

**MANAGEMENT INFORMATION SYSTEM INTEGRATION AND
PERFORMANCE OF SMALL AND MEDIUM ENTERPRISES IN EMBU
COUNTY, KENYA**

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DECLARATION

This study is my original work and has not been presented to any other University for the award of a degree.

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DEDICATION

I dedicate this research project to my family for their inspiration and moral encouragement during the time of undertaking this research work.

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ABSTRACT

Firms need to use of Information Systems (IS) in order to increase efficiency of operations within the enterprise. Survival of businesses to beat competition depends on their ability to use information systems. Those SMEs that use information systems are able to compete with their rivals in larger firms. Information systems allow SMEs to cut down costs, make better products and offer quality service to customers. SMEs that have integrated information systems are able to cut down on cost and provide better services to customers. SMEs in developed economies have exploited the full benefits of information systems unlike those in developing countries like Kenya. This is so because of the slow development of information systems within SMEs in developing countries. There are a number of challenges experienced by SMEs in developing countries that impedes the adoption and use of information system. These challenges include; poor ICT infrastructure, lack of management support, inadequate user expertise and poor information storage. This study sought to investigate how these challenges affect performance of SMEs in Embu County, Kenya. The study targeted 250 SMEs with a total of 400 employees. Stratified random sampling was employed to select 80 employees from the target population. Primary data was collected using closed and open-ended structured questionnaires with reliability coefficient of 0.6 and above. Data was collected using drop and pick method. Data was analyzed using both descriptive and inferential statistics using SPSS 20. Descriptive analyses was done using frequencies, percentages, mean and standard deviation. Inferential analysis was based on multiple regression model. The study revealed that SMEs had adequate ICT infrastructure that enabled them to communicate easily; the management of the SMEs supported the firms by investing in IIS projects by providing necessary resources and training of staff; SMEs staff had adequate Skills and knowledge in ICT that allowed them to use ICT tools efficiently; Information systems within SMEs enabled the firms to communicate, store, access and share information easily with their stakeholders. The study concluded that ICT infrastructure, Management support, user expertise and information storage influenced performance of SMEs in Embu County. *The* study recommended that management of SMEs in Embu County should provide sufficient ICT infrastructure; provide training to their staff to acquire skills in ICT. The study also recommended that the government of Kenya should waive taxes on ICT gadgets to enable SMEs procure the devices at low cost.

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OPERATIONAL DEFINITION OF TERMS

Management information system	a system for gathering data, processing, storing, and Disseminating information to management to help them make concrete decisions
Small and Medium enterprise	an firm whose employees range between 5 to 99 persons.
Performance	a metric used to measure whether a firm has achieved its objectives.
SME performance:	A reflects the status of SME in relation to profitability, Productivity, market share and efficiency of the firm
ICT infrastructure:	technologies used to gather data, process, store and disseminate information
Management support:	assistance offered by the management to facilitate implementation of information systems
User expertise:	Skill, knowledge, experience, competency and training of staff involved in the operations of information systems
Information storage:	A process of gathering data, processing, storing and disseminating information to users

ABBREVIATIONS AND ACRONYMS

GDP	Gross Domestic Product
GoK	Government of Kenya
IS	Information System
MIS	Management Information System
SMEs	Small and Medium Enterprises
OECD	Organization for Economic Co-operation and Development
KNCCI	Kenya National Chamber of Commerce and Industry
IT	Information Technology
ICT	Information Communication Technology
KNBS	Kenya National Bureau of Statistics
ITU	International Trade Center

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Information and Communication Technology (ICT) has transformed ways of conducting businesses and many businesses across the world are investing heavily on ICT (Acquah, 2012). ICT allows countries to access global market and enjoy competitive advantage (Nkosana, Skinner, & Goodier, 2016). Adebayo et al. (2013) agrees that in today's globalized economy, ICT can change ways of conducting business operations enabling them enjoy competitive advantage (Adebayo, Baloguno, & Kareem, 2013). Noor & Alam (2009) assert that all businesses must embrace the use of ICT in order to make maximize benefits (Alam & Noor, 2009). The use of ICT is enabling businesses all over the globe to lower their cost, increase efficiency and offer better services to customers (Irefin, 2012) . Existing studies suggest that Small and Medium Enterprises are vital for the growth of economy of a country (Matambalya & Wolf, 2001), (Alam & Noor, 2009) , (Irefin, 2012), (Albar & Hoque, 2017), (Okundaye, 2016), (Asunka, 2016) , (Acquah, 2012) (Ashrafi & Murtaza, 2008) . SMEs provide opportunities for job creation thereby reducing poverty and promoting the growth of economy (Okundaye, 2016), (Apulu, 2012), (Emonena, 2018), (Adebayo et al., 2013). (Alam & Noor, 2009) alludes that SMEs account for over half all of businesses in developed economies such as United Kingdom. According to Acosta (2010), over 90 percent of business ventures in Europe are SMEs (Acosta, Conesa, & Colomo-Palacios, 2010). ICT can enhance business processes for SMEs enabling them to cut cost, enable them reach their customers faster, understand their needs and preferences and innovate their products to fit these needs. ICT is a pillar for economic development and many countries across the globe are pushing SMEs to invest in ICT (Asunka, 2016).

However, while SMEs in developed nations have experienced considerable growth in ICT, studies point to a slow rate of ICT uptake within SMEs in developing countries like Kenya (Ashrafi & Murtaza, 2008), (Chacko & Harris, 2011) , (Mwenda, 2018), (Alam & Noor, 2009) , (Okundaye, 2016), (Albar & Hoque, 2017), (Emonena, 2018) and according to Chacko and Harris (2011) SMEs are yet to enjoy the gains of ICT. To be able to obtain the

benefits of ICT SMEs have to invest in ICT in order to get connected with the global economy. Many SMEs in developing economies are yet to align themselves with the required level of ICT uptake unlike large firms. The slow rate of ICT uptake in SMEs in developing nations has made the lag behind in productivity and not able to bring enough returns for economic development of their countries (Chacko & Harris, 2011)

In African countries Small and Medium Enterprises (SMEs) have significant role in the growth of economy. Studies conducted in Zimbabwe, Ghana, Rwanda, Nigeria, Somalia, Botswana and South Africa indicate that SMEs act as a source of job creation and poverty reduction (Makiwa, 2018), (Modimogale & Kroeze), (Apulu, 2012), (Asunka, 2016), (Yusuf, 2013), (Pillay, 2016), (Acquah, 2012), (Ibrahim, 2014), (Akomea-Bonsu & Sampong, 2012). SMEs account for more than 90 percent of all businesses and employ 60 percent of workers in the continent (ITC, 2018). There is low utilization of ICT in Africa in comparison to developed nations such as United Kingdom (Chacko & Harris, 2011), (Makiwa, 2018). Rufai (2014) affirms that in Africa, SMEs can leverage the use of ICT in lowering cost, increasing productivity and efficiency in their firms. However, many studies reveal that the use of ICT within SMEs in African countries is low (Akomea-Bonsu & Sampong, 2012), (Acquah, 2012), (Pillay, 2016) , (Apulu, 2012) (Asunka, 2016), (Ibrahim, 2014), and therefore these firms are unable to cope with the global competition owing to the slow uptake of ICT (Apulu, 2012). SMEs in African countries are thus struggling to cope with competition owing to the slow uptake of ICT (Irefin, 2012), (Apulu, 2012), (Adebayo, 2013), (Yusuf, 2013), (Asunka, 2016).

Matambalya & Wolf (2001) note that in East African countries, small and medium enterprise (SME) are crucial to the growth and development of economy. The use of ICT can enable SMEs access to market information, enhance interactions with their customers, reduce production cost and increase efficiency. However Matambalya (2001) note that SMEs have not been able to take advantage of these opportunities unlike large firms. SMEs therefore have not been able to cope with competition due to the slow rate of ICT uptake (Matambalya & Wolf, 2001). Several other studies conducted in East African countries including Rwanda, Somalia, Uganda, Tanzania and Kenya also indicate that performance

of SMEs in this region falls short of expectations due to the rate of ICT uptake (Mwenda, 2018), (Ibrahim, 2014), (Bais, 2017) (Yusuf, 2013) , (Okello-Obura, 2007), (Masenge, 2014).

Small and medium Enterprises (SMEs) in Kenya play a key role job creation and economic growth of the country. According to (KNCCI, 2019), SMEs accounts for 98 percent of businesses and create more than 80 percent of jobs in the country. They contribute about 34 percent of GDP in the country. Embu County, a county in Kenya has 859 SMEs which act as a source of job creation and a key factor in development of economy in the County (Chege & Gichira, 2017). However, despite the role SMEs play in the growth of the economy, small and Medium Sized Enterprises (SMEs) in Kenya fall short of expectations and have not yielded much returns the economy (GoK, 2005).SMEs are faced with many challenges such as lack of access to the market, poor policies, lack of finances are (GoK, 2005), (KIPRA, 2006) which inhibit their performance and many collapse within the first stages of their operation (Nganu, 2018)

According to Apulu (2012), SMEs need to adopt and use ICT in order survive in a competitive economy (Apu, 2012). The government of Kenya also recognizes ICT as a key factor in driving the economy (ROK, 2019), and has taken various steps to transform Kenya into a digital society. To enable SMEs access the market, the government has installed a fibre optic broad-band cable to provide businesses with Internet connectivity. The government has also embraced the use of digital applications such as Mula, M-PESA, Pesapal and PesaLink to facilitate online transactions. The government is also investing highly to become a technological hub in Africa by the construction of the Konza digital city. This is aimed at allowing businesses to compete, access market and replace the traditional ways of doing businesses with modern methods such as e-commerce. This then would enable SMEs expand their market, lower transaction cost and produce quality products.

However, despite the much effort put by the government in promoting ICT, SMEs in Kenya are still constrained by lack of accessibility to markets, high transaction cost (GOK, 2005; KIPPRA, 2006), and production of low quality products(Macharia, 2009). Inaccessibility to market renders these SMEs to lack information on opportunities that are

available in the market. They suffer from market saturation as a result of overproduction as well as the dumping of imported cheaper commodities. Performance of SMEs therefore falls short of expectations due to the slow adoption of information systems (Mwenda, 2018).

The slow adoption of information systems is attributed to a number of challenges that include poor ICT infrastructure, poor management support, inadequate user expertise and poor information storage (Ndiege & Wayi, 2012), (Macharia. 2009). This study therefore examined the effect of these challenges on performance of SMEs. The study focused on management information system integration and performance of SMEs in Embu County, Kenya.

1.1.1 Management information system integration

Management information system (MIS) is a system that collects data, process the data, store and retrieve data and disseminate information to the managers to allow them make concrete decisions. It allows management to obtain complete, accurate, quality reliable information at the right time. MIS is a tool that enables managers to plan, direct and control activities in a firm. Managers are therefore able to make concrete decisions by the help of MIS (Sonawane, 2016). MIS allows information to flow across hierarchical levels of management to help make decisions (Santosh, Indrakumar & Vijay, 2012). Integration of management information system (MIS) in firms can allow them identify opportunities and respond to environmental threats (Alene, 2018). MIS integrates sections and departments within an organization to facilitate online flow of information. It allows information to reach the right people in the right format, at the right speed and at the right time (Yaser, Shamsuddin & Aziati, 2014).

SMEs need to integrate management information systems to enable them access quality information, increase efficiency in business operations, cut production and transaction production, increase knowledge thereby enhancing performance of SMEs. For SMEs to be able to compete and remain afloat with global completion, they require quality business information. Access to quality business information is dictated by availability of efficient and effective information systems (Obura, 2007).

