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**CRITICAL FACTORS THAT INFLUENCE GROWTH OF
TECHNOLOGY-BASED SMALL AND MEDIUM ENTERPRISES: CASE
OF SOFTWARE AS SERVICE PROVIDERS IN NAIROBI, KENYA**

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MBA/81973/14**



**THIS DISSERTATION IS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS
ADMINISTRATION OF STRATHMORE UNIVERSITY.**

NOVEMBER 2021

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis/dissertation (use as appropriate) contains no material previously published or written by another person except where due reference is made in the thesis/dissertation itself.

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Date.....11/11/2021.....

Approval

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ABSTRACT

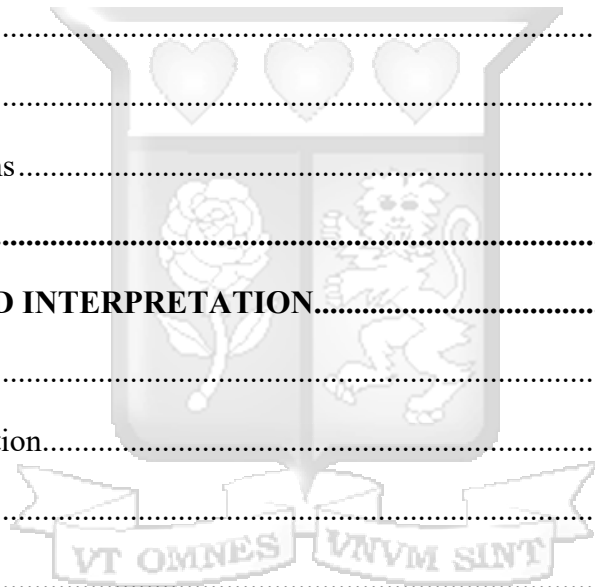
Small and Medium-sized enterprises all over the world especially in third world countries play an important role in the economy and contribute substantially to unemployment reduction. This sector is emerging today as an avenue for lucrative employment, is being progressively recognized as the prime means for achieving sustainable as well as equitable industrial diversification, growth, and dispersion; thus, improving both economic and social development. Consequently, the current study aims at examining the critical success factors that influence the growth of small and medium information communication and technology enterprises in Nairobi County. The study's specific objectives were to examine the effect of management skills, competition, regulation, and technology changes on the growth of ICT SMEs in Nairobi City County. The study was based on resource-based theory and diffusion innovation theory. The study adopted a descriptive research design. Primary data was collected using questionnaires from a sample of 160 respondents drawn from SaaS ICT SMEs. Validity was examined through the use of Cronbach's Alpha coefficient and the research instrument was valid. Data was analyzed through descriptive statistics that included mean, standard deviation, percentages, and frequencies. Inferential statistics included correlation and multiple linear regression. Findings were presented in figures and tables. Study findings indicated that there was a positive and significant effect of management skills, competition, regulation, and technology changes on the growth of ICT SMEs in Nairobi County. From the findings, it was concluded that there is need for the development of management skills training programs for ICT SMEs. There is need for the embracement of innovation to respond to competition. There is need for the development of research and development departments to aid ICT in response to technology changes that may impact their performance positively. Policymakers should develop policies that are aimed at enhancing the competitiveness of ICT SMEs.

Keywords: Small and Medium Enterprises, ICT, business growth, Management skills, competition, regulation, technology changes.

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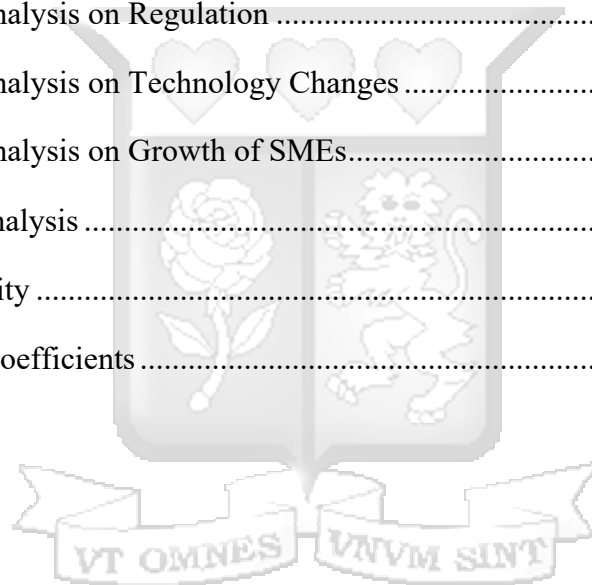
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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
ICT	Information Communication Technology
MBA	Masters in Business Administration
NACOSTI	National Commission for Science, Technology and Innovation
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for Social Sciences
VIF	Variance Inflation Factors
SAAS	Software as a Service



OPERATIONAL DEFINITION OF KEY TERMS

Competition	This is the capacity of an enterprise to response to the threat of new entrants, competitive rivalry, substitute service and goods and power of buyers.
Growth	This refers to positive changes recorded in an organization in form of profit margins, number of branches and market share.
Management Skills	This refers to capacity of an enterprise to develop skills on finance, leadership, human capital and governance so as to stimulate its growth capacity.
Regulation	This refers to the policies in place on taxation, licensing, patents and copyrights and ICT Act.
Technology Changes	This refers to information technology aspects that are propelling innovation, creativity and development of user-friendly technological innovations.



CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The rapid growth of mobile phone usage and the penetration of internet in Kenya has played a vital role in the development of the information and communication technology (ICT) industry, contributing over 12.4% of Kenya's GDP (Ncube & Ondiege, 2013). The number of Internet users has in turn grown from 2.7 million in 2007 (Communications Authority of Kenya & Netcom Information Systems Ltd, 2007) to over 40 million by March 2017 which is approximately 83% of the total population (Communication Authority of Kenya, 2017)

This has opened up opportunity for the development of software products and services by technology-based enterprises through web and mobile applications (Gillwald, Ndung'u & Waema, 2011). It was envisioned that by the end of the year 2017, at least 500 new ICT companies were created (Mengistu & Imende, 2013), and this has been witnessed by the growth of web and mobile services in various sectors such as Agriculture, Education, Social Justice amongst others. Most of these existing services use an emergent technology in Cloud computing referred to as Software as a Service (SaaS).

Software as a Service is a software technology where instead of installing and maintaining software for every possible client, one instance of the product is made available for all clients to access via the Internet (Sarbojit & Shivam, 2014). A SaaS provider therefore develops, maintains and improves one instance of a product, and is thus able to scale up with minimal operational costs.

This pay-as-you-use approach has in turn drastically lowered the cost for businesses looking to adopt information and communication systems for efficacy in internal operations and is a suitable model for businesses trying to survive the harsh economic times along with keeping up with the demanding and competitive market (Simba, 2014). In emerging markets such as Kenya, research studies have shown that there is growing adoption of SaaS services (Omwansa, Waema, & Omwenga, 2014). It is estimated that 78% of SME's globally are planning to use more SaaS software across business processes in the next three years growing the value of the SaaS market to \$246.8 billion (Gartner Inc., 2017).

1.1.1 Growth of Small and Medium Enterprises

Small enterprises all over the world especially in third world countries play an important role in the economy and contribute substantially to unemployment reduction. This sector is emerging today as an avenue for lucrative employment, is being progressively recognized as the prime means for achieving sustainable as well as equitable industrial diversification, growth and dispersion; thus, improving both economic and social development. The segment generates wealth, represents a huge number of trades in the world, and is extensively considered vital to a country's competitiveness. It emerges as a critical avenue towards the development of several nations' economies because it is a superb foundation for the development of indigenous technology and local entrepreneurs' development. In a nutshell, small businesses not only contribute considerably to upgraded living standards, generation of employment and poverty lessening but in addition, generate substantial domestic capital establishment and accomplish abundant altitudes of output and capability (Aylin, 2013).

In developing countries, over 90% of all firms outside the agricultural sector are SMEs or micro-enterprises. These firms produce a considerable part of the GDP. In Morocco, for example, 93% of industrial firms are SMEs accounting for 38% of the production, 33% of investment and 30% of exports. The contribution of SMEs is considerably higher in South Africa. The estimated 91% of the formal business entities in South Africa that are SMEs contribute 52–57% to the GDP. In Ghana, SMEs are even more prominent in the local economy, representing about 92% of Ghanaian businesses and contributing about 70% to Ghana's GDP (Abor & Quartey, 2010). Overall, statistics can sometimes mask the particular contribution made by individual sectors. For example, in 2006/7, the contribution made by micro and small businesses to India's GDP was only around 6%. Even so, manufacturing SMEs accounted for around 40% of industrial output, and 40% of all exports (Ghatak, 2010). Similarly, the United States International Trade Commission (2010) reports that SMEs contributed to roughly 50% of the US private nonagricultural GDP in 2004, a share that had remained relatively stable from 1998 to 2004. The service sectors are by far the most important contributors, accounting for 79% of SMEs' contribution to GDP. When compared with larger businesses, SMEs' contribution to output tends to be lower per firm because they tend to be more labour intensive than larger firms and concentrated in service sectors. They therefore typically achieve lower levels of productivity, though they do contribute significantly to employment (Wymenga *et al.* 2011).

Moreover, SMEs are generally more common in rural areas than larger businesses. Especially in developing countries, SMEs thus provide much-needed employment in rural areas. SMEs can become the engines that sustain growth for long-term development in developing countries. When growth becomes stronger, SMEs gradually assume a key role in industrial development and restructuring. They can satisfy the increasing local demand for services, which allows increasing specialization, and support larger enterprises with services and inputs (Fjose *et al.*, 2010).

In Africa, small businesses have gradually become the principal source of employment creation. It is estimated that ninety-one percent of the formal business entities in South Africa are small enterprises providing above fifty-five percent of entire employment. Nigeria small enterprises contribute about ninety-five percent of formal industrial activity and nearly seventy percent of manufacturing jobs. The small business sector accounts for around ninety percent of entire business units in Ghana and contributes nearly sixty percent of the country's employed labor force. In Namibia, small businesses have significantly contributed to the entire national economy in numerous ways—for instance the sector has constituted thirty-five percent job creation and nearly twenty-three percent of gross domestic product. Since the onset of the Algerian economy and the advanced espousal of a market economy, the small enterprise sector has captured a net amplification in numbers. Algerian Ministry of Industry statistics in Business and Investment Promotion demonstrates that the segment has confirmed its progressively significant part in the national economic structure. Algeria's registered medium-size, as well as small-size enterprises, surpassed 748,000 by 2013, covering ninety-one percent of businesses that are registered. Several countries in African have recorded above twenty percent GDP emanating from the small enterprise sector; twenty-two percent in South Africa, Nigeria twenty-five percent, Liberia thirty-five percent, Benin twenty-one percent, and Namibia twenty percent (Ebitu, 2013).

1.1.2 Factors Affecting Growth of Small and Medium Enterprises

Elements of the growth in the business construct are considered to be developed according to these dimensions and related to how to succeed entrepreneurially. It is argued that this dimension includes components that could be developed or learned in the same manner envisioned by Stevenson and Jarillo (2007) as relating to the domain of management. It is argued that certain contextual factors and entrepreneurial growth dimensions contribute to the growth of SMEs, and that entrepreneurial growth is shaped by contextual factors. Entrepreneurial competencies, as represented by

entrepreneurial orientation, are taken to constitute a potential source of competitive advantage (Jantunen, 2014). Entrepreneurial competencies contribute to the growth of a business differentially along the dimensions of proactiveness, innovativeness and risk-taking propensity according to a specific context (Lumpkin, 2013).

Research in the less developed countries has clearly shown that small enterprises both in the formal and informal sectors have failed to evolve into medium-sized firms (Ferrand, 2013). Slightly more than 10% of businesses ceased operations in less than one year, 25% stopped business between one and two years, while another 20% closed their doors between their third and fifth anniversaries (Hamel & Sapienza, 2014). However, the perception by owner-managers of SMEs regarding the growth of enterprises from developed countries in the rest of Europe and the USA is remarkable (Madsen, 2013).

Some of the contrasting challenges of SMEs growth are presented by the research done by Aremu and Adeyemi (2015) in Nigeria, where despite government support through incentive programs, most SMEs in Nigeria still struggle to access credit or even attain enterprise growth performance. He argued that in Nigeria the socio-economic obstacles within the business regulation systems do affect SMEs growth performance. In as much as systems were put in place to fast track access to financial resources, lack of business experience, management, poor SME location, and incoherent laws and regulations hinder the growth and assimilation of SMEs.

In Kenya, though SMEs contribution to the economy and poverty reduction, owners, and businessmen in the field of SMEs have continually faced many obstacles in either accessing financial credit, viable market or support from the government. According to ILO (2015), most financial institutions are skewed towards providing credit financial services to SMEs due to a high level of risk exposure. It is for this reason that SMEs suffer due to a lack of capital and credit to grow their businesses. Most SMEs close shop within the first five years of start-up (Marlow, 2014).

Kenya has not been unique to SME challenges faced by business ownership and growth. In Kenya, the SMEs have thrived over decades but still do face challenges of financing, markets, access to loans among others. Vision 2030 incorporates SMEs at the heart of Kenya's economic growth projections. It envisages that if SME financing mechanisms are enhanced and sustainable, SMEs in Kenya offer

the potential of growing into viable and vibrant businesses that can compete with multinational firms in products and services (Ministry of Planning, National Development & Vision 2030, 2013). The challenge of accessing credit facilities, poor working conditions, high taxation, and lack of business training continue to hinder the growth of SMEs in Kenya (Marlow, 2014). As a result, business owners within Kenya find it difficult to grow their businesses. Government interventions through tax incentives, market creation for SMEs have gone a long way in establishing a thriving business condition. However, SMEs have still experienced problems in establishing a foothold for sustainable growth (Kimuyu, 2014)

1.2 Statement of the Problem

Growth-oriented firms are considered a significant contributor to a nation's economic gain, both in developed and developing countries. Shah, Nazir, Zaman and Shabir (2015) highlight that the prevailing studies suggest that each enterprise has to start, then grow while facing various challenges and crises, and finally mature and decline. Despite the possible growth patterns that a firm might take, enterprises face different challenges as well as many precursors which will allow an enterprise to move from one stage to another. These factors will determine the rate and scope of growth of the SMEs to different levels depending on the level of competition that the firm is experiencing as well as the level of economic development of the country that the firm is operating from. In the case of a developing country as Kenya, the understanding of the factors that affect the growth of SMEs will be of importance, considering the critical role that SMEs play in terms of employment generation.

