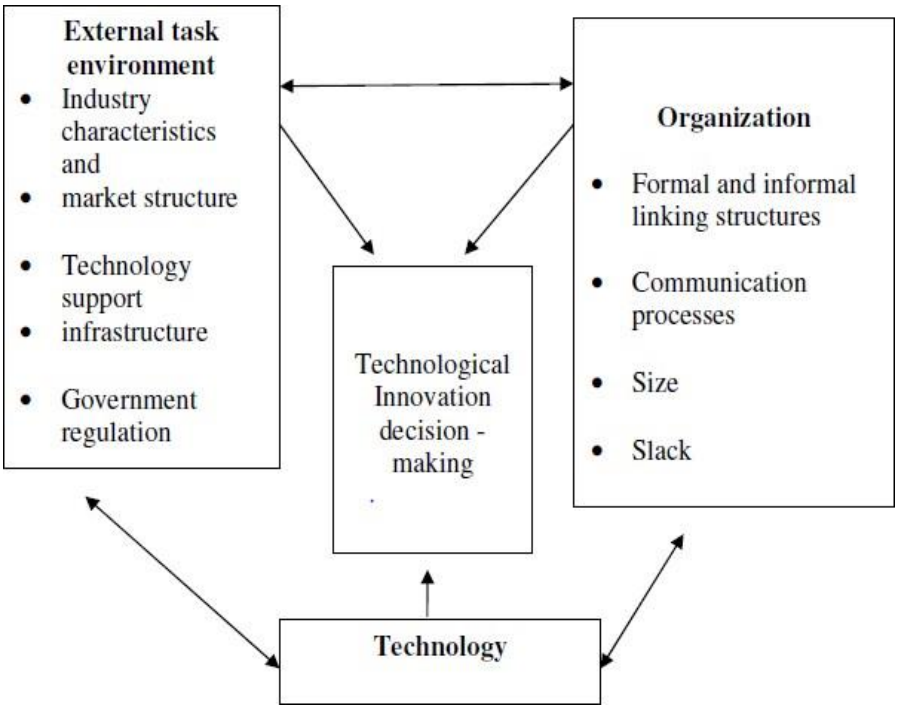

Figure 2.2: Technology, organization and environment model; Adapted from Tiago & Maria (2010)

2.2.2.1 Technological factors

Technological factors have been recognized as important factors that impact acceptance of IT inventions by prior literature. Some of the critical features include; compatibility, relative advantage, trialability, complexity, observability and security risks of the IT systems (Odhiambo, 2013; Mukulungui, 2016; Ramdani, 2013; Hassan et al, 2017; Molinillo & Japutra, 2017).

Relative advantage, which has been described as alleged advantages and influence of the acquired IT system in comparison to its predecessor, was established to have a positive relationship with the acceptance of IT invetions (Odhiambo 2013; Ramdani, 2013; Sabraz & Gunapalan, 2015). Therefore, it means that when a technological invention is perceived as being more beneficial and advantageous when compared to its predecessor, it has a higher likelihood of being adopted.

Compatibility, generally explained as the extent to which a new system is viewed as consistent with the predominant values, previous experiences and the requirements of a possible adopter,

has been identified as an imperative factor of ICT innovations acceptance by preceding research (Mambo & Ombui, 2015; Ramdani, 2013; Ojiabo et al., 2015;). The new system compatibility with different enterprise ethics, culture and prevailing infrastructure is a significant determinant of successful implementation.

Complexity has been expressed as the alleged ease of usage and command of an information system. The degree of alleged complexity of an IT application generates higher uncertainties that hinder successful adoption hence raising the risk of the users deciding not to accept the system (Achuora & Arasa, 2012). Preceding study have found system complexity to have negatively influenced ICT inventions adoption Ramdani (2013); never the less, it has been acknowledged as a very imperative technology adoption feature (Alkhalil et al., 2017; Molinillo & Japutra, 2017).

Trialability and observability denotes the methods in which inventions can be tested and how the observed outcomes can be shared and compared to others separately on a restricted timeframe (Batiibwe & Bakkabulindi, 2016; Wachinga, 2019). Previous studies have shown that trialability has positive relationship with e-procurement adoption whereas observability is not positively related with e-procurement adoption (Ramdani, 2013). Therefore, an information system that can be seen to enhance productivity and performance has a high likelihood of being adopted.

2.2.2.2 Organizational factors

Previous studies have established that organizational factors plays significant role in influencing acceptance of IT inventions by SMEs and they are primary attention of countless studies. These factors comprise of support of the top management, size of the enterprise, attributes of the owners and managers, organizational readiness factors and previous ICT experience (Ramdani, 2013; Sabraz & Gunapalan, 2015; Achuora & Arasa, 2012; Odhiambo, 2013). It has been established that support and commitment of senior management team is critical in predicting successful implementation of ICT innovation. Top management can

inspire adoption by driving change in the organization through communicating and supporting innovation application by outlining vision and giving direction in regards to the firm's stand. It has been considered necessary in forging a supportive and empowering atmosphere that is essential for successful implementation of IT inventions (Achuora & Arasa, 2012). In majority SMEs, top management for the decision-making unit hence their backing is significant if the implementation technological innovations will happen successfully.

Managers and owner traits, for example, levels of education, age, ICT knowledge, gender and work experience have been established to positively and significantly influence the likelihood of espousal of technological inventions (Odhiambo, 2013). Studies have also shown that owner's ICT knowledge significantly affects adoption of technological inventions. Huy (2012) further observed that worker's knowledge and experience on technological innovations, firm size and top manager's perception on inventions are positively and statistically significantly related to successful adoption.

The organizational readiness factor can be termed as the accessibility of the required resources within the firm to facilitate successful adoption and they comprise of budgetary provisions, IT infrastructure, sufficient time and adequate human capital (Ramdani, 2013; Odhiambo, 2013; Sabraz & Gunapalan, 2015). The size of the firm and the levels of bureaucracy have been identified as one of the forecastersof technological invention adoption as it is contended that big enterprises have bigger requirements, huge resources base, skills and expertise that are necessary for successful adoption of technological innovation such as e-procurement in comparison with small firms such as SMEs (Amemba et al., 2013).

2.2.2.3 Environmental factors

These are the functional enablers and inhibitors facing a firm. They include; competitive pressure, structure and size of the industry, market size and scope, external ICT backing and government regulations. These environmental factors denote the present operational environment of a firm and they normally affect a firm as it tries to implement new technological inventions (Sabraz & Gunapalan, 2015).

According to Nyamu (2014), competitive pressure is a major driver of e-procurement invention acceptance by firms including SMEs. Firms faced by cut throat competition in their pricing models, market segment and leadership have a higher likelihood of turning to new technological innovations so as to evade the stiff competition and create a competitive advantage for themselves (Achoura & Arasa, 2012). It is highly observed when the said innovation affects the competition directly and thereby becomes a strategic requirement that enables a firm to compete successfully in the marketplace. According to Odhiambo (2013), relationship exists between the industry competition intensity and the degree of IT inventions implementation. Consequently, competition is commonly perceived as to positively influence acceptance of IT inventions such as e-procurement.

Prevailing literature has shown that the industry in which an enterprise operates in is a major driving force in implementation of IT invention for example e-procurement (Odhiambo, 2013; Achoura & Arasa, 2012). Some sectors like trading, service industry and manufacturing and engineering are some major segments that have shown a significant relationship with inventions implementation since they require various applications, for instance, service and trading industry requires a point of sale application while manufacturing and engineering sectors requires an ERP application (Sabraz & Gunapalan, 2015; Alkhalil et al., 2017). This means that IT usage and requirements vary from one sector to the other and aslo within the individual sub-sectors themselves.

Market scope is generally defined as the area in which an organization trades in and can either be local or international. It consequently means that the bigger the scope, the greater the degree of complexity in operational requirements such as legal and regulatory, ethics and ethos, social cultural diversities, logistics and supply chains and business partners relationships and linkages (Ramdani, et al., 2013). Studies have shown that organizations that have gone international and established global footprints have resulted to using IT applications and systems to aid in management of their processes hence market scope is considered to be positively related with acceptance of IT inventions for example e-procurement (Moertini, 2012).

IT system support from external sources was identified as a significant factor that ensures successful implementation of technological innovation and it is usually positively related (Ramdani, et al., 2013). It is usually the accessibility of the necessary third-party assistance in deployment and utilization of IT applications. Achuora & Arasa (2012), agrees with prior research findings that third-party assistance is not only an important factor in ensuring successful adoption, but it is also alleged to have a positive relationship with to acceptance of technological inventions like e-procurement. The growth and acceptance of outsourcing non-essential functions such IT related ones and solid third-party support has made more organizations to adopt ICT applications that are creating competitive advantage more so where there is sufficient vendor support (Molinillo, & Japutra, 2017).

Government support such as providing incentives, issuing grants and favourable regulations are acknowledged as significant factors which encourage implementation of technological inventions by enterprises (Alkhalil et al., 2017). Government factors have been known to encourage or discourage organizations in accepting new technological inventions (Chong & Olesen 2017). Additionally, government support is amongst the greatest significant factors that influence successful adoption of new IT applications like e-procurement.

The TOE adoption model was used in this research to expound more on how organizations adopt technological inventions in their processes and operations by identifying the significant principles and factors that guide the adoption initiatives such as new advancements in technological, environmental factors and changes in organization context. This framework offered a holistic approach in matters of technological implementation and it has been used extensively in assessing adoption of technology by numerous studies.

Additionally, TOE model is regarded as a generic framework for assessing and determining acceptance of technological innovations since it offers a broad number of factors which attempts to predict the likelihood of IT applications adoption by enterprises hence it seamlessly went in tandem with the aims of the research study. The TOE model concentrates on the enterprise as a decision-making unit, the study examined acceptance of e-procurement at the firm's level and hence it was deemed appropriate in assessing e-procurement implementation by SMEs in NyeriCounty.

2.3 Empirical Review

Kasaine (2016), in his research on implementation of e-procurement by supermarkets in Nairobi, which are SMEs in general, established that organizational, firm's readiness, environmental and technological features have a great effect on successful implementation of e-procurement. It was established that combined, above mentioned factors accounted for 67.1% ofthe likelihood of successful acceptance of e-procurement and they are statistically significant in influencing acceptance of e-procurement. The study however was shallow on literature review and did not expound more on the factors influencing e-procurement adoption. It also focused on supermarkets alone excluding other key sectors where SMEs operates. This study leveraged on these discoveries and aimed at establishing if they played similar roles with SMEs in Nyeri County. The study applied multivariate linear regression model to establish the joint relationship. This model does not take in to account the non-adopters and also does not predict the likelihood of e-procurement adoption.

Altayyar & Beaumont-Kerridge (2016), conducted a research titled, “an investigation into barriers to the adoption of e-procurement within selected SMEs in Saudi Arabia,” established that frail IT infrastructure and failure by government to offer required support were the utmost noteworthy challenges whereas inadequate and unsupportive procurement rules and regulations and mistrust in electronic payments systems were identified as additional challenges. The above research study recognized the crucial role the government plays in promoting e-procurement implementation and development, a key objective of the current study. The study undertook a case study of four firms through purposive sampling to represent the entire SMEs. The sample selected was very small to represent the entire population. The current study has a sample of 195 firms which was sufficient to make inferences on the population. The study was also not consistent with the data analysis technique to enable establish the relation between the independent and dependent factors. The current study employed LRA to test the research hypothesis and make conclusions of the study.

Mukulungi (2016), evaluated the challenges facing SMEs in Machakos County when they are adopting e-procurement. The research discovered that the barriers comprised of technological barriers (insufficient evaluation of ERP applications prior to installations, inadequate IT infrastructure, shortage of experts and experienced staff with technical knowledge); organizational barriers (scarce knowledge on ICT applications by management teams and staff, firm size and low rates of staff retention) and environmental challenges (market sector and scope, high fees for acquisition, implementation and maintenance of the IT application and the negative perceptions management teams have in regards to e-procurement technology). These factors shows how SMEs struggle in their e-procurement adoption journeys which resonates with the aims of this research, that is, evaluation of factors influencing e-procurement implementation by SMEs in Nyeri County.

In evaluating barriers that hinder e-procurement adoption, Mukulungui (2016) did not factor in government policies as factor that could hinder e-procurement adoption. The study therefore

missed on a key element that could strong dictate whether adoption would take place or not. The current study adopted government policies as a moderating factor so as to determine whether it has any influence on the relationship between organizational, technological and environmental in adoption of e-procurement.

Hassan et al (2017), explored factors influencing e-procurement utilization by SMEs in New Zealand. Results of the research indicated that technological factors, such as, relative advantage affected the extensiveness of e-procurement usage while compatibility influenced the depth of e-procurement utilization even tough on a medium basis. The study further revealed that technological, organizational and environmental factors have a bearing on the extent of e-procurement adoption and general usage by SMES. The researcher adopted an explanatory research model in carrying out his study. The results of this study reinforce the theoretical context and fundamentals of this research as well as elucidates more on the dependent variable; extent of e-procurement adoption by SMEs in Nyeri County.

Eei, et al (2012), carried out a review of the advantages and challenges facing Malaysian SMEs in their e-procurement implementation journey. Findings from the research revealed that e-procurement had not been broadly accepted by SMEs due to a host of both external and internal factors that limited embracing of e-procurement. Some of the external factors highlighted were; infrastructure and laws, technological related factors and environmental factors whereas two clusters of internal barriers were painted as insufficient resources and nature of the organization. The study suggested that in order for SMEs to get over the adoption challenges, input by all stakeholders, government included, is required in form of the essential laws and policies from the government, application developers and sellers who create systems and support their utilization, SMEs managers, owners and employees who actually utilize the applications and also the regulatory bodies who conduct audits and assurance to ensure compliance is maintained and risks addressed. The above works supports objectives of the current research because it aims at evaluating the manner in which the identified factors inspire

adoption of e-procurement by SMEs and also moderate them against the government policies.

The study was qualitative in nature and did not involve data collection or analysis hence could not be used in making inference on the population. The current study was quantitative in nature and involved data analysis through inferential statistics with an aim of making reference to the population.

2.3.1 SMEs and e-procurement adoption

SMEs have been regarded as the drive engines controlling majority of the economies in the world more so in emerging nations like Kenya because they promote innovations hence sparing territorial growth, create employment and generate national wealth (Shemi, 2012). The growing IT infiltration in all areas has ushered substantial changes in the manner in which business processes are conducted in industrialized and emerging countries. Globalization coupled with high accessibility of global markets has reached unprecedented levels and SMEs are revamping their capabilities and systems in order to benefit from this new international frontier (Hassan et al, 2017). Governments are encouraging SMEs to modernize their systems by providing them with incentives, subsidies and funding programs as well as creating rules that are beneficial to them, (Chatzoglou & Chatzoudes, 2016).

Gupta & Narian (2011), revealed that e-procurement has completely changed organizational processes as well as fully modernized the ways business is being done. E-procurement has promoted conducive environment for doing business, improved government regulation and has created competitive advantage for SMEs hence firms are progressively adopting it in big numbers. In spite of these huge benefits, still some issues exist for example, security of cash-based payments, privacy and confidentiality of online transaction that should be fixed to warrant seamless enactment of e-procurement.

According to Giotopoulos, et al, (2017), e-procurement and other technologies adoptionprocess needs expertise and in-depth training in modern technologies in conjunction with well understood process shared with t to the users. Integrating then new system with the old one is

critical in guaranteeing successful adoption of e-procurement and if not looked into, it usually leads to replication of tasks, higher risks hence reducing the degree to which firms depend on e-procurement systems (Kiveu & Ofafa, 2013). This has caused many firms more so, SMEs to totally avoid implementation of e-procurement and technological intentions.