1.1.2 Small and medium enterprises

The meaning of SMEs is depended on the country in which a business operates in. SMEs can be categorized depended on the volume of sales, its total assets or a combination of both. In United States, definition of SMEs is depended on the industry in which the business operates. In manufacturing industry, SMEs is that enterprise with a maximum number of 500 employees, and in wholesales industry, SMEs is that enterprise with a maximum number of 100 employees. In Canada, SMEs is that enterprise with less than 500 employees. Globally, SMEs are generally defined as enterprises with more than 50 employees and a maximum number varying from country to country. For some countries, the maximum number is 200, while others fix their maximum number to 250 and 500 employees. Some countries categorize SMEs based on the minimum of employees. Small enterprises are those with less than 50 employees while micro enterprises are those with 5 to 10 employees. SMEs are also defined in terms of financial assets. European Union defines a medium sized firm as that with less than 50 million EUR turnovers, a small size firm is that with less than 10 million EUR turnover, while a micro size firm is that with less than 2 million EUR turnover. According to OECD, (2016), the account balance for micro, small, and medium sized enterprises should have less than 2 million EUR, 10 million EUR and 43 million EUR respectively (OECD, 2016).

Kenya defines SME according to the number of employees. Micro enterprise is those with less than 10 employees, small enterprises are those with 10 to 49 employees and medium-sized enterprises are those with 50 and 99 employees.

1.1.3 SMEs performance

Performance defined as the measure of how a particular process achieves its goal. There is however no standard definition of performance (Tabatabaie, 2008). According to Hasan and Mubarak (2016) SME's performance is measured in terms of the output of the business (Hasan & Mubarak, 2016). According to (Moullin, 2002) SMEs performance is measured by the amount of value that the firm attaches to their customers. According to (Neely, Gregory, & Platts, 2005), SMEs performance is measured in terms of efficiency and effectiveness of a firm..

According to (Tabatabaie, 2008), SMEs performance the productivity and effectiveness that the firm obtains in meeting its goals. Santo et al., (2016) and Odhuno (2018) view

performance in terms of financial and strategic/operational performance. Financial performance is determined by efficiency, profitability, effectiveness, and market growth of a firm. Strategic performance is measured using aspects such as employee's satisfaction and customer satisfaction (Santos & Brito, 2012), (Odhuno & Ngui, 2018). Hasan & Mubarak (2016) measure performance of SMEs in terms of profit and volume of sales (Hasan & Mubarak, 2016). According to Chairuel et al. (2015) SMEs performance is measured using financial and operational aspects. He relates financial performance to aspects such as profits and volume of sales and operational performance to aspects such as reduction in cost and increased productivity (Chairuel, Widyarto, & Pujani, 2015). According to Dalrymple (2004), performance of SMEs is measured in terms of profit margin, financial management, productivity, level of investment, growth, people management, customer service, supplier management and customer satisfaction (Dalrymple, 2004). Consoli (2012) views SMEs performance in terms of growth is sales, expansion of the firm, and efficiency and effectiveness of the firm (Consoli, 2012).

This study defines performance in terms of both financial and operational aspects. The study views financial aspects to include increased market, reduced cost and operational aspects to include profitability and productivity and therefore these concepts are herewith explained in depth.

Market share refers to the volume of sales a company has in a particular market (Young-Harry, Oparanma, & Ejo-Orusa, 2018) . It measures how a consumer prefers a certain product over other products. A larger market share translates to more sales. It is a measure of a firm's competitiveness and viability in the market. Advertising is one strategy employed by companies to widen their market share. Companies can enlarge their market share through the use of information systems such as Internet and websites to reach customers.

Cost reduction is the process used by companies to reduce their costs and increase their profits. This study views cost reduction in terms of applying ICT tools to reduce operational and production cost in order to maximize profits.

Profit refers to the balance left after deducting costs from total revenue (Young-Harry, Oparanma, & Ejo-Orusa, 2018) 2010). It measures company effectiveness in using resources to attain profits (Muya & Gathogo, 2016). Profit is a strong determinant of a firm's viability (Farah & Nina, 2016). Many companies strive to maximize their profitability by reducing cost and increasing sales (Schreibfeder, 2006). Profit is a reward for a proprietor investment in business and is what motivates him to carry on with business.

Productivity is the ratio between the outputs and inputs (Tabatabaie, 2008). It is the measure of a firm's effectiveness of utilizing fewer inputs e.g. capital, material cost and labor to produce maximum output. Productivity determines a firm performance in terms of its growth and competitiveness (Krugman, Defining and measuring productivity, 1994).

1.2 Statement of the problem

SMEs have in the recent past have experienced transformational change in technology in various parts of the world (Manyinka et al, 2011). This is due to the fact that many governments have implemented policies to oversee realization of ICT investment to SMEs. Similarly, the government of Kenya is inclined towards implementing policies to promote ICT growth.. One way that the government has done this is through installation of fiber optic cable to provide Internet connectivity to businesses.

Alam & Noor, (2009), Apulu, (2012), underscore the significance of ICT investment in increasing performance of SMEs, however, despite the much struggle by the government to improve the growth of ICT, SMEs in Kenya are still lagging behind in the use of ICT due to its slow adoption (Nduati, Ombui, & Kagiri, 2015) . Mwenda (2018), (Masenge, 2014) advocate that Kenya SMEs unlike larger firms are yet to enjoy the gains of ICT owing to its slow adoption. SMEs are thus experiencing several challenges such as lack of access to the global market (KIPPRA, 2006), high transaction cost (Mwenda, 2018), and production of poor quality products (Macharia, 2009). These enterprises rely mainly on manual transmission of market information (Kinyua, 2009).

Few studies indicate that the slow rate of ICT uptake by SMEs in Kenya is due to poor ICT infrastructure, poor management support, inadequate user expertise and poor information storage (Ndiege & Wayi, 2012), (Macharia. 2009). However, there is no sufficient research that shows how these challenges affect performance of SMEs. This

study aimed at assessing how these ICT adoption challenges affect performance of SMEs. The study focused on investigating management information system integration and performance of SMEs in Embu County, Kenya

1.3 Research objectives

This section looks at the objectives of the study

1.3.1 General Objective

The study investigated management information system integration and performance of small and medium enterprises in Embu County, Kenya.

1.3.2 Specific objectives

The study sought to investigate the following specific objectives

- (i) To determine the effect of ICT infrastructure and performance of SMEs in Embu County, Kenya.
- (ii) To evaluate the effect of management support and performance of SMEs in Embu County, Kenya.
- (iii) To establish the effect of user expertise and performance of in SMEs in Embu County, Kenya.
- (iv) To assess the effect of information storage and performance of SMEs in Embu County, Kenya.

1.3.3 Research questions

The study sought to answer the following research questions

- (i) What is the effect of ICT infrastructure and performance of SMEs in Embu County, Kenya?
- (ii) What is the effect of management support and performance of SMEs in Embu County, Kenya?
- (iii) What is the effect of user expertise and performance of SMEs in Embu County, Kenya?
- (iv) What is the effect of information storage and performance of SMEs in Embu County, Kenya?

1.4 Scope of the study

The study focused on 250 SMEs in Embu County that were registered with the ministry of trade and industry. The study investigated the impact of management information system on performance of SMEs in Embu County, Kenya. The sample of study was confined only to SMEs that have integrated digital systems in their businesses. The study covered small and medium enterprises. Small enterprises are those with 10 to 50 employees, medium enterprises are those with 50 to 99 employees. The sample of the study was taken from those SMEs that were in operation by the end of year (2021). This included ICT managers and employees in the 250 targeted SMEs.

1.5 Significance of the study

The study will offer immense knowledge to SMEs managers or owners as it will shed light on the importance of utilizing ICT in their businesses. It will also be significant to policy makers as it will act as a reference in formulation of policies relating to adoption of information systems in Kenya. The study will be vital to the government of Kenya as it will provide them with requisite knowledge needed in planning for IS investments. The study will also help financiers understand the importance of information systems to businesses and therefore generate will to render resources towards IS establishments. The study will provide enough knowledge to ICT specialists such as system analysts and developers that will aid them in development of information systems. Similarly, the study findings will act as the base of knowledge to academicians and researchers on the effect of management information systems on performance of SMEs. The findings will also aid these IS specialists in their further research.

1.6 Justification of the study

Technological advancement in ICT has transformed the manner of conducting businesses and governments are driving their firms towards ICT investment. Research has shown that many businesses across the world are investing in ICT in order to cut cost, improve efficiency and productivity and enhance service for customers. In Kenya, SMEs play a pivotal role of in job creation and poverty reduction. However while SMEs would benefit greatly from the use of ICT, SMEs in Kenya lack knowledge about the need of information systems and are thus characterized by slow adoption of this crucial asset. Some research

has shown that information systems can allow SMEs access global market and cut down cost, however SMEs in Kenya are characterized by lack of access to market and high transaction cost and they fail within their early stages of operation. While some research on information systems have been done on large firms, very little research has been undertaken on SMEs in Kenya. It is therefore important to undertake a study to investigate the impact that information systems would have on performance of SMEs.

1.7 Limitations of the study

This study has some limitations. The study focused on SMEs and does not pay attention to larger firms. It would be good to undertake a study on larger firms. The sample of the study comprised of SMEs within EMBU County in Kenya excluding SMEs in other regions. The findings of the study cannot be generalized to comprise all SMEs in Kenya. A study can be undertaken to cover all SMEs in the country. The study was limited in terms of sample size. Another study can be taken to cover a wider sample size. The study was also limited in that it covered only SMEs that are IT integrated. The study was also constrained by the fact that some respondents were not willing to provide information. The researcher instilled confidence into respondents by assuring them that she would uphold confidentiality of their information. Similarly, the study was limited in evaluating only one factor that affects performance of SMEs yet there are other factors affecting performance of firm. Further studies can be conducted to examine how other factors such as government regulation, inflation, and access to credit affect performance of SMEs.

1.8 Organization of the study

Chapter one is the introduction of the study covering the background of the study, exposition of management information system integration, statement of the problem, objectives of the study, scope of the study, significance of the study, justification of the study and limitations of the study. Chapter two is the literature review covering introduction, theoretical review, empirical review, summary of research gaps and conceptual framework. Chapter three is Research methodology covering introduction, research design, target population, sample size and sampling design, data collection instrument, data analysis and presentation and ethical considerations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter covered a review of both theoretical and empirical literature, summary of research gaps and conceptual framework.

2.2 Theoretical review

The theories that were reviewed to support this study include Technological Acceptance Model (TAM), Diffusion of Innovation Theory (DOF), Self-efficacy theory and Unified Theory of Acceptance and Use Technology (UTAUT).

2.2.1 Technological Acceptance model

Davis (1986) developed the Technological Acceptance Model (TAM) that explains what drives users of an information system to accept a technology (Durodou, 2016). The model claims that there are two factors that determine the acceptance of an information system: Perceived usefulness (PU) and perceived ease of use (PEOU). Davis (1989) defines perceived usefulness as the degree to which an individual believes that his performance will improve if he uses a system. He then defines perceived ease of use as the degree to which an individual believes that the system will ease his mental and physical effort. Perceived ease of use will captivate users to use a system (Zhang, Aikman, & Sun, 2008). TAM suggests that the attitude of a person determines his behavioral intention and his behavioral intention determines his use of a system. According to Davis (1968), a person's use of a system is determined by both his attitude towards the system as well as the impact the system will have on his performance. The probability that one will use a complex system is high if one perceives that the system will improve his performance. Perceived usefulness has a strong link to the adoption and use of an IS than perceived ease of use (Muriithi, Horner, & Pemberton, 2016), (2013) (Venter, Resburg, & Davis, 2012) (Davis, 1989; Bagozzi & Warshaw, 1989). People are more likely to accept a complex system if they perceive that it has a positive advantage on their performance (Davis, Bagozzi, & Warshaws, 1989).