SME growth is considered as a key driver to the creation of wealth and employment and economic development in every country around the world since through growth, SMEs can become large organizations and growth is closely linked to job creation, which is vital for the success of the economy (Davidsson, Achtenhagen, & Naldi, 2010). However, for the growth of SMEs to be realized, they have to counter different challenges that might affect their growth. The understanding of these factors is important to come up with systems that will increase their growth.

A plethora of studies have presented inconclusive findings due to conceptual, contextual and methodological gaps. For instance, Muthoni (2013) documented significant positive growth of SMEs upon its management participation in empowerment forums. The study posed population gaps since it drew its respondents not from the SaaS sector thus the results ought not to be generalized in it.

Omolo (2015) reported a positive effect of training and development on the performance of SMEs in Kisumu County. Due to the heterogeneity of the business operating environment between Kisumu and Nairobi, the results present a contextual gap. Idris and Primana (2015) reported a significant effect of competitive strategy on SMEs performance. The study posed timely gaps since technological changes are dynamic and the need for continuous examination on the contribution of heterogenous aspects on SMEs performance. Oludele and Enilie (2012) reported that the level of compliance with occupational health and safety measures enhanced levels of SMEs performance in Cameroon. The study posed a methodological gap since there was no justification for the choice of inferential statistics through relevant diagnostic tests. Even though research studies have been carried out on factors affecting the growth of SMEs, these depend upon and vary with different industries (Evrpidis, 2016). With the SaaS industry offering such an opportunity for technology-based SMEs and with limited research about providers and their success, a clear research gap is established. The aim of this study is therefore to analyze the critical factors and activities underpinning technology-based enterprises growth in the SaaS industry.

1.3 Research Objectives

1.3.1 Main Objectives

The main objective of the study was to determine factors affecting the growth of small and medium information and communication technology enterprises in Nairobi City, County.

1.3.2 Specific Objectives

The specific objectives of the study were:

- i. To determine the effect of management skills on growth of ICT SMEs in Nairobi City County.
- ii. To examine the effect of competition on growth of ICT SMEs in Nairobi City County.
- iii. To establish the effect of regulation on growth of ICT SMEs in Nairobi City County.
- iv. To examine the effect of technology changes on growth of ICT SMEs in Nairobi City County.

1.4 Research Questions

The study sought to answer the following research questions:

- i. What is the effect of management skills on growth of ICT SMEs in Nairobi City County?
- ii. To what extent does competition affect growth of ICT SMEs in Nairobi City County?
- iii. What is the effect of regulation on growth of ICT SMEs in Nairobi City County?
- iv. To what extent does technology changes affect growth of ICT SMEs in Nairobi City County?

1.5 Significance of the Study

The findings in this study will be useful for business leaders and entrepreneurs in the ICT sector in making informed decisions and in strategy formulation towards building investment-worthy businesses. The business owners may adopt the findings as tools for initiating negotiations on better terms of the business environment especially on policy-based issues.

Secondly, this study will contribute valuable information into how the ICT sector in Kenya can be part of the global SaaS revolution to position itself as a global ICT hub. This may in turn improve the investor outlook as more profitable investment options in ICT businesses become available in Kenya. Contribution on the joint effect of management skills, competition, regulation and technology changes may provide information on the effect of internal and external factors that influence growth of SMEs.

1.6 Scope of the Study

The scope of this study was focusing on technology-based SMEs in the SaaS industry that are past the survival stage, where the idea has already been proven and the focus is how to grow revenue organically to support its operations.

The study targeted those businesses that meet the threshold of an SME; More than 10 but less than 50 employees, annual turnover of more than KES 500,000 but less than KES 5 Million and Registered Capital of more than 5 Million but less than 20Million (Ong'olo & Awino, 2013). This ensured that the findings of the study may be relevant to SME businesses as they grow from the survival stage to other stages of the organizational life cycle.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on the critical success factors of technology-based SMEs. It discusses the various theories that underlie the study, further presents the empirical review and the conceptual framework.

2.2 Theoretical Foundations

The theoretical foundations in this study were resources-based theory and diffusion innovation theory. Theoretical foundations and relevance in the study are discussed in this section.

2.2.1 Resources Based Theory

Resources-based view theory (RBV) was brought forth by (Peteraf 1993 & Barney, 1991). The theory supports the need for an organization's understanding of its resources capability and constraints they are exposed to as they strive to gain competitive advantage. Although an organization ought to strategically optimize resources gathering strategies there is no surety of optimal benefits due to pilferage of its capabilities (Sanders, 2013). An organization's capacity to manage its resources would optimize value addition to be derived from internally and externally generated resources (Hooley & Greenley, 2005). To achieve performance sustainability there is a need for an organization to accumulate rare, non-substitutable and non-imitable resources despite operating in a highly volatile and competitive environment (Finney *et al.*, 2004).

RBV model assumes that firms within an industry (or within a strategic group) may be heterogeneous with respect to the bundle of resources that they control. Second, it assumes that resource heterogeneity may persist over time because the resources used to implement firms' strategies are not perfectly mobile across firms, that is, some of the resources cannot be traded in factor markets and are difficult to accumulate and imitate. Resource heterogeneity (or uniqueness) is considered a necessary condition for a resource bundle to contribute to a competitive advantage. The RBV is concerned with the connection between internal resources, strategy and the performance of the organization. It focuses on the encouragement of sustained competitive advantage through the

development of human capital rather than just aligning human resources to current strategic goals (Sanders, 2013). The argument that resources internal to an organization can result in competitive advantage is a shift from earlier suggestions of strategy which focuses on the external environment and such factors as customers, industry, and competitors.

The theory has the advantage of aiding an organization in the identification of its unique resources and creation of a competitive environment (López, 2005; Helfat & Peteraf, 2003). Further, it provides value additive criterion to be adopted whenever an organization seeks to discover the blue ocean market through the creation of value additive products and services. Its major drawback is its organization's ability to respond optimally to the dynamic organization operating environment. Assumption of the inability of resources to be substituted and imitated cannot be maintained owing due to imitative competitors' behavior.

The theory is appropriate for the study since Saas SMEs needs to accumulate tangible and intangible resources that would aid in achievement of their objectives. Intangible resources can be achievement through possession of management skills through financial literacy, leadership, human capital and governance skills that may optimize organization performance. Further, Saas SMEs should embrace regulations in place and strive to comply with taxation, ICT act, licensing and patents and copy rights. Patenting and copyrighting would enable Saas SMEs to acquire source of income that may aid in realization of blue ocean market. Through utilization of resources as a means of responding to threats of new entrants, competitive rivalry, substitute service and goods and power of buyers. Saas SMEs would mitigate against cannibalization of their market share.

2.2.2 Diffusion Innovation Theory

Innovation diffusion theory was developed by Rogers (1983) and aimed at explaining how an idea or product gains momentum over time within a given population. Technology is perceived to be adopted if an individual incorporates it to achieve change as compared to the previous mode of operations. Innovation decision making was perceived to be dependent on individual characteristics (income), social attributes whereby it can be perceived to violate ethical and social norms of elite and perceived attributes of innovations.

Rogers (2003) asserts that there are four main elements of diffusion of innovation. They are innovation, communication channels, time and social systems. Innovation can be defined as a new product or idea that is meant to change the current state of affairs. Innovations is related to knowledge, persuasion and decision. Technological adoption will be dependent on its capacity to alleviate challenges that may increase resistance to change. Rogers asserts on the need to discuss the advantages and disadvantages of technology adoption. Technology outcomes can be classified as functional or dysfunctional, direct or indirect and anticipated or unanticipated.

According to Rogers (2003), there is a need for the creation of communication channels aimed at creating consensus among different stakeholders involved in technology adoption. Communication can be channeled through mass, social, localite and cosmopolite channels. Innovation diffusion being a social process, there is a need for the creation of interpersonal relationships. In interpersonal relationships, there are higher odds of individuals sharing similar characteristics as compared to diffusion that calls for heterogeneity of attributes. Moreover, communication channels can act as the link between internal and external stakeholders. Due to differences in the information required, mass media and cosmopolite channels can be used in the knowledge stage while localite channels and interpersonal can be used at the persuasion stage of the decision-making process. Phases of technology adoption are dependent on time five phases. Rogers (2003) argues that a social system is a set of interrelated components integrated to solve a problem or achieve a common goal.

Rogers (2003) argues that the innovation decision process is an information-seeking and process activities aimed at uncertainty reduction on its advantages and disadvantages of innovation. Innovation is a five-stage process comprising knowledge, persuasion, decision, implementation and confirmation. These phases are achieved in a hierarchical manner. In the knowledge stage, an individual learns about innovation with an aim of understanding how it can achieve desired goals. Knowledge can be classified as awareness knowledge, how knowledge and principle knowledge. Awareness knowledge provides innovation that can create desires for understanding how innovation will work. How knowledge describes how innovation can be used correctly. To increase the likelihood of technology adoption there is a need for seeking more information on how to use innovation before trial. Principles knowledge describes operational guidelines of technology. Technology adoption is highly dependent on the understanding of its principles.

In the persuasion phase, individual attitude towards innovation can be changed though it does not lead to acceptance or rejection (Rogers, 2003). Attitude towards innovation is dependent on an individual. Unlike the knowledge phase that is cognitive, persuasion is affective. Individual participation in innovation is mostly in the persuasion stage. Hence, their opinion is determined by the opinions and beliefs of others. In the decision stage, individuals have a choice on acceptance or rejection of innovation. Rogers (2003) defined innovation adoption as the use of better alternatives available to solve problems or achieve desired goals. To increase the likelihood of acceptance of innovation then there is a need for systematic implementation. Innovation rejection can be passive or active. In active rejection, an individual pursues innovation that is not ultimately accepted, unlike passive rejection whose decision is made outright.

In the implementation phase, innovation is experimented with. While implementing innovation, there is a need for the involvement of all stakeholders to increase the likelihood of its acceptance. Further, technical experts should be actively involved in developing the skills of users of technology being adopted (Rogers, 2003). In this phase, innovation is reinvented to meet users' specific needs. The faster the reinvention the faster the acceptance of innovation. In the confirmation stage, the decision on users' support is sought. Rogers (2003) asserts that the decision can be reversed if there are conflicts. Technology adopted seeks for support of their investment decisions. In this phase, the attitude of users is crucial since a negative attitude would lead to discontinuance. Discontinuance can be pursued through replacement. Moreover, there can be disenchantment discontinuance due to dissatisfaction and failure of technology to meet desired needs.

The level of technological adoption is dependent on relative advantage, this is the degree to which innovation is perceived to be superior to the current program or product being replaced. Compatibility refers to how consistent the innovation is in line with the values, experiences and potential needs of adopters. Complexity, the ease of understanding and using the system. Triability is the extent to which innovation can be experimented prior to its adoption. Observability is the measure of how technological adoption provides tangible results (Rogers, 2003).

The theory is appropriate for the study since there is a need for a technology-based enterprise to find how innovation can lead to their growth. SMEs should be sensitized to the need for the adoption of innovative operational procedures, creativity in product development and enhancement of graphical user interfaces of their respective products.

2.3 Empirical Review

Empirical literature review documents past existing literature on the effect of management support, competition, regulation and technology changes on the growth of ICT SMEs. In each study, existing gaps are identified and an approach to be followed to bridge the gaps is discussed.

2.3.1 Management Skills and Growth of SMEs

Popescue et al., (2020) studied the role of managerial skills on the sustainability of SMEs in Romania. A cross-sectional research design was applied and primary data was gathered via the administration of questionnaires. Study findings indicated that the sustainability of SMEs in Romania was dependent on interpersonal skills, self-awareness and emotional intelligence. The study was limited to psychological aspects of management skills while the current study examined financial, human capacity, leadership and governance skills possessed by leaders of SMEs in the ICT sector in Kenya. The study presents contextual gap since it drew its respondents from a Country whose business operating environment differs from Kenya, hence, the findings may not be generalized.

Muthoni (2013) studied the effect of capacity building on the performance of women-owned enterprises in Gikomba market. Descriptive research design was applied and stratified sampling used to select 357 respondents who were included in the study. Descriptive statistics and regression modeling analyzed the data. Study findings indicated that there was an improvement in the performance of SMEs after participation in empowerment forums. It was noted that through empowerment forums women's networking skills and capacity were developed. Moreover, there were challenges on leadership skills possessed hence there were calls for sensitization programs that are aimed at developing them to enhance growth of SMEs. The study was limited to women enterprises hence the findings may not be generalized across all SMEs. Furthermore, Muthoni presented methodological gaps since despite of adopting regression modelling no diagnostic results was documented.

Omolo (2015) studied the effect of training and development on the performance of small and medium enterprises in Kisumu County. Descriptive research design was applied and primary data was collected through the administration of questionnaires. Descriptive statistics and multiple regression analyzed the data. Study findings indicated that training and development positively

affected the performance of SMEs. The study drew its respondents in Kisumu County whose operating business environment differs from Nairobi City County. Thus, its findings may not be concluded to be a true representative of ICT SMEs in Nairobi City County. The study presents population gaps since Kisumu and Nairobi Counties do not have homogeneous business operating environment.

Mbogo (2011) studied the effect of management accounting skills on the success and growth of small and medium enterprises in Kenya. Cross-sectional research design was applied and primary data was collected through the administration of questionnaires. Descriptive statistics and structural equation modeling analyzed the data. Study findings indicated that management capabilities in financial, marketing, managerial accounting and human resources affect decision making and they had an effect on the success of SMEs. The study should have reported structural equation model fitness statistics. This may have increased the odds of drawing a non-biased conclusion. Moreover, the findings may not be generalized among SMEs in ICT sector because the current study was limited to incubated firms only. The study presented conceptual gaps since it was limited to single management skills as compared to the current situation that evaluated the effect of leadership, human capital and governance skills.