Shemi (2012), established that the immediate business environment where SMEs operates in has a direct bearing on the type of technology selected by the SME. This means that when the environment does not favor technological adoption, businesses have a low probability of adopting new technological innovations while vice versa is true. Government was noted to have a critical role of providing foundations for supporting internet transactions and empowering SMEs in order for them to fully utilize e-procurement. The exploration further noted that implementation of e-procurement by SMEs is not an easy task especially in developing countries.

2.3.2 Challenges facing implementation of e-procurement by SMEs

Globally, SMEs have struggled and endured a lot of hardships when they have tried to adopted e-procurement within their process chiefly due to the constant changes and new developments in ICT where technologies are becoming obsolete within no time hence affecting business requirements and (Mukulungui, 2016). Findings from prior studies have shown that majority of SMEs in emerging economies have not fully utilized internet and to an extent e-procurement outside the traditional spectrum as most of them apply simple technologies like emails (Chatzoglou & Chatzoudes, 2016). SMEs in developing countries still pulls the tail in learning technology-based application as well conducting business in the website when compared to first world countries.

Moertini (2012), observed that numerous SMEs in Indonesia had enrolled on web-based market place where they were using B2B commercial business sites to conduct their business. The research disclosed the main challenges facing SMEs in emerging economies when implementing technological innovations such as e-procurement to be insufficient information

on website design, creation of content and unappealing website profiles, which are key concerns to website users. This in return brands the whole process unattractive to SMEs hence they evade using it consequently, they do not derive the benefits associated with using e-procurement.

Kiveu & Ofafa (2013), states that in spite of SMEs having unrivalled access to information systems application and internet, usage levels are still very little. They generally use these tools in gathering and sharing of information, normal communication and for social interactions. This exhibits insufficient cognizance of the potential opportunities available in the internet particularly in e-procurement and e-commerce. These little utilization of the internet and information system applications could be caused by alleged high purchase prices, security and privacy risks and insufficient knowledge and expertise of handlers.

In their study, Altayyar, & Beaumont-Kerridge (2016), feeble IT infrastructure and inadequate support from the government were identified as the main challenges SMEs faced when they adopt e-procurement whereas security and privacy of data and the systems in general came second. Qualitative statistics revealed that nonexistence of precise procurement policies and mistrust in electronic payment methods were also identified as barriers that hinder successful implementation of e-procurement.

Korir, et al (2015), additionally observed that significant challenges on adopting e-procurement successfully are within an enterprise. This is as a result of the necessity to re-engineer operational processes so as to integrate and accommodate the requirements of the new system, lack of expertise and training amongst the workforce, poorly integrated front end and back end systems and the high fee of buying the IT systems. Security risks and low trust with business associates were the other important factors observed as dragging implementation of e-procurement.

Eei, et. Al (2012), established that SMEs are yet to widely accepted e-procurement applications due to both external and internal factors, external factors were identified as technological factors, poor IT infrastructure, ambiguous government regulations and environmental factors whereas internal factors included inadequate resources and the characteristics of the organization. In order to surmount these challenges, the study recommended that effort of all stakeholders, that is, the government, application developers, business owners, business partners and members of staff is significantly needed.

2.4 Government policies on SMEs

Government's intervention measure have been perceived as accelerators of growth and facilitation of SMEs globally. These measures are in form of developing policies, institutional aid to cater for financial and technological requirements, boosting ICT and other infrastructure and passing SMEs responsive regulations, (Shemi, 2012). In industrialized nations, e-procurement and e-commerce are highly advanced while equated against developing states. This is facilitated by their governments which have assumed a more proactive opinion and provided all the essential infrastructure and an enabling environment for e-procurement to flourish something that is critically missing in emerging nations (Singh, 2016). Consequently, punitive government regulations and rules stifle out creativity and innovations in SMEs, jeopardizing their very existence in the economy notwithstanding the important rolethey play. In respect to the report by Kenya MSME policy index (2019), it was established that government regulations and the overall business regulatory environment are neither favorable nor responsive to the needs of MSMEs and they are yet to fulfill their intend purposes. MSME proprietors raised apprehensions in regards to the costly regulatory requirements, prohibitive laws and inept legal structures which hamper growth, productivity and development of this significant economic sector. Additionally, the survey indicated that regulations in that govern innovation, adoption of technology and technological transfer are obstructive to MSME and are also astonishingly not well understood by most of MSME managers/owners.

The survey ranked Kenyan MSME policy index at 3.0/5, a rank that is lesser compared to renowned global benchmarks for example ASEAN mean index of 3.7/5. The report generally resolved that the Kenyan MSME regulatory and policy setting does not support MSMEs growth and development agenda to a big measure.

The vision 2030, Kenya's long-term development plan, recognizes SMEs as crucial contributors in making Kenya a transformed, industrialized middle-income nation by the year 2030. SMEs have further been documented as the dominant enablers of realizing the 'Big Four' Kenyan government transformative agenda, where they are regarded as the 'bedrock' of manufacturing under the manufacturing pillar. Thus, policies and other business transformative regulations that aims at providing trade-oriented environment and build capacity at the organizational level will go a long way in helping Kenyan SMEs develop competitive advantages and be able to compete in the local, regional and international markets (ITC, 2019).

The Government of Kenya, in compliance to the requirements of the Micro and Small Enterprise Act No. 55 of 2012, created a legal body named MSME authority to help in growth of MSME in the country as well as operationalize the Act. The Act mandated the authority to create and harmonize existing policies in order to promote,develop and regulate SMEs in Kenya. In 2019, The MSME authority formulated two significant regulations, that is, Micro & Small Enterprises (Worksite) Regulations 2019 and Micro & Small Enterprises (Association) Regulations 2019 which are anticipated to completelychange the way SMEs in Kenya are regulated and governed. Additionally, achieving Vision 2030 also relies on the success of the Act and MSME Authority in supporting SMEs through provision of legal and institutional guidelines guaranteeing growth, regulation and expansion of SMEs in Kenya. The provisions of the Act have also created the office of the Registrar of MSME which ensures MSMEs are legally registered through associations or individually hence formalizing the sector; Dispute resolution tribunal to ensure conflicts and disputes are resolvedamicably and MSME Fund to cater for the financial requirements of SMEs.

Under the manufacturing pillar of the Government of Kenya Big Four Agenda 2019, the government reiterates its policy of providing production and innovation hubs for manufacturing SMEs in order to improve their competitiveness and provide product testing facilities and labs with an aim of increasing their product portfolio. It also aimed at integrating incubation and innovation hubs with other public facilities within the 47 counties so as to resolve challenges in product development and design, accessibility of the internet and other technologies, patenting of products and innovations, amongst several other difficulties facing SMEs. This shows the critical role SMEs play in ensuring economic growth and industrialization of this country hence the need to ensure regulations are favorable to them.

The National ICT Policy (2019) main aim is ensuring that Kenya achieves full potential of the digital economy by ensuring universal access and usage of ICT infrastructure and cheap internet services to all Kenyans and firms. Objectives of this policy include; mobile first that aims at ensuring that internet is reasonably accessible to all Kenyans and at low costs; growth and facilitation of the digital markets; develop expertise and highly skilled human resources; promote technological innovations and developments and finally ensure that government services are digitized and available online to the public so as to enhance service delivery. The policy also aimed at providing infrastructures and guidelines that facilitate creation of data centers within counties, reliable accessibility of the internet and also guaranteeing a secure innovation ecosystem for firms and Kenyans in general.

The Kenyan Government has developed clear and concise policies that govern SMEs to ensure economic growth is achieved and also ensure ICT is entrenched in the country. These policies have a huge impact on SMEs especially on implementation of technological inventions like e-procurement as they seem to favor, nature and are highly oriented towards usage ICT and other technologies. It is for this reason that government policies were considered as a moderating variable in this study since they impact SMEs hugely.

2.5 Literature and research gaps summary

The literature review summary of this study has been detailed as per the Table 2.1

Table 2.1 Summary of research gaps

Author (s)	Research area	Methodology adopted	Study major findings	Key knowledge gaps	Current study consideration
Kasaine (2016)	Researched on factors influencing e-procurement implementation by supermarkets inNairobi – Kenya. Supermarkets arecategorized as SMEs inKenya.	Descriptive research design was used and a census survey was applied in collecting primary data.	It was established supermarkets had adopted e-procurement to a moderate extent. Organization, readiness, environmental and technological factors were highlighted as the main factors that stimulate e-procurement adoption by supermarkets by a whopping 67%	The research dwelt mainly on external factors that affect implementation of e-procurement. The perspective was also narrow since it concentrated on supermarketsalone ignoring other sectors hence results could be difficult to generalize. The literature review context was shallow as the listed factors were not fully elaborated.	The study focused on SMEs inall economic sectors in assessing factors influencing how they implement e- procurement technology. The study was also conducted in semi-urban set up to gauge whether the factors have the same influence as compared to the city. It also employed LRA to determine the likelihood of e-procurement adoption
Mukulungui (2016)	Assessed barrierspreventing adoption of e-procurement by SMEs in Machakos county	The study applied descriptive statistics with a sample of 95 firms and applied regression analysis.	Insufficient ICT infrastructure, owners/management knowledge and perceptions one-procurement were identifiedas the major barriers to adoptionof e-procurement	Government policies were not considered as factors influencing e-procurement adoption. The sample size of 95 was small considering the nature of SMEs.	Government policies and regulations were considered as moderating variable in the research. A sample of 195 firms were used and considered sufficient.
Altayyar & Beaumont-Kerridge (2016)	Investigated on barriers deterring acceptance of e-procurement by Saudi Arabian SMEs	Used comparative case studies of four SMEs. It also replicated the Gunasekaran and Ngai (2009) model to assess adoption barriers. Qualitative data was applied.	It established that lack of government support, poor IT infrastructure, unskilled poorly trained employees and security risks were the main barriers hindering e-procurement adoption	The sample size was too small to enable inference on the population. The study was not clear on data analysis technique.	The study used a sample size of 195 firms to allow inferencing. TOE was used as the adoption framework. LRA was used in analysis
Eei et al(2017)	Examined the benefits and barriers facing Malasyian SMEs when adopting e-procurement	Adopted a qualitative research study design. The study comprehensively reviewed existing literature on e-procurement adoption to gain insight on benefits and challenges facing e-procurement adoption.	The study identified barriers facing e-procurement adoption by SMEs as external (technology, regulations and infrastructure) and internal (organizational characteristics and insufficient resources)	This was a qualitative research hence did not involve data collection and analysis. This does not permit inferencing the population.	The research used descriptive design and involved collection and analysis of data so as to draw conclusions on the population.

Most of the research studies conducted on factors influencing e-procurement implementation both locally and globally have focused on firms located in urban and industrial centers and majority have focused on barriers that deter e-procurement adoption. This study intended to assess how adoption of e-procurement is impacted by various factors. Thus, this study relied on local and global literature on technological innovations adoption to come up with an adoption framework that can be relied on to assess how various factors impact implementation of e-procurement by SMEs particularly in unindustrialized nations like Kenya. Shortage and unavailability of credible viable data regarding acceptance of e-procurement by SMEs continues to be a major difficulty to their understanding. SMEs also have a brief life span of normally three to five years which is also a challenge which makes it hard to understand them.

2.6 The Conceptual Framework

It is a structure of variables that the researchers apply so as to accomplish aims of their studies. According to Sekaran et al. (2016), a variable is anything which can accommodate values that are different and that keep on changing. The independent variables have been defined as variables which affect dependent variable in a positive or negative way while the moderating variable is a variable with a solid contingent effect on the independent - dependent variable relationship. The researcher is primarily interested on the dependent variable.

A conceptual framework illustrates figuratively the anticipated relationship between the independent variable and the dependent variable. In this study, e-procurement adoption by SMEs was the dependent variable while technological, organizational and environmental variables were the independent variables and were treated as the factors influencing e-procurement implementation. Variables were evaluated in accordance with the TOE model and the relationship was moderated by government policies. This model was then used to derive the research hypothesis thus drawing a complete research framework for this study.

Environmental factors consisted of market structure, industry characteristics, competitive pressure and readiness factors. Technological factors entailed complexity, relative advantage, compatibility, support from system vendors and security and confidentiality of the system. Organizational factors comprised of commitment and support of management, skills employees' skills, expertise and knowledge in IT, firm structure and size, proprietor's traits (age, gender, level of education) and organizational readiness. Under government policies; the vision 2030, MSE Act (2012) and National ICT Policy (2019) were the factors considered as moderating variables. These factors were believed to influence implementation of e-procurement by SMEs in Nyeri County.

Figure 2.3 illustrates the study conceptual framework model.

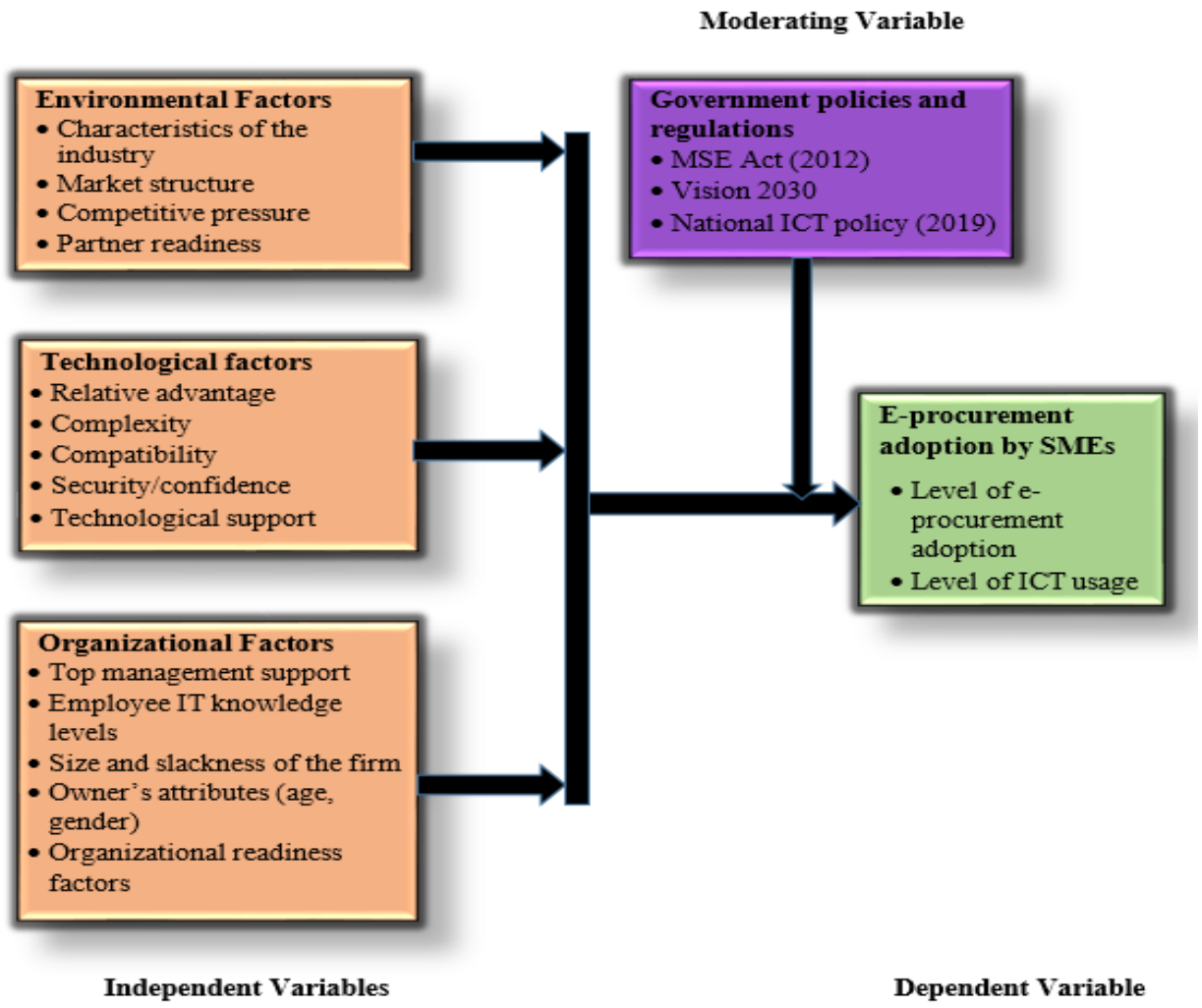

Figure 2.3: The conceptual framework **Source: Researcher 2022**

2.7 Summary of Conceptual hypotheses

H_1 Organizational factors have a significant effect on e-procurement adoptions by SMEs in Nyeri Country.