This theory relates to information management as people will be willing to adopt and use information system such as Internet, e-commerce and websites due to the perceived

benefits of ease of information gathering, storage, fast dissemination and access to information

2.2.2 Diffusion of Innovation Theory

This is Rogers (2003) model of innovation-decision process emphasizing each individual's role in an innovation-adoption process. The perceptions of an individual towards an innovation determines his acceptance or rejection of an innovation (Rogers, 2003). The model demonstrates the adoption process from when an individual evaluates a new innovation to the time he makes a choice on whether to adopt or reject the innovation. A person choice of an innovation is mainly determined by one's perceived advantage towards an innovation. SMEs owner or manager are the opinion leaders who obtain facts about an innovation evaluates the innovation and based on its advantage or disadvantage makes a choice (Rogers, 2003). According to Manuelli et al., (2007), SMEs owner or manager is the change agents who assesses the advantage that an ICT innovation may bring to the firm and determines whether to adopt or reject it.

The attitude of a manager towards an innovation and his innovativeness are crucial in innovation decision-making process. They influence the manner in which a person obtains knowledge about the new innovation, pushes for its adoption, make a choice on innovation and put it into use (Rogers 2005). According to Ghobakhloo et al., (2012), the attitude of SMEs owners or managers' towards IS, knowledge in IT, innovative and experience on use of IT all are key factors that influence the adoption of IT. A number of studies have revealed that in SMEs the role of managers or owner is crucial as they influence all decisions in various stages of IS adoption process i.e. planning, implementation, monitoring and maintaining (Thong, 2001) (Prekumar, 2003) (Ghobakhloo et al., 2012); (Bais, 2017).

This theory relates to management support. Successful implementation of information systems requires continuous support from the management right from planning stage, implementation and operational phase of the system.

2.2.3 Self-efficacy Theory

Self-efficacy is a person's belief in his ability in performing a task (Bandura, 1977). It is an evaluation of one's capability and competence in executing a task (Bandura, 1986),

(Bandura, 1997). Self-efficacy is one's perception that they have the opportunity, sufficient knowledge and required resources to carry out a specific task (Ajzen, 2002)

In ICT, self-efficacy refers to one's belief in his or her ability that he or she can use an ICT tool (Caldeira, 2002). According to (Zhao, 2010), self-efficacy is one's belief that he possess enough skills, adequate knowledge and is competent to use ICT. This has direct linkage with ICT adoption and usage (Compeau & Higgins, 1995), (Chang & Demirhan, 2006), (Papastergiou, 2010). According to Park (2006), (Venkatesh, Morris, & Davis, 2003) efficacy determines IS adoption and use. Those who believe that they lack the capability to use ICT avoid adopting the system (Ajzen, 2002).

Existence studies indicate that knowledge, experience and skills in ICT as well as training do increase the belief of an individual that he is capable of using ICT (Chang & Cheung, 2001) (venkateh & Davis, 2000) (2000), (Otieno, 2017); (Karimazondo, JérémyCastéra, Impedovo, & Martinez, 2020). (2010), (Radovan & Kristl, 2017), (Moghavyemi, 2014) (Ghobakhloo, Hong, Sabouri, & Zulkifli, 2012)and attempt to use the system even if it is complex (Moghavyemi, 2014), (Ghobakhloo, et al., 2012). Those with ICT skills normally learn how to use the system with ease (Chang and Cheung 2001). Expertise in ICT raises an individual's belief in his ability to use the system (Otieno, 2017)

This study views self-efficacy in terms of user expertise. User ICT skills, knowledge, competence and experience in ICT will increase their belief in their ability to use information systems such as Internet, e-commerce, website and email will positively affect their use and adoption of information system.

2.2.4 Unified Theory of Acceptance and Use of Technology (UTAUT)

Vankatesh Unified Theory of Acceptance and Use of Technology (UTAUT) suggests that there are four key constructs that to influence user's intentions and behaviour to use ICT that include social influence, performance expectance, effort expectancy and facilitating conditions. Behavioural intentions to use ICT is determined by performance expectancy, effort expectancy, and social influence and the use of a technology is determined by both behavioral intentions and facilitating conditions (Venkatesh, Thong, & Xu, 2016).

Facilitating conditions is the extent to which a user believes that there is enough technical infrastructure to support use of ICTs (Venkatesh, Bala, & Sykes, 2010). Radowan and

Kristl (2017), defines facilitating conditions as ICT infrastructure and expertise required by users in order to use information systems (Kristl & Radovan, 2017).

In this study, facilitating conditions refer to ICT infrastructure. SMEs need ICT infrastructure such as Internet, websites, mobile phones and e-commerce to undertake their business operations.

According to Ghobakhloo et al., (2012), users who believe that there is availability of ICT infrastructure tend to use the system more while those who lack ICT infrastructure have low usage of ICT. Lack of ICT infrastructure will result to low usage of ICT (Gillian (2005).

In this study, the theory relates to ICT infrastructure. SMEs need ICT infrastructure such as internet, websites, e-commerce to be able to use of information systems.

2.3 Empirical review

This section covers a review of previous studies that are related to the variables of this study that includes ICT infrastructure, management support, user expertise and information storage.

2.3.1 ICT infrastructure and SMEs performance

Successful adoption and use of information systems is highly dependent on effective ICT infrastructure (World-Bank, 2004). According to (Röller & Waverman, 2001), (Cloete, Courtney, & Fintz, 2002), (Akkeren & Cavaye, 1999), (Manochehri, Al-Esmail, & Ashrafi, 2012) ICT infrastructure needs to be put in place in order to develop an IS project.

According to Alam and Noor (2009), countries need to build robust ICT infrastructure in order to allow their firms compete on an international scale and boost their economic growth. ICT infrastructure allows expansion of market thereby increasing profitability of firms (Duncan, 1995), (Fatima, 2015). ICT infrastructure enables integration of SMEs to the global business environment (Odhuno & Ngui, 2018), (Xiong, Qureshil, & Najjar, 2013)

Lawrence & Usman (2010), observe that lack of ICT infrastructure would lead to a loss in realizing the benefits of ICT (Lawrence & Usman, 2010). ICT infrastructure increases productivity and efficiency of firms (Boothby, Dufour, & Tang, 2010). (Limao & Venables, 2001) (Nordas & Piermartini, 2004) (Park & Koo, 2005) (Francis & Machim, 2007) (Ahmad, Ismail, & Law, 2011) note that ICT infrastructure enables firms to increase their volume of trade and cut down cost. ICT infrastructure allows firms access the global business networks (Francis & Machim, 2007).

ICT infrastructure need to be put in place for firms to realize technological global changes. ICT infrastructure allows SMEs to improve productivity, efficiency and enter new market channels (Pillay, 2016), (Makiwa, 2018), (Apulu, 2012), (Mouelhi, 2009). .However studies indicate that lack of ICT infrastructure is a major problem facing SMEs in developing countries (World-Bank, 2004) such as Nigeria, Botswana and South Africa, Tanzania making their survival difficult in today's global competitive environment (Mutula & Brakel 2006) (Moruf, Olusola, & Oluwaseun, 2014).

Matambalya & Wolf (2007) in an investigation of the role of ICT in East Africa found that the use of ICT infrastructure vital to growth and productivity of firms. However they note that lack of ICT infrastructure is a major problem that hampers the growth of SMEs in East Africa just like other African countries.

During an investigation of the effect of ICT on performance of firms in Kitui County, Kenya, Munyao (2017), found that availability of ICT infrastructure improve performance of in firms. However he too note that lack of ICT infrastructure is a major problem facing firms in developing nations

2.3.2 Management support and SMEs performance

Management support is defined as the level that the management is committed to successful adoption and use of a system (Caldeira and Ward, 2002). Management support is therefore a major contributing factor to the successful adoption of information systems (Sharma & Yetton, 2007), (Gono et al., 2009). According to (Ramdani & Kawalek, 2007) management support involve allocation of requisite resources and provision of expertise to facilitate

adoption a new system. According to (Buruncuk & Gülser, 2012), the managers innovativeness, their participation and involvement in planning and implementation of IS plans is crucial to the successful adoption of an information system. For effective ICT adoption, managers should be able to come up with concrete goals that match the needs of a business, formulate IS project plans, allocate necessary resources and expertise to the IS project (Manueli et al., 2007).

Several studies reveal that innovativeness and participation of owner managers is vital to successful adoption and use of IS in order to increase efficiency and productivity of SMEs (UNCTAD, 2006) (Giotopoulos, Kontolaimou, Korra, & Tsakanikas, 2017) (Thong, 1999) (Rai & Howard, 1994) (Jeyraj, Rottman, & Lacity, 2006) (Thong & Yap, 1995) (Sabherwal, Jeyaraj, & Chowa, 2006) (Mirchandani & Motwani, 2001). Lack of manager's innovativeness in ICT will lead to stifled growth of SMEs.

Chairoel et al., (2015) Investigation of ICT adoption and its effect on performance SMEs in Indonesia, found that the owner manager has a vital role to play in adoption and use of ICT (Chairoel, Widyarto, & Pujani, 2015). Qureshi et al., 2008) also insist that the capability of the owner manager is crucial to successful IS adoption in SMEs. Qureshi et al., (2008), (Chairoel, Widyarto, & Pujani, 2015) further maintain that ICT adoption enhance performance of SMEs through cutting down cost, increasing their productivity and efficiency and expanding their sale market.

Caldeira & Ward (2002) note that management support contributes to successful adoption of IS improving performance of SMEs. Further, their study notes that management involvement and participation in IS adoption is important in the success of IS investments. Parida et al., (2010) , Rozmi et al., (2020) in their study observe that manager's attitude towards IS is an major factor that affect IS adoption in SMEs hence improving performance of firms (Parida V. , 2010) (Rozmi, Nohuddin, & Hadi, 2020). SMEs managers should therefore support the adoption of IS by providing resources in order to allow SMEs compete on both local and international scale (Emonena, 2018).

Gono et al., (2016), Apulu (2012), Adebayo et al (2013), (Matambalya & Wolf, 2001) also note that owner manager has a vital role to play in ICT adoption. CTI adoption Increases productivity of SMEs (Matambalya & Wolf, 2001). However Apulu (2012) observes that lack of management commitment and support is a major problem facing IS adoption in developing nations such as Nigeria and South Africa leading to its low uptake.

Otieno (2017), (Munyao, 2017) observe management support is crucial to IS adoption. Managers should ensure that they support the IS project by providing resources needed for its development. However, Otieno (2017) also notes that lack of management support is a major problem facing IS adoption within SMEs in developing countries.