Woldie *et al.*, (2008) investigated factors influencing the growth of small and medium enterprises in Nigeria. Cross-sectional research design was applied and primary data collected through the administration of questionnaires. Descriptive and Cramer's V analyzed the data. Study findings indicated that SMEs performance was affected by the education qualifications of the manager, motivation of venturing into business and desire to create employment. Further, there was a significant association between management skills and the performance of SMEs in Nigeria. The findings may not be generalized in the Kenyan perspective since they drew respondents from Nigeria whereby the state of economic development differs from Kenya. Further, the study should have explored the joint effect of variables under examination through the use of regression modeling or structural equation model.

Kamunge, Njeru and Tirimba (2014) studied factors performance of small and medium enterprises in Limuru Town. Descriptive research design was applied and primary data was collected through the administration of structured questionnaires. Descriptive and inferential statistics analyzed the data. It was found that the performance of SMEs was contingent to access to business information, access to

infrastructure, access to finance and managerial experience. The study had methodological challenges since it fitted multiple regression modeling and did not report on diagnostic tests that guided the study. Further, the study reported a positive moderating effect of government policies on the performance of SMEs. This stimulates the conceptual gap since the current evaluated direct effect of government policies.

Machirori (2012) conducted a study to identify the effect of networking on access to finance and SMEs performance in Eastern Cape Town, South Africa. The factors put into consideration in this study were entrepreneurial characteristics, firm characteristics, networking and access to debt finance. The results implied that the education and gender of the SME owner together with the age, size of the SME and the legal status were some of the characteristics that are positively related to networking. The study also showed that there is a positive and significant relationship between networking and access to debt finance and the performance of the SME. The study stimulates contextual and conceptual gaps since it was limited to the effect of finance on performance of SMEs in South Africa unlike currently where several antecedents of Saas SMEs growth have been examined.

2.3.2 Competition and Growth of SMEs

Idris and Primiana (2015) studied the effect of competitive strategy and partnership strategy on the performance of SMEs. Qualitative research design was applied and secondary data collected through document content analysis. Study findings indicated that competitive and partnership strategies aided SMEs in the evaluation of internal and external capacities that aided in the achievement of their competitive advantages. The findings were drawn from different SMEs sectors hence they may not be generalized in the ICT sector. Further, there are changes that may have happened technologically from 2015 to date and may have created the demand for the adoption of new technological models. The study presents methodological gap since it relied purely on qualitative data, hence, the need for adoption of quantitative approach to compare and contrast the findings.

Kraja and Osmani (2013) studied the competitive advantage and performance of small and medium enterprises in Albania. Qualitative research approach was applied and document content analysis used in data collection. Study findings indicate that the performance of SMEs in Albania was affected by a lack of a strategic plan, mission statement and customer relationship management skills. It was recommended that SMEs ought to carry out Strengths, weaknesses, opportunities and threats analysis

prior to establishing their enterprises. This would aid in the identification of their strengths and optimization of their resources to achieve desired growth. Localized evaluation of strengths, weaknesses, threats and opportunities should be carried out to enhance growth of ICT SMEs in Nairobi County.

Kaunyangi (2014) studied the impact of competition on the performance of firms in the telecommunication sector in Kenya. Descriptive research design was applied and primary data collected through the administration of questionnaires. Inferential and descriptive statistics were used for data analysis. Study findings indicated that competition positively affected the performance of telecommunication companies in Kenya. Further, new entrants, competitive rivalry and buyers' bargaining power have a significant impact on the performance of telecommunication companies in Kenya. These findings may not be replicated among SMEs since the size of the corporation may have an influence on their performance. The study presents population gap since SMEs in telecommunication sector differs from Saas thus the industry specific characteristics may have implications on heterogeneity of findings.

2.3.3 Regulation and Growth of SMEs

Yongqiang (2014) studied the effect of regulations on the financial performance of small corporations in Australia. The study applied cross-sectional research design and collected primary data using questionnaires. A sample of 387 was selected through stratified sampling technique. Data was analyzed through the use of descriptive and structural equation modeling. Study findings indicated that there was a significant association between regulation and performance of small corporations in Australia. The study findings may not be concluded in Kenyan ICT sector SMEs performance since it drew its respondents from different sectors whose regulations differ. Further, it was appropriate to report diagnostic tests prior to modeling using SEM this may have the effect of drawing biased conclusions.

Oludele and Emilie (2012) studied regulations, awareness and compliance on SMEs performance in Cameroon in the manufacturing and retail sectors. Cross-sectional research design was applied and primary data collected through the administration of questionnaires. Descriptive and inferential statistics analyzed the data. Study findings indicated that there was an inverse relationship between regulations and SMEs performance. Further, a high level of compliance with customs and municipal

regulations negatively impacted the development of SMEs. High compliance with occupational health and safety standard measures enhanced the performance of SMEs. The study findings have contextual differences when compared with Kenyan ICT SMEs since the respondents hailed from manufacturing and retail sectors.

Nabintu (2013) studied factors affecting the performance of small and micro enterprises traders in the City Park market in Nairobi County. Survey research design was applied and a sample of 47 traders were issued with questionnaires. Univariate and multiple regression techniques were used for data analysis. Study findings indicated that the performance of SMEs was dependent on access to finance, access to business information and regulations. The study drew its respondents among hawkers hence there was none was drawn from ICT sector thus the need for carrying out a customized study to address population gap.

Mbugua and Moronge (2016) studied the effect of government policies on the performance of small and medium enterprises in Kiambu County. Descriptive research design was used and primary data gathered through issue of questionnaires among 174 respondents. Descriptive statistics and multiple regression analysis analyzed the data. Study findings indicated the inverse effect of taxation and licensing on the performance of SMEs. Further, training and access to capital have a significant effect on the performance of SMEs in Kiambu County. The study drew respondents from different sectors and did not carry out diagnostic tests prior to classical regression modeling.

2.3.4 Technology Changes and Growth of SMEs

Gathogo and Ragui (2014) studied the effect of capital and technology on the performance of SMEs in the manufacturing sector in Kiambu County. Descriptive research was applied and primary data collected through the administration of questionnaires. Study findings indicated that there was a significant effect of capital and technology on the performance of manufacturing SMEs in Thika municipality. The findings may not be generalized among ICT firms since their model of business operations differs from manufacturing. Further, the business operating environment in Thika differs from Nairobi County since licensing procedures are regulated by the County government and taxation policies may differ between the manufacturing and ICT sector.

A study done in the Republic of Croatia by Bozic and Sonja (2005) attempted to analyze the effect of innovation on SMEs. The study aimed at establishing the relationship between the determinant factors relating to changes in technological innovation and how they affect SMEs in the ICT Sector when adopted. The factors put in consideration were; ownership structure, proportion of highly educated employees, implementation of strategic changes and market orientation. Adoption of new technologies had a positive effect since it resulted in; increased market share, improved product quality and reduced material cost per unit among others. The study covered 498 SMEs and the method used in data collection was mail survey. The analysis was done using multiple linear regression models and the findings were that careful implementation of the factors listed above led to the improved innovation effect in SMEs. The study posed methodological gap since despite of adopting regression analysis it did not report on diagnostic tests.

Sawang et al (2011) carried out a study in Australia and Thai on the effects of changes in technology on software development firms. The study was carried out using the balanced approach. It utilized the financial and non-financial metrics to get the full potential advantages of implementing technological innovation. The study was done on 144 firms in both countries. The factors that were considered for this study were; customer satisfaction, sales revenue and growth, product/service quality and profit margin and return on investment. The enterprises that used the balanced approach were better positioned to benefit from innovations compared to using financial measures only. The study poses population gap since the respondents drawn from Australia and Thailand may have heterogenous characteristics as compared to Kenya hence the need for a localized study.

Walobwa et al., (2013) did a study to investigate the different types of technological innovations adopted by different SMEs and their impact on the growth of the SMEs. The factors considered in this study were technology, marketing, strategic innovations and administration. The study evaluated each of these factors and their impact on the growth of the SME. The study used descriptive data got from 31 respondents from the garment industry SMEs in Jericho market Nairobi. Regression model was used and the data was analyzed using SPSS. The results proved that technological, marketing, administrative and strategic innovations contributed to 56% of variations in growth of SMEs. It was also found that market innovation contributes most to growth of the enterprises. Although, the study was carried out in Nairobi County, its population characteristics were heterogenous as compared to

the current study that narrowed on Saas SMEs. This may have limited the application of the results among Saas SMEs due to heterogeneity of business characteristics.

Bagshi-Sen (2001) carried out a study in the Niagara region of Canada. The study was conducted on four SMEs and it showed that SMEs that use innovation as a strategy of competition gained a competitive edge in sales and exports other than their competitors. In Kenya, studies on competitive strategies of firms have been done by Ogutu and Nyatichi (2012) and Mbeche (2003). These studies mainly put their focus on multinational banks and large firms respectively. These researches revealed competitive strategies adopted by larger firms in Nairobi, Kenya and the challenges faced by SMEs. Another study carried out in Mombasa showed that the adoption of a competitive strategy mainly is affected by the financial capability of an SME.

2.4 Research Gaps

The literature has discussed various studies on the factors that influence the growth of small and medium enterprises. This is because the growth of SMEs has important implications to a nations' economy as well as a source of employment. From the extensive literature, it is evident that the popular growth path of most of the SMEs is the lifecycle whereby the growth of an SME can be seen as a progression from smaller to larger firms as it passes from start-up, expansion through diverse stages, some firms do disengage from the growth trajectory of the life cycle. The factors that came out prominently with regard to the internal factors that affect the growth of SMEs was that a successful manager is one who understands his business environment, both internal and external through an effective assessment of competitors, suppliers, customers, government agencies, labour organizations, and financial institutions.

In regard to the external factors that affect the growth of SMEs, it was found that firms in developing countries suffer more than large firms from many policy and institutional constraints arising from imperfect markets, and, as a consequence, they benefit disproportionately from reforms. Unfair competition arising from the low cost of doing business in the informal sector is a serious challenge for a significant section of SMEs, especially small sellers and producers.

The studies undertaken centered mostly in the developed countries and for the studies reviewed in the developing countries, majority of the studies were undertaken in the already established SME

firms that are not technology-oriented and with a longer product cycle. However, it was evident that some studies have been undertaken to try and determine the factors that affect the growth in technology-based firms. Hence this study will try to bridge this gap in a developing country as Kenya, by establishing the factors that affect growth of technology-based SMEs in Nairobi, Kenya.

Empirical examination on antecedents of growth of small and medium enterprises have been inconclusive despite a plethora of studies. Existing studies have posed population gaps through collection of data from SMEs in different sectors as compared to technology. This may limit findings generalization due to heterogeneity of industry-specific characteristics. Methodological gaps are notable through choices of research design, philosophy, types of data and data analysis techniques. Despite the adoption of inferential statistics, some studies have not documented diagnostic tests that justify the choice of their design. There are conceptual differences since different studies have adopted heterogenous antecedents of SaaS SMEs growth.



Table 2.1 Summary of Empirical Literature and Research Gaps

Author(s)	Objectives/Purpose	Key Findings	Research Gaps	Focus of this Study
Muthoni (2013)	Effect of capacity building on performance of women owned enterprises in Gikomba market.	Improvement in performance of SMEs after participation in empowerment forums	The study was limited towards women enterprises hence the findings may not be generalized across all SMEs.	The study examined the joint effect of management skills, competition, regulation and technology changes on growth of ICT.
Omolo (2015)	Effect of training and development on performance of small and medium enterprises in Kisumu County.	Training and development positively affected performance of SMEs.	The findings may not be concluded to be true representative of ICT SMEs in Nairobi City County.	Growth of ICT firms may not be solely affected by training and development hence the study examined the joint effect of management skills, regulation, competition and technology changes.
Kamunge et al., (2014)	Studied factors performance of small and medium enterprises in Limuru Town.	Performance of SMEs was contingent to access to business information, access to infrastructure, access to finance and managerial experience.	The study had methodological challenges since it fitted multiple regression modelling and did not report on diagnostic tests that guided the study.	Before modelling the study examined assumption of regression modelling.
Idris & Primiana (2015)	Studied the effect of competitive strategy and partnership strategy on performance of SMEs.	Competitive and partnership strategies aided SMEs in evaluation of internal and external capacities that aided in achievement of their competitive advantages.	The findings were drawn from different SMEs sectors hence they may not be generalized in ICT sector.	The study was limited to ICT whose industry specific intrinsic factors differs from other sectors.
Kraja & Osmani (2013)	Studied competitive advantage and performance of small and medium enterprises in Albania.	Performance of SMEs in Albania was affected by lack of strategic plan,	Localized evaluation of strengths, weakness, threats and opportunities should be carried out so as to enhance	Before modelling the study examined assumption of regression modelling.

		mission statement and customer relationship management skills.	growth of ICT SMEs in Nairobi County.	
Oludele & Emilie (2012)	Studied regulations, awareness and compliance on SMEs performance in Cameroon in manufacturing and retail sectors.	There was inverse relationship between regulations and SMEs performance.	The study findings have contextual differences when compared with Kenyan ICT SMEs since the respondents hailed from manufacturing and retail sectors.	Before modelling the study examined assumption of regression modelling.
Nabintu (2013)	Studied factors affecting performance of small and micro enterprises traders in City Park market in Nairobi County	Performance of SMEs was dependent on access to finance, access to business information and regulations affected performance of SMEs in Nairobi County	The study drew its respondents among hawkers hence there was none was drawn from ICT sector thus the need for carrying out customized study.	The study was limited to ICT whose industry specific intrinsic factors differs from other sectors.
Machirori (2012)	Effect of networking on access to finance and SMEs performance in Eastern Cape Town, South Africa	There is a positive and significant relationship between networking and access to debt finance and performance of the SME.	The study drew respondents from South Africa hence it may not be generalized in Kenya due to differences in state of economic development.	Before modelling the study examined assumption of regression modelling.
Walobwa et al., (2013)	To investigate the different types of technological innovations adopted by different SMEs and their impact on the growth of the SMEs	The results proved that technological, marketing, administrative and strategic innovations contributed to 56% of variations in growth of SMEs.	The study findings may not be generalized in ICT sector since there are exposed to different levels of risks.	The study was limited to ICT whose industry specific intrinsic factors differs from other sectors.