H_2 A significant relationship exists between technological factors and adoption of e-procurement in SMEs in Nyeri County.

H_3 Environmental factors have a significant influence in the adoption of e-procurement in SME in Nyeri County.

H_4 There is a significant moderating effect of government policy on the relationship between organization, technological and environmental factors and the adoption of e-procurement in SMES in Nyeri County.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section discusses the research methods applied and they included; research design, targeted populace, research sampling, data collection methods, procedures and analysis. It further describes techniques applied by the researcher in carrying out data analysis.

3.2 Research Design

It refers to how the researcher prepares data collection and analysis models with an aim of ensuring the objectives of the research are achieved in the most economical way. It is usually a hypothesized model upon which a study is carried out by providing methodologies to be followed during data collection, determining data structures and when analysis is done (Kothari & Garg, 2014). It is further alluded as the conceptual framework upon which a research study is conducted. It details the procedures and methods applied during data collection, target population and methods applied when analyzing and processing data.

The research study adopted an inferential statistics research design. This design was appropriate as it enabled the researcher to identify thedegree and nature of cause and effect relationship among the research variables as well as testthe research hypothesis by analyzing a given phenomenal with an aim of describing the relationship patterns among the variables (Kothari & Garg, 2014; Creswell & Plano, 2011). This in return enabled the researcher to draw conclusions and make inference on the population.Therefore, this research design was useful in this research study since the primary interest wasto identify the relations and relationship within the research variables which could only be explained by use of an inferential statistic research design.

This designed was deemed fit in assessing the factors that influence-procurement adoption by SMEs in Nyeri County as it enabled generalization of the research findings to the entire population. It was appropriate as it tried to explain the effects of organizational, technological

and organizational factors on the likelihood of e-procurement adoption by SMEs. It also allows usage of standardized tools of data collection such as questionnaires which were critical in this study.

Inferential statistics refers to a means of making inferences on a population based on research samples where samples in a study are analyzed and measured and the results are used to derive generalizations on the population (Kothari & Garg, 2014). It was also used in testing of the research hypothesis.

The descriptive statistics used purposed to develop a detailed explanation of various patterns by describingprecise characteristics of an exact individual or cluster (Odhiambo 2013; Osir, 2016; Mukulungui, 2016). It provides responses on the enquiry of what, where and how in relation to a specific question as it enables analysis of raw data into factual information (Mambo & Ombui, 2015; Wachinga 2019). They assisted the researcher in data visualization by providing summariessuch as frequency distribution through tables, measures of central tendencies (mean, median) and measurement of variability (variance and standard deviation) hence made the data more meaningful and easier to comprehend.

3.3 Study population

Population is a collection of groups, individuals, activities or objects which have a shared identifiable characteristic upon which a sample is drawn. Targeted population can therefore be referred to as a particular group of clusters or individuals whom are of interest to the researcher and he intends to draw conclusions from (Osir, 2016; Wachinga, 2019). The study targeted SMEs situated in Nyeri town and its close vicinities within Nyeri County. Figures from Nyeri County licensing department (2018) showed that there were three hundred and seventy-seven (377) registered firms in Nyeri town. The target population consisted of individual firms that were identified as SMEs with their owners or top level management as the preferred candidate.

Table 3.1 Categorization and spread of SMEs in Nyeri (2018)

Table 3.1 Categorization and spread of SMEs in Nyeri (2018)

Targeted sector	Business type	Estimated registered firms
Small enterprises	Manufacturing	34
	Traders	95
	Agribusiness	51
	Service	85
Medium enterprises	Manufacturing	18
	Traders	32
	Agribusiness	26
	Service	36
	Totals	**377**

Source: Licensing Department - Nyeri County Government

3.4 Research sampling and procedures

A sample can be defined as a representative or percentage of a targeted population selected to be part of a research study representing the entire population. According to Wachinga (2019), sampling design is a procedure or technique that researcher applies when selecting what is to be included in a sample. It is a well elaborate plan of collecting a sample from the targeted population and it usually indicates quantity of objects that are to be included in a sample, otherwise known as size of the sample (Kothari & Garg, 2014).

In conducting the study, proportionate stratified random sampling technique was used to develop sample size from the target population and then simple random sampling technique was applied for elements in their particular strata. Kothari & Garg (2014), asserts that this technique is used when the targeted population is not homogenous like in this study where the population strata of SMEs are heterogeneous in nature, that is, SMEs belong to different subgroups, either Small or Medium. Under this method, all the subgroups within the targeted population hadan equal chance of being represented hence it was deemed appropriate for this research study. This method was successfully used by Odhiambo (2013) in a similar study.

3.4.1 Determination of Sample size and distribution

Sample size is the number of representatives chosen from targeted population so as to represent the population in a data analysis and measurement methods (Kothari, 2014). The model as proposed by Yamane (1967), was used in this study since it has also been successfully used by Mukulungui (2016) in a similar study. In order to determine the sample size a 95% confidence level was used which translated to a significance level of 5% (0.05).

The sample size determination model was constituted as below;

$$n = \frac{N}{1 + N(e)^2}$$

Where: n = number of samples

N = target population

e = margin of error (significance level of 5%)

The number of samples were calculated as below;

n	=	377 / 1+377(0.05)²		
n	=	377 / 1.9425	=	195

Based on the formula above, a total of 195 samples were derived and used in conducting this study. These were the firms selected as samples and hence they represented the owners or top managers. The sample is adequate and with a decent representation of the targeted population thusenabling inferential statistics to be applied with ease in order to make inferences on the entire population.

From the sample size determined above, allocation of number of samples to each strata of the targeted population were done using proportional allocation criteria where the number of samples in each strata were kept proportional to size of each strata.

The allocation of samples was as per table 3.2

Table 3.2 Distribution of Samples

Target Class	Type of Target Business	Approximate number of registered Businesses	Weights	No of Sample (Weight * Sample size (195))
Small Sized	Manufacturing	37	0.098	19
	Traders	66	0.175	34
	Agribusiness	49	0.130	25
	Service	85	0.225	44
Medium Sized	Manufacturing	20	0.053	10
	Traders	42	0.111	22
	Agribusiness	26	0.069	13
	Service	52	0.138	27
	Totals	**377**		195

3.5 Data collection

This is gathering of material information from existing fields through various methods and techniques such as questionnaires. Before engaging in data collection activities, an approval from Technical University of Kenya was sought and an additional research permit was obtained from NACOSTI (National Council for Science, Technology and Innovation) in line with requirements of Kenyan laws.

The study used questionnaires as the preferred research instruments. This is because the research employed primary raw data. This method was suitable due to its cost effectiveness, provided greater chances of data standardization and offered a lot of convenience (Wachinga, 2019). Questionnaires as research instruments provide a high degree of standardization of responses data and conveniently enables collection of data from a large sample.

The items in the Likert scale ranged from “not at all (1) to “very large extent” (5) in denoting the level agreement or disagreement with the listed factors. Mukulungui (2016), successfully applied this tool in conducting a similar study. The questionnaire consisted of six parts; Part one related to biodata and other general information; second part was on organizational factors; third part touched on technological factors; fourth part was on environmental factors; fifth section was on government policies while sixth part was on level of e-procurement adoption.

Wachinga (2019) asserts that questionnaires enables a researcher to front identical questions and obtain answers within a similar range from every respondent. Only Part one had open ended questions while the other sections had questions based on Likert scale.

The questionnaires were hand delivered to the respondents at their work stations where the ideal candidates for this study were SME owners or top management teams. The respondents were left with the questionnaires and allowed time to fill them and then pickedwithin one week. This ensure the respondents had ample time to fill them and the desired candidate was gotten within that period.

3.6 Research pilot Study

This was done prior to the actual research being conducted. It provides an opportunity of testing the research tools prior to the actual research being conducted and it helps in detecting challenges that can deter collection of useful data (Wachinga, 2019). When conducting the pilot study, effectiveness of data gathering tools were assessed with an aim of testing them and adjusting where necessary. In running the pilot study, 16 questionnaires were purposively administered to selected individuals and firms with an aim of collecting feedback and further analysis before the final version was approved for issuance to the respondents. It enabled testing for validity and reliability of questionnaire in collecting data that was need in this study.

3.7 Testing of validity and Reliability

3.7.1 Validity testing

According to Sekaran et al. (2016), validity is the level of variance to which outcomes obtained from samples analyzed are an authentic representation of the topic being researched. According to Wachinga (2019), validity exists in two forms; content and construct. Construct validity was maintained by reviewing studies done by other researchers; content validity was safeguarded by use of balanced questions in the questionnaire sheets while the study overall validity was protected by conducting pre-tests on the questionnaires through pilot study in order to amend impolite, leading and ambiguous questions before issuing the final copy.

3.7.2 Reliability testing

Reliability measures the level to that research tools give consistent results. According to Rapp (2012) reliability can be measured by the use of Cronbach's alpha which correlates an item with each other and also correlates it against the total score. When Cronbach's alpha coefficient is closer to 1, the internal consistency reliability is believed to be higher. It is generally accepted that when coefficient of reliability is over 0.7, it is considered as suitable whereas when it is below 0.7 it is considered undesirable (Mugenda & Mugenda, 2003; Wachinga, 2019; Mukulungui, 2016). Thus, a Cronbach alpha coefficient value of 0.7 and above was considered acceptable and research tools labelled reliable.

3.8 Data Analysis

This encompasses amassing data into its exact components so as to determine its structure, characteristics, elements, and accuracy levels. The research study intended to produce both quantitative and qualitative statistical data. The collected data was prepared for further statistical examination by conducting tests such as validation, inspection to ensure clearness, significance, appropriateness and legibility. Data analysis was achieved by issuance of quantitative statistics examination techniques. So as to streamline and analysis the data properly, questionnaires gotten from the respondents were coded in line with their particular variables under investigation. This guaranteed utmost accuracy, reduction of errors, easier handling of data and helped in avoiding duplication when analyzing data. The process of analyzing and examining data was conducted applying Statistical Package for Social Sciences (SPSS) version 24 data analysis tools. The data analysis package was chosen because of its Automated Data Preparation Feature (ADPF) that is able to produce various comparisons as well as permits results customization in tables and graphs which were appropriate in the study.

3.8.1 Descriptive statistics

These represents data measurements tools such as variability and measures of central tendency. The study applied the following statistics; mean/average, maximum, minimum and measure of standard deviation which described the basic structures of the collected data, provided summaries of the research samples and other measures. Additionally, frequencies assisted in providing outputs in by use of frequency distribution tables that facilitated easier presentation, comprehension and interpretation of obtained results.

3.8.2 Inferential statistics

Inferential statistics facilitated analysis of data with an aim of drawing inferences about the population and they were composed of;

3.8.2.1 Correlation analysis

It generally seeks to determine the relationship among various variables in a research study and it can still be used in making predictions on the relationship among the various research variables. To establish the relationship among the research variables, Pearson's product-moment correlation analysis(r) was used in testing whether there was any relationship. The correlation coefficient obtained measures the strength of linear relationship between two variables. It tries to draw a line of best fit through cutting across the data points that tries to show how data is aligned or scattered along this line. Pearson correlation (r) is the frequently used coefficient because it measures the strength and direction of linear relationship between two research variables. This co-efficient ranges from +1 to -1 in its measurements where a greater than or less than those values indicates that there was an error in its calculation. A co-efficient value of 0 depicts that there was no linear relationship between the two research variables; a value greater than 0 (0 to +1) shows that a positive relationship existed between the two research variables with a +1 showing a perfectly positive correlation between the variable; a value less than 0 (0 to -1) represents a negative relationship between the research variables with a -1 showing a perfect negative relation (Wachinga, 2019; Kothari & Garg,

(2014).

3.8.2.2 Logistical regression analysis (LRA)

This model, LRA, categorizes data into two orders, that is, first and second order constructs with the dependent variable being binary in nature and the independent variables being nominal or ordinal (Odhiambo, 2013). It predicts the probability that observable output belongs to either of the two classes of a dichotomous dependent variable based on one or more independent variables that can either be continuous or categorical (Ramdani, 2013). LRA is not subjected to limitations of normality tests or restricted by missing values in research data. Independent variables are subjected to incremental addition to determine their individual and collective effect on adoption of e-procurement. In this study, levels of e-procurement adoption with values less than 2 were considered as non-adopters while those with value more than 3 were considered as adopters.

Let Y = e-procurement adoption; where Y is a binary variable, that is Y = 1 if e-procurement was adopted and Y = 0 when there was no adoption. Contemplate a group of ***n*** independent variables (See Fig 2.4) represented as follows;

$$\mathbf{X^n = (X_1, X_2\ X_3, X_4, \ldots\ldots\ldots.X_i\ldots\ldots\ldots\ldots X_n)}$$

Where X*i* represents the independent variables (environmental, technological and organization).

Have probability of e-procurement adoption represented as below;

$$\mathbf{P(Y=1/\ X_i) = \pi\ (Y)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(1)}$$

Where π represents the probability of an event and π (Y) is a nonlinear function of the best combination of the independent variables.

The logit of the multiple regression model was as below;

$$Z = \beta_0 + \sum_{i=1}^{n} \beta_i X_i + \varepsilon \quad \text{.....(2)}$$

Interpretation: β_i (regression coefficients linked to the independent variable)

X_i (independent descriptive variables)

Additionally, Z was computed as shown below;

$$z = In\left(\frac{p}{(1-p)}\right) \quad \text{.....(3)}$$

Based on equation 2, LRA model can be equated as per below;

$$\pi(Y) = P[Y=1] = \frac{e^{\beta_0 + \sum_1^{18} \beta_i X_i}}{(1 + e^{\beta_0 + \sum \beta_i X_{i=n}})} \quad \text{.....4}$$

As per equation 4 above, the likelihood of e-procurement not being adopted (Y = 0) was expressed by; Y = 1 - π(Y) or;

$$P[Y=0] = \frac{1}{(1 + e^{\beta_0 + \sum \beta_i X_{i=n}})} \quad \text{.....(5)}$$

Noting that for theoretical and mathematical reasons, *is based on a linear model of natural logarithm of the odds (the log. odds) in favor of Yi= 1, then the log of the ratio of adoption and non-adoption of e-procurement is shown below:

$$In\left[\frac{P(Y=1/X_1, X_2 \ldots X_n)}{(1 - P(Y=1/X_1, X_2 \ldots X_n)}\right] = In\left[\frac{\Pi(x)}{1-\Pi(x)}\right] \quad \text{.....(6)}$$

As per LRA theory, combining equation 1 and 6 yields the below equation;

$$In\left[\frac{\Pi}{1-\Pi}\right] = \beta_0 + \beta_1 X_1 + \ldots\ldots + \beta_n X_n \quad \text{.....(7)}$$

Final equation was gotten by reorganizing the outcomes in the odd ratio as per below:

$$\left[\frac{\Pi}{1-\Pi}\right] = \frac{e^{\beta_0+\beta_1 X_1+\ldots\ldots\ldots\ldots+\beta_n X_n}}{1+e^{\beta_0+\sum\beta_i X_i}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(8)$$

To better understand the equation, let $\frac{\pi}{1-\pi}$ be represented by expression y*. The final equation was represented as below:

$$y* = \beta_0+\beta_1X_1+\beta_2X_2+\cdots\cdots\cdots\cdots\beta_nX_n \ldots\ldots\ldots\ldots(9)$$

The above equation was applied in evaluating how independent factors impact e-procurement acceptance by SMEs in Nyeri County.