2.3.3 User expertise and SMEs performance

Employees are vital assets for the survival of firms (Nguyen, 2009), (Venkatesh & Brown, 2004), (Caldeira & Ward 2002) which have to be developed to bring success to businesses (Zhou, Li, & Lam, 2009), (Egbu, Hari, & Renukappa, 2005). Users skills, knowledge and training can affect the use and adoption of IS (Thong, 2001), (Fisher & Howell, 43) . For successful implementation of IS, IS users therefore need to be trained to acquire skills in ICT (Thong, 2001), (Ghobakhloo, Zulkifli, & Aziz, 2010) (Sarosa & Zowghi, 2003)

There is enough evidence that ICT skills, knowledge and training directly affect adoption of IS thus enhancing performance of firms (Pavic, Koh, & padmore, 2007) (Boothby, Dufour, & Tang, 2010) (Busaidi, Bhuiyan, & Zulkifli, 2019), (Brynjolfson & Hitts 2003), (Scupola A. , 2009), (Thong, 1999) (Taylor & Todd, 1995) , (Sabherwal, Jeyaraj, & Chowa, 2006) , (Jeyraj, Rottman, & Lacity, 2006), (Scupola A. , 2003), (Rozmi, Nohuddin, & Hadi, 2020), (Giotopoulos, Kontolaimou, Korra, & Tsakanikas, 2017), (OECD, 2004) (Gono, Harindranath, & Özcan, 2016), (Arvanitis, 2005), (Husseini & Safa, 2009), (Barba-Sanchez, Martinez-Ruiz, & Jimenez-Zarco, 2021), (Parida, Westerberg, & Ylinenpaa, 2009) (Productivity-Commission, 2004), (UNCTAD, 2006) .Lack of skills, knowledge and training in ICT can affect the use of ICT leading to poor performance of firms (Ghobakhloo, Zulkifli, & Aziz, 2010), (Egbu, Hari, & Renukappa, 2005), (Stork & Schmidt, 2009). ICT investments require staff with the right skills, knowledge and training in ICT (UNCTAD, 2006), (Bayo-Moriones & Lera-Lopez, 2007) (Bayo-Moriones, Billon,

& Lera-Lopez, 2013) (Caldeira & Ward, 2002) (Tarute & Gatautis, 2013) (Manochehri, Al-Esmail, & Ashrafi, 2012) in order to enhance performance of firms (Sircar, Turnbow, & Bordoloi, 2000)

A paper by World Bank establishing the link between the use of ICT and performance of firms observes that ICT skilled workforce is important for enhancing performance of firms. However, the paper notes lack of skills and knowledge in ICT is a major problem facing firms in developing countries thus limiting their growth (World-Bank, 2004). In order to realize the gains of ICT investments, users need to have sufficient skills in ICT (Productivity-Commission, 2004)

According to Akomea-Bonsu & Sampong (2012), skills in ICT enables SMEs to quickly adjust and innovate their products in order to fit and adapt to the changing environmental and customer needs. According to Modimogale & Kroeze (2011), workers need sufficient ICT skills for firms to remain competitive and achieve some level of productivity. However, Akomea-Bonsu & Sampong (2012), (Moruf, Olusola, & Oluwaseun, 2014)note that lack of skills in ICT is a major problem hampering the growth of SMEs in developing countries (Akomea-Bonsu & Sampong, 2012). Firms therefore need to train their workers in order to acquire skills in ICT (Mouelhi, 2009).

Matambalya and Wolf (2001) argue that ICT skills are vital for enhancing performance of SMEs. The duo add that lack of skills in ICT was hindering the growth of firms and therefore workers need to be trained to acquire skills in ICT (Matambalya & Wolf, 2001). Workers require sufficient skills to be able to use ICT (Mugobi & Mlozi, 2020).

Munyao (2017) on his investigation of the effect of ICT on performance on performance of community based organizations (CBO) in Kitui County, Kenya and found that skills and knowledge in ICT enhance efficiency of firms. Therefore, staff needs to be regularly trained in order to improve their skills in ICT (Munyao, 2017).

2.3.4 Information storage and SMEs performance

Barba-Sanchez et al. (2021) assert that, ICT enhances communication and easy access of information. ICTs allow easy flow of information within the firm and outside the (Porter & Miller, 1985).

Spanos et al., (2002) argue that the use of ICT enhances dissemination and sharing of information where buyers and sellers can communicate effectively at a reduced cost (Spanos, Prastacos, & Poulymenakou, 2002) (Shanker, 2008) (Kollberg & Dreyer, 2006) (Buhalis, 2003). Businesses are able to interact smoothly using ICT at a faster rate (Kridan & Goulding, 2006) (Spanos, Prastacos, & Poulymenakou, 2002). Cordella (2006) emphasizes that ICT has led to increased availability of information (Cordella, 2006).

Emonena (2018) argue that ICT has increased productivity of firms through sharing of information. However he notes that information flow within SMEs in developing countries is still not efficient due to low adoption of ICT (Emonena, 2018).

According to (Apulu & Latham, 2011), (Busaidi, Bhuiyan, & Zulkifli, 2019) (Daferighe, Offiong, & Okon, 2019) ICT enables faster communication of information and enables a firm to interact with their customers and suppliers. SMEs can therefore receive feedback and react faster to the demands of their customers (Apulu & Latham, 2011).

A paper by the Organization for Economic Co-operation and Development (OECD) (2004) observes that ICT enhance effective communication and sharing of information at reduced cost (OECD, 2004). Essential information from consumers can be easily accessed thus enabling firms to enjoy competitive advantage (Prasad, Ramamurthy, & Naidu, 2001).

The use of ICT enables businesses to access market information which give them a competitive advantage (Matambalya & Wolf, 2001)(Yusuf, 2013), (Akomea-Bansu et al., 2012). ICT also enhances communication and access of information between customers and suppliers and reduce transaction cost (Matambalya & Wolf, 2001) (Acquah, 2012), (Pillay, 2016), (Irefin, 2012). However (Mutula & Brakel, 2006) note that access to

information is a major problem facing developing countries in Africa due to slow adoption of ICT.

A study by Mwenda (2018) found that ICT can enable businesses access market information and be aware of new opportunities in the market, access information about products and enable firms to enjoy reduced transaction costs. This will improve performance of SMEs (Mwenda, 2018).

2.4 Summary of research gaps

From the review, it is clear that most studies have focused on ICT adoption in small and medium enterprises (Harindranath et al., 2008), (Gono et al., 2009), (Ghobakhloo et al., 2010), (Apulu, 2012), (Irefin, 2012), (Njuguna & Mokaya, 2012), (Adebayo et al., 2013), (Ibrahim, 2014), (Okundaye, 2016), (Otieno, 2017), (Albar & Hoque, 2017), (Makiwa, 2018), (Acquah, 2018), (Rozmi et al., 2020) (Barba-Sanchez, 2021). Other studies have focused on ICT adoption and performance of SMEs (Matambalya and Wolf 2001), (OECD, 2004), (Ashrafi & Murtaza, 2008), (Modimogale & Kroeze, 2011), (Chacko & Harris, 2011), (Akomea- Bonsu and Sampong, 2012), (Tarute & Gatautis, 2013), (Yusuf, 2013), (Moruf et al., 2014), (Adeniyi, 2014), (Masenge, 2014), (Chairoel et al., 2015), (Odhuno & Ngui, 2018), (Bais, 2017). However, no study has focused on management information system adoption and performance of SMEs. It is therefore evident that by conducting this research, a gap in knowledge will be filled. This study aimed at investigating the effect of management information system integration on performance of SMEs in Embu County, Kenya.

Table 2.1 Summary of research gaps

Author& Year	Focus of the study	Findings	Research gap	Focus of the current study
Matambalya & Wolf (2001)	ICT and SMEs	ICT has a positive effect on productivity of SMEs	Focused on ICT and productivity of SMEs in East Africa	Focus on MIS and performance of SMEs in Kenya
Muller-Falke (2001)	Impact of ICT in small businesses	ICT increases productivity of firms	Focused on ICT and productivity of SMEs in India	Focus on MIS and performance of SMEs in Kenya
OECD (2004)	ICT and SMEs performance	ICT improves performance of SMEs	Focused on ICT and performance of SMEs	Focus on MIS and performance of SMEs
Ashrafi & Murtaza (2008)	Use and impact of ICT in SMEs	ICT enhances performance of SMEs	Focused on ICT and performance of SMEs in Oman	Focus on MIS and performance of SMEs in Kenya

Gono et al. (2009)	ICT adoption by SMEs	Management support affect ICT adoption	Focused on ICT adoption by SMEs in South Africa	Focus on MIS adoption by SMEs in Kenya
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Zehir et al., (2010)	Impact of ICT on firm performance	ICT enhances the performance of firms	Focused on ICT and performance of firms generally	Focus on MIS and performance of SMEs specifically
Ghobakhloo et al. (2010)	ICT adoption and SMEs	Management support affect adoption of ICT	Focused on ICT adoption by SMEs	Focus on MIS adoption by SMEs
Modimogale & Kroeze (2011)	ICT and performance of SMEs	ICT increases efficiency of firms	Focused on ICT adoption and performance of SMEs in South Africa	Focus on MIS adoption and performance of SMEs in Kenya
Chacko & Harris (2011)	ICT and performance of SMEs	ICT improves performance of SMEs	Focused on ICT and performance of SMEs in Asia Pacific countries	Focus on MIS and performance of SMEs in Kenya
Akomea & Sampong (2012)	ICT and productivity of SMEs	ICT increases productivity of SMEs	Focused on ICT and productivity of SMEs in Ghana.	Focus on MIS and performance of SMEs in Kenya.
Apulu (2012)	ICT adoption by small and medium enterprises	Management support affect ICT adoption.	Focused ICT adoption by SMEs in Nigeria	Focus on MIS adoption by SMEs in, Kenya

Irefin (2012)	ICT adoption by SMEs in Nigeria	ICT infrastructure, Government and, Management support affect ICT adoption	Focused on ICT adoption by SMEs in Nigeria	Focus on MIS adoption by SMEs in Kenya
Adewoye & Ankabi (2012)	ICT and profitability of SMEs	ICT has positive effect on profitability of SMEs	Focused on ICT and profitability of SMEs	Focus on MIS and overall performance of SMEs
Njuguna & Mokaya (2012)	ICT adoption by SMEs	ICT infrastructure , ICT knowledge , and level of education affect adoption of ICT by SMEs	Focused on ICT adoption by SMEs in Thika town, Kenya	Focus on MIS adoption by SMEs in Embu County, Kenya
Adebayo et al., Kareem (2013)	ICT adoption by SMEs	ICT infrastructure, skills and training, management support affect ICT adoption	Focused on ICT adoption by SMES in Nigeria	Focus on MIS adoption by SMEs in Kenya
Yusuf (2013)	Impact of ICT on SMEs	ICT improves efficiency of SMEs.	Focused on ICT and performance of SMEs	Focus on MIS and performance of SMEs

Tarute & Gatautis (2013)	ICT impact on SMEs performance	ICT improves communication of SMEs	Focus on ICT and performance of SMEs	Focus on MIS and performance of SMEs
Moruf et al. (2014)	ICT and performance of SMEs	ICT has positive effect of performance of SMEs	Focused on ICT and performance of SMEs in Nigeria	Focus on MIS and performance of SMEs in Kenya
Adeniyi (2014)	Impact of ICT on performance of SMEs	ICT ha positive effect on performance of SMEs	Focused on ICT and performance of SMEs in Nigeria.	Focus on MIS and performance of SMEs in Kenya
Masenge (2014)	ICT and performance of SMEs	Use of enhance performance of SMEs	Focused on ICT and performance of SMEs in Kamukunji sub-county, Kenya	Focus on MIS and performance of SMEs in Embu County, Kenya
Hoque, Saif, & Albar (2015)	ICT adoption by SMEs	management support affect ICT adoption	Focused on ICT adoption by SMEs in Bangladesh	Focus on MIS adoption by SMEs in Kenya
Chairoel et al. (2015)	ICT and SMEs performance	ICT increases performance of firms	Focused on ICT and performance of SMES in Indonesia	Focus on MIS and performance of SMEs in Kenya

Okundaye (2016)	ICT adoption by SMEs	ICT skills affect adoption of ICT	Focused on ICT adoption by SME in Nigeria	Focus on MIS adoption by SMEs in Kenya
Bais (2017)	ICT and performance of SMES	ICT has positive effect on performance of SMEs	Focused on ICT and performance of SMES in Tanzania	Focus on MIS and performance of SMEs in Kenya
Otieno (2017)	ICT adoption and usage by SMEs	Perceived usefulness and perceived influence adoption of ICT	Focused on ICT adoption by SMEs in Nairobi County, Kenya	Focus on MIS adoption by SMEs in Embu County, Kenya
Albar & Hoque (2017)	ICT adoption by SMEs	management support affect ICT adoption	Focused on ICT adoption by SMEs in Saudi Arabia	Focus MIS adoption by SMEs in Kenya
Noor et al. (2017)	ICT and firm's performance	ICT has positive effect on performance of firms	Focused on ICT and performance of firms in general	Focus on MIS and performance of SMEs specifically
Odhuno & Ngui (2018)	ICT and SMEs performance	ICT has positive effect on performance of SMEs	Focused on ICT and performance of SMEs in Papua New Guinea	Focus on MIS and performance of SMEs in Kenya