2.5 Conceptual Framework

From the review of literature, it is depicted that there exist both internal and external factors that influence the growth of technology-based SMEs. Hence, in order to understand the factors that influence the growth of the SMEs the study considers the independent variables relevant to consist of changes in technology, management, completion and regulation. The dependent variable is the growth of the SaaS. This relationship is represented in Figure 2.1.

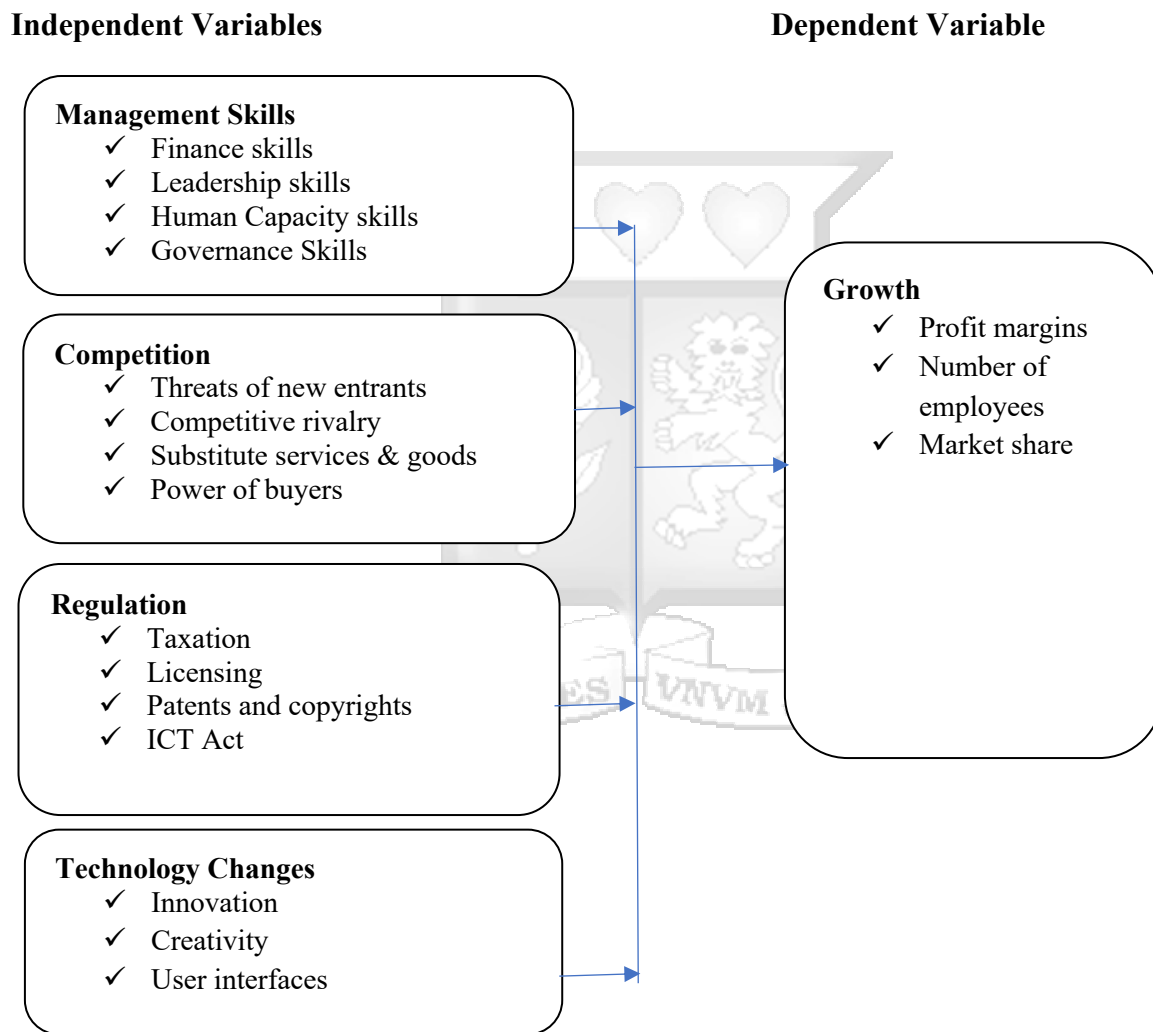


Figure 2.1 Conceptual Framework

2.6 Operationalization of Variables

In Table 2.2, management skills were operationalized as finance skills, leadership skills, human capital skills and governance skills. Competition was operationalized as threat of new entrants, competitive rivalry, substitute of service and goods and power of buyers. Regulation was operationalized as taxation, licensing, patents and copyrights and ICT Act. Technology changes was operationalized as innovation, creativity and user interfaces. Growth was operationalized as profit margin, number of branches and market share.

Table 2.2 Operationalization of the Variables

Variable	Attributes	Analysis	References
Management skills	Finance skills	Descriptive	(Muthoni, 2013; Omolo, 2015; Kamunge, et al., 2014)
	Leadership skills	Correlation	
	Human capital skills	Regression	
	Governance skills		
Competition	Threats of new entrants	Descriptive	Idris & Primiana, 2015; Kaunyangi, 2014)
	Competitive rivalry	Correlation	
	Substitute service and goods	Regression	
	Power of buyers		
Regulation	Taxation	Descriptive	& Moronge, 2016)
	Licensing	Correlation	
	Patents and copyrights	Regression	
	ICT act		
Technology changes	Innovation	Descriptive	
	Creativity	Correlation	
	User interfaces	Regression	
Growth	Profit margin	Descriptive	
	Number of Employees		
	Market share		

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research methodology that was adopted in the study. In it, research philosophy, research design, sampling techniques and sample size, target population, research instruments, data collection procedure and data analysis are discussed and justified.

3.2 Research Philosophy

According to Creswell (2017) research philosophy is a system of beliefs and assumptions concerning knowledge generation and development. He further elaborated that there are two most important research ways of philosophy: the positivist and the interpretivist methods of reasoning. Positivism accepts that the truth is steady, recognizable and can be portrayed equitably without meddling with the wonder under scrutiny whereas interpretivist propose that the truth is precarious and must be comprehended through emotional understanding which requires mediation as a general rule (Cooper & Schindler, 2014). This research applied a positivism position as the truth is steady, recognizable and can be depicted equitably without meddling with the marvel.

3.3 Research Design

Research design is the logical guideline on how a study will be conducted (Saunders *et al.*, 2014). According to Sekaran and Bougie (2013), research design can be perceived as that criterion that can be adopted to ensure that there is a clear guideline on how to achieve the desired study objectives. The study adopted descriptive research with a bias of quantitative data. According to Kothari (2011), a descriptive research design is adopted whenever the researcher seeks to answer questions on why, how, when and what in regard to the subject under examination. Descriptive research design fits the study since the study describes antecedents of growth of ICT SMEs in Nairobi City County.

3.4 Target Population

Population in statistics is the specific population about which information is desired. According to Ngechu (2014), a population is a well-defined or set of people, services, elements, events and groups of things or households that are being investigated. This definition ensures that the population of

interest is homogeneous. Population studies are more representative because everyone has an equal chance to be included in the final sample that is drawn. The target population is a complete count of all individuals and elements under consideration in a given study (Saunders *et al.*, 2014). The population of this study was SaaS businesses that meet the threshold of an SME, with a sampling frame of 160 SME's in the SaaS business sector. This was obtained from secondary data through online directories that contain the number of SaaS businesses registered in Nairobi. In each of these businesses, either the Founder/Head of the organization, marketing manager, finance manager and research and development manager were interviewed.

3.5 Sampling Design and Sample size

There are challenges associated with consideration of all individuals in a study for instance there are budgetary and timely constraints. Hence, the need to consider a subset of the target population, commonly known as sample (Cooper & Schindler, 2014). Through the sampling process, it would be easier to select a true representative of the population under consideration. The sampling procedure can be probabilistic whenever all elements under consideration have equal chances of being considered and non-probabilistic when there is an inclusion and exclusion procedure (Sekaran & Bougie, 2013). The sampling size for the study was determined through simple random sampling and the Yamane formula (Yamane, 1967). The sample for the study was 115 determined as follows $n = N / [1 + N (e)^2]$ Where n is the sample size, N is the population size, and e is the level of precision.

$$= 160 / [1 + 160(0.05)^2] = 115$$

3.6 Data Collection

3.6.1 Research Instruments

The main tool for data collection was a questionnaire. The dominance of questionnaires in social sciences is anchored on their capacity to collect data from a large population with ease of administration (Kothari, 2011). Further, questionnaires do not require self-administration in all instances hence the respondents can respond to them at their convenience as compared to focus group discussion and interview guide (Sekaran & Bougie, 2013). Further, it is easier to guide expected responses through the use of alternative scales of measurement.

The questionnaire for this study comprised of three main sections. The first section gathered demographic information that was in a nominal scale. In the second section, the Likert scale was used to measure the responses on factors affecting growth of SMEs. In the last section, growth of SMEs was sought. The question was developed based on past empirical studies that had examined the causality of management skills, competition, regulation and technology on growth of SMEs.

3.6.2 Data Collection Procedure

The data for this study was collected through a questionnaire through direct participant interviews that were guided by a pre-defined set of questions as per the questionnaire. If established that one department was a custodian of all the data required to collect for this study, that one department was interviewed. In cases where a direct interview was not possible, the questionnaires were delivered through email, and the respondents were given two weeks to fill the online questionnaire.

3.7 Research Quality

Before the actual administration of the questionnaires, pilot testing was carried out among four ICT SMEs. Pilot testing was carried out to improve the quality of research instruments and identify the challenges that may hinder the achievement of research objectives. Further, pilot testing made it easier for the researcher to determine the average time it may take to respond to the questionnaires.

3.7.1 Reliability of Research Instrument

The reliability of a research instruments is the likelihood of achieving similar results when it's administered to alternative respondents (Cooper & Schindler, 2014). Reliability of the current research instrument was examined through the use of Cronbach's Alpha coefficient. This coefficient score has a minimum of 0 and a maximum of 1. According to Sekaran and Bougie (2013) the higher the reliability coefficient the more reliable the instrument. Further, if the coefficient is at least 0.7, then it's excellent and has attained internal consistency (Bryman & Bell, 2015).

Reliability analysis was examined through the use of Cronbach Alpha coefficients. Findings in Table 3.1 indicate that the research tool was reliable since Cronbach's Alpha coefficients were greater than 0.7. Growth of SMEs has the highest of 0.858, technology changes 0.814, regulation 0.817, competition 0.72 and management skills 0.724.

Table 3.1 Reliability Analysis

Variable	Cronbach Alpha	Number of items
Management skills	0.724	8
Competition	0.72	5
Regulation	0.817	8
Technology changes	0.814	7
Growth	0.858	8

3.7.2 Validity of Research Instrument

According to Kombo and Tromp (2012) validity of research is the degree to which a research instrument measures what it is expected to measure. In this study face, content and construct validity were adhered to during the research instrument development. According to Sekaran and Bougie (2013), there is a need for evaluation on whether a research instrument presents requisite contents failure to which there will be low odds of meeting the desired objectives. Empirical literature guided in the development of research instruments. Further, the input of both the lecturer and statisticians was sought to ensure that the research is in line with the study objective.

3.8 Data Analysis

Data collected was cleaned coded and entered into Statistical Packages for Social Sciences (SPSS version, 23). Prior to entering the data, it was cleaned and the completeness of questionnaires confirmed. Data was analyzed through the use of descriptive and inferential statistics. Findings were presented in figures and tables. Descriptive statistics were mean, standard deviation, frequency and percentage. Inferential statistics included Product Moment Correlation coefficient and multiple linear regression. Product Moment correlation showed the strength of the management skills, competition, regulation and technology changes on growth of SMEs. Multiple regression analysis showed the nature of the effect of management skills, competition, regulation and technology changes on growth of SMEs. Multiple regression model was of the form:

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

Where

Y is Growth of SMEs

β_0 is a constant

β_1 to β_4 are regression coefficients of independent variables and represents change in Y per unit change in X

X_1 is Management skills

X_2 is Competition

X_3 is Regulation

X_4 is Technology changes

ε is the error term

Regression analysis assumes that there is a linear relationship between dependent and independent variables. Scatter plots were used for linearity between each independent variable and dependent variable. Further, correlation analysis was used to show the strength of the relationship between dependent and independent variables (Kothari, 2011). The data is said to be normally distributed if it is not too flat, positively or negatively skewed (Gujarati, 2012). Even though, non-normality of data has no effect on the estimator's consistency it does affect the efficiency which can ultimately bias the statistical estimates (Greene, 2008). To minimize the possibilities of data non-normality there is a need to increase the sample size since the problem ceases due to the central limit theorem (Greene, 2008). To test for normality histogram was used and normally distributed have a bell shape.

Multicollinearity exists when two or more of the predictors in a regression model are moderately or highly correlated. Unfortunately, when it exists, it can wreak havoc on our analysis and thereby limit the research conclusions we can draw. Both variance inflation factors and tolerance limits were used to test for multicollinearity and the cut-off was if VIF is greater than 10 then two independent variables are highly correlated and correlation matrix was used to check the variables.

3.9 Ethical Considerations

The researcher sought research permit from Strathmore University Internal Ethics Review Committee and National Commission for Science Technology and Innovation (NACOSTI). The researcher-maintained integrity in the process by upholding objectivity throughout the research. As such, the researcher declared any interests beforehand to avoid any conflict of interest. All information that was collected was treated with confidentiality and the privacy of respondents was upheld.

This research study was conducted in a manner to ensure integrity and objectivity, with all interactions as well as data collected represented truthfully and accurately. All Interviewees were treated with respect and their privacy and choice of anonymity was respected. The purpose of the study was disclosed to the interviewees, who were then have the right to voluntarily participate or withdraw. All data collected was kept confidential, with the final findings made available to only those who have the rightful responsibility, with express permission sought to use and publish information, not in the public domain. For secondary data obtained from sources such as websites, blogs and forums, access was obtained through legal channels, to ensure no infringement.



CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents data analysis and interpretation. Data was analyzed through the use of descriptive and inferential statistics. The findings are presented in figures and tables. The analysis has response rate, reliability analysis, descriptive statistics, correlation and multiple regression analysis.