3.8.3 Moderating variable

It is a variable with a strong influential relationship on independent and dependent variables in a research study. It has the capacity to alter the nature of the relationship between an independent and a dependent variable by increasing or reducing the nature of the relationship or it can even change the relation between the two variables from positive to negative (Mahdaleta, 2016). According to Wachinga (2019) moderating variable aims at highlighting and explaining more on the changes observed in the relationship between a predictor and outcome variable when a third proposed variable is introduced in the equation. Government policies were taken as the moderating variable in the research study where it was tested the relationship between e-procurement adoption and the independent factors.

The effect of the moderating variable (government policies) was examined by carrying out stepwise regression analysis as advanced by Baron & Kenny (2010). The first step entailed regressing independent factor X against the dependent variable Y in order to obtain the standardized regression coefficient so as to check whether X can significantly predict Y. If the predictor variable was established to be significantly vary from zero the testing process would then move the next step (step two) where the moderating variable would be regressed against the predictor to approximate the standardized beta regression coefficient so as to determine the degree and direction of their relations.

Consequentially, if beta coefficient is established to be higher than zero, the process would then move to step three and regress Y on Z so as to determine the beta coefficient for path b. If beta path b is found to be significant, the dependentvariable Y would then be regressed on X while controlling the effect of Z on Y through a hierarchical regression analysis that treat Z and X as successive independent variables. Upon confirming both coefficients to be significant, then Z is established as moderating the relationship between X and Y (Memon et al, 2018). Wasike, et al (2018) argues that for a moderating variable to be seen as having a moderating effect, its interaction with the independent variable must have a significant outcome on the dependent variable.

The stepwise regression process model was as per the below:

$Y = \alpha + \beta_1 X_1 + \acute{\varepsilon}$ i

$M = \alpha + \beta_1 X_1 + \acute{\varepsilon}$ ii

$Y = \alpha + \beta_1 M + \acute{\varepsilon}$ iii

$Y = \alpha + \beta 1\ X_1 + \beta_2 M + \acute{\varepsilon}$ iv

α =constant (intercept)

$\beta_1\ \beta_2$ = Coefficients.

X_1= Independent Variable

Y= Dependent Variable

M = Moderating Variable.

$\acute{\varepsilon}$= Error term.

Model i = Step one involves regressing independent variable on dependent variable.

Model ii = in step 2 independent variable is regressed against Government Policy

Model iii = step three the influence of moderating variable on dependent variable performance is tested using a simple linear regression model.

Model iv = Step four tests the influence of independent variable on dependent variable under the controlling effect of the moderating variable.

These assessments were conducted by using LRA and was repeated for all the predictor variables so as to test the hypothesis that government policy has no significant moderating influence on the relationship between independent variable and dependent variable. The final model was determined as below;

$$Y= \alpha +\beta_1 Z X_1 +\beta_2 Z X_2+\beta_3 Z X_3+ \acute{\varepsilon}..... \beta_n Z X_n$$

3.9 Ethical consideration

The researcher notified the participants on their right to decide on whether to participate in the research or not. They gave out an informed consent and agreed to fill the questionnaires voluntarily. The objectives of the study were thoroughly explained to the respondents and the importance of engaging in the study was highly emphasized and how their contributions were significant to the outcomes of the study. Confidentiality and assurance of privacy was given to the participants. They were assured that the data given would be accorded the highest levels of privacy and no identity would be disclosed. They were also assured that the data was for academic purposes only. Only the willing participants were engaged in the study.

Table 3.3 Summary of data analysis procedures

	Hypothesis	**Research objective**	**Data Analysis Technique**	**Interpretation**
H01:	Organizational factors have no significant relationship on e-procurement adoptions in SMEs in Nyeri Country.	To evaluate organizational factors that influence e-procurement adoption by SMEs in Nyeri County	**Descriptive statistics** Minimum Maximum Mean	Minimum level of agreement or disagreement with the factors listed Maximum level of agreement or disagreement with the factors listed Measured the average level of agreement or disagreement with the factors listed

			Standard deviation **Logistics regression analysis** $Y^*=\beta 0+\beta 1X1$ where Y* = E-procurement Adoption, β0 = Constant, β1 = Regression coefficients linked to organizational factors X_1 = Organizational factors	showed the spread of data around the mean P value to test significance where p value should be below 0.05 for the factor to be significant Exp(B) - Odds ratio showed the likelihood of organizational factors in influencing e-procurement adoption Nagelkerke R^2 to show the extent to which variations in e-procurement adoption are explained by organizational factors.
H02:	There is no significant relationship between technological factors and adoption of e-procurement in SMEs in Nyeri County**.**	To assess technological factors that affect e-procurement adoption by SMEs in Nyeri County.	**Descriptive statistics** Minimum Maximum Mean Standard deviation **Logistics regression analysis**	Minimum level of agreement or disagreement with the factors listed Maximum level of agreement or disagreement with the factors listed Measured the average level of agreement or disagreement with the factors listed showed the spread of data around the mean P value to test significance where p value should be below

				0.05 for the factor to be significant Exp(B) - Odds ratio showed the likelihood of technological factors in influencing e-procurement adoption Nagelkerke R^2 to show the extent to which variations in e-procurement adoption are explained by technological factors.
			$Y^*=\beta0+\beta1X1$ where Y^* = E-procurement Adoption, $\beta0$ = Constant, $\beta1$ = Regression coefficients linked to technological factors X_1 = Technological factors	
H03:	Environmental factors have no significant relationship on the adoption of e- procurement in SMEs in Nyeri County	To study environmental factors that affect e-procurement adoption by SMEs in Nyeri County.	**Descriptive statistics** Minimum Maximum Mean Standard deviation **Logistics regression analysis** $Y^*=\beta0+\beta1X1$	Minimum level of agreement or disagreement with the factors listed Maximum level of agreement or disagreement with the factors listed Measured the average level of agreement or disagreement with the factors listed showed the spread of data around the mean P value to test significance where p value should be below 0.05 for the factor to be significant Exp(B) - Odds ratio showed the likelihood of environmental factors in influencing e-procurement adoption

			where Y* = E-procurement Adoption, β0 = Constant, β1 = Regression coefficients linked to environmental factors X_1 = Technological factors	Nagelkerke R^2 to show the extent to which variations in e-procurement adoption are explained by environmental factors.
H04:	There is no significant moderating effect of government policy on the relationship between organization, technological and environmental factors and the adoption of e-procurement in SMEs in Nyeri County.	To examine the moderating effects of Government policies on the relationship between organization, technological and environmental factors and adoption of e-procurement in SMEs in Nyeri County	stepwise regression model; Baron & Kenny (2010) Step 1: Y= α+ β1X1+ ε Step 2: M= α+ β1X1+ε Step 3: Y= α+ β1M+ ε Step 4: Y= α+ β1 X1+ β2M+ε Where: Y = E-procurement Adoption (Dependent variable) α = intercept/constant β_1 and β_2 = Beta coefficients X1 = E-procurement adoption factors M = Government policies (Mediating Factors) ε= Error term	Nagelkerk R^2 to show the extent to which variations in e-procurement adoption are explained by government policies as moderating variables F ratio to show the significance of the model used. The P value for F value should be below 0.05 for the model to be termed as fit

CHAPTER FOUR

RESEARCH FINDINGS AND PRESENTATION

4.1 Introduction

This research was conducted with an aim of evaluating factors that impact e-procurement adoption by SMEs in Nyeri County – Kenya. Results of data analysis process, study finding and discussions are provided in this section and they are primarily based on the study goals and variables. The observed findings were presented through tables, diagrams, charts and statistical graphs.

4.2 Response Rate

According to the sample size, 195 questionnaires were approved and issued for delivery to the respondents. The questionnaires were successfully delivered to the willing respondents/firms where a representative from the firm was requested to participate by filling in the questionnaire. Out of the 195 questionnaires issued, 128 were answered and returned within the anticipated time frame while 67 questionnaires were not returned. This was a result of the respondents not being keen to meet the deadlines and others not being cooperative even after picking the research tools. The returned questionnaires bore a 67% response rate that was deemed adequate for this study, going by Mugenda & Mugenda (2003). Awino (2011) emphasizes that for a social science study, a yield of 65% in responses is considered sufficient. This compliments Wachinga (2019) who argues that a response rate of about 15.4% is deemed adequate considering the demands of the employees/owners/managers in such firms.

The distribution of the responses obtained was as per table 4.1:

Table 4.1 Distribution of Respondents

Distribution as per Firm Size

Firm Size	**Number of Firms**	**Percentage**
Small Sized	61	48%
Medium Sized	67	52%
Totals	**128**	**100%**

From table 4.2, small sized enterprises amounted to 48% of the total respondents while52% were medium sized enterprises. Distribution of the respondents was further classified by subsectors within the main sector. The table 4.2 shows the classifications and percentages of each subsector in relation to the overall responses.

Table 4.2 Distribution of Respondents per sector

Distribution per sector

Firm Size	**Sector**	**Number**	**Percentage**
Small Sized	Agribusiness	11	9%
	Manufacturing	5	4%
	service	20	16%
	Traders	25	20%
Medium Sized	Agribusiness	9	7%
	Manufacturing	7	5%
	service	30	23%
	Traders	21	16%
	Totals	**128**	**100%**

From table 4.2 above, medium sized service enterprises accounted for 23% of all the respondents; small sized traders' enterprises accounted for 20% of all the respondents; small sized service enterprises and medium sized traders' enterprises each accounted for 16% of all the respondents; small sized agribusiness enterprises accounted for 9% of all respondents; medium sized agribusiness enterprises accounted for 7% of all the respondents; medium sized manufacturing enterprises accounted for 5% of all the respondents while small sized manufacturing enterprises accounted for 4% of all the respondents.

The figures could be attributed to Covid 19 pandemic which has greatly reduced the operation size of firms. Some firms previous categorized as large had down scaled their operation to medium sizes while many small sized firms had downsized to micro enterprises. Many firms had reduced their staff force and sales levels had reduced due to scaled back operations.

4.3 Demographic Factors

4.3.1 Gender Profile

From the 128 responses obtained, 77 of the respondents were male, representing 60% of the respondents while female totaled 51 representing 40% of the total respondents.

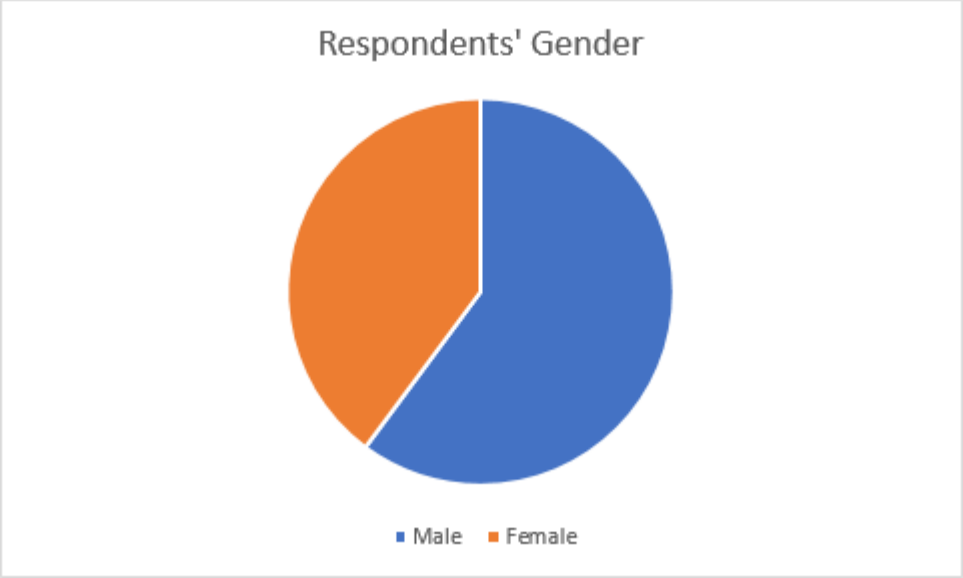

Figure 4.1 Gender profile

The figures still show that male gender still dominated the SME field underpinning the need to have female empowerment. However the gender gap is not very wide.

4.3.2 Education Profile

The respondents' education profile was as per table 4.3;

Table 4.3 Educational profile

Level of Education	Numbers	Proportion
Certificate	23	18%
Diploma	64	50%
Degree	36	28%
Postgraduate	4	3%
Graduate	1	1%
Total	**128**	**100%**

The education profile results shows that 50% of the respondents were Diploma holders; 28% were degree holders; 18% were certificate holders; 3% had attained postgraduate qualifications

while 1% were graduates. The outcomes indicated that majority of the respondents were well educated and possibly had knowledge on e-procurement and technological usage and adoption in general.

SMEs are dominated by degree and diploma holders at 78% of the respondents. This could be due to the technical nature of SMEs which require hands on qualifications only available in diploma and degree graduates. It is a manifestation of literacy levels where majority of the population have tertiary qualifications such as diploma or degree.

4.3.3 Age profile

Table 4.4 Respondents Age distribution

Age Bracket	**Number**	**Proportion**
Above 55	9	7%
46-55 Years	25	20%
36-45 Years	42	33%
26-35 years	38	30%
18-25 years	14	11%
Total	**128**	**100%**

The age profile outcomes confirmed that 33% of the respondents were aged between 36-45 years; those aged between 26-35 accounted for 30%; 20% had their age between 46-55 years; 11% were aged between 18-25 years while those with 55 years and above represented 7% of the total respondents.

The outcomes indicated that most of the respondents were aged between26-55 years at 83% of the respondents. This age cluster usually consists of either the owners/ managers/ senior employeesof most SMEs who have knowledge on e-procurement activities. The Kenyan is averagely youthful in nature hence the age distribution.

4.3.4 Number of employees

Table 4.5 Staff size

Employees range	Number	Proportion
Below 10	34	27%
10-50 employees	76	59%
51-100 Employees	12	9%
Above 100	6	5%
Totals	**128**	**100%**

Results showed that 59% of the enterprises had employed between 10-50 employees; 27% of the enterprises had below 10 employees; 9% had 51-100 employees while 5% had over 100 employees.

4.4.4 Level of capital invested

Table 4.6 shows results of the level of capital invested by the different enterprises.

Table 4.6 Level of capital invested

Capital Invested	Number of enterprises	Proportion
0-5 M	42	33%
5-20 M	44	34%
20-50M	31	24%
Over 50M	11	9%
Totals	**128**	**100.00%**

Table 4.6 showed that 34% of the enterprises had had a capital invested of 5-20M; 33% had 0-5M; 24% had 20-50M while 9% had over 50M.