Makiwa (2018)	ICT adoption by SMEs	Management support and ICT training affect ICT adoption	Focused on ICT adoption by SMEs IN developing countries	Focus on MIS adoption by SMEs in Kenya
Acquah (2018)	ICT adoption by SMEs	ICT knowledge and skills affect ICT adoption	Focused on ICT adoption by SMEs in Metropolis, Ghana	Focus on MIS adoption by SMEs in Embu County, Kenya
Mwenda (2018)	ICT and performance of Micro and small enterprises	ICT improves performance of SMEs	Focused on ICT adoption and performance of micro and small firms in Isiolo County, Kenya	Focus on MIS adoption and performance of SMEs in Embu County Kenya
Rozmi et al., (2020)	ICT adoption by SMEs	Management support affect adoption of ICT	Focused on ICT adoption by SMEs in Kuala Lumpur, Malaysia	Focus on MIS adoption by SMEs in Kenya
Barba-Sanchez (2021)	ICT adoption and performance SMEs	ICT enhance performance of SMEs	Focused on ICT and performance of SMEs	Focus on MIS and performance of SMEs

Source: researcher (2022)

2.5 Conceptual framework

Conceptual framework shows the relationship between independent variables (ICT Infrastructure, management support, user expertise, information storage) and the dependent variable (SMEs performance)

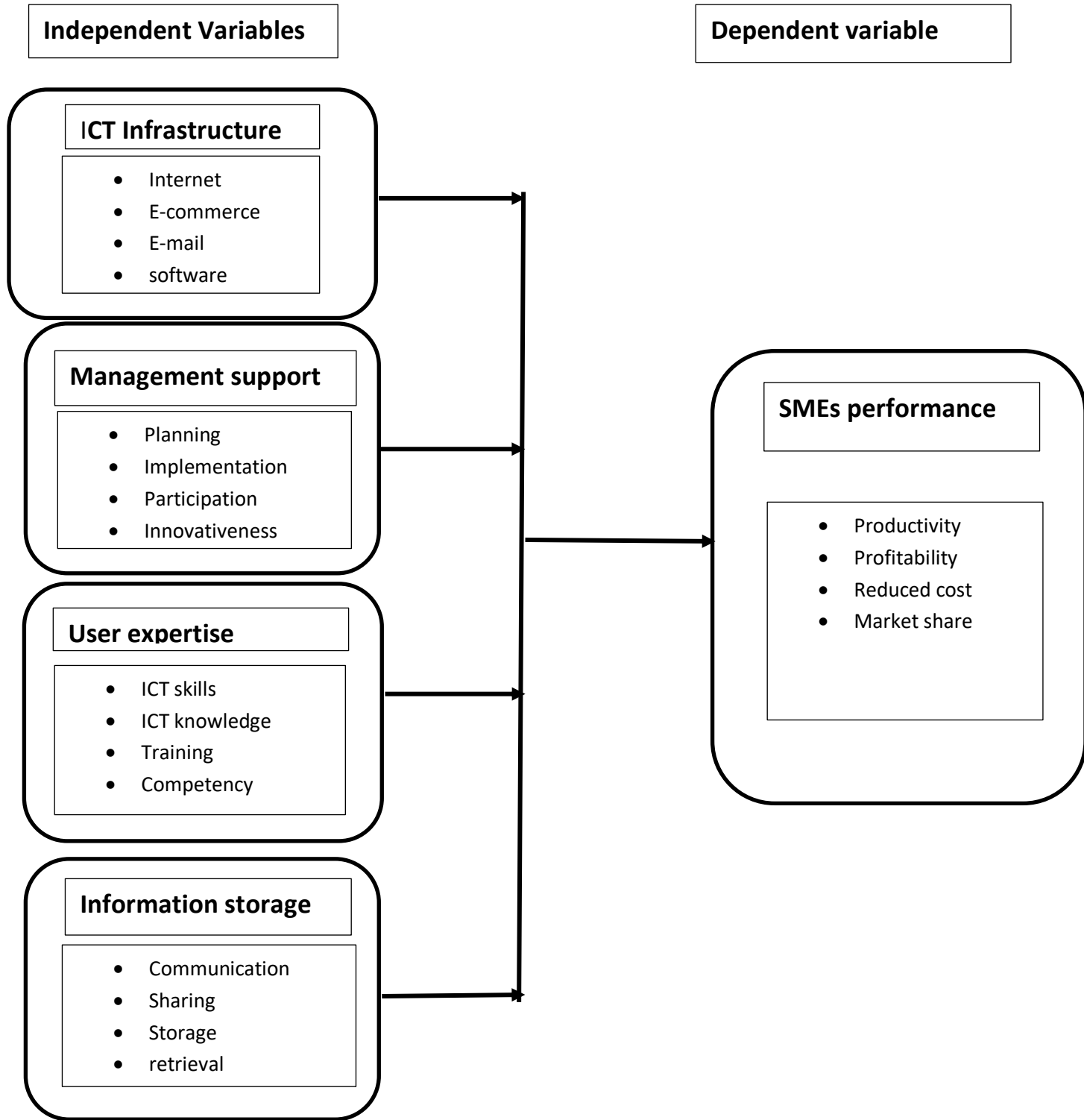


Figure 2.1 Conceptual Framework

Source: Researcher (2022)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives a highlight of the research methods to be employed in this study. It covers research design, target population, sampling size and sampling design, data collection instrument, data analysis and presentation and ethical considerations.

3.2 Research design

The study adopted exploratory design. Exploratory research aims at investigating a problem which has not been studied before with which scanty or no literature exists. It is meant to provide some insights into a problem without giving conclusive findings. The researcher looks at an idea to establish various issues which can be focused deeply in further research (Bhat, 2020). Exploratory design was the best suited for the study since there has not been thorough investigation into the problem before.

3.3 Target population

A population is the total number of elements needed for a study (Cooper & Schindler, 2005). The study targeted a population of 250 SMEs with a total number of 400 employees. These SMEs included boutiques, restaurants, retail shops, cosmetics, Jua Kali, Agriculture located in Embu County.

3.4 Sample size and Sample Design

Sampling design is the technique employed in picking a sample of elements from a target population (Cooper, & Schindler, 2003). The study employed stratified random sampling to select a sample of 80 respondents from 250 SMEs. SMEs were stratified into clusters based on their operational activities. 250 SMEs which were IT integrated were then purposively selected across various strata. The researcher then randomly selected a sample of 10% to 30% of respondents from each stratum forming a sample size of 80 respondents from the entire population of 400 respondents. According to Mugenda and Mugenda (2013), a sample of 10% to 30% of entire population is adequate for a study.

Table 3.1 Sample frame

SMEs categories	Sample size	% of the total sample size
Boutique	10	13
Restaurants	8	10
Retail shops	16	20
Cosmetics	14	17
Jua Kali	8	10
Transport	9	11
Agriculture	15	19
Total	80	100

Source: Kenya National Chamber of Commerce & Industry (2022)

3.5 Data collection instrument

The study employed primary data that was gathered from respondents using questionnaires. According to Sekeren (2009), a questionnaire is a preprinted form containing questions to be answered by respondents. The questionnaire was categorized into two parts, Section A and section B. Section A captured respondent's background information and Section B captured information pertaining to the study variables. Data was collected using drop and pick method.

3.5.1 Validity of research instrument

According to Mugenda & Mugenda (2003), Validity examines whether a research instrument measures what it was meant to measure. It assesses whether the results derived from the study is a true reflection of the variables under study (Wachira, Muturi, & Sirma, 2014). Content validity examines whether the research questions universally cover all the content of a study (Straub, Boudreau et al. 2004). The researcher sought the assistance of the supervisor to establish whether the research questions satisfied content validity. Construct validity is the degree to which a research instrument measures the concept which it was meant to measure. To satisfy construct validity, the researcher ensured that questions carefully represented the intended concepts.

3.5.2 Reliability of research instrument

Reliability examines whether a research instrument yields consistent results when a test is administered repeatedly (Saunders, Lewis, & Thonhill, 2007)). Assessment of reliability is determined through the test-retest process (Mugenda and Mugenda, 2003). The researcher determined the reliability of research instrument by administering a test to 5 employees recording the scores and then re-administering the same test to the same employees two weeks later. The scores of the two tests were then compared using Cronbach Alpha Co-efficient to assess the reliability of the instrument. An alpha coefficient of not less than 0.6 indicated that the research instrument was reliable.

3.6 Diagnostic tests for regression analysis

According to (Williams, Grajales, & Kurkiewicz, 2013)), it is significant to test the assumptions of multiple linear regressions before its application in analyzing data. The following tests were administered to assess these assumptions.

3.6.1 Normality test

Both Shapiro- Wilk and skewness tests were conducted to assess normality of data. Shapiro test was first conducted but did not give the expected results due to its limitations. There was thus a need to conduct another test to evaluate the skewness of data. Values falling between -1 and 1 indicated that the data was normally distributed.

3.6.2 Heteroscedasticity test

A p-p plot was done to establish heteroscedasticity of the scores. Points falling along diagonal line indicated that the data was free from heteroscedasticity.

3.6.3 Multicollinearity test

Independent variables were subjected to multicollinearity test to assess their degree of correlation. According to Kothari (2004), the reliability of regression coefficients in a multiple regression analysis decreases with respect to increase in correlation between independent variables (Kothari, 2004). Multicollinearity of independent variables was tested using Variance inflation factor (VIF). A VIF value below 10 indicated that the data was free from multicollinearity.

3.7 Data Analysis and presentation

Descriptive and inferential statistics were used to analyze quantitative data. Content analysis was used to analyze qualitative data. Common themes emerging from open-ended questions were sorted into categories and inferences drawn from these themes to arrive at specific findings. According to (Coopers & Shindler, 2006), content analysis allows capturing of data which cannot be captured using structured questions.

Data collected from respondents was coded, keyed in the computer and analyzed using Statistical Package for Social sciences (SPSS). Descriptive data was analyzed using frequencies, percentages, mean and standard deviation and represent the data into charts and tables to provide simple interpretation of the data.

Inferential statistics was used to determine the relationship between independent variables and dependent variable. The regression model was as illustrated below.

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + e$$

Where:

Y – Performance of SMEs in Embu County (dependent variable)

β_0 - constant

X_1 – ICT infrastructure

X_2 - management support

X_3 - User expertise

X_4 –Information management

$\beta_1, \beta_2, \beta_3$ & β_4 - Coefficients of independent variables

e – Error term

The error term indicate that there are other factors that affect performance of SMEs which cannot be accentuated in this study.

3.8 Ethical considerations

The researcher upheld the privacy and confidentiality of information for the respondents. She sought permission from the graduate school and NACOSTI in order to conduct the study. She also issued an introductory letter to respondents to explain the purpose of the study. The researcher sought the consent of the respondents before administering data collecting. During administration of data collection, the respondent's

identity was concealed to ensure confidentiality of information. The findings of the study were represented without any interference of the researcher.

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter comprises of analysis and findings of the study.

4.2 Rate of response

A sample of 80 respondents were selected from the target population to participate in the study. The response rate is as tabulated in Table 4.1.

Table 4.1 Response rate

Response rate	Frequency	Percentage
Questionnaires filled and returned	57	71.25 %
Questionnaires not returned	23	28.75%
Total	80	100

Source: Survey data (2022)

Table 4.1 shows that 57 questionnaires were filed and returned representing of 71.25%. This is an indication that over 50% of the targeted respondents were to take part in the survey. According to Mugenda and Mugenda (2008), a threshold of 50% of the targeted sample should be reached to ensure adequacy of the study.

4.3 Respondents information

4.3.1 Respondents gender

Respondents' gender was sought during the study. The results are tabulated in table 4.2

Table 4.2.Respondents gender

Gender	Frequency	Percentage
Male	33	59.9
Female	24	42.1
Total	57	100

Source: Survet data (2022)

Table 4.2 indicates that the respondents gender distribution was 59.9% male and 42.1% female. This indicates a fair distribution of respondents in terms of gender.