4.1.1 Response Rate

In Table 4.1, 87% of completely filled questionnaires were used in the study. Sekaran and Bougie (2013) argue that the response of at least 70% is acceptable in social sciences and more than 75% indicates an excellent return rate. The response rate was attributed to the adoption of alternative methods for data collection and follow-up in two weeks for those questionnaires that were dropped in respective organizations.

Table 4.1 Response Rate

Questionnaires	Number	Percentage
Filled	100	87
Not filled	15	13
Total	115	100

4.2 Background Information

Background information of the respondents was sought. The information includes the size of SMEs, type of business ownership, firm age, annual turnover and target market. Since data collected was in nominal scale frequencies and percentages were used for data analysis.

4.2.1 Number of Employees

Regarding the number of employees, the findings in Table 4.2 indicate that 63% of SMEs have between 51 to 100 employees, 34% have between 11 to 50 and 3% had less than 10. This indicates that at least 97% of information technology firms are medium enterprises.

Table 4.2 Number of Employees

	Frequency	Percent
Less than 10	3	3
11 – 50	34	34
51- 100	63	63
Total	100	100

4.2.2 Type of Business Ownership

Concerning the type of business, the pictorial presentation in Figure 4.1 indicates that 58% of enterprises are self-owned and run by employees, followed by 24% that are third-party owned and run by employees and 18% that are self-owned and family run. Since a majority of SMEs are run by employees there is a high likelihood of recruiting employees who will promote diversity and aid an organization in the achievement of its goals and objectives.

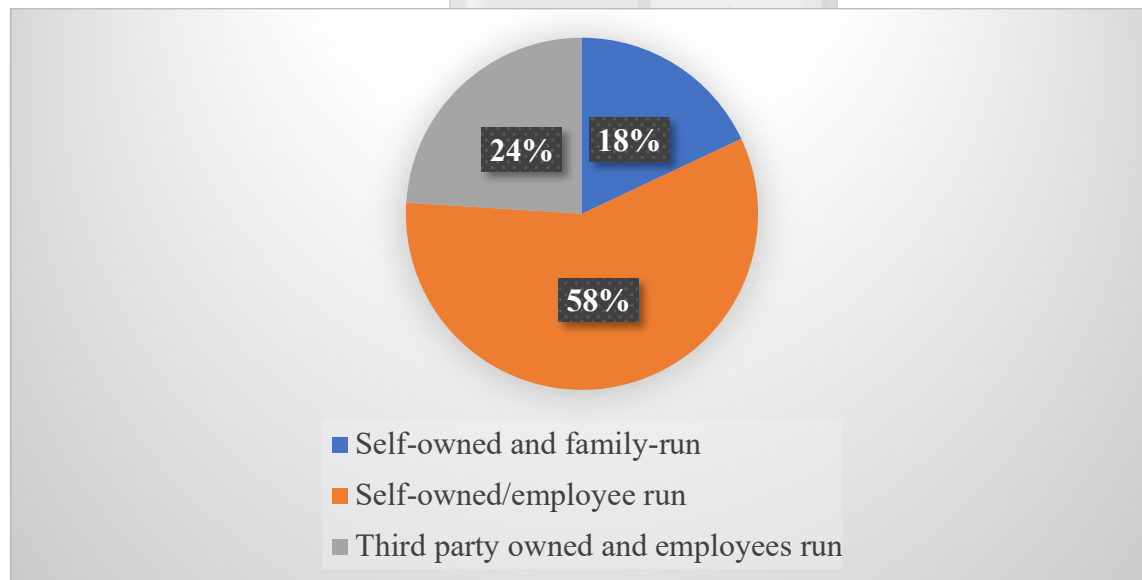


Figure 4.1 Type of Business Ownership

4.2.3 Age of the Firm

Regarding the age of SMEs Figure 4.2 indicates that 43% of them were operational for 4 to 7 years, followed by 32% that had been run for 8 to 11 years and 13% were operational for more than 12 years. This indicates that SaaS SMEs had existed beyond the business incubation period hence they had higher chances of recording positive growth.

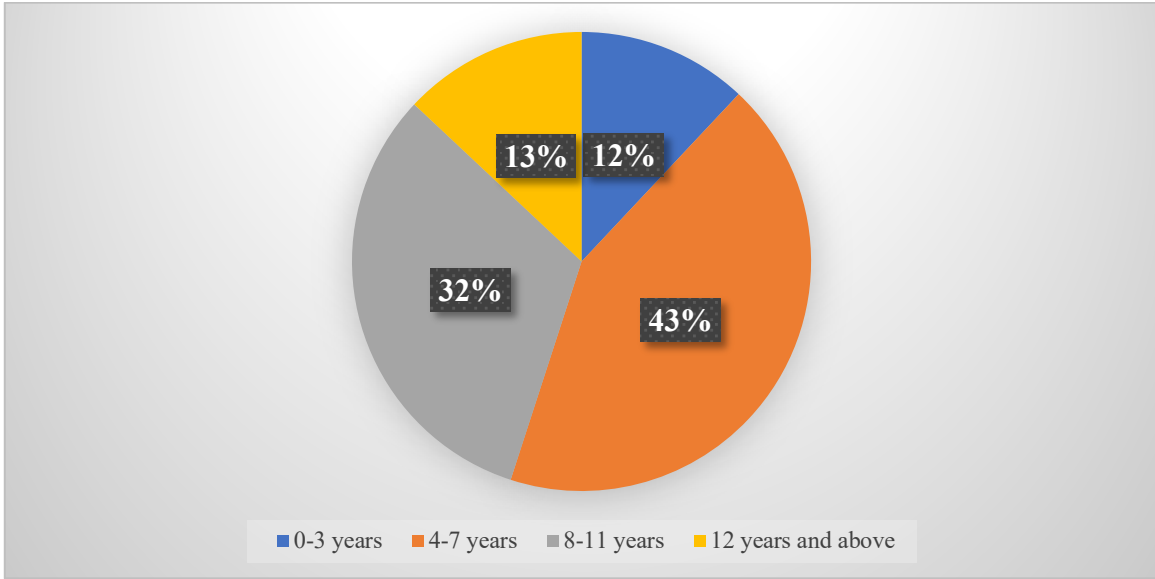


Figure 4.2 Age of the Firm

4.2.4 Annual Turnover

Findings in Figure 4.3 indicate that 33% of SMEs earned either less than 1 million or 1 to 5 million and 27% earned 5 to 10 million and only 7% earned more than 10 million per annum.

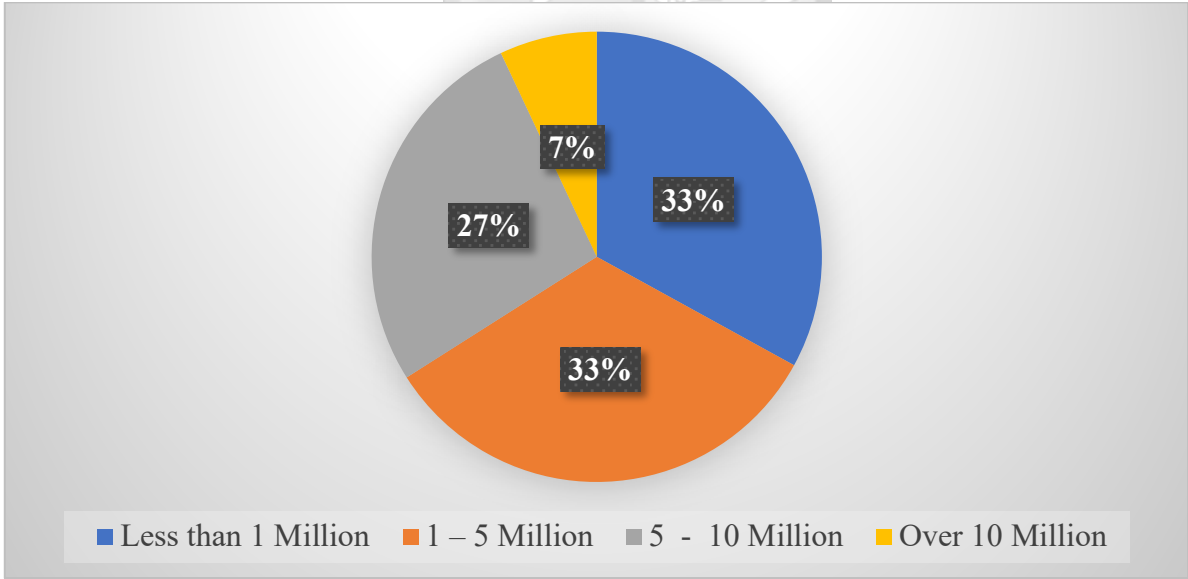


Figure 4.3 Annual Turnover

4.2.5 Target Market

Regarding the target market for the products, a majority 59% reported that their customer base is local or from the East Africa market while 41% reported having a preference for the international market.

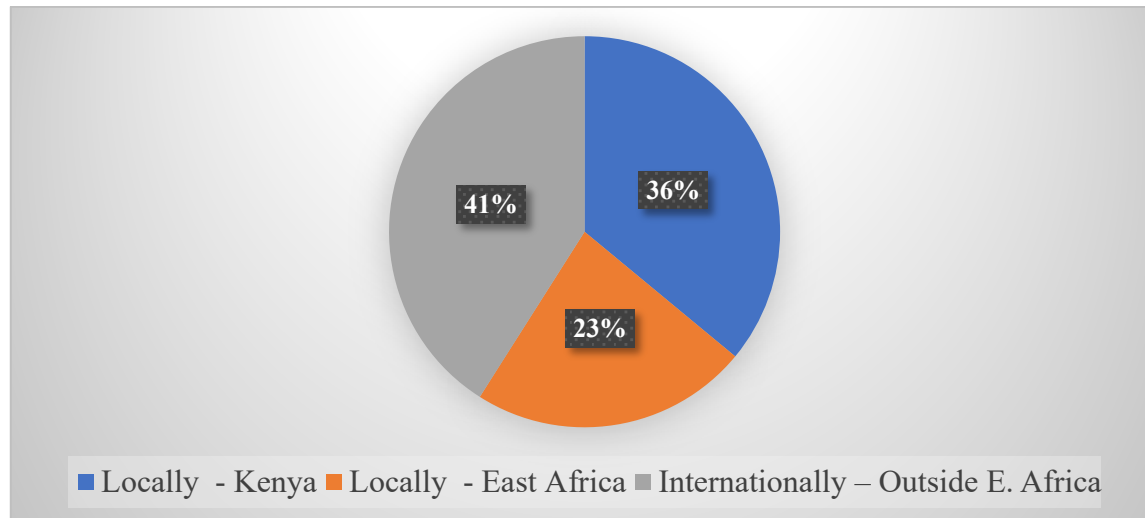


Figure 4.4 Target Market

4.3 Descriptive Analysis

4.3.1 Descriptive Analysis on Management Skills

The first objective of the study sought to determine the effect of management skills on growth of SMEs in Nairobi City County. Respondents rating on a five-point Likert scale was sought ranging from 1- Not at all, 2-Little extent, 3- Moderate extent, 4- Great extent and 5- Very great extent. Descriptive statistics was adopted for data analysis. Findings in Table 4.3, majority of respondents reported that to a very great extent top management in respective SMEs has different skills that guided organization growth (mean = 4.5). A majority reported that to a great extent (mean 4.4) their management has put in place measures on training and development. To a great extent, SMEs had a clear process of knowledge acquisition or top management had a diverse professional background (mean = 4.3).

Further, findings indicate that a majority of respondents reported that a great extent management skill has effect on growth of SMEs in Nairobi City County (mean = 4.0). It was reported that to a great extent the management of SMEs strives at developing accounting and bookkeeping skills. Moreover, the majority reported that they have developed budgetary procedures aimed at managing resources

allocation (mean = 3.9). Further, a majority mean = 3.6 reported that to a great extent, the management of SMEs facilitates strategic changes in response to market demand.

Table 4.3 Descriptive Analysis on Management Skills

	n=100 (Percentage)					Mean	Std. Dev
	1	2	3	4	5		
The management have strived efforts aimed at developing accounting and bookkeeping skills	2	5	15	49	29	4.0	0.9
The management has developed budgetary procedures aimed at managing resources allocation	4	7	20	32	37	3.9	1.1
The management of the firm have the requisite entrepreneurial skills to guide the company	2	4	16	38	40	4.1	0.9
The top management have diverse experience in different fields to guide the organization growth	3	0	8	24	65	4.5	0.9
The knowledge acquisition process is well explained in the firm	3	2	9	30	56	4.3	0.9
The management of our organization have measures in place for training and development	2	3	7	31	57	4.4	0.9
The top management have a diverse professional background	0	6	14	22	58	4.3	0.9
The management facilitates the strategic changes to align its activities to the market demands	4	13	27	32	24	3.6	1.1
Overall average						4.1	1.0

**1- Not at all, 2-Little extent, 3- Moderate Extent, 4- Great extent, 5-Very great extent.*

4.3.2 Descriptive Analysis on Competition

The second objective of the study sought to examine the effect of competition on growth of SMEs in Nairobi City County. Respondents rating on a five-point Likert scale was sought ranging from 1- Not at all, 2-Little extent, 3- Moderate extent, 4- Great extent and 5- Very great extent. Descriptive statistics was adopted for data analysis. Findings in Table 4.4 indicate to a great extent most startups in the ICT industry have no competitive advantage (mean = 4.0). To a great extent, there has been an increase in foreign entrants in the ICT sector (mean, 3.9). This may intensify competition in the local market. A majority reported a moderate extent on the effect of cost of related software products on the growth of SaaS SMEs. A majority reported that to a great extent (mean = 3.8), the market size of ICT products is flooded with cheap foreign and online products affecting the growth of local SMEs in the ICT industry. To a great extent competition among ICT innovation firms is intense and affect

the growth of business in the industry (mean = 3.5). Overall, to a great extent competition has effect on the growth of SaaS SMEs in Nairobi City County (mean = 3.7).