4.5 Pilot study, Validity and Reliability test results

Before commencement of the actual study, a pilot study was first done so as to test the overall validity of questionnaires with an aim of ascertaining their adequacy and dependability as data collection tools. A total of 16 questionnaires were purposively issued to work mates and some business owners known to the researcher for the purposes of conducting a pilot study. Results of the pilot study were as per table 4.7;

Table 4.7 Pilot study results

Cronbach's Coefficient	Cronbach's Coefficient as per the Standardized Items	Number of Items
.720	.750	29

The pilot study yielded a Cronbach's Alpha coefficient of 0.72 (72%) and was regarded as satisfactory hence research tools were declared reliable. It is generally accepted that when coefficient of reliability is over 0.7, it is considered as suitable whereas when it is below 0.7 it is considered undesirable (Mugenda & Mugenda, 2003; Wachinga, 2019; Kothari & Grag, 2014; Mukulungui, 2016). The alpha of coefficient obtained was further applied in measuring internal consistency of the research and the results are as per table 4.8;

Table 4.8 measure of internal consistency

Case Processing Summary

		N	%
Cases	Valid	127	99.2
	Excluded[a]	1	0.8
	Total	128	100

a. Listwise deletion based on all variables in the procedure.

The results yielded an internal consistency measure of 99.2%. This means that the answers provided by the respondents agreed with each other up to 99.2% hence the study was deemed consistent and the results yielded acceptable.

4.6 Descriptive Statistics

The key determinants in this study were organizational factors, technological factors, environmental factors, government policies and e-procurement adoption. These factors were measured on a Likert scale denoted as follows; 1 = Not at all, 2 = Less extent, 3 = Moderate extent, 4 = Large extent, 5 = Very large extent. Summary statistics, that is, mean, minimum, maximum and standard deviation were used to summarize the descriptive statistics. The results of descriptive statistics are discussed below.

4.6.1 Organizational Factors

The study had an objective of evaluating whether organizational factors influence e-procurement implementation by SMEs. This was done by developing a set of sub-factors regarding organizational factors which included: support of the top management, size of the enterprise, attributes of the owners and managers, organizational readiness factors and previous ICT experience.

The descriptive result for organizational factor were represented as per table 4.9;

Table 4.9 Descriptive statistics on organizational factors

Organizational Factors	N	Minimum	Maximum	Mean	Std. Deviation
Owner's/Employee ICT knowledge and their functions	128	2	5	4.6094	0.66681
Owner's attributes (age, gender, attitude, commitment) on IT	128	1	5	4.5078	0.78365
Organization size, structure and slackness	128	1	5	4.3125	0.94536
Low staff retention rates	128	2	5	4.0859	0.97227
Poor organization structures and bureaucracy	128	1	5	3.9844	0.97192
Resistance to change and uptake of IT innovations	128	1	5	4.0469	0.987
Low levels of trust on technology reliance in business activities	128	1	5	4.0469	0.97899
Perceptions of the owner/ manager on e-procurement	128	2	5	4.3281	0.87942

The Table 4.9 above present's descriptive statistics on organization factors and indicates the respondent tendency on the assessment variables in terms of minimum, maximum, mean and standard deviation. Proprietor and staff ICT skills levels, owner's traits (age, gender, attitude, commitment) on IT, organization characteristics (size, structure and slackness,) poor employees retention rates, resistance to change and uptake of IT innovations, low levels of trust on technology reliance in business activities, perceptions of the owner/ manager on e-procurement yielded a mean of 4.6094, 4.5078, 4.3125, 4.0859, 4.0469, 4.0469 and 4.328 respectively. This means that the respondents agreed that these factors influence e-procurement adoption by SMEs to a large extent. On the other hand, poor organization structures and bureaucracy yielded a mean of 3.9 which means that respondent strongly agree that it influences e-procurement adoption with a moderate extent.

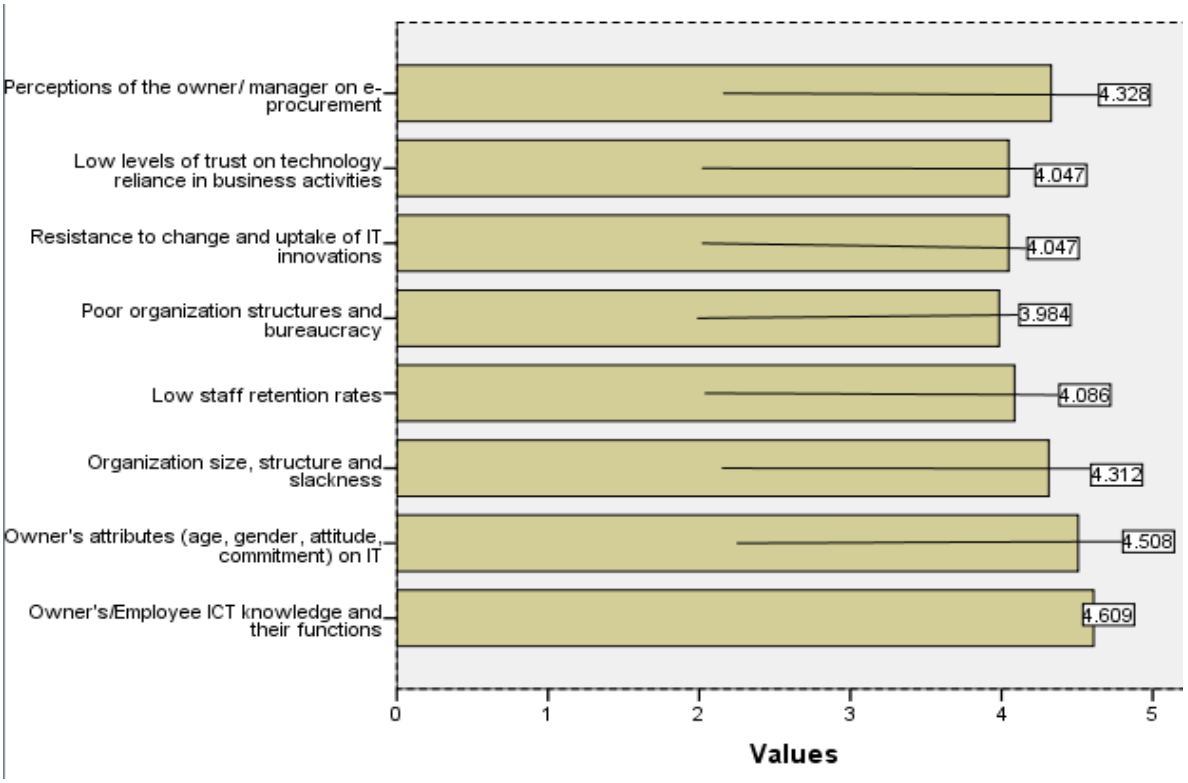

Figure 4.2 Mean for the responses on organizational factors

Overall, organizational factors had an average mean of 4.24 across all the factors with an average standard deviation of 0.898 which indicated that participants agreed that organizational factors affect e-procurement adoption by SMEs by a large extent. This is in line with findings of other research works for example; Achuora & Arasa (2012); Ramdani (2013); Sabraz & Gunapalan (2015); Odhiambo (2013) who asserted that organizational factors have huge influence on the embracing of IT inventions such as e-procurement.

4.6.2 Technological factors

Technological factors in nature have been known to influence e-procurement implementation significantly and in this study categorized them as: relative advantage, compatibility, complexity, trialability, observability and risks of the information system. Descriptive results of these factors are as per table 4.10:

Table 4.10 Descriptive statistics on technological factors

Technological Factors	N	Minimum	Maximum	Mean	Std. Deviation
Compatibility of e-procurement systems with other systems	128	1	5	4.5625	0.77103
Complexity and ease of usefulness of e-procurement system	128	1	5	4.5312	0.84124
Relative advantage on e-procurement systems	128	1	5	4.5354	0.78473
Security threats and confidentiality of information in e-procurement systems	128	1	5	4.1484	0.89698
Technological support from system vendors and developers	128	1	5	3.9609	0.95902
Unavailability or absence of IT infrastructure	128	1	5	3.91	0.9309

From the above statistics, technological factors yielded an average mean of 4.28 which means that to a large extent, technological factors are key determinants of e-procurement acceptance by SMEs. This compliments other studies which have acknowledged technological factors as key determinant in implementation of IT inventions such as e-procurement (Molinillo & Japutra, 2017; Hassan et al, 2017; Mukulungui, 2016; Ramdani, 2013; Odhiambo, 2013).

Compatibility of e-procurement applications with different applications, complexity and simplicity of use, relative benefits of e-procurement applications, security risks and data privacy within e-procurement applications yielded a mean of 4.5625, 4.5313, 4.5354 and 4.1484 respectively which means that these factors to a large extent, are key determinants of e-procurement embracing by SMEs. Prior studies identified these factors as factors that highly influence adoption of IT inventions for example e-procurement where they have been consistently identified as the most important determinant that influence innovation adoption (Sabraz & Gunapalan, 2015; Ojiabo et al., 2015; Mambo & Ombui, 2015; Alkhalil et al., 2017; Molinillo & Japutra, 2017; Ramdani 2013).

On the other hand, support from vendors and and inadequate ICT infrastructure yielded a mean of 3.9609 and 3.914 respectively which means that they determine e-procurement adoption by SMEs by a moderate extent.

The figure below shows the mean frequency distribution of technological factors

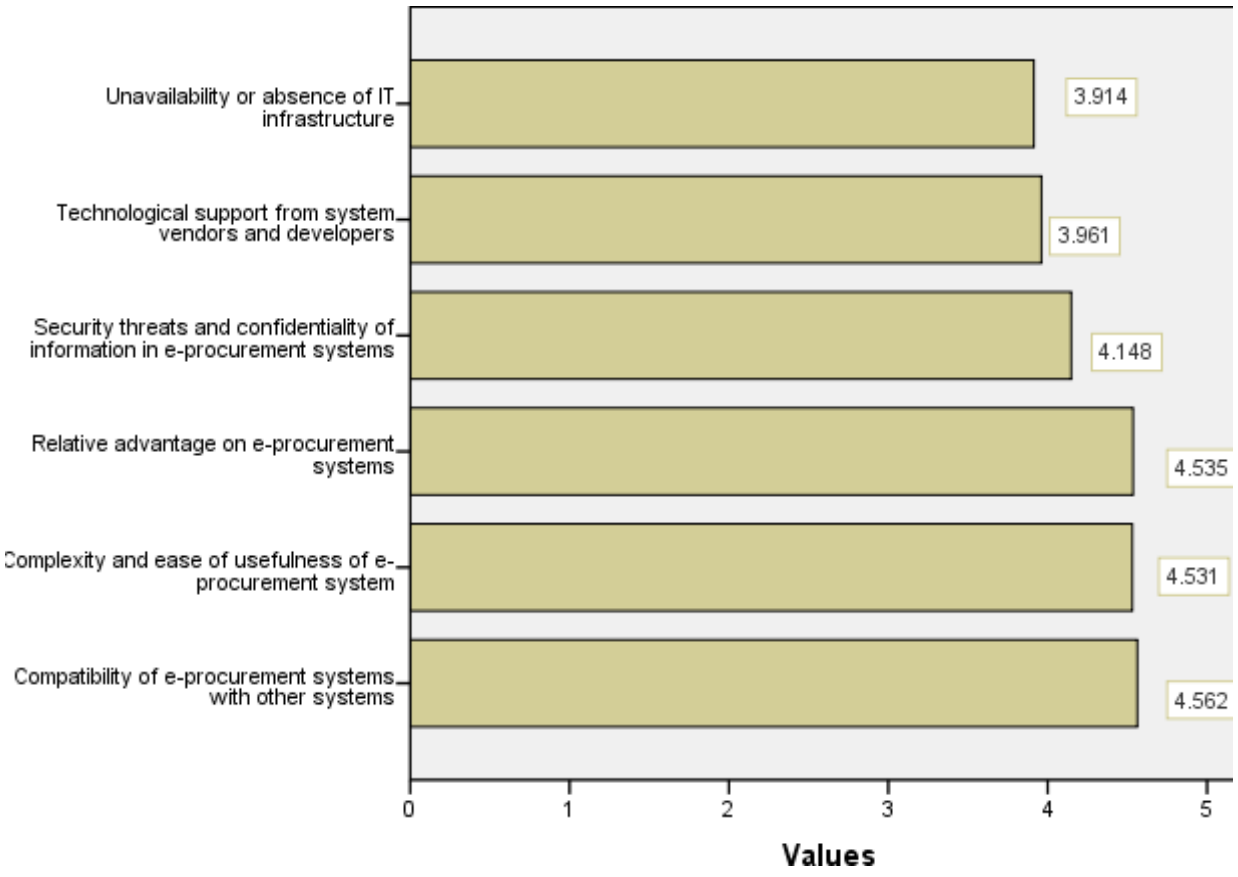

Figure 4.3 Mean for the responses on technological factors

4.6.3 Environmental factors

Environmental factors, as one of the factors influencing e-procurement adoption in the study, were categorized as follows; the market sector and structure, characteristics of the industry, competition pressure, government support, large number of SMEs in the same market and partners readiness. Descriptive results of these factors are as per table 4.11:

Table 4.11 Descriptive statistics on environmental factors

Organizational factors	N	Minimum	Maximum	Mean	Std. Deviation
The market sector and structure is a critical adoption factor	128	1	5	4.3125	0.83005
Characteristics of the industry influences adoption	128	2	5	4.4688	0.65132
Competition pressure is a critical adoption factor	128	1	5	4.3047	0.85627
Government support is a critical adoption factor	128	2	5	4.0391	0.87306
Large number of SME's in the same market influences adoption	128	1	5	3.9453	0.95825
Partners readiness influences adoption	128	1	5	3.8906	0.95764

From table 4.11, environmental factors yielded a mean of 4.16 which means that to a large extent, environmental factors are key determinants of e-procurement adoption by SMEs. Previous studies Sabraz & Gunapalan (2015); Nyamu (2014); Alkhalil et al. (2017) also identified environmental factors as key factors which influence implementation of IT inventions like e-procurement.

The results further showed that, market sector and structure, characteristics of the industry, competition pressure and government support had a mean of 4.3125, 4.4688, 4.3047 and 4.0390 respectively. This means that interviewee acknowledged to a large extent that these factors are key determinants in implementation of e-procurement by SMEs. SMEs operating in large numbers one market and partners readiness factors had a mean of 3.9453 and 3.8906. This means that to a moderate extent, these factors are a key determinant of e-procurement adoption by SMEs.