4.3.2 Respondents age dustribution

Respondents' age was sought during the study and the results are tabulated in Table 4.3

Table 4.3 Respondents age distribution

Age(Years)	Frequency	Percentage
20-34	9	15.8
35-45	37	64.9
46-60	11	19.3
Total	57	100

Source: Survey data (2022)

Table 4.3 shows that most of the respondents were aged between 35 and 45 years (64.9%), followed by those aged between 46 and 60 years (19.3%) and lastly those aged between 20 and 34 years (15.8%). This indicates that over 50% of the respondents were those aged between 35 and 45 years of age.

4.3.4 Respondents Level of education

Respondents' level of education was sought during the study. The findings are tabulated in Table 4.4

Table 4.4 Respondents' level of education

Level of Education	Frequency	Percentage
Secondary	12	21.1
Tertiary	34	59.6
University	11	19.3
Total	57	100

Source: Survey data (2022)

Table 4.4 shows that most of the respondents had tertiary education (59.6%), followed by respondents with secondary education (21.1) and lastly respondents with university education (19.3).

4.3.5 Respondent's work experience

Respondents' work experience was sought during the study and the results are tabulated in Table 4.5

Table 4.5 Respondents' work experience

Experience	Frequency	Percentage
Below 3 years	15	26.3
Between 3 and 5 years	30	52.6
Above 5 years	12	21.1
Total	57	100

Source: Survey data (2022)

Table 4.5 indicates that most of the respondents (52.6%) had work experience of between 3 to 5 years; 26.3% had work experience below 3 years; 21.1% had work experience of

above 5 years. This indicates that most of the respondents had work experience of between 3 to 5 years.

4.4 Descriptive analysis

The descriptive statistic used was standard deviation and mean. Mean points to the average obtained from the data sets while standard deviation shows the degree of dispersion of the data set relative to its mean.

4.4.1 ICT infrastructure

The study sought to investigate the extent to which ICT infrastructure influence SMEs performance. The results are tabulated in Table 4.6

Table 4.6 results of ICT infrastructure

	SD	D	N	A	SA	Mean	Std
Our firm has adequate Internet connectivity	5.3 %	8.8%	21.1%	31%	10.5%	3.56	0.982
Our firm has a website	3.5%	10.5%	35.1%	43.9%	7%	3.40	0.904
Our firm has email	5.3%	12.3%	49.1%	29.8%	3.5%	3.14	0.875
Our firm has mobile phones	3.5%	5.8%	8.8%	50.9%	21.1%	2.95	0.934

KEY:5-Strongly Agree(SA), 4-Agree(A),3-Neutral(N),2-Disagree(D),1-Strongly Disagree(SD)

Source:Survey data (2022)

From the findings, the 10.5 % of the respondents strongly agreed that that they had adequate Internet connectivity, 31 % agreed, 10.5% strongly agreed, 21.1& remained neutral, 8.8% disagreed and 5.3% disagreed. This findings are in line with Apulu (2011) who underscores the important of Internet for competitiveness of firms. Another study by

Mutula & Brakel (2006), argue that Internet enhances operations of firms allowing them to access the global network. A study by Masenge (2014) on ICT use and performance of SMEs in Kamukunji sub-County, Nairobi also emphasizes the important of Internet in improving performance of firms. 43.9% of the respondents agreed that they had adequate Internet connectivity with 7% of the respondents strongly agreeing. 35.1% remaining neutral, 10.5% disagreed and 3.5 strongly disagreed. This findings are in line with Masenge (2014) who observes that the use of websites increases performance of SMEs. The findings also indicates that 29.8% agreed that their email was reliable, with 3.5% of the respondents strongly agreeing. 49.1% of the respondents remained neutral over reliability of the email, 12.3 % disagreed and 5.3 strongly disagreed with this view. From the findings, 21.1 % of respondents strongly agreed that they had reliable mobile phones, 50.9 agreed, 8.8% remained neutral, 5.8 disagreed and 3.5 strongly disagreed. This findings are in line with Munyao (2017) who states that the use of mobile phones enhance operations of firms thereby increasing their overall performance. When asked how ICT infrastructure had influenced performance in their firms, 32 percent of respondents indicated that it had enhanced communication in their firms. This findings are in line with Akomea- Bonsu et al (2012) who observe that Information systems enhance communication in firms. 28% of the Respondents also agreed that Internet enabled firms access market information. This findings are in line with Akomea-Bonsu et al., (2012), (Francis & Machim, 2007), (Matambalya, et al., 2001) who underscore the importance of ICT infrastructure particularly the Internet in searching for market information. 34% of respondents agreed that ICT infrastructure such as Internet and websites enabled their firms access global business networks thus increasing their sales volume. This findings concurs with Masenge (2014), who observed that the use of ICT tools accelerates expansion of firms both locally and globally thereby increasing their sales volume. 42.3% indicated that ICT had enhanced work efficiency in their firms. This findings concurs with Matambalya (2001) who observed that a good ICT infrastructure increases efficiency of operations in firms.

4.4.2 Management support

The study sought to investigate the extent to which management support influence SMEs performance. The results are tabulated on Table 4.7 below.

Table 4.7 Result of management support

	SD	D	N	A	SA	mean	std
Management take part in formulation of IS projects	7%	14%	52.6%	22.8%	3.5%	3.02	0.896
Management invest in IS projects	10.5 %	26.3%	49.1%	10.5%	3.5%	2.70	0.925
Management implement IS projects by training staff and providing resources to IS investments	10.5 %	28.1%	43.9%	14%	3.5%	2.72	0.959
Management facilitate organization in taking regular system monitoring and updates	15.8 %	17.5%	47.4%	14%	5.3%	2.75	1.057

KEY:5-Strongly Agree(SA), 4-Agree(A),3-Neutral(N),2-Disagree(D),1-Strongly Disagree(SD)

Source: Survey data (2022)

The findings indicates that 22.8% of the the respondents agreed that management took part in formulation of IS projects, 3.5 % strongly agreeing, 52. 8% remained neutral, 14% disagreed while 7% strongly disagreed. This findings are in line with Ghobakhloo (2012) who observed that lack well formulated plans in IS projects impedes adoption of IS and has negative effect on firms performance. The findings also indiactes that 10.5 % of the respondents agreed that management was committed to IS investmens with 3.5% strongly agreeing, 49.1% remained neutral. 26.3.3% d while 10.5% of the respondents strongly disagreeing with this view. This findings concurs eith Munyao (2017) who asserts that the commitment of the management to IS investment has postive effect to performance of firms. Similarly, Caldeira & Ward (2002) emphasize the need of the management to be fully involved and committed to IS investments for the success of firms. The findings also indicate that 14% of the respondents agreed that the management take part in the

implementation of IS plans by providing resources and training of staff, 3.5% of the respondents strongly agreeing. 43.9% of the respondents remained neutral, 28.1% disagreed while 10.5 % strongly disagreed with his view. This findings are in line with Munyao (2017) who argues that the provision of necessary resources by the management to IS investments as well as training of staff in acquisition ICT skills has a positive effect on firms performance. The findings also indicate that 14% of the respondents agreed that management facilitate the firms in taking regular monitoring and updates, 5.3% strongly agreeing. 47.4% remained neutral, 17.5 % disagreed while 15.8% strongly disagreed with this view. This findings concurs with Thong et al (2001) who emphasized the importance of firm managers to provide support to firms by regular monitoring their system to detect defects and avoid failures and risks.

4.4.3 User expertise

The study sought to investigate the extent to which user expertise influence SMEs performance. The results are tabulated in 4.8

Table 4.8 User expertise

	SD	D	N	A	SA	Mean	Std
Employees have adequate skills and knowledge on IT	3.5%	8.8%	36.8%	47.4%	3.5%	3.39	0.840
Employees are provided with training	5.3%	12.3%	50.9%	26.3%	5.3%	3.14	0.895
Employees are competent on the system use	3.5%	8.8%	35.1%	43.9%	8.8%	3.46	0.908
Employees are well experienced with ICT tools	5.3%	3.5%	43.9%	43.9%	3.5%	3.37	0.837

KEY:5-Strongly Agree(SA), 4-Agree(A),3-Neutral(N),2-Disagree(D),1-Strongly Disagree(SD)

Source: Survey data (2022)

The findings reveals that 47.4% of the the respondents agreed that the staff had adequate skills on the use of ICT , 3.5 % strongly agreeing, 36.5 remained neutral, 8.8% disagreed while 3.5% strongly disagreed. This findings are in line with (Hendriks1 C. , 2012) who argues that firms require staff that are adequately skilled in ICT to enable them undertake firm's operations effectively. For a firm to realize potential gains of ICT investments, it requires staff with sufficient skills and knowledge in ICT (Productivity-Commission, 2004). Further, a study by (Forth & Manson, 2006) investigating the impact of ICT Skills on performance of firms found that lack of ICT skill impedes performance of firms.

From the findings, 26.3 % of the respondents agreed that employees underrgo regular training on ICT with 5.3% strongly agreeing. 50.9 of the respondent remained neutral.12.3% disagreed while 5.3% strongly disagreed with this view. This findings concurs with (Hendriks1 C. , 2012) who emphasises the need of training staff in acquiring skills in ICT occassioned by the dynamic and imerging trends in the technology. Further studies by Matambalya & Wolf, 2001) and (Mouelhi, 2009) also emphasize on the need of training workers to acquire skills in ICT to stimulate work efficiency. A study by Parida et al., (2009) observes that there is a need to train staff to acquire skills and competence in ICT in order to stimulate economic growth and increase competitiveness in firms (Parida, Westerberg, & Ylinenpaa, 2009). The findings also indicated that 43.9 % of respondents agreed that they are competent on the use of ICT, 8.8% of respondents strongly agreeing with this view. 35.1 % of the respondents remained neutral, 8.8 % disagreed while 3.5 % of the respondents strongly disagreed with this view. This findings concurs with (Matambalya & Wolf, 2001) who observe that Internet can raise productivity of firms. However the duo acknowledge that Internet can only be used by staff who are competent and have capability in the use of ICT. The findings also revealed that 43.9% of the respondents agreed that the staff had experience on the use of ICT with3.5% strongly agreeing. 43.9% of the respondents remained neutral, 3.5 % disagreed while 5.3 % strongly disagreed. With this view.

The respondents were asked how expertise in the use of ICT had influenced performance of their firms and 18.3% indicated that it had improved their work efficiency while 20.3 % indicated that it had allowed connect with their customers globally through the Internet hence increasing competitiveness of their firms. This findigs are in lne with Mehretens et

al., 2001 who argues that Internet is used in firms where the staff have the skills, capability, and are competent in the use of ICT (Mehretens, Cragg, & Mills, 2001).

4.4.4 information storage

The study sought to find the the extent to which information storage influenced SMEs performance. The results are tabulated in table 4.9.