Table 4.4 Descriptive Analysis on Competition

	n=100 (Percentage)					Mean	Std. Dev
	1	2	3	4	5		
The costs of related software products affect the growth of SaaS	9	18	29	33	11	3.2	1.1
Competition between ICT innovation firms themselves is intense hence affecting the growth of business in the industry	11	15	16	33	25	3.5	1.3
The market size of ICT products is flooded with cheap foreign and online products affecting the growth of local SMEs in the ICT industry	4	3	20	51	22	3.8	0.9
Most start-ups in the ICT industry have no competitive advantage	4	4	17	43	32	4.0	1.0
There has been an increase in foreign entrants in the ICT sector	1	4	25	41	29	3.9	0.9
Overall average						3.7	1.1

**1- Not at all, 2-Little extent, 3- Moderate Extent, 4- Great extent, 5-Very great extent.*

4.3.3 Descriptive Analysis on Regulation

The third objective of the study sought to establish the effect of regulation on growth of SaaS SMEs in Nairobi City County. Respondents rating on a five-point Likert scale was sought ranging from 1- Not at all, 2-Little extent, 3- Moderate extent, 4- Great extent and 5- Very great extent. Descriptive statistics was adopted for data analysis. Findings in the study indicate that to a great extent, regulation affects the growth of SaaS SMEs in Nairobi City County (mean =3.8). To a large extent ICT taxation policy should be pegged on the demand of ICT services (mean = 4.2). A majority (mean = 4.0), reported that to a great extent, the government has put in place promotion procedures that stimulate SMEs growth. A majority reported that to a great extent, either the government's control on the usage of ICT innovations in the country influence the growth of SMEs industry or regulations on the incentives given to ICT SMEs by the government influence their growth (mean = 3.9).

It was reported that to a great extent the government has put in place effective policies and regulations that promotes the growth of SMEs (mean =3.7). Further, to a great extent, ICT SMEs growth was dependent on ICT innovators' capacity to comply with government policies and regulations (mean =

3.6). Moreover, to a moderate extent issuance of ICT licenses by relevant government bodies poses a challenge to the growth of SaaS SMEs in Nairobi City County (mean = 3.2).

Table 4.5 Descriptive Analysis on Regulation

	n=100 (Percentage)					Mean	Std. Dev
	1	2	3	4	5		
The government has put in place effective policies and regulations that promote the growth of ICT SMEs	3	15	17	36	29	3.7	1.1
The government has put in place promotion procedures that stimulate the growth of ICT SMEs	4	7	14	39	36	4.0	1.1
Issuance of ICT licenses by the relevant government bodies is a major challenge affecting the growth of SMEs	8	18	35	21	18	3.2	1.2
The government's control on the usage of ICT innovations in the country influence the growth of SMEs in the industry	5	7	16	36	36	3.9	1.1
Regulations on the incentives given to ICT SMEs by the government influence their growth	15	11	10	35	29	3.9	1.4
ICT innovators' capacity to comply with government policies and regulations	5	11	21	48	15	3.6	1.0
Taxation policies in Kenya should be aligned to ICT services demand	3	9	7	28	53	4.2	1.1
It is easy to access business licenses from the Government	7	8	13	30	42	3.9	1.2
Overall average						3.8	1.2

**1- Not at all, 2-Little extent, 3- Moderate Extent, 4- Great extent, 5-Very great extent.*

4.3.4 Descriptive Analysis on Technology Changes

The fourth objective of the study examined the effect of technology changes on growth of SMEs in Nairobi City County. Respondents rating on a five-point Likert scale was sought ranging from 1- Not at all, 2-Little extent, 3- Moderate extent, 4- Great extent and 5- Very great extent. Descriptive statistics was adopted for data analysis. Findings in Table 4.6 indicate that to a great extent technology changes have an effect on the growth of SMEs in Nairobi City County (mean = 3.9). A majority (mean = 4.4), reported that to a great extent compatibility of their processes with their clients have improved. To a great extent changes in technology that may render it obsolete have an effect on SMEs growth (mean = 4.1). It was reported that either (mean = 3.9) technology-based operations of their

firm have improved interaction with customers or their business operating costs have become manageable to stimulate SMEs growth.

Table 4.6 Descriptive Analysis on Technology Changes

	n=100					Mean	Std. Dev
	1	2	3	4	5		
Compatibility of our processes with clients has improved	8	9	16	32	36	4.4	1.1
The adoption of technology-based operations has enabled the firm to diversify its product offering	5	8	12	40	35	3.6	1.1
Technology-based operations of the firm have improved our interaction with customers	9	10	15	40	26	3.9	1.2
The innovational capability of the firm has been enhanced through the adoption of technology	8	9	10	37	36	3.8	1.2
The cost-of-service delivery has become manageable and hence making our pricing competitive	7	8	5	52	28	3.9	1.1
Changes in technology can render software products obsolete	5	5	5	47	38	4.1	1.3
The is a short product life cycle of our products due to changes in Technology	10	5	5	43	37	3.7	1.2
Overall average						3.9	1.2

**1- Not at all, 2-Little extent, 3- Moderate Extent, 4- Great extent, 5-Very great extent.*

4.3.5 Descriptive Analysis on Growth of SMEs

An evaluation on the extent of SMEs growth was evaluated on a five-point Likert scale. Descriptive statistics was used for data analysis. Findings in Table 4.7 indicate that majority (mean = 4.2) reported that either their product range has increased over the past five years or revenue of their firm has been increasing over a period of time. Further, a majority (mean = 4.0) reported that either to a great extent the risk exposure to their firm has declined or their SMEs have increased value addition process. To a large extent, the number of customers has increased in the last five years (mean = 3.7).

Table 4.7 Descriptive Analysis on Growth of SMEs

	n=100					Mean	Std. Dev
	1	2	3	4	5		
The number of customers has increased in the last five years	6	12	8	47	27	3.7	1.4
The firm's product range has increased in the last five years	2	4	11	35	48	4.2	0.9
The revenues of the firm have been increasing over the period	1	7	10	40	42	4.2	0.9
The risk exposure to the firm's operations has declined	5	3	14	40	38	4.0	1.0
The firm has increased its value addition process	6	7	10	33	44	4.0	1.2
The firm's profitability position has improved over the last five years	4	17	25	31	23	3.5	1.1
The firm has expanded its volume of business	6	15	18	29	32	3.7	1.2
The quality of the firm's products has improved	14	14	5	40	29	3.9	1.3
Overall average						3.9	1.1

**1- Not at all, 2-Little extent, 3- Moderate Extent, 4- Great extent, 5-Very great extent.*

4.4 Correlation Analysis

Correlation analysis was used to examine the strength of the effect of management skills, competition, regulation and technology changes on growth of SMEs in Nairobi City County. Findings in Table 4.8 indicates that there was positive and significant effect of Management skills on growth of SMEs ($\rho = 0.860$, $p\text{-value} < 0.05$), Competition has positive effect on growth of SMEs ($\rho = 0.846$, $p\text{-value} < 0.05$), Regulation has positive effect on growth of SMEs ($\rho = 0.825$, $p\text{-value} < 0.05$) and Technology changes has a positive effect on growth of SMEs ($\rho = 0.798$, $p\text{-value} < 0.05$). Ranking of the contribution of independent variables on the growth of SMEs indicates that management skills have the highest effect, followed by competition, regulation and technology changes.

Table 4.8 Correlation Analysis

		Growth	Management Skills	Competition	Regulation	Technology changes
Growth	Pearson					
	Correlation	1	.860**	.846**	.825**	.798**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000
	N		100	100	100	100
Management Skills	Pearson					
	Correlation		1	.112**	.098**	.617**
	Sig. (2-tailed)			0.000	0.000	0.000
	N			100	100	100
Competition	Pearson					
	Correlation			1	.078**	.577**
	Sig. (2-tailed)				0.000	0.000
	N				100	100
Regulation	Pearson					
	Correlation				1	.277**
	Sig. (2-tailed)					0.000
	N					100
Technology changes	Pearson					
	Correlation					1

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

4.5 Regression Analysis

Multiple regression analysis evaluated the effect of management skills, competition, regulation and technology changes. Regression analysis was based on linearity, normality and multicollinearity assumptions.

4.5.1 Linearity Test

Pictorial presentation in Figure 4.5 indicates that there was a positive effect of management skills on the growth of SMEs in Nairobi City County. Competition has a positive effect on growth of SMEs in Nairobi City County. Thirdly, there is a positive effect of regulation and technology changes on the growth of SMEs in Nairobi County.

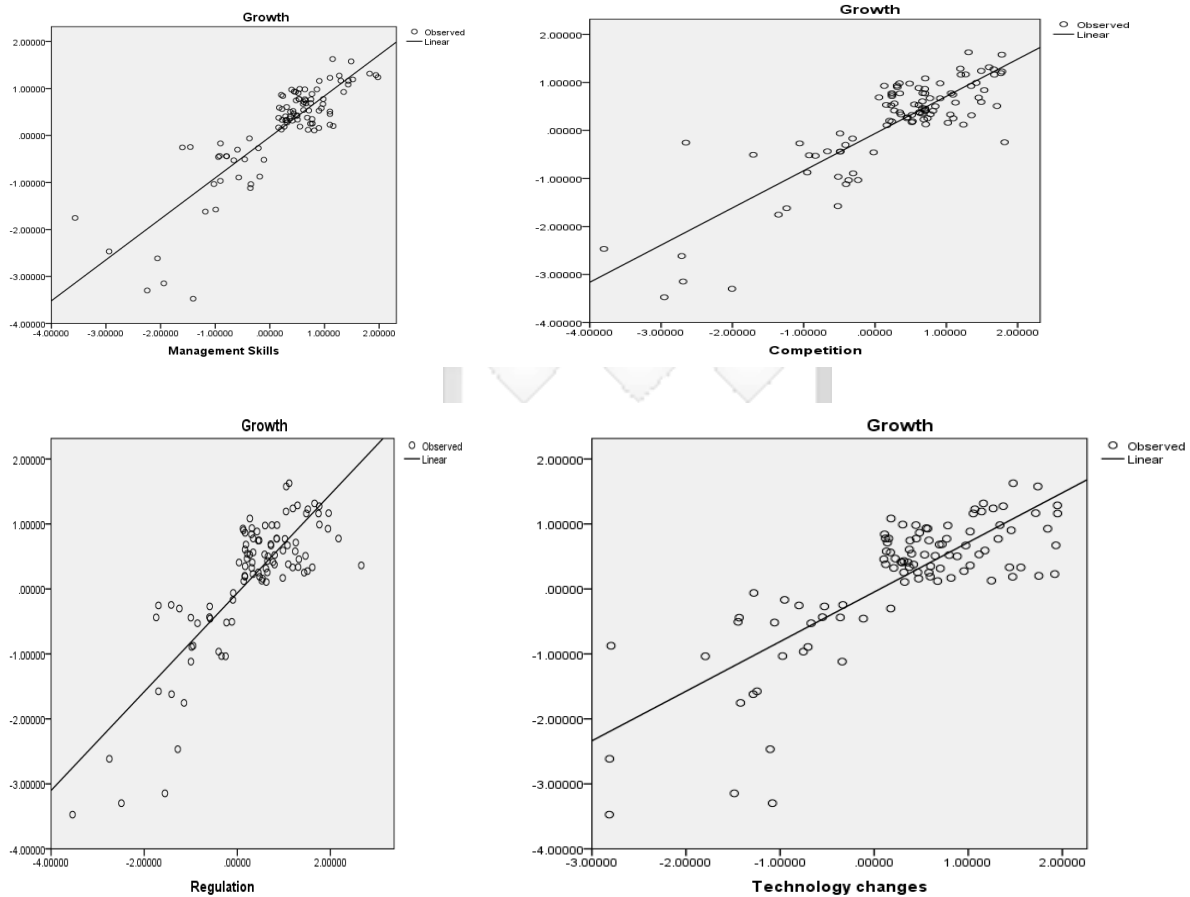


Figure 4.5 Linearity Test

4.5.2 Normality Test

Normality was examined through the use of a histogram. Findings in Figure 4.6, indicate that the data was normally distributed since the mean was zero and standard deviation 1.

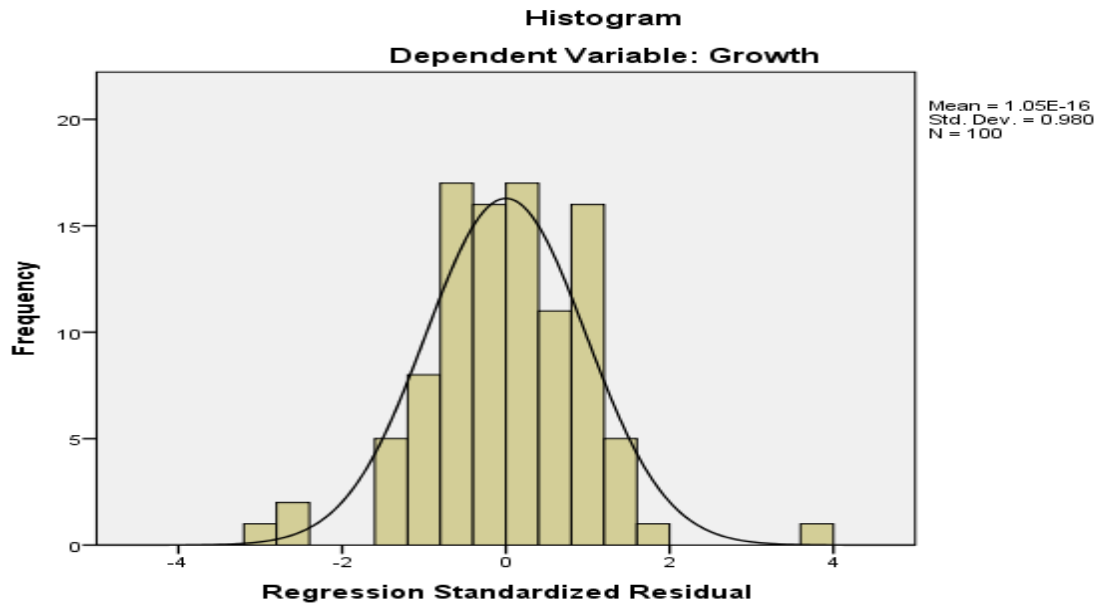


Figure 4.6 Normality Test

4.5.3 Multicollinearity

Multicollinearity was examined using tolerance limits and variance inflation factors. Findings in Table 4.9 indicate that there was no high correlation between management skills, competition, regulation and technology changes since none of VIF was greater than 10.