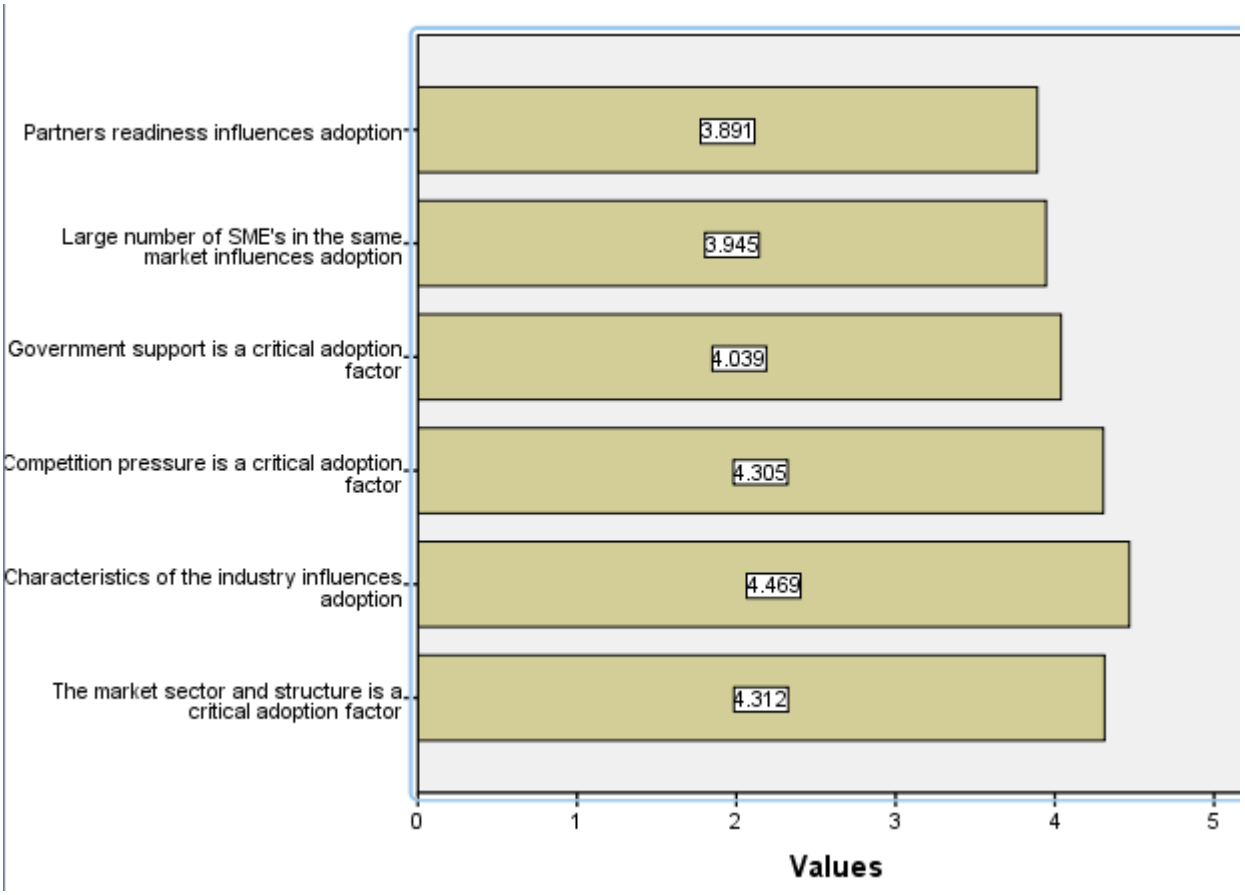

Figure 4.4 Mean for the responses on environmental factors

4.6.4 E-procurement adoption by SMEs

E-procurement adoption by SMEs was measured under two factors; Level of ICT usage in the firm and the actual level of e-procurement adoption. The descriptive results are as displayed as per the table 4.13;

Table 4.13 Descriptive statistics on e-procurement adoption by SMEs

E-procurement adoption	N	Minimum	Maximum	Mean	Std. Deviation
Level of ICT usage in your firm	128	1	5	3.6172	1.07309
Level of e-procurement adoption	128	1	5	2.875	0.98012

From table 4.13, level of ICT usage had a mean of 3.617 which means that ICT usage bySMEs was at a moderate extent while level of e-procurement adoption had a mean of 2.875 which meant the e-procurement adoption by SMEs was to a less extent. These outcomes of thestudy compliments with the findings from previous studies; Mafini et al. (2020); Mukulungui (2016); Achuora & Arasa (2012);Annuar (2015); Fernandes & Vieira (2015), who asserted that in spite

of the notable advances in technological growth and IT infrastructural development, utilization of IT and its subsequent adoption has remained minimal, particularly in unindustrialized economies likes Kenya and where majority of the firms, more so SMEs, are yet to start utilizing e-procurement technologies at all or there is very low adoption altogether.

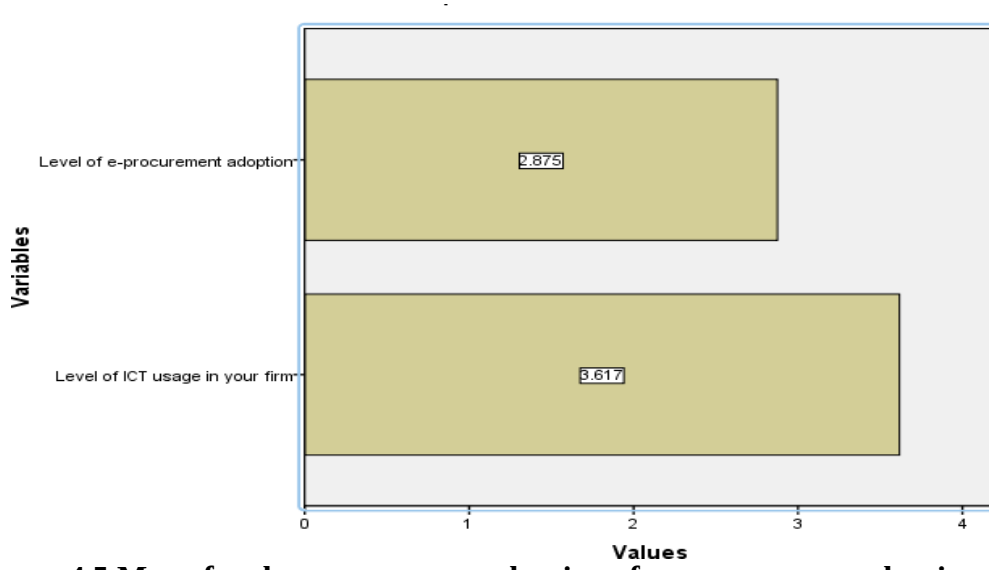

Figure 4.5 Mean for the responses on adoption of e-procurement adoption

According to the descriptive statistics obtained, it can be deduced that SMEs, to a large extent, agreed that organizational factors, technological factors and environmental factors are factors influencing e-procurement adoption while government policies only affects adoption to a less extent. However, their level of ICT usage and actual adoption was found to be at a moderate extent and less extent respectively which means that despite the SMEs being aware of the factors influencing e-procurement adoption, they have not gone ahead and adopted it. This in return means that the level of ICT usage and e-procurement adoption is very low or even non-existent in SMEs which agrees with earlier studies that have established that adoption of new IT innovations in developing countries is very low.

The findings from descriptive studies were in line with diffusion of innovation theory which asserts that in some instances, individuals or firms will deliberately avoid adopting an innovation regardless of its benefits while others opt not to acquire similar technologies when they become available hence many firms had not adopted e-procurement despite them being aware of the benefits they could reap (Rodgers, 2003; Wachinga, 2019).

4.7 Correlation analysis results

The study applied correlation analysis tools in testing and determining whether there was any relationship between the research variables as well as make predictions on the relationship between and among the variables. Correlation analysis aimed at determining whether there was linear relationship between outcome variable (e-procurement adoption) and predictor variables (organizational factors, technological factors, environmental factors and government policies). Statistically, if the value of the correlation coefficient obtained is not more than 0.05 ($p<0.05$),a statistically significant relationship is established but if the value is more than 0.05 ($p>0.05$), the relationship is considered to be statistically insignificant.

Pearson correlation coefficient (r) ranges from +1 to -1 where 0 represents no relationship between the variables under study; a positive relationship is denoted by values greater than 0 while a negative relationship is symbolized by values less than 0 (Wachinga, 2019; Kothari & Garg, 2014). The table below displays outcomes of the correlation analysis are as per table 4.14;

Table 4.14 Correlation results

Factor		Level of e-procurement adoption	Organizational Factors	Technological Factors	Environmental Factors	Government Factors
Level of e-procurement adoption	Pearson Correlation	1	-.175*	-0.082	-.194*	-0.003
	Sig. (2-tailed)		0.048	0.359	0.028	0.975
	N	128	128	128	128	128
Organizational Factors	Pearson Correlation	-.175*	1	.322	.466	0.065
	Sig. (2-tailed)	0.048		0	0	0.469
	N	128	128	128	128	128
Technological Factors	Pearson Correlation	-0.082	.322	1	.411	0.071
	Sig. (2-tailed)	0.359	0		0	0.427
	N	128	128	128	128	128
Environmental Factors	Pearson Correlation	-.194*	.466	.411	1	0.173
	Sig. (2-tailed)	0.028	0	0		0.051
	N	128	128	128	128	128

*. Correlation is significant at the 0.05 level (2-tailed).

From table 4.14, a significant statistical relationship exists between e-procurementadoption and organizational factors ($r = -0.175$; $p = 0.048<0.05$) even though it is negative. The results are in contrast with descriptive statistics which showed that organizational factors influence adoption of e-procurement by a great extent. This deviation from expected outcomes can be

explained by the fact that despite the SMEs agreeing to a large extent that organizationalfactors influence e-procurement, the actual adoption is at a very low rate hence there exists no correlation between these two factors, that is, awareness of organizational factors do not necessary lead to adoption of e-procurement adoption.

This supports previous research findings that have shown that in spite of advancements in technology growth and IT infrastructure developments, utilization and implementation of IT inventions like e-procurement has remained low in emerging countries like Kenya (Mukulungui, 2016).

The correlation results showed there was a negative insignificant statistical relationshipbetween e-procurement adoption and technological factors ($r = -0.082$; $p = 0.359 > 0.05$). This is in contrast with descriptive statistics results which showed that technological factorsinfluence e-procurement adoption to a large extent and therefore it was expected to yield a positive significant relationship on acceptance of e-procurement by SMEs. Despite the expected relationship, it was established that e-procurement adoption levels were low hence the obtained results. It was expected that awareness of technological factors as enablers of e- procurement adoption would lead to actual adoption but it was not the case in this research.

It was further recognized that a negative significant relationship between e-procurement implementation and environment factors ($r = -.194^{*}$; $p = 0.028 < 0.05$) which means that environmental factors hinder e-procurement adoption by SMEs even though at a low rate. This concurred with Ramdani, et.al (2009) who asserted that none of the environmental factors seemed to have any influence on adoption of enterprise systems such as e-procurement by SMEs. The obtained results contrasted descriptive statistics results which can be explained by the fact that even though SMEs were aware that environment factors affect e-procurement adoption to a large extent, the actual adoption levels were found to be very low underpinning the fact that e-procurement adoption is very low in developing countries.

4.8 Logistic regression analysis (LRA) and test of hypothesis

E-procurement implementation was considered as the outcome variable Y in the research, while organizational, technological, environmental factors and government policies were considered as independent variables.

To facilitate data analysis by use of LRA, the average figures of dependent variable Y were classified into two; Y = 1 for adopters and Y = 0 for non-adopters. In order to facilitate this classification, all the respondents who indicate their level of e-procurement adoption as 2 and below were considered as non-adopters while those with a level of 3 and above were considered as adopters.

The objective of running LRA was to come up with a logistic regression equation of the independent variables against the dependent variable and have a model summary that can be used to assess e-procurement adoption by SMEs. It was also used to determine the direction and significance of the effects of predictor variables on the possibility of e-procurement adoption. It also assisted in determining which variables single handedly or interactively contributed most significantly on the possibility of embracing of e-procurement by SMEs. This model concentrates on predicting likelihood of occurrence of a phenomenal rather than the direction of the relationship.

Table 4.15 Logistics regression analysis – Classification Table

Dependent Variable Encoding

Original Value	Internal Value
Not adopted	0
Adopted	1

Classification Table[a]

Observed			Predicted		
			Level of E-procurement adoption		Percentage Correct
			Not adopted	Adopted	
Step 1	Level of E-procurement adoption	Not adopted	11	38	22.4
		Adopted	8	71	89.9
	Overall Percentage				64.1

a. The cut value is .500

In this study, LRA was used to estimate the probability of acceptance of e-procurement by SMEs. The classification table 4.15 above was used to validate the predicted probabilities. According to the above table, the cut off value of 0.5 indicated that if the probability of occurrence is higher than or equals to 0.5, the activity was considered to have occurred, that is, e-procurement was considered as adopted. If the probability was less than 0.5, e-procurement was considered as not adopted. Overall, 64.1% of all cases were correctly classified and as a rule of thumb, a classification accuracy of 25% and above is usually acceptable (Teo et.al, 2009; Hair, et.al, 1987).

Table 4.16 Model Summary

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	165.023[a]	0.041	0.055

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

From the logit analysis model summary above, the model R^2 was 5.5% which means that 5.5% of the variations in the outcome variable (e-procurement adoption) were explained by this model.

The logistics regression analysis results were as represented in table 4.17;

Table 4.17 Logistic regression analysis variables

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Org	-.212	.373	.322	1	.570	.809
	Tech	.227	.366	.384	1	.536	1.254
	Env	-.698	.389	3.214	1	.073	.497
	Constant	3.333	1.874	3.163	1	.075	28.036

a. Variable(s) entered on step 1: Org, Tech, Env.

In table 4.17 above, the effect of each independent variables in this study were assessed by use of Wald statistics and the resultant level of significance in order to test the research hypothesis, where the Wald statistic value equals to the square of the ratio between logistic coefficient β and its corresponding standard error S.E. As a rule of thumb, a significant Wald statistics value 0.05 or less implies that the variable is significant in the research model. The standard error (S.E.) are the errors associated with the coefficients where they tested whether the parameter significantly deviates from zero and they were also used to form a confidence interval for the parameters.

Column "Exp (b)" in the table 4.17 above denotes the variations in odds for a unit increase of the corresponding independent variable, that is, odd ratios lower than 1 correspond to decreases and odds ratios more than 1.0 corresponds to increases in odds. It can further be interpreted that

when odds ratios are closer to 1.0, it implies that a unit change in the predictor variable hasno effect the outcome variable. They are the odds ratio of the predictors hence an exponential of the coefficients. It shows the probability of an event happening rather than the association between the outcome variable and the predictor variable, that is, the effects of the predictor variable on the odds ratio. Further, the degree of freedom (df) was established as 1 since this model had only one degree of freedom for each predictor.

Based on table 4.17, a logit regression equation was derived as follows;

E-procurement Adoption = 3.33 - 0.212 * Organization + 0.227* Technology - 0.698 * Environment

The above estimates represent the relationship between the independent variable (organization, technology, environment and government policy) and the dependent variable (e-procurement adoption).

They show the magnitudes of increase or reduction (if the coefficient is negative) in the estimated log odds which would be estimated by a 1 unit increase or reduction in the forecaster variable, taking all other factors constant. The results for each objective are as discussed below;

4.8.1 Objective 1 - to evaluate influence of organizational factors on e-procurement adoption by SMEs

According to the table 4.17, it was established that at 0.05 significance level, organizational factors were not significant in determining e-procurement adoption by SMEs with a Wald's chi-square test (p value) of 0.570 (β = -0.212; p=0.570>0.05). The results obtained supports null hypothesis (Ho1) that organizational factors have no significant relationship on e-procurement adoptions by SMEs in Nyeri Country hence it was accepted to be true. The alternative hypothesis (H_1) which stated that Organizational factors have significant effects on e-procurement adoptions in SMEs in Nyeri Country was therefore rejected.

The odds ratio of 0.809 meant that a one unit change in organization factors would make e-

procurement adoption around one time more likely to occur. It showed that organizational factors are 0.809 more likely to influence e-procurement adoption though not significantly according to the research model.

The findings from this study agrees with other studies, Teo, et.al (2009) and Odhiambo (2013) who established that larger firms are more likely to adopt new technologies compared to small firms like SMEs. When compared with the descriptive statistics which indicated that organizational factors influence e-procurement adoption to a large extent, the findings established that despite the SMEs being aware of the factors that influence e-procurement adoption, they have adopted e-procurement themselves. This could possibly be due to resource constraints experienced by SMEs and also due to their small scale operations hence they see no need of adopting e-procurement.