Table 4.9 results of Information storage

	SD	D	N	A	SA	Mean	Std
Information systems facilitates Communication of information	1.8%	3.5%	28.1%	59.6%	7%	3.67	0.740
Information system allow sharing of information	7%	17.5%	49.1%	21.1%	5.3%	3.00	0.945
Information system facilitate easy access to information	5.3%	8.8%	52.6%	29.8%	3.5%	3.18	0.848
Information systems facilitates storage of information	5.3%	8.8%	50.9%	31.6%	3.5%	3.19	0.845

KEY:5-Strongly Agree(SA), 4-Agree(A),3-Neutral(N),2-Disagree(D),1-Strongly Disagree(SD)

Source: Survey data (2022)

The findings reveals that 59.6 % of the rhe respondents agreed that information systems facilitate communication of information, while 7 % strongly agreed. 28.1% of the respondents remained neutral, 3.5% disagreed while 1.8% strongly disagreed with this viw. This findings concurs with (Mwongera, 2013), who observes that information systems enhance communication within fims. (Apulu & Latham, 2011), (Busaidi, Bhuiyan, & Zulkifli, 2019) (Daferighe, Offiong, & Okon, 2019), (Matambalya & Wolf, 2001) also affirm that information systems enable firms to communicate faster and easily with their stakeholders. 21.1 % agreed that information systems allow sharing of information with

5.3% strongly agreeing. 49.1% of the respondents remained neutral, 17.5% disagreed while 7 % strongly disagreed with this view. This findings are in line with Emonena (2018), who posits that information systems, particularly the email accelerates the rate and speed of sharing of information among stakeholders thus increasing productivity of firms. Munyao (2015), also observes that information systems allows firms to share new opinions and enable these firms to market their products through the Internet. From the findings, 29.8 % of the respondents agreed that the information systems facilitate easy access to information, while 3.5% of the respondents strongly agreed. 52.6% of the respondents remained neutral, 8.8% disagreed while 5.3 % strongly adisagreed wth the view. This findings concurs with (Matambalya & Wolf, 2001), who observes that the use of ICT enables businesses gain access to market information which give them an edge over their competitors. Similarly a study by (Mwenda, 2018) found that information systems such as Internet enable businesses to access new opportunities and new products in the market. 31.6% of the respondents agreed that information systems facilitates storage of information while 3.5% stongly agreed. 50.9% of the respondents remained neutral, 8.8% stongly disagreed while 5.3% strongly disagreed with this view. This findings are in line with Bidgoli (2004), who asserts that information systems allow users to store massive information hence increasing efficiency, and productivity of firms.

4.4.5 SMEs performance

The study sought to find the influence of management information system on SMEs performance. The results are tabulated in table 4.10.

Table 4.10 results of SMEs performance

	SD	D	N	A	SA	Mean	Std
Management information system increase productivity in the firm	1.8%	3.5%	28.1%	59.6%	7%	3.67	0.740
Management Information system increase profitability in the firm	7%	17.5%	49.1%	54%	5.3%	3.00	0.945
Management Information system lead to a expanded market in the firm	3.5%	8.8%	35.1%	43.9%	8.8%	3.18	0.848
Management Information lead to reduced cost in the firm	3.5%	3.5%	36.8%	47.4%	8.8%	3.19	0.845

KEY:5-Strongly Agree(SA), 4-Agree(A),3-Neutral(N),2-Disagree(D),1-Strongly Disagree(SD)

Source: Survey data (2022)

The findings reveals that 59.6% of the the respondents agreed that management information system increase productivity of firms while 7 % strongly agreed.28.1% of the respondent remained neutral, 3.5 disagreedw while 1.8 % strongly disagreed with this view. This findigs are in lne with (Brynjolfsson & Hitt, 2003), who arue that the use of information systems make enormous contribution to productivity of firms. Similarly Matambalya & Wolf (2001) and Munyao (2017) underscore the importance of information systems in enhancing productivity of firms. 54 % agreed that Management information systems increase profitability of businesses with 5.3% strongly agreeing. 49.1% of the respondents remained neutral, 17.5 % disagreed while 7% strongly disagreed with this view. This findigs concurs with Munyao (2017) who argues found that the use of information systems significantly enhances profitability of firms. 43.9 of the respondents agreed that the use information system enhance expansion of firms with 8.8% strongly

agreeing. 35.1 of the respondents remained neutral, 8.8% disagreed while 3.5% disagreed with this view. This finding concurs with Alam and Noor (2009) who posit that information systems allow firms to compete both locally and internationally thus expanding their market. A study by Munyao (2017) also found that the use of information system lead to expanded market of firms increasing their sales volume. Masenge (2014) also affirms that the use of information systems expands the market of a firm.

47.4% of the respondents agreed that management information systems led to reduction in cost for the firms, 8.8% strongly agreeing. 36.8% of the respondents remained neutral, 3.5% disagreed while another 3.5% strongly disagreed with this view. This findings are in concurs with Masenge (2014) who found that the use of information systems allow firms to reduce their cost of production. This was corroborated further by a study by Munyao (2017) who found that the use of information system reduces the operational cost of business. Apulu 2011 also emphasizes that information systems can improve performance of firms by reducing the cost of production.

4.5 Reliability Analysis

The reliability of research instrument was assessed by analysing consistency of the scores obtained from the test administered twice on the same employees at different times using Cronbach's alpha (α) coefficient. As indicated in Table 4.11 all variables attained an alpha coefficient of more than 0.6 indicating a high level of consistency and therefore the research instrument was reliable for use in data collection.

Table 4.11 Reliability Statistics

Variable	Alpha coefficient	Remark
ICT infrastructure	0.71	Accepted
Management support	0.67	Accepted
User expertise	0.82	Accepted
Information storage	0.73	Accepted
SMEs performance	0.65	Accepted

Source: Survey data (2022)

4.6. Diagnostic Tests

Normality, multicollinearity, and heteroscedasticity tests were conducted to establish the suitability of the data before conducting regression analysis.

4.6.1. Normality test

Normality test was conducted to establish whether the data sets were normally distributed. Two complimentary tests, the Shapiro-Wilk test and skewness test were used to test for normality of data. The results are as indicated in table 4.12.

Table 4.12 Normality test results

	Shapiro-Wilk			Skewness	
	Statistic	df	sig	Statistic	Std Error
ICT Infrastructure	.617	57	.000	-0.101	0.316
Management support	.611	57	.000	-0.560	0.316
User expertise	.631	57	.000	-0.254	0.316
Information storage	.742	57	.000	-0.599	0.316
Performance	.611	57	.000	-0.560	0.316

Source: Survey data (2022)

According to Shapiro-test, values falling above 0.05 are taken to indicate normal distribution of data. From the table 4.12, Shapiro-Wilk test results show that all values are below 0.05. This test therefore did not give the expected results and due to its limitation there was a need to undertake another test to evaluate the skewness of data. According to skewness test, the normal distribution of data is denoted by values falling within the range between -1 and 1 indicates. Table 4.12 show that all values obtained from skewness test fall between -1 and 1 affirming that the data was normally distributed.

4.6.2 Multicollinearity test

Multicollinearity test was conducted to assess the degree of correlation between the independent variables. Table 4.13 shows the findings.

Table 4.13: Multicollinearity test results

	Tolerance	VIF
User expertise	.613	1.631
ICT infrastructure	.812	1.631
Information storage	.582	1.718
Management support	.782	1.718

Source: Survey data (2022)

Tolerance values that fall below 0.1 or VIF falling above 10 are perceived to indicate a problem of multicollinearity. Table 4.13 shows that the tolerance values for all variables fall above 0.1 and VIF values fall within the range between 1 and 10. This implies that the data was free of multicollinearity.

4.6.3 Test for Heteroscedasticity

Heteroscedasticity was assessed using normality of residuals on a Normal P-P Plot. The results are indicated in Figure 4.1

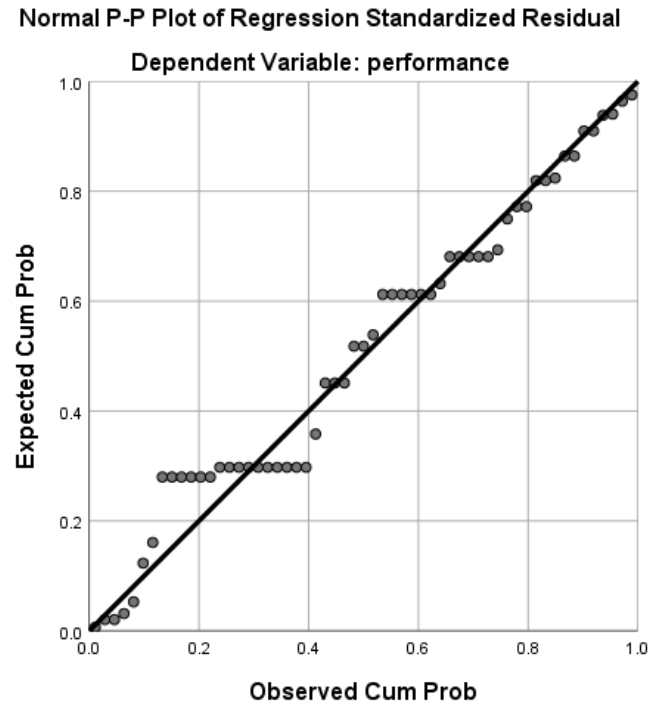


Figure 4.1: Normal P-P Plot of Regression Standardized Residue

Source: Survey Data (2021)

The P-P plot in Figure 4.1 shows that all points fall along the diagonal line. This indicates an existence of a linear relationship between the independent variables and the dependent variable. The figure therefore indicates that there was no heteroscedasticity of data.

4.7 Regression analysis

The aim of the study was to establish the influence of ICT infrastructure, management support, user expertise and information management on performance of SMEs in Embu County. The multivariate regression analysis was carried out to determine the relationship between the study variables.

4.7.1 Model Summary

Table 4.14 shows that there is a strong and positive relationship between the dependent variable and independent variables (R of 0.869). The adjusted R square is the coefficient of determinant indicating the variation in the dependent variable in respect to changes in the independent variables. The adjusted R squared of 0.737 was obtained which indicates

that 73% of the variation in SMEs performance in Embu County is explained by ICT infrastructure, management support, user expertise, and information management.

Table 4.14 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.869 ^a	.756	.737	.21708

a. Predictors: (Constant), ICT infrastructure, management support, user expertise, information storage

Source: Survey data (2022)

4.7.2 ANOVA

The significance of the model was tested using the Analysis of Variance (ANOVA) technique. The findings are tabulated in Table 4.15

Table 4.15 ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	7.585	4	1.896	46.237	.000 ^b
Residual	2.450	52	.047		
Total	10.035	56			

a. Dependent Variable: performance

Source: Survey data (2022)

b. Predictors: (Constant), ICT infrastructure, management support, user expertise, information storage

Source: Survey data (2022)

The table shows that at 5% level of significance, a p value ($0.000 < 0.05$) indicates that the regression relationship significantly predicts how ICT infrastructure, management support, user expertise and information management influence performance of SMEs in Embu County. The value of F calculated value was found to be 46) which was greater than the value of F critical value that was read from F statistical table (7.81). This indicates that the model was fit in predicting the relationships between the study variables.

4.7.3. Regression Coefficients

Regression coefficients were used to determine the variation of dependent variable with respect to changes in independent variable(s). The findings are tabulated in the table 4.16

Table 4.16 Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	β	Std. Error	Beta		
(Constant)	.565	.261		2.164	.035
1 ICT infrastructure	.296	.061	.374	4.885	.000
Management support	.150	.050	.221	2.981	.004
User expertise	.264	.052	.315	3.965	.000
Information storage	.207	.054	.361	4.265	.000

a. Dependent Variable: performance

Source: Survey data (2022)

The result of regression model was denoted as :

SMES performance = $0.565 + 0.296$ ICT infrastructure + 0.150 management support + 0.264 user expertise + 0.207 information storage

The regression equation reveals that all factors (ICT infrastructure, management support, user expertise and information storage) held constant, performance of SMEs in Embu county was 0.565 . The regression results indicate that there is a positive and significant influence of ICT infrastructure and performance of SMEs in Embu County with $\beta = 0.296$

and $p=0.000<0.05$ B shown. This indicates that a unit increase in management support would lead to 29% increase in performance of SMEs in Embu County. This findings concur with (ISAAC, 2014) who states that ICT infrastructure influence performance of SMEs. The findings are also in line with (Mbataru & Wanjau, 2013), found that ICT infrastructure has a significant influence on performance of SMEs. The regression results also reveals that there is a positive and significant relationship between management support and performance of SMEs in Embu County as shown by $\beta = 0.150$ and $p=0.000<0.05$. This indicates that a unit increase in management support would lead to 15% increase in performance of SMEs in Embu County. This findings concur with (Najjar, 2009) findings that management support has significant influence on performance of firms. Another study by Munyao (2017) also found that management support has a positive effect on performance of firms.