Table 4.9 Multicollinearity

	Collinearity Statistics	
	Tolerance	VIF
Management Skills	0.257	3.896
Competition	0.274	3.643
Regulation	0.278	3.593
Technology changes	0.325	3.076

4.5.4 Regression Coefficients

In this model, an R squared of 0.739, indicates that 73.9% of changes in the growth of ICT SMEs can be accounted for by management skills while the remaining proportion is associated with other aspects excluded in the model. Management skills has positive and significant effect on growth of ICT SMEs ($\beta = 0.872$, $p\text{-value} < 0.05$). In model 2, an R squared of 0.716, indicates that 71.6% of changes in the growth of ICT SMEs can be explained by competition. Further, there was a positive

and significant effect of competition on the growth of ICT SMEs ($\beta = 0.774$, $p\text{-value} < 0.05$). In model 3, 68.1% of changes of growth in ICT SMEs can be accounted for by regulation. Moreover, regulation have positive and significant effect on growth of ICT SMEs ($\beta = 0.76$, $p\text{-value} < 0.05$). in the fourth model, an R squared of 63.6% indicates that 63.6% of changes in the growth of ICT SMEs can be accounted for by technology changes while the remaining percentage is associated with other factors excluded in the model.

Model summary in model 5 has an R squared of 0.834, this shows that 83.4% of changes in the growth of SMEs can be explained by technology changes, competition, regulation and management skills while the remaining percentage can be accounted for by other attributes excluded in the model. Analysis of variance findings indicates that technology changes, competition, regulation and management skills have a joint significant effect on the growth of SMEs in Nairobi City County ($F= 119.429$, $p\text{-value} < 0.05$). Regression coefficient findings in model 5 indicate that there was a positive and significant effect of management skills on the growth of SMEs ($\beta = 0.341$, $p\text{-value} < 0.05$). This implies that unit increase in management skills while holding constant competition, regulation and technology changes. Competition has positive and significant effect on growth of SMEs ($\beta = 0.264$, $p\text{-value} < 0.05$). This implies that an increase in competition while holding constant management skills, regulation and technology changes constant. Regulation has positive and significant effect on growth of SMEs ($\beta = 0.187$, $p\text{-value} < 0.05$). This implies that unit increase in regulation while holding constant management skills, competition and technology changes constant. Technology changes have positive and significant effect on growth of SMEs ($\beta = 0.159$, $p\text{-value} < 0.05$). This implies that unit increase in technology changes while holding constant management skills, competition and regulation increase growth of SMEs by 0.159 units. The resultant multiple regression equation for the study is:

$$\text{Growth} = -0.092 + 0.341 * \text{Management skills} + 0.264 * \text{Competition} + 0.187 * \text{Regulation} + 0.159 * \text{Technology changes}.$$

Table 4.10 Regression Coefficients

Dependent Variable	Growth				
Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	-0.03 (0.053)	-0.064 (0.056)	-0.063 (0.059)	-0.047 (0.063)	-0.092 (0.044)
Management skills	0.872** (0.052)				0.341** (0.084)
Competition		0.774** (0.049)			0.264** (0.073)
Regulation			0.76** (0.052)		0.187** (0.073)
Technology changes				0.764** (0.058)	0.159** (0.07)
R	0.86	0.846	0.825	0.798	0.913
R Square	0.739	0.716	0.681	0.636	0.834
Adjusted R Square	0.737	0.713	0.678	0.633	0.827
F	277.869**	247.429**	209.474**	171.481**	119.429**

From the descriptive findings it can be deduced that a majority reported that to a great extent management skills, competition, regulation and technology changes have an effect on the growth of ICT SaaS. Correlation and regression analysis indicated a positive and significant effect of management skills, competition, regulation and technology changes on growth. Further, the most significant factor was management skills, followed by competition, regulation and technology changes.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter summary of major findings, discussions with past empirical findings, conclusions and recommendations drawn from the major findings will be presented.

5.2 Discussion

The main objective of the study was to determine factors affecting growth of small and medium information and communication technology enterprises in Nairobi City, County. Specifically, the study examined the effect of management skills, competition, regulation and technology changes on growth of small and medium information and communication technology enterprises in Nairobi City County. The study was based on resource-based theory, porters five forces model, public interest theory and diffusion of innovation theory. The study adopted a descriptive research design and primary data was collected through the administration of questionnaires. Descriptive and inferential statistics were used to analyze the data. Study findings indicate that majority agreed that management skills, competition, regulation and technology changes have an effect on growth of small and medium information and communication technology enterprises in Nairobi City, County.

5.2.1 Effect of Management Skills on Growth of ICT SMEs

The first research question sought to determine the effect of management skills on growth of ICT SMEs in Nairobi City County. Correlation and regression analysis indicated that management skills have a positive and significant effect on growth of ICT SMEs in Nairobi City County. The study findings are in support of Popescue *et al.*, (2020) who documented that the sustainability of SMEs in Romania was dependent on interpersonal skills, emotional intelligence and self-awareness. The trio attributes have a significant contribution to the state of psychosocial wellbeing that influences employee performance and motivation. The results also concur with Muthoni (2013) who documented positive contribution of capacity building on the performance of women enterprises in Gikomba market. Further, the results mirrored Omolo (2015) who supported the need for training and development so as to enhance performance of SMEs. The success of training and development

programs was attributed to employee needs assessment. In line with Mbogo (2011) there is need for provision of accounting management skills so as to enhance growth of SMEs.

Further, the study concurred with Woldie *et al.*, (2008) who reported that performance of SMEs in Nigeria was contingent on education qualifications, business venture motivation and management skills. Moreover, the study supports Kamunge *et al.*, (2014) who documented that performance of SMEs was dependent on access to business information, infrastructure and managerial. In line with the resource-based view, the study supports the need for the acquisition of skills that would lead to a firm's capacity to enjoy competitive advantage. This would be possible if SMEs can identify, accumulate intrinsic and extrinsic resources. Further, the results are in support of the resource-based view that alludes that an organization's performance is contingent on tangible and intangible resources endowment. In the current findings, a firm's access to financial, leadership, human capital and governance would stimulate its tangible and intangible resources endowment that may ultimately enhance performance. Furthermore, Machironi (2012) sensitized the need to embrace networking to ease of accessing finance.

According to Cuervo *et al.*, (2007), the role of an entrepreneurial leader is to create business. Management of any business determines its success or failure. Entrepreneurial leaders can be analyzed in two levels; environmental aspects and individually, whereby psychological features and non-psychological features together with social factors are analyzed. The environmental analysis includes economic aspects, financial and fiscal policies, and subsidies available for small and medium enterprises. Environmental aspects could also be analyzed from the legal dimension which comprises licensing, time and cost of registering a new firm amongst others. It also analyzes the social and non-psychological factors like education, training, family, networks, etc.

Since entrepreneurship plays a very vital role in the growth and development of a country's economy, the establishment and success of small and medium enterprises are important (Altinay, 2005; Goedhuys & Sleuwaegen, 2008). Good management skills are the determinant of the success of an entrepreneur (Yusuf, 2015). In a study carried out in Jamaica by Huck and McEwen (2011), it was realized that three management skills determine the success of entrepreneurs. These skills were; efficient administration, marketing/ sales activities and careful planning and budgeting.

The behavior of the management can be used to predict the success or failure of entrepreneurship (Drucker, 1985). Lorrain and Dussault (2008) also found out that the behaviors and skills of successful entrepreneurs are different from those of unsuccessful entrepreneurs. As Neshamba (2000) found out, other than experience, the acquired skills at work are also important for the growth of a small enterprise. The management must be very proactive and as Apostilidis (1997) found out, there are some characteristics that the management should have to be successful in their operations. They must also design an attractive product range, they must be prepared to gain the market share that is in accordance with the firm's size, they must source sufficient capital and must create a master plan for the growth of the firm.

5.2.2 Effect of Competition on Growth of ICT SMEs

The second objective of the study determined the effect of competition on growth of ICT SMEs. The study found a positive and significant effect of competition on growth of ICT SMEs in Nairobi City County. The results were in support of porters five forces model that argues in favour of an organization adopting measures aimed at achieving competitive advantage. Increased bargaining power of customers may trigger creativity and innovation to respond to customers' demands. Availability of substitutes would enhance production efficiency in respective SMEs that would ultimately stimulate performance. The study concurred with Idris and Primiana (2011) who reported that competitive and partnership strategies amplify performance of SMEs. Further, the study supports Kraja and Osmani (2013) who documented the positive effect of competitive advantage on performance of SMEs in Albania. Similar findings were documented by Kaunyagi (2014) who found competition positively affected performance of telecommunication firms in Kenya.

According to Karnani (2007), the number of technology-based SMEs is growing by the day due to the demand in the market. The success or failure of SMEs depends on their competitiveness. Having a competitive advantage means that a business entity is able to undertake something much better than its competitors. Competitive advantage is when a company can create software that cannot be made by competitors or is desired by the competitors. In order for any business to survive, it must have a competitive advantage and in order for a business to have a competitive advantage, it must have a competitive strategy. Facing competition from similar firms offering similar services calls for a high level of innovation to get an edge against the competitors. The competitiveness of organizations is no longer physical but rather knowledge and creativity (Wong &Aspinwall, 2005). Competitive edge

can be an effect of the organization's choice of strategy. Porter, (1986) conceptualized three strategies that can be used by firms to gain a competitive advantage, these include cost leadership, differentiation and focus. To beat other companies at the market share, the company must be able to provide services that are much more affordable than its competitors, with the same quality.

When it comes to software business, a firm must strive to satisfy customers because the ICT industry is very competitive and many software engineers can develop something close to what a firm has. Clients' loyalty goes a long way in helping the firm cope with the competition. All clients want good technological service providers who are able to deliver on their specific demands. When a company offers tailored software products in the market, it automatically gains a competitive advantage. Clients on the other hand know that committing themselves to one service provider is important for their growth, consistency and stability. The findings support Porters five forces model since threats from potential, suppliers bargaining power, buyers bargaining power, pressure of substitute products and rivalry from competitors. Courtesy, of these forces SaaS SMEs should embrace measures that would mitigate against threats of new entrants, competitive rivalry and substitutes of goods and services. Moreover, there is need for management of power of buyers through client's relationship management and ultimately optimize organization performance.

5.2.3 Effect of Regulation on Growth of ICT SMEs

The third objective of the study examined the effect of regulation on growth of ICT firms in Nairobi City County. Study findings indicated that there was a positive and significant effect of regulation on growth of ICT SMEs in Nairobi County. The findings are in support of Yongqiang (2014) who reported a positive significant effect of regulations on the performance of SMEs in Australia. Also, the study confirmed Nabintu (2013) who reported that the performance of SMEs was positively affected by information access and regulations. The study contradicted Oludele and Emilie (2012) who documented an inverse relationship between regulations and the performance of SMEs. Similarly, the study contradicted Mbugua and Moronge (2016) who found the inverse effect of taxation and licensing on the performance of SMEs in Kiambu County.

Since the development and expansion of various technologies by different countries, the biggest challenge to the vendors has been the protection of copyrights (Okoto, 2010). As a result of this challenge innovators came up with the licensing of software whereby the buyer was obligated to keep

the software confidential, and because of this, some courts held that some computer software could retain their trade secret status. Copyright is the most suitable mode of legal protection for computer programs and software. Patent and trade secrets have traditionally been associated with the protection of utilitarian works (Munell, 2008).

Kenya's Copyright Act recognizes computer software and programs as a proper subject matter of copyright protection (TCA, 2001). Prior to 1st May 2002, Kenyan law then governing grant and protection of patent expressly excluded computer programs from the scope of patent protection (The Industrial Property Act 2010). The 2001 statute does not include computer programs among unpatentable inventions (The Industrial Property Act, 2001). It is therefore arguable that computer programs and software are now a proper subject matter of patent protection in Kenya subject to the patentable invention satisfying the statutory prerequisites for protection which include novelty, inventive step and industrial applicability.

According to Okoto (2010), competition obligations require the relevant institutions to secure appropriate behaviors amongst service providers in the marketplace. The regulatory authorities oblige efficient tools to create the requisite enabling environment for antagonism in the ICT industry. In this linkage, there is a need for the setting of relevant legislations and the building of a formidable institution to regulate economic interactions amongst service providers in the ICT industry. The enactment of ICT laws by states is imperative, considering the local and global certainties. Effective ICT laws will assist operators and government in forming clear, minimum safeguards and security measures to defend privacy concerns in E-commerce, communication services, and networks as well as web-based applications, transactions, and social network sites. These laws in turn influence the growth of firms in the industry (Son, 2011).

5.2.4 Effect of Technology Changes and Growth of ICT SMEs

The fourth objective of the study documented a positive and significant effect of technology changes on growth of ICT SMEs in Nairobi County. These findings were in support of Gathogo and Ragui (2014) who reported a positive effect of capital and technology on SMEs performance. Further, the study supported Bozic and Sonja (2005) who documented a positive effect of technology adoption on the performance of SMEs in Croatia. Moreover, the study supported Walobwa *et al.*, (2013) who reported a positive significant effect of strategic innovations on the performance of SMEs.

Small and medium enterprises in the ICT industry that have invested more in sophisticated technology are likely to grow faster. The rapid growth of an enterprise is mostly related to the introduction of new products (Kinsella *et al*, 2013). A few years back, the major condition was whether the technology was available or how high or low it was. Nowadays the issue is about the rapid change that is being experienced in technology (Pearce and Robinson, 2007). Pearce and Robinson (2007) observed that a change in technology and innovation can have a sudden dramatic effect on a firm that is operating in the ICT industry. Technological innovation can affect a firm positively whereby it could open up new markets and other opportunities or it could also affect the firm negatively by rendering a firm's services or products obsolete.

Phillips and Kirchhoff (2008) assert that for a firm to survive in the ever-changing environment, it is important for it to understand the existing technology and also be able to predict future technological advancements, changes and innovations. This helps will help a firm to prepare for new markets in case of an opening due to technology change or the impending challenges which may occur. The survival of business entities especially those that operate in the ICT industry could depend on how they respond to the changes in technology. Those enterprises that position themselves well benefit from the changes in technology whereas those that are resistant to these changes often face challenges and most of them become obsolete hence collapsing (Jordan & Segelod, 2006).