The findings contrasted previous studies (Hassan, 2017; Arasa & Ochola, 2012; Kasaine, 2016) who asserted that organization factors were significant influencers of e-procurement adoption by SMEs. This could be due slow diffusion of technological innovations such as e-procurement amongst SMEs in Nyeri County. This evidence from the descriptive statistics which showed that SMEs were aware of the e-procurement adoption but had not adopted it.

4.8.2 Objective II – To assess influence of technological factors on e-procurement adoption by SMEs.

According to table 4.17, technological factors were found to positively influence e-procurement adoption by SMEs in Nyeri County but not in a significant manner. This is because at a 0.05 significance level, the obtained Wald's chi-square test (p value) of 0.536 was greater than the significant value ($\beta = 0.227$; $p=0.536>0.05$). The obtained results supported the null hypothesis (Ho_2) which stated that there was no significant relationship between technological factors and adoption of e-procurement in SMEs in Nyeri County. Consequently, alternative hypothesis (H_2) which stated that there was a significant relationship between technological factors and adoption of e-procurement in SMEs in Nyeri County was rejected.

The odds ratio of 1.254 meant that a one unit change in technological factors would make e-procurement adoption around 1.254 times more likely to occur. It showed that technological factors are 1.254 more likely to influence e-procurement adoption though not significantly according to the research results.

The findings implied that technological factors are not significant in determining e-procurement adoption by SMEs. This could be due to the possibility that SMEs lack prerequisite technological competences that guarantee successful adoption of e-procurement. Technological competences hugely impact on the overall adoption intention and decision by SMEs (Wachinga, 2019). This could be in terms of employees competencies, available technologies hence it follows that the higher the technological competence of a firm, the higher the possibility of accepting new technological innovations. The findings were in contrast with (Teo et.al, 2009) who found that technological factors are significant in determining e-procuremetn adoption.

4.8.3 Objective III – To study influence of environmental factors on e-procurement adoption by SMEs.

It was established that environmental factors have no significance relation on e-procurement adoption by SMEs in Nyeri County. At a significance level of 0.05, the derived Wald's chi-square test (p value) was 0.073 which was higher than the expected significance value of 0.05 ($\beta = -0.698$; $p=0.073>0.05$) and also indicated that environmental factors negatively influenced e-procurement adoption. The results supported the null hypothesis (Ho_3); environmental factors have no significant relationship on adoption of e-procurement in SMEs in Nyeri County hence it was accepted. Subsequently, alternative hypothesis (H_3) which stated that environmental factors have a significant influence in the adoption of e-procurement in SME in Nyeri County was rejected.

The odds ratio of 0.497 meant that a one unit change in environmental factors would make e-procurement adoption around 0.497 times more likely to occur. It showed that environmental

factors are 0.497 more likely to influence e-procurement adoption though not significantly according to the research results.

The results obtained concurred with Ramdani, et.al (2009) who asserted that environmental factors seemed to have no influence on adoption of enterprise systems such as e-procurement by SMEs. Eei et al (2012) asserted that sometimes SMEs adopt a wait and see attitude towards adoption of e-procurement and they choose not to use it in order to sustain their trust and close association with their suppliers and customers. Also suppliers or customers can replicate the same where they are reluctant to complete a deal since they do not fully trust their counterparts. Perhaps this could explain why there is low levels of e-procurement adoption by SMEs.

4.9 Test of Government policies as a moderating Variable

The government policies were contemplated as moderating variable and their relationship evaluated against the predictor variables to determine whether they have a moderating effect on the other variables. The results obtained from the analysis indicated that there were no changes on the association between the predictor variables and the outcome variable after introduction of government policies as moderating variable. The results are as shown in table 4.18.

Table 4.18 Government policy as moderating variable

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	165.059[a]	.040	.055
2	165.023[a]	.041	.055

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Org	-.212	.373	.322	1	.570	.809
	Tech	.227	.366	.384	1	.536	1.254
	Env	-.698	.389	3.214	1	.073	.497
	Constant	3.333	1.874	3.163	1	.075	28.036

a. Variable(s) entered on step 1: Org, Tech, Env.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 2[a]	Org	-.214	.373	.329	1	.566	.807
	Tech	.228	.366	.387	1	.534	1.256
	Env	-.686	.394	3.024	1	.082	.504
	Govt	-.042	.219	.036	1	.849	.959
	Constant	3.403	1.909	3.178	1	.075	30.040

a. Variable(s) entered on step 1: Govt.

According to table 4.18, two steps process was carried out to examine to test the moderating

effects of government policy on other predictor variables. Step one tested the predictorvariables (environmental, technological and environmental) without the influence of government policies where the Nagelkerke R Square was established as 0.055. Step two tested the effect of introduction of government policies on the predictor variables as a moderating variable. Obtained outcomes indicated that there were no changes in Nagelkerke R Square, thatis, the change was 0.000 (0%) which can be interpreted as the percentage increase in the variation explained by the addition of the moderating variable. The change was 0% and this means that government policies have no moderating effect on the influence of organizational, environmental and technological factors on levels of e-procurement Implementation by SMEs within Nyeri County.

Results obtained had a significance value at 0.849 which was more than the model significance level of 0.05 ($p=0.849>0.05$). These results obtained lead to acceptance of the null hypothesis (Ho_4) which hypothesized that there is no significant moderating effect of government policy on the relationship between the factors affecting e-procurement and the adoption of e-procurement in SMES in Nyeri County since the p-value of 0.849 obtained is higher than the significance value ($p= 0.849 > 0.05$). Consequentially, the alternative hypothesis (H_4) which stated that there is a significant moderating effect of government policy on the relationship between the factors affecting e-procurement and the adoption of e-procurement in SMES in Nyeri County was rejected.

Government policies were found to have no moderating effect on organizational factors. There were no material changes on significance level when government policies were introduced as moderating factor, that is, the significance level changed by a margin of 0.004 which is immaterial. Also, on technological and organizational factors, government policies were to have no moderating effect, that is, their significance value changed by 0.002 and 0.009 respectively which were deemed immaterial. It was therefore concluded that government policies have no moderating effect on organizational, technological and environmental factors

in relation to e-procurement adoption by SMEs.

The research findings concurred with Osir (2016) who asserted that the greatest challenges encountered by firms when adopting e-procurement mainly comprise of lack of clear and concise legal framework supporting e-procurement and obstructive government policy. These findings concur with Nyamu (2014) who established that government policies and restrictions on ICT normally hinder adoption of ICT innovations by businesses. This can possibly explain why there is very low implementation of IT inventions like e-procurement in developing countries like Kenya as explained by Kenya's MSME policy index (2019) report which noted that guidelines on innovation, IT implementation and transfer of technology are not only obstructive to SMEs they are also unknown to most of the MSME owners and managers.

The summary of hypothesis tested as per table 4.19

Table 4.19 Summary of the results

	Research objective	**Hypothesis**	**Results**	**Conclusions**
H01:	To evaluate organizational factors that influence e-procurement adoption by SMEs in Nyeri County	Organizational factors have no significant relationship on e-procurement adoptions in SMEs in Nyeri Country.	Organizational factors were found to be not significant in determining e-procurement adoption by SMEs with a Wald's chi-square test (p value) of 0.570 (β = -0.212; p=0.570>0.05)	Organizational factors do not significantly influence e-procurement adoption by SMEs. This could be as a result of the operations being small with small structures.
H02:	To assess technological factors that affect e-procurement adoption by SMEs in Nyeri County.	There is no significant relationship between technological factors and adoption of e-procurement in SMEs in Nyeri County.	Technological fsctors were not significant in influencing e-procurement adoption by SMEs. The obtained Wald's chi-square test (p value) of 0.536 was greater than the significant value (β = 0.227; p=0.536>0.05)	Eeven though not significant, technology factors had a positive relationship. Therefore availability of technological resources can influence e-procurement adoptio by SMEs.

H03:	To study environmental factors that affect e-procurement adoption by SMEs in Nyeri County.	Environmental factors have no significant relationship on the adoption of e- procurement in SMEs in Nyeri County	It was established that environmental factors have no significant relation on e-procurement adoption by SMEs in Nyeri County. At a significance level of 0.05, the derived Wald's chi- square test (p value) was 0.073 which was higher than the expected significance value of 0.05 (β = - 0.698; p=0.073>0.05)	Environmental factors do not significantly influence e-procurement adoption by SMEs. This is because the operating environment still embraces traditional procurement practises.
H04:	To examine the moderating effects of Government policies on the relationship between organization, technological and environmental factors and adoption of e-procurement in SMEs in Nyeri County	There is no significant moderating effect of government policy on the relationship between organization, technological and environmental factors and the adoption of e-procurement in SMEs in Nyeri County.	Government policies were found to have no moderating effect on the influence of organizational, environmental and technological factors on levels of e-procurement Implementation by SMEs within Nyeri County. The change was 0% and results obtained had a significance value at 0.849 which was more than the model significance level of 0.05 (p=0.849>0.05)	Government policies were found to have no moderating effect. This could be due to ineffective laws and lack of support to the SMEs. The government has also not availed the prerequisite infrastructure that supports e-procurement adoption.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This section summarizes the research findings, conclusions and inferences as well as study recommendations in accordance with the research objectives. The section also outlines study limitations encountered when carrying out the study as well as proposing areas of additional exploration.

5.2 Summary of the findings

The study focused on assessment of factors influencing e-procurement implementation by SMEs in Nyeri County – Kenya. Research findings aimed at assisting various stakeholders within the SMEs sphere understand these factors and their contributions towards enhancing e-procurement adoption and usage by SMEs. The study also aimed at providing means of countering the expected challenges as well as enlighten SMEs on the importance of formulating strategies when they are adopting e-procurement to ensure there is successful adoption and usage.

Previous studies have established that factors such as organizational, technological and environmental influence implementation of e-procurement by different magnitude, but few of these studies have focused on SMEs in emerging economies like Kenya. It has also been established that e-procurement and other ICT innovation adoption in developing countries is very low and at times adoption has not occurred. Therefore, the study was undertaken with an aim of evaluating factors affecting e-procurement implementation by SMEs in Kenya, a developing country.

The first objective was to evaluate the organizational factors that affect e-procurement implementation by SMEs.

Descriptive studies established that proprietors and staff ICT knowledge, owner traits towards IT, owners and top management perceptions on e-procurement, size of the organization and structure, poor staff retention, change management and resistance to adopt IT inventions and mistrust in technology in conducting business processes influenced e-procurement acceptance by a large extent. However poor organization structures and bureaucracy were found to influence e-procurement acceptance by a moderate degree.

It was also established that organizational factors were not significant in determining e-procurement adoption by SMEs which led the acceptance of null hypothesis (Ho_1) that organizational factors have no significant relationship on e-procurement adoptions in SMEs in Nyeri Country. This contrasted previous studies which have found majority of organizational factors to positively and significantly influence the likelihood of implementation of IT inventions such as e-procurement (Chandra & Kumar, 2018; Odhiambo, 2013; Huy, 2012; Ramdani, 2013; Sabraz & Gunapalan, 2015). The findings also tend to agree with Achuora & Arasa (2012) who found the relationship between organizational factors and e-procurement adoption to be linear even though a little bit weak.

The second objective was to assess technological factors which influence e-procurement acceptance by SMEs within Nyeri County. Descriptive statistics established that the new e-procurement system compatibility with the existing ones, relative advantages it offers, its ease of use and complexity, associated security risks and data privacy were the factors that influenced e-procurement adoption by a large extent. System vendor support and insufficient ICT infrastructure were established as influencing acceptance of e-procurement by a moderate degree.

Technological factors were also found to have no significant influence on e-procurement implementation by SMEs hence the null hypothesis (Ho_2) which stated that ‘‘there is no significant relationship between technological factors and adoption of e-procurement in SMEs in Nyeri County’’ was accepted. The results obtained do not support previous literature which

has identified technological factors positively and significantly influence e-procurement implementation (Hassan et al, 2017; Ramdani, 2013; Molinillo & Japutra, 2017).

The third objective was to examine the environmental factors that impact e-procurement implementation by SMEs in Nyeri County. Through descriptive statistics, it was established that characteristics of the industry, market sector and structure, competition pressure and government support influence e-procurement adoption to a large extent while large number of SMEs in the same market and partners readiness influences e-procurement adoption to a moderate extent.

It was also established that environmental factors have no significant relationship on acceptance of e-procurement by SMEs in Nyeri County hence the null hypothesis (Ho3); environmental factors have no significant relationship on adoption of e-procurement in SMEs in Nyeri County was accepted. Majority of literature argue that the relationship between organizational factors and implementation of e-procurement is positive and significant(Nyamu, 2014; Alkhalil et al., 2017; Molinillo, & Japutra, 2017; Chong & Olesen 2017). However, the results obtained coincide with those of Ramdani (2009) and Hassan et al (2017),who established that organizational factors had no significant relationship on adaption of enterprise IT systems such as e-procurement.

Objective four aimed at determining whether government policies have a moderating effect on the relationship between the various factors influencing acceptance of e-procurement and the actual implementation of e-procurement by SMEs in Nyeri County. It was established that government policies have no moderating effect on the influence of organizational, environmental and technological factors on levels of e-procurement embracing by SMEs in Nyeri County. Consequently, null hypothesis (Ho_4) which stated that ‘‘there is no significant moderating effect of government policy on the relationship between the factors affecting e-procurement and the adoption of e-procurement in SMES in Nyeri County’’ was adopted. There is very little literature on government policies as a moderating variable, how government

policies and regulations as an independent factor has been found to significantly influence e-procurement acceptance by SMEs (Alkhalil et al., 2017; Nyamu, 2014).

ICT usage by SMEs in Nyeri County was found to be at a moderate extent while e-procurement adoption level was at a less extent. This shows that despite the higher growth and technological advancements, SMEs are yet to fully adopt ICT inventions like e-procurement. This could explain the insignificance of the discussed factors as potential influencers of e-procurement adoption. The study established that despite the SMEs being aware of the various factors that encourage usage of e-procurement technology, they had not assimilated it in their organizational processes. The low levels of ICT usage could also explain the low levels of e-procurement adoption since the two go hand in hand.

The findings of this study agree with the premises of diffusion of innovation theory which asserts that in some instances, individuals or firms will deliberately avoid adopting an innovation regardless of its benefits while others opt not to acquire similar technologies when they become available while others may discontinue using the technology all together hence diffusion of innovation is neither uniform nor inevitable. Therefore, it can be concluded that e-procurement technological innovation has not fully diffused by SMEs and it has not been fully embraced. This could be due to the fact e-procurement is relatively new hence SMEs are conservative on it.

5.3 Conclusions

According to the results of the descriptive statistics, the study established that organizational factors, that is, SMEs owners and staff knowledge on technology; Characteristics of the proprietor (age, views, gender, commitment), top management/owner attitude towards e-procurement technology; characteristics of the organization (size, structure and slackness); poor employees retention, poor implementation of change management leading to resistance in acceptance of technological innovations and mistrust of IT systems in running business processes influence e-procurement adoption by SMEs by a large extent.

Overall, the study concluded that organizational factors do not have a significant relationship on adoption of e-procurement by SMEs despite influencing its adoption by a large extent as per the descriptive statistics. This is a result of the low adoption levels witnessed on the SMEs.

The odds ratio of 0.809 indicated that a one unit change in organization factors would make e-procurement adoption around one time more likely to occur which means that organizational factors are 0.809 more likely to influence e-procurement adoption.