The regression results also reveals that there is a positive and significant relationship between User expertise and performance of SMEs in Embu County as shown by $\beta = 0.264$ and $p=0.000<0.05$. This indicates that a unit increase in user expertise would lead to a 26% increase in performance of SMEs in Embu County. The findings concurs with (Najjar, 2009) who state that user expertise has a significant influence on organizational performance. Munyao (2017) also affirms that there is a strong relationship between user expertse and performance of firms

The regression results also show that there is a positive and significant relationship between information storage and performance of SMEs in Embu County as shown by $\beta = 0.207$ and $p=0.000<0.05$. This indicates that a unit increase in information storage would lead to a 20% increase in performance of SMEs in Embu County. These findings are in line with a study by Munyao (2017), who found that information systems provide adequate storage and sharing of data thus improving performance of firms.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter comprises of the study findings, conclusions and recommendations of the study and suggestions for further research.

5.2 Summary of the findings

The study aimed at investigating management information system integration and performance of small and medium enterprise in Embu County, Kenya. The study looked at four specific objectives: to establish the effect of ICT infrastructure on performance of small and medium enterprises in Embu County Kenya; to assess the effect of management support on performance of small and medium enterprises in Embu County, Kenya; to investigate the effect of user expertise on performance of small and medium enterprises in Embu County, Kenya.; to determine the effect of information storage on performance of small and medium enterprises in Embu County, Kenya. The data was collected from 80 respondents sampled from 250 SMEs in Embu County that were IT integrated. The study employed exploratory research design and used primary data that was obtained from respondents through structured questionnaires. The researcher sought the assistance of the supervisor to establish whether the research questions satisfied content validity. The researcher also ensured that questions carefully represented the intended concepts in order to satisfy construct validity. The data collected was then coded and entered into computer for analysis using the Statistical Package for Social Sciences (SPSS). Quantitative data was analysed using descriptive and inferential statistics while qualitative data was analysed using content analysis technique. Regression analysis was used to establish the relationships between the study variables.

5.2.1 ICT infrastructure

The study revealed that SMEs had adequate ICT infrastructure that enabled easier communication and connection with their customers both locally and Internationally. The study also found that ICT infrastructure enhanced efficiency of operations in SMEs.

5.2.2 Management support

The study found that the management supported IS investments and participated in IS planning. Respondents felt that the management provided necessary resources to IS investments and facilitated training of staff on acquiring ICT skills. The study also found that management supported IS maintenance and regular monitoring of the system.

5.2.3 User expertise

The study found that majority of the staff had sufficient skills, knowledge, and were competent in using information systems. The study also found that the majority of the staff were able to access the Internet and search for information. Respondents felt that ICT skills, knowledge, competency and experience had enhanced their work efficiency.

5.2.4 Information storage

The study revealed that the use of information systems enhanced communication within SMEs. The study also found that information systems allowed SMEs to share information with their stakeholders. Respondents felt that the use of information systems facilitated easier storage and access to information in their firms.

5.2.5 SMEs performance

The study revealed that management information system enhanced performance of small and medium enterprises in Embu County, Kenya. Respondents felt that the use of Internet facilitated easier communication with their customers across the globe leading to an expanded market.. The study also found that the use of information systems enhanced reduction of operational, production and communicational costs hence increasing profitability of firms. Respondents also felt that the use of information systems enhanced productivity of workers..

5.3 Conclusion

The first objective sought to assess the effect of ICT infrastructure on performance of small and medium enterprises in Embu County, Kenya. The study found that ICT infrastructure comprising of Internet, website, email and mobile phones allowed SMEs to connect with their customers across the globe and search for information from the Internet. The study

concluded that ICT infrastructure has a positive and significant influence on performance of small and medium enterprises in Embu County.

The second objective sought to assess the effect of management support on performance of small and medium enterprises in Embu County, Kenya. The study found that management support is crucial if IS investments are to be realized. Management need to support IS projects through provision of resources and training of staff. The study concluded that management support has a positive and significant influence on performance of small and medium enterprises in Embu County, Kenya.

The third objective sought to determine the effect of user expertise on performance of small and medium enterprises in Embu County, Kenya. The study found that skills in the use of ICT, competency, experience and training enhanced efficiency of workers and enabled them source for market information from the Internet. The study concluded that user expertise has a positive and significant influence on performance of small and medium enterprises in Embu County, Kenya.

The fourth objective sought to establish the effect of information storage on performance of small and medium enterprises in Embu County, Kenya. The study found that information systems enhanced communication and sharing of information within SMEs. The study also found that information storage facilitated SMEs to securely store and access to information. The study concluded that information storage has a positive and significant influence on performance of small and medium enterprises in Embu County, Kenya.

5.4 Recommendation

This study makes the following recommendations

- (i) Management of small and medium enterprises in Embu County, Kenya should invest in building adequate and quality ICT infrastructure in order to enhance performance of firms.
- (ii) Management of small and medium enterprises in Embu County, Kenya should facilitate training of their staff to acquire skills in ICT in order to enhance their competence on the use of information systems.

- (iii) The government of Kenya should waive taxes on ICT gadgets to enable their small and medium enterprises procure these devices at a low cost.

5.5 Suggestion for further research

This study sought to investigate management information system integration and performance of small and medium enterprises in Embu County, Kenya. It would be prudent to undertake a further research to investigate how management information system influence performance of other sectors of the economy.

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APPENDICES

Appendix I: LETTER OF INTRODUCTION

HANNAH WANGECHI KAMAU,
D53/OL/EMB/32430/2017,
KENYATTA UNIVERSITY,
NAIROBI.
Tel. 0721720527
Email: wangechikamaush@gmail.com

TO THE RESPONDENT,

RE: PARTICIPATION IN RESEARCH

Dear Sir/Madam,

Dear Respondent,

I am a student undertaking a Master degree of Business Administration in Management Information System at Kenyatta University. I am carrying out a research on management information system integration and performance of SMEs in Embu County. I have sampled your firm to participate in the study in aid of gathering information. I will uphold the confidentiality and privacy of data that will be provided.

Thank you for supporting me.

Yours faithfully,

HANNAH KAMAU

Appendix II: QUESTIONNAIRE

This questionnaire aims at collecting data on management information system integration and performance of Small and Medium Enterprises in Embu County, Kenya. Please complete this questionnaire as instructed.

SECTION A: General information

Instructions:

Select your choice by Ticking (√) in the brackets ()

1. Respondent's gender

() Male () Female

2. Age

Between 20-29 () years between 30-39 () years between 40-49 () years above 50 () years

3. Level of education?

Primary () Secondary () Tertiary () Undergraduate degree () Postgraduate degree ()

4. How many years have you worked in this firms?

() Below 3 years () 3 –5 years () 6 –10 years () above 10 years ()

SECTION B:

Questions on ICT infrastructure on performance of SMEs in Embu County

5. Which of the following connectivity is applied in your firm?

a) Fibre connectivity [] b) Mobile connectivity []

c). others (specify).....

6. How good is the connectivity in your firm?

a) Very fast [] b) Moderately fast [] c) Slow []

7. How has the ICT infrastructure enhanced performance in your firm? **Yes No**

i). Enhanced communication [] []

ii). Access to information [] []

- iii). Market expansion [] []
- iv) . Improved efficiency [] []

v) Enhanced customer service [] []

v) Other ways (specify)

.....

.....

.....

.....

8. To what extent do you agree with the statements listed below? Use the following scale to indicate the degree of your choice 1-strongly disagree 2-disagree 3- Neutral 4-agree and 5 -strongly agree. Select your choice by ticking (√) in the spaces provided.

Attributes	1	2	3	4	5
Our firm has adequate Internet connectivity					
Our firm has a website					
Our firm has reliable mobile phones					
Our firm has reliable email address					

9. To what extent do you agree that ICT infrastructure influence performance of your firm? Use the following scale to indicate the degree of your choice 1-strongly disagree 2-disagree 3- Neutral 4-agree and 5 -strongly agree.

Questions of management support on performance of SMEs in Embu County

10. To what extent do you agree with the statements listed below? Use the following scale to indicate the degree of your choice 1-strongly disagree 2-disagree 3- Neutral 4-agree and 5 -strongly agree. Select your choice by ticking (√) in the spaces provided.

Attribute	1	2	3	4	5
Management are capable of formulating ICT plans					
Management participate in ICT investments					
Management implement ICT policies					
Management are innovative on ICT projects					

11. To what extent do you agree that management support influence performance of your firm? Use the following scale to indicate the degree of your choice 1-strongly disagree 2-disagree 3- Neutral 4-agree and 5 -strongly agree. Select your choice by ticking (√) in the spaces provided.

Questions on user expertise on performance of SMEs in Embu County

12. To what extent do you agree with the statements listed below? Use the following scale to indicate the degree of your choice 1-strongly disagree 2-disagree 3- Neutral 4-agree and 5 -strongly agree. Select your choice by ticking (√) in the spaces provided.

Attribute	1	2	3	4	5
Employees have adequate skills on IT					
Employees are adequately training					
Employees are competent on the system use					
Employees are well experienced with ICT tools					

13. Which of the following ICT skills do you have? Select your choice by ticking (√) in the spaces provided.

Internet use & Email	
Desktop applications	
Word processing	

Database management	
Accounting application	
Excel	

14. Have you received any training on ICT? [No/Yes] If yes which skills were you trained on?

15. On what operations do you use ICT in your firm?-----

16. How has your expertise in the use of ICT influenced performance of your firm?

Please

explain.....

.....

.....

.....

.....

17. To what extent do you agree that user expertise influence performance of your firm?

Use the following scale to indicate the degree of your choice 1-strongly disagree 2-disagree 3- Neutral 4-agree and 5 -strongly agree. Select your choice by ticking (√) in the spaces provided.

Questions on information storage on performance of SMEs in Embu County

18. To what extent do you agree with the statements listed below? Use the following scale to indicate the degree of your choice 1-strongly disagree 2-disagree 3- Neutral 4-agree and 5 -strongly agree. Select your choice by ticking (√) in the spaces provided.

Attribute	1	2	3	4	5
Information systems facilitates Communication of information					
Information system allow sharing of information					
Information system facilitate easy access to information					
Information systems provides secure storage of data					

19. Which media does your firm use to communicate to its stakeholders? Tick (✓) where appropriate

Email	
Internet	
Website	
Mobile phone	
Printed form	
Television	
Radio	
Verbal	
Others(specify)	

Questions on management information systems on performance of SMEs in Embu County

20. To what extent do you agree that management information system influence performance of your firm? Use the following scale to indicate the degree of your choice 1-strongly disagree 2- disagree 3- Neutral 4-agree and 5 -strongly agree. Select your choice by ticking (✓) in the spaces provided.

Management information system has increased sales for the firm	
Management information systems has increased profitability of the business	
Management information systems has increased productivity of the business	
Management information systems has led to cutting down cost	

21. To what extent do you agree that information storage influence performance of your firm? Use the following scale to indicate the degree of your choice 1-strongly disagree 2-disagree 3- Neutral 4-agree and 5 -strongly agree. Select your choice by ticking (✓) in the spaces provided.

22. How else has the use of management information system influenced performance of your firm.....

.....

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.....

.....

Appendix III: Research Authorizations



**KENYATTA UNIVERSITY
GRADUATE SCHOOL**

E-mail: dean-graduate@ku.ac.ke

Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: D53/OL/EMB/32430/2017

DATE: 22nd August, 2022

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR HANNAH WANGECHI KAMAU –REG. NO. D53/OL/EMB/32430/2017

I write to introduce Ms. Hannah Wangechi Kamau who is a Postgraduate Student of this University. She is registered for MBA degree programme in the Department of Management Science.

Ms. Kamau intends to conduct research for a MBA Project Proposal entitled, "Management Information System Integration and Performance of Small and Medium Enterprises in Embu County, Kenya".

Any assistance given will be highly appreciated.

Yours faithfully,


PROF. ELISHIBA KIMANI
DEAN, GRADUATE SCHOOL

EE/nn