As noted by Garcia and Calantone (2002) the pace at which technology is evolving, sometimes makes it hard for firms dealing in software products to handle some specific projects. This prompts the firms to keep on sharpening the skills of their key human resources to sustain operations and hence growth. According to Pearce and Robinson, (2007), as technology keeps on changing, it comes with new easier ways of developing software products that do not require high expertise. Most of these new technologies however do not stay for long in the market and are always replaced by other newer models.

5.3 Conclusion

Since management skills have a positive and significant effect on growth of ICT SMEs in Nairobi City County. It can be concluded that there is need for managers of SMEs to enhance their accounting skills. There is need for optimization of resources allocation through budgetary procedures. The management of respective SMEs should develop procedures for equipping their employees with entrepreneurial skills and knowledge management. Management skills can be developed through training on financial management, leadership, human resources management and governance structure. Positive and significant effect of management skills on growth of SaaS SMEs in Nairobi. This indicates the adoption of finance skills, leadership skills, human capital skills and governance skills. Through, development of skills SaaS SMEs would optimize value generation of finance, leadership, human capital and governance.

Secondly, there was a positive and significant effect of competition on growth of SMEs. Hence, the cost of related products, competitive innovation and increase of foreign entrants has an effect on growth of ICT SMEs in Nairobi County. Further, an increase in competition increases growth of SMEs. Enhanced competitiveness would aid ICT SMEs in the management of threats of new entrants, competitive rivalry, availability of substitutes. Thus, it can be concluded that there is need for ICT SMEs to develop products that would enhance suppliers' bargaining power and minimize odds of consumer bargaining power. ICT should invest in measures aimed at responding to competition from foreign entrants. A positive and significant effect of competition on growth of SaaS SMEs in Nairobi indicates that threats of new entrants, competitive rivalry, substitute service and goods and power of buyers have a significant contribution on growth of SaaS SMEs in Nairobi Kenya.

Thirdly there was a positive and significant effect of regulation on growth of ICT SMEs in Nairobi County. Hence, an increase in regulation positively affects growth of SMEs. Consequently, there is need for the adoption of regulations that would support the growth of SMEs. There is need for ICT SMEs to participate in taxation policies development and licensing procedures regulations to optimize benefits to be accrued from them. Moreover, there is need for the development of awareness of the ICT Act and copyrights and patenting of ICT products. A positive and significant effect of regulation on growth of SaaS SMEs in Nairobi County, Kenya indicates that taxation, licensing, patents and

copyrights and the information communication and technology act has a significant contribution on growth of SaaS in Kenya.

Finally, there was a positive and significant effect of technology changes on growth of SMEs. Hence, there is need for the adoption of measures and strategies geared towards innovative development of soft wares that can be easily be used by target users with minimum assistance from software developers. Moreover, software developers should be innovative and continuously engage in research and development to respond to end users' needs as they arise. A positive and significant effect of technological changes and growth of SaaS SMEs in Nairobi County indicates that SaaS SMEs in Nairobi County were responsive to technological advancement thus they attained competitive advantages.

5.4 Recommendations

Since management skills have a positive and significant effect on growth of ICT SMEs. The study recommends that the management should develop efforts aimed at enhancing the quality of accounting and bookkeeping. Budgetary procedures can be enhanced through training on appropriate strategies that would optimize resources allocation. Alternative forums and workshops on entrepreneurship should be held. Through these forums' management skills would be improved. Further, there is need for the development of employees training and development forums that would develop human capital and strategic management skills. A positive significant contribution of management skills on growth of SaaS SMEs indicates that there is need for enhancement of accounting and bookkeeping skills and deployment of budgetary model in the management of financial and non-financial resources. Further, the management within these SMEs should diversify their financial management skills portfolio by hiring employees with heterogeneous skills. Furthermore, there is need for the adoption of strategic planning approach to optimize on achievement of firm goals.

The second objective of the study documented a positive and significant effect of competition on growth of ICT SMEs in Nairobi County. Hence, the management of ICT firms should develop measures aimed at examining cost-saving strategies. Respective ICT SMEs should be innovative to respond to the intense competition facing them. To be innovative and creative in product development, ICT SMEs should have budgetary allocation for research and laboratories for

simulating innovation prototypes. A positive and significant contribution of competition on growth of SaaS SMEs calls for the adoption of pricing strategies that would minimize input costs. This may be achievable through the intensification of research and development of products that would aid in responding to firm-specific needs. Due to globalization and the penetration of digital marketing, there is need for SaaS SMEs to develop measures that may minimize the odds of market share cannibalization.

The third objective of the study indicated a positive and significant effect of regulation on growth of ICT SMEs. Then it can be recommended that the government should put in place effective policies that promote ICT growth. Government should develop policies that are aimed at developing promotion procedures that would stimulate ICT growth. There is need for alleviation of hurdles that may hinder access to ICT product licenses to stimulate innovation. The government control policies should not be retrogressive. This may pose a threat to growth of local enterprises. Further, taxation policies should not be adopted as strategic tools for hindering ICT innovation. Since regulations have a positive and significant effect on SaaS SMEs growth. There is need for the development of government policies and regulations that stimulates growth among SaaS. The government ought to ease the process of licensing through the adoption of electronic-based process for licensing and fees collection. Moreover, taxation policies adopted in Kenya should be dynamic to market changes.

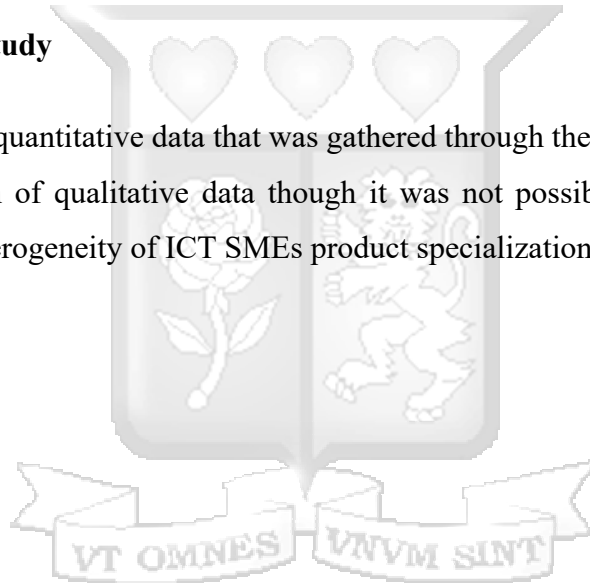
The fourth objective found that there was a positive and significant effect of technology changes on growth of ICT SMEs. There is need for SMEs to respond to technological changes swiftly. This would be possible if their research and development department is engaged in continuous product improvement. ICT SMEs should develop heterogeneous products to respond to the needs of their client bases and expand their market share. There is need for the adoption of ICT as a cost minimization strategy. Moreover, the adoption of creative product development would lead to optimal management of production costs and maximization of revenue and profit. A positive and significant contribution of technology on the growth of SaaS SMEs indicates that technology is compatible with client needs. Firms should continuously embrace technology that enhances their product diversification. To enhance customer relationship management there is need for the development of technology-based innovations. Furthermore, SaaS SMEs should embrace technological development as cost management strategies.

5.5 Suggestions of Further Studies

Based on the study findings, there is need for subsequent studies to examine critical success factors that affects the performance of SMEs in different sectors. This would aid in a comparative examination on the effect of management skills, competition, regulation and technology changes. Future, studies may consider adopting structural equation modeling to examine the contribution effect of each attribute of independent variables as well as other factors that may have an effect on growth of ICT SMEs. The study limited its respondents to those ICT SMEs hailing from Nairobi County subsequent studies may consider drawing respondents from other continues to compare the current findings with others.

5.6 Limitations of the Study

The study relied only on quantitative data that was gathered through the use of questionnaires. There is need for incorporation of qualitative data though it was not possible to carry out focus group discussion due to the heterogeneity of ICT SMEs product specialization.



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APPENDICES

Appendix I: Introduction Letter

I am a Masters student at Strathmore University Business School, undertaking a Research on **“CRITICAL FACTORS THAT INFLUENCE GROWTH OF TECHNOLOGY-BASED SMALLA AND MEDIUM ENTERPRISES: CASE OF SOFTWARE AS SERVICE PROVIDERS IN NAIROBI, KENYA”**. I kindly, request to collect your opinions on factors that affect the profitability of female owned enterprises. Please note that your participation in this study is purely voluntary and highly valued and you will therefore not be coerced to participate. The responses you give are extremely private and confidential and will only be used for purposes of this study and not be shared with any other party. Your anonymity and confidentiality will be strictly protected no individual information will be collected without your consent. It will take you about ten minutes to complete this questionnaire.

Thank you for your participation.

Kind Regards,
Mark Mwongela Ngungi
MBA-81973



Appendix II: Questionnaire

This questionnaire is designed to gather information on the critical success factor affecting the growth of SMEs in the ICT industry in Kenya (SaaS) in Kenya and is purely for academic purposes only. Kindly provide information to all items in the questionnaire by putting a tick (✓) on one of the options. For questions that require your own opinion, fill in the blanks. (.....)

SECTION A: GENERAL INFORMATION AND BIO DATA

1. Name of the Technology based SME (Optional)
2. How many employees are there in your company?
 - a) Less than 10 []
 - b) 11 – 50 []
 - c) 51- 100 []
 - d) Above 101 []
3. Type of Business Ownership
 - a) Self-owned and self-run []
 - b) Self-owned and family-run []
 - c) Self-owned/employee run []
 - d) Third party owned and employees run []
4. For how long has your firm been in operation?
 - a) 0-3 years []
 - b) 4-7 years []
 - c) 8-11 years []
 - d) 12 years and above []
5. What is your annual turnover (Kenya Shillings)
 - a) Less than 1 Million []
 - b) 1 – 5 Million []
 - c) 5 - 10 Million []
 - d) Over 10 Million []
6. Where is your target market?
 - a) Locally - Kenya []
 - b) Locally - East Africa []
 - c) Internationally – Outside E. Africa []

SECTION B: CRITICAL FACTORS AFFECTING TECHNOLOGY BASED SMEs

7. In your opinion, to what extent do you agree with the following statement relating to competition affect the growth of SMEs in the ICT industry? (Tick, as appropriate)

5= Very Great Extent; 4= Great Extent; 3=Moderate Extent;
2= Little Extent 1=Not at All

a) Management Skills

Statement	5	4	3	2	1
The management have strived efforts aimed at developing accounting and book keeping skills					
The management have developed budgetary procedures aimed managing resources allocation					
The management of the firm have the requisite entrepreneurial skills to guide the company					
The top management have a diverse experience in different fields to guide the organization growth					
The knowledge acquisition process is well explained in firm					
The management have an educational advance background					
The top management have a diverse functional diverse background					
The management facilitate strategic changes to align its activities to the market demands					

b) Competition

Statement	5	4	3	2	1
The costs of related software products influence the growth of SaaS					
Competition between ICT innovation firms themselves is intense hence affecting the growth of business in the industry					
The market size of ICT products is flooded with cheap foreign and online products affecting the growth of local SMEs in the ICT industry					

Most start-ups in the ICT industry have no competitive advantage					
There has been an increase in foreign entrants in the local market from foreign countries					

c) Regulation

Statement	5	4	3	2	1
The government has put in place effective policies and regulations that promote the growth of ICT SMEs					
Issuance of ICT licenses by the relevant government bodies is a major challenge affecting the growth of SMEs					
Government's control on the usage of ICT innovations in the country influence the growth of SMEs in the industry					
Regulations on the incentives given to ICT SMEs by the government influence their growth					
ICT innovators' capacity to comply with government policies and regulations					
Taxation policies in Kenya should be aligned to ICT services demand					
It is easy to access business licenses from the Government					

d) Changes in Technology

Statement	5	4	3	2	1
Compatibility of our processes with clients has improved					
The adoption of technology-based operations has enabled the firm to diversify its product offering					
Technology based operations of the firm has improved our interaction with customers					
Innovational capability of the firm has been enhanced through the adoption of technology					

The cost-of-service delivery has become manageable and hence making our pricing competitive					
Changes in technology can render software products obsolete					
The is a short product life cycle of our products due to changes in Technology					

SECTION C: Influence of the independent variables on Growth of Technology Based Service Organization

8.) To what extent does efficiency of mobile banking affect the performance of your bank?

- 5-Very great extent [] 4-Great extent []
 3-Moderate extent [] 2-Little extent [] 1-No extent []

Statement	5	4	3	2	1
The number of customers has increased in the last five years					
The firm's product range has increased in the last five years					
The revenues of the firm have been increasing over the period					
The risk exposure to the firm's operations has declined					
The firm has increased its value addition process					
The firm's profitability position has improved over the last five years					
The firm has expanded its volume of business					
The quality of the firm's products has improved					


THANK YOU SO MUCH FOR YOUR TIME

Appendix III: NACOSTI Permit

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION
REPUBLIC OF KENYA

Ref No: 706746

RESEARCH LICENSE




This is to Certify that Mr.. Mark Ngungi Mwongela of Strathmore University, has been licensed to conduct research in Nairobi on the topic: Analysis of Critical Factors Influencing Growth for Technology-Based SMEs: Case of Software as Service Providers for the period ending : 01/October/2022.

License No: NACOSTI/P/21/13270

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Appendix IV: Starthmore University Ethical Approval



23rd September 2021

Mr Mwangela Mark,
mark.mwangela@gmail.com

Dear Mr Mwangela,

RE: Analysis of Critical Factors Influencing Growth for Technology-Based SMEs: Case of Software as Service Providers

This is to inform you that SU-IERC has reviewed and **approved** your above **SU- master's** research proposal. Your application reference number is **SU-IERC1166/21**. The approval period is **23rd September 2021 to 22nd September 2022**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MTA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 48 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 48 hours
 - v. Clearance for export of biological specimens must be obtained from relevant institutions.
 - vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
 - vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke/> and also obtain other clearances needed

Yours sincerely,

for: Dr Virginia Gichuru,
Secretary; SU-IERC

Cc: Prof Fred Were, Chairperson; SU-IERC

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