As per the research findings, it was determined that technological factors do not significantly influence e-procurement adoption by SMEs. Majority of the SMEs asserted that Compatibility of the new system with the existing ones; relative advantage, complexity and ease of usage of the IT system; security risks and privacy of the IT e-procurement system influence adoption by a large extent. With an odds ratio of 1.254, technological factors were 1.254 more likely to influence e-procurement adoption by SMEs clearly indicating that increase in availability and accessibility of technologies would lead to an increase in likelihood of e-procurement implementation by SMEs. Even though low levels of e-procurement adoption were witnessed, technological factors still played a critical role in predicting adoption levels and its influence cannot be wished away.

Environmental factors, that is, characteristics of the industry, market sector and structure, pressure from competitors and government backing were determined as having no significant relationship on e-procurement adoption even though they influenced e-procurement adoption by a great extent. This was as a result of the low levels of e-procurement adoption by SMEs witnessed. The odds ratio of 0.497 elucidates that one unit change in environmental factors could make e-procurement adoption around 0.497 times more likely to occur. It showed that organizational factors are 0.497 more likely to influence e-procurement adoption. This study therefore concluded that in spite of the environmental factors having high influence on e-procurement implementation, they do not significantly predict the actual e-procurement acceptance by SMEs.

The study further established that government policies negatively influence e-procurement adoption by SMEs. This could be attributed to the fact that policies enacted by the government do not favor SMEs growth and development and they do not serve their interest. This study therefore concludes that government policies if not well articulated and devised towards facilitating adoption of ICT innovations such e-procurement, they will continue hindering adoption of these innovations and the SMEs will not reap the benefits associated with these new innovations. The study determined that there was no moderating effect of government policies on e-procurement adoption by SMEs, hence the government does not play any roles in adoption of technological innovations such as e-procurement.

The study also concluded that TOE factors, that is, technology, organization and environment factors are still instrumental in influencing e-procurement adoption by SMEs but they are not entirely significant. This greatly deviates from the previous literature that have identified them as significant. The study brought out a new dimension in assessing the factors that influence e-procurement by SMEs in developing countries. More factors should be looped to enable identify the likelihood of adopting new innovations such as e-procurement.

5.4 Implications of the study findings

This study encourages SMEs to implement and fully utilize e-procurement technology within their business operations so as to reap the benefits accrued when e-procurement is successful implemented. The study highlighted on the benefits of e-procurement, for example, savings on costs, less lead time, improved supplier relations and wide source of market of products and services which the SMEs stand to enjoy. The study also encourages SMEs to formulate adoption strategies that will inform the best-case scenario for a successful implementation of e-procurement.

The government, together with its agencies, were urged to create awareness and promote e-procurement usage by SMEs. The study further established that most of the SMEs were not cognizant of the government interventions on ICT usage and they felt that the regulations in

place were gagging growth of the ICT sector hence the SMEs could not access the requisite technologies to facilitate e-procurement adoption. The government should also avail the requisite infrastructure and develop SMEs friendly policies regulations. Other intervention measures may include campaigns, sensitization workshops and seminars, incentives and subsidies in order to encourage more SMEs to use e-procurement.

The study used TOE framework which narrowed down on three factors to assess e-procurement adoption. A wide approach can be employed to cater for other factors especially in developing countries where institutions are not fully matured compared to developed countries. Social cultural environment especially in Kenya plays a big role in how business is conducted and perhaps social cultural factors can be incorporate in the TOE framework when measuring acceptance of IT inventions like e-procurement.

5.5 Recommendations

SMEs should be encouraged to adopted new innovations such as e-procurements within their ranks in order to benefit from the immense benefits brought about by these technologies. Based on the research findings, the SMEs are still using traditional methods in their procurement activities. Continuous campaigns and sensitization should be carried out by the relevant stakeholders and bodies to encourage usage of ICT services which will in return lead to adoption of e-procurement. This will be very helpful in ensuring that SMEs are adopting new technologies and also in identification of the barriers that hinder their adoption. They should also formulate strategies in consultation with various stakeholders on how to successfully adopt new technologies.

This study has also underscored critical factors which influence e-procurement adoption as organizational, technological and environmental, SMEs should critically consider them when developing policies and strategies concerning implementation of inventions like e-procurement. This will ensure successful adoption and usage of the new technologies. Interventions should be made to change owners/managers perceptions on e-procurement as this

can greatly determine whether e-procurement is adopted or not.

The government has a role to play in providing a fair ground for SMEs. As per the research findings, the government policies do not favor SMEs and do not promote IT inventions like e-procurement adoption. Both levels of government (national and county) should promote and create awarenessregarding benefits that SMEs could derive from using e-procurement. This can be by use of policy interventions, provision of ICT infrastructure and resources as well as incentives to SMEs. The innovations and ICT hubs should be operationalized as envisaged in ICT policy of2019. This will consequently boost embracing of e-procurement and also foster innovations leading to economic growth.

From the results of this study, it was established that e-procurement adoption is very low amongst SMEs in Nyeri County. The study therefore recommends further research on this area in order to establish why there are low levels of implementation of e-procurement by SMEs despite the owners/managers being aware of the factors that influence its adoption. Further studies should be conducted with an aim of identifying barriers that could still be hampering adoption of e-procurement and can also recommend measures that can be used in order to overcome these barriers. Also, more research should be carried out incorporating more factors to try and establish significance of other factors which influence e-procurement adoption by SMEs especially in developing countries. Additionally, more research on e-procurement should be conducted to determine the forms of e-procurement technology in use and also establish the most appropriate ones that can yield higher value for the SMEs.

Concerning the established low levels of e-procurement adoption, the study recommended further research on e-procurement adoption to ascertain variations in adoption based on organization size, business sector and complexity. This will enable advancement of a predictive framework model for predicting acceptance of e-procurement that can assist in identifying firms that can excel or lag behind based on their ways of management preferences. This predictive model of e-procurement adoption process can be used to enhance development of a

targeting option when it comes to the growth of procurement.

5.5 Limitation of this study

One of the gross limitations during this study was the outbreak of Covid 19 pandemic that heavily affected business as well as interactions with the respondents. Some of the businesses had closed down others drastically reduced their operations while some of the senior employees were working remotely hence it was difficult to access them. Nevertheless, the study obtained adequate data that enabled drawing of conclusions on the population. The study applied TOE framework and it could be interesting to see the outcomes if other models and factors were considered outside this model. Some SMEs also refused to take part in this study and could not fill the questionnaires.

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APPENDICES

Appendix I: Study Questionnaire

Part I: Bio Data

Kindly answer the below questions to the best of your knowledge by ticking where appropriate

1. Age of the respondent

18-25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ 55 and above ☐

2. Gender

Male ☐ Female ☐

3. Education Level

Certificate ☐ Diploma ☐ Degree ☐ Postgraduate ☐ Graduate ☐

4. For how long has the organization been in operation?

Below five years ☐ 5-10 years ☐ 10-15 years ☐ Over 15 years ☐

5. What is the current number of employees?

Below 10 ☐ 10-50 ☐ 51-100 ☐ Above 100 ☐

6. What is your organization capital base in Kenya Shillings?

0 - 5 Million ☐ 5 – 20 Million ☐ 20 -50 Million ☐ Over 50 Million ☐

7. Business sector

Small Sized	Manufacturing	
	Traders	
	Agribusiness	
	Service	
Medium Sized	Manufacturing	
	Traders	
	Agribusiness	
	Service	

PART II: Organizational Factors

To what extent do you agree with the below statements as factors affecting e-procurement adoption by SMEs? Kindly tick the appropriate box using the key provided: 1 = Not at all, 2 = Less extent, 3 = Moderate extent, 4 = Large extent, 5 = Very large extent

Statement	1	2	3	4	5
Owner's/Employee ICT knowledge and their functions					
Owner's attributes (age, gender, attitude, commitment) on IT					
Organization size, structure and slackness					
Low staff retention rates					
Poor organization structures and bureaucracy					
Resistance to change and uptake of IT innovations					
Low levels of trust on technology reliance in business activities					
Perceptions of the owner/ manager on e-procurement					

PART III: Technological Factors

To what extent do you agree with the below statements as factors affecting e-procurement adoption by SMEs? Kindly tick the appropriate box using the key provided: 1 = Not at all, 2 = Less extent, 3 = Moderate extent, 4 = Large extent, 5 = Very large extent

Statement	1	2	3	4	5
Compatibility of e-procurement systems with other systems					
Complexity and ease of usefulness of e-procurement system					
Relative advantage on e-procurement systems					
Security threats and confidentiality of information in e-procurement systems					
Technological support from system vendors and developers					

Unavailability or absence of IT infrastructure					

PART IV: Environmental Factors

To what extent do you agree with the below statements as factors affecting e-procurement adoption by SMEs? Kindly tick the appropriate box using the key provided: 1 = Not at all, 2 = Less extent, 3 = Moderate extent, 4 = Large extent, 5 = Very large extent

Statement	1	2	3	4	5
The market sector and structure is a critical adoption factor					
Characteristics of the industry influences adoption					
Competition pressure is a critical adoption factor					
Government support is a critical adoption factor					
Large number of SMEs in the same market influences adoption					
Partners readiness influences adoption					

PART V: GOVERNMENT POLICIES

To what extent do you agree with the below statements as factors affecting e-procurement adoption by SMEs? Kindly tick the appropriate box using the key provided: 1 = Not at all, 2 = Less extent, 3 = Moderate extent, 4 = Large extent, 5 = Very large extent

Statement	1	2	3	4	5
Knowledge of SME act (2012)					
The government provides awareness and education programs on ICT					
The registration of SME are done in accordance with the MSE Act					
The government ICT Data centers and enablers are readily available					
The government policies favor ICT adoption					
The government promotes ICT adoption among SMEs					
Universal Access of ICT Services and Infrastructure as per the ICT policy					

PART VI: LEVEL OF E-PROCUREMENT ADOPTION

What is the level of your firms e-procurement adoption based on the below parameters? Kindly tick the appropriate box using the key provided: 1 = Not at all, 2 = Less extent, 3 = Moderate extent, 4 = Large extent, 5 = Very large extent

Statement	1	2	3	4	5
Level of ICT usage in your firm					
Level of e-procurement adoption					

Thank you and God bless you

Appendix II: NACOSTI Research Permit

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 195504

Date of Issue: 25/August/2021

RESEARCH LICENSE

This is to Certify that Mr., PETER WAWERU GITONGA of Technical University of Kenya, has been licensed to conduct research in Nyeri on the topic: Assessment of factors influencing E-Procurement Adoption by Small and Medium-sized Enterprises in Nyeri County Kenya for the period ending : 25/August/2022.

License No: NACOSTI/P/21/12597

195504

Applicant Identification Number

Director General
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Appendix III: Introductory Letter

PETER WAWERU GITONGA

P.O. Box 5047 - 10100

NYERI

Dear Respondent,

My name is **PETER WAWERU GITONGA a student at** the Technical University of Kenya, Department of Business Administration and Management. This survey research is a partial fulfillment of requirements for the award of Master's Degree in Business Administration (Procurement and Supply Chain Management). The purpose of the study is to assess the ***factors influencing e-procurement adoption by small and medium-sized enterprises in Nyeri County – Kenya.*** The results from this study will be published in respected journals dedicated to Logistics and Supply Chain Management, and operations management, which are educational and useful for the procurement and supply chain community.

The questionnaire forms an integral part of the study. I am therefore, kindly requesting you to assist in facilitating the completion of the questionnaire. The instructions for completing the questionnaire can be found on the questionnaire itself. The survey will take about 20 minutes to complete.

Please be assured that the information and data you provide will remain secured and will only be used for scientific research purposes treated in total confidentiality. A copy of the research results will be provided upon request. If you have any enquiries, please feel free to contact me using my contact details below.

Yours faithfully,

Peter Waweru Gitonga

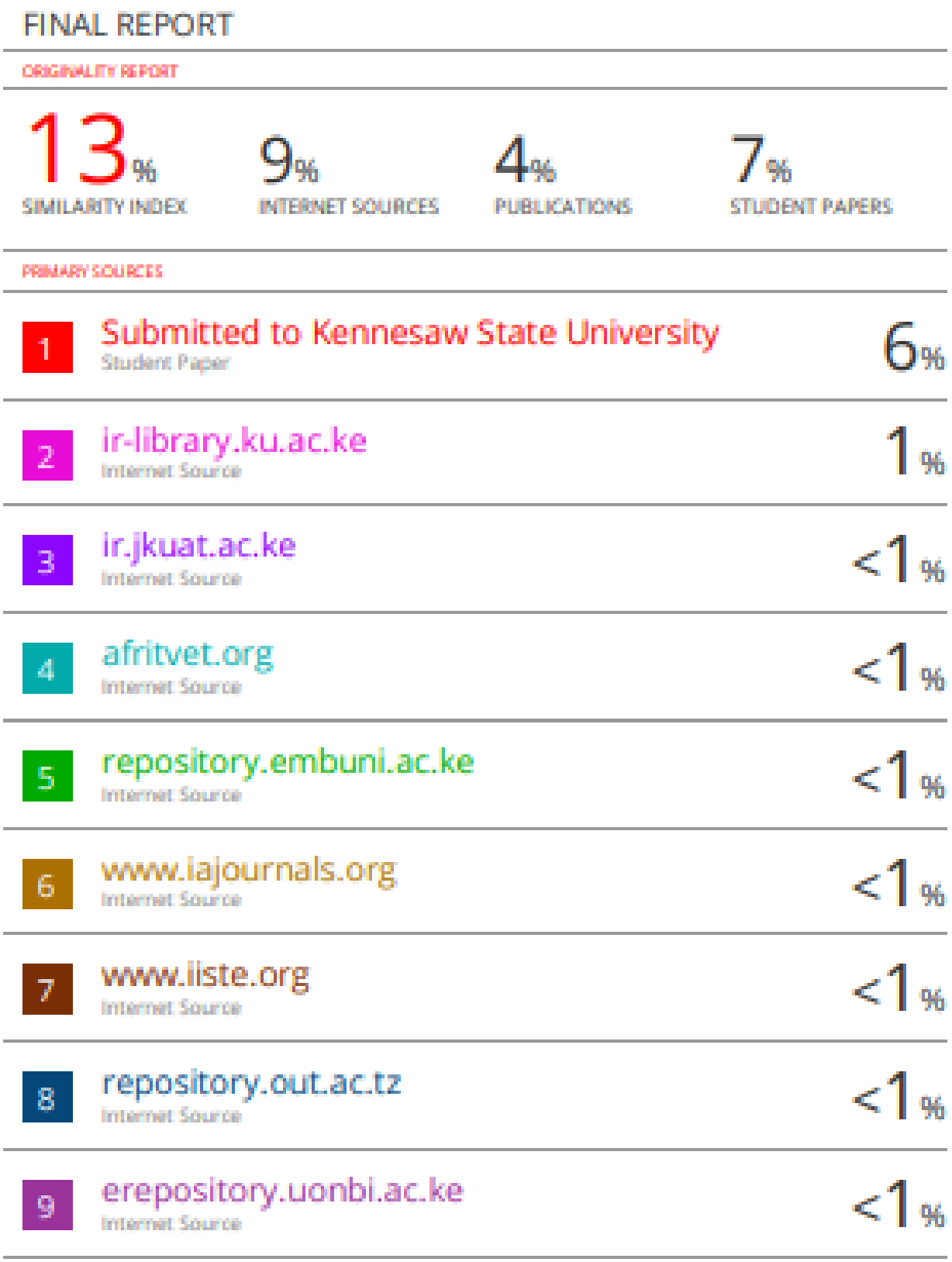
ABBU/06423P/2016

Technical University of Kenya

Cell phone: 0726445855

Email: pgitonga5@gmail.com

Appendix IV: Plagiarism Report



FINAL REPORT

ORIGINALITY REPORT

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