TECHNOLOGICAL INNOVATIONS STRATEGIES AND PERFORMANCE OF SMALL AND MEDIUM ENTERPRISES IN BUNGOMA COUNTY, KENYA

BRIAN ITOLONDO KHADIAKALA

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A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF BUSINESS, ECONOMICS AND TOURISM IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTERS IN BUSINESS ADMINISTRATION (STRATEGIC MANAGEMENT) OF KENYATTA UNIVERSITY

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DECLARATION

This Research Project is my original work and has not been presented for a degree or any other award in any other university. No part of this Research Project should be reproduced without the authority of the author or/and of Kenyatta University.

Signature …… Date …….…….

Brian Itolondo Khadiakala

D53/OL/HEP/22740/2021

I confirm that the work reported in this Research Project was carried out by the candidate under our supervision as the appointed university supervisor.

Signature …… Date …….…….

Prof. Stephen Muathe (PhD)

Business Administration Department,

School of Business, Economics and Tourism

Kenyatta University

DEDICATION

This Research project is dedicated to my spouse Marjorie Liza, whose unwavering support and encouragement have served as the guiding symbol throughout the process. To my daughters Luna Marcia and Adrielle Daphey for You inspire me to reach for the stars and strive for excellence every day. To my parents, whose sacrifices and wisdom have laid the foundation for my aspirations and achievements, your belief in me has fueled my determination to pursue higher goals and make a difference in the world.

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ABBREVIATION AND ACRONYMS

B2B	Business-to-Business
FsQCA	fuzzy set qualitative comparative analysis
GDP	Gross Domestic Product
ICT	Information and communication technology
IT	Information Technology
KIPPRA	Kenya Institute for Public Policy Research and Analysis
NACOSTI	National Commission for Science, Technology, and Innovation
RBV	Resource-Based View
R&D	Research and Development
ROE	Return on Equity
ROI	Return on Investment
SEM	Structural equation modeling
SMEs	Small and Medium sized enterprises
SPS	Statistical Package for Social Sciences
USA	United states of America
UK	United Kingdom

OPERATIONAL DEFINITION OF TERMS

Customer Satisfaction	Extent to which the products or services offered by an enterprise meet or exceed the expectations of the consumer, as measured by the customer satisfaction index.
Market Share	It is an objective measure of an enterprise market-based performance of the firm's products which is computed as the percentage of the total sales of a firm generated during a specific period.
Marketing Innovation Strategies	Willingness to adoption of new marketing channels, sales avenues, and distribution channels that are not being utilized by other competitors in the industry, resulting in customer satisfaction
Organizational Innovation Strategies	Activities that involve routines business practices, procedures, and networking, resulting in the efficient operation of SMEs, which in turn leads to enhanced firm performance and consumer satisfaction.
Performance	The achievement of positive outcomes or results that align with an organization's objectives. In this research, it will be assessed using market share, customer satisfaction and market position.
Process Innovation Strategies	Activities entails formulation and execution of a new or significantly enhanced process, such as energy consumption and waste material management.

Product Innovation Strategies	Activities that involve the modification, improvement and production of high quality products that result in consumer satisfaction.
Small and Medium Enterprises	Small businesses have a workforce of 5–49 employees, while medium-sized businesses serve 50–99 employees.
Technological Innovations Strategies	It is an attribute of market penetration strategies that involve segmenting a diverse market by breaking it into smaller, more homogenous groups depending on certain qualities or traits shared by the members of each segment for example demographic segmentation, geographic segmentation and Psychographic segmentation.

ABSTRACT

The global economy's changes have prompted organizations to develop strategies to respond to turbulence, expand markets, improve customer satisfaction, and boost sales within small and medium enterprises in Kenya. The dynamic environment has led to a gradual reduction in market shares, sales volume and overall size. In the year 2017-2018 the sector experienced a decrease in sales revenue by 58% and 75% employee reductions. Further in the year 2022 there was a decline of 59% in sales and profit growth. In this case, technological innovations strategies are crucial elements that enhance the performance. Therefore, the current project investigated the effect of technological innovation strategies on performance. Specifically, the study examined the effect of product innovation, process innovation, marketing innovations and organization innovations on the performance. The research was guided by resource-based view, dynamic capabilities theory, theory of innovation and technology organization environment framework. The research adhered to descriptive research design. A self-administered structured questionnaire was used to collect primary data from four thousand two hundred and sixty-four small and medium enterprises in Bungoma County, Kenya using stratified and random sampling techniques. An aggregate of three hundred and sixty-six respondents was determined using Yamane formula of 1967. Primary data was collected using a structured questionnaire that were self-administered. A pilot test of thirty-seven respondents was conducted and the text was reliable. The study instrument's reliability and validity were evaluated using Cronbach's alpha coefficient, with a threshold of 0.7 been acceptable. The response rate was seventy six percent, which was adequate for drawing judgments and forming inferences from the data. Descriptive statistics were summarized using frequencies, percentage, mean and standard deviations. The study established a positive and significant relationship between product innovations, process innovations, marketing innovations and organizational innovations on the firm performance. The study recommends that the enterprises should developing products that address specific market gaps, prioritize adopting technology-driven solutions that streamline operations, reduce costs, increase productivity and leverage digital platforms to reach a broader and more targeted customer base and empower employees through skill development and training, increases effectiveness. The study recommends further research on metrics beyond technological innovation strategies and firm performance, as well as exploring counties beyond Bungoma County in Kenya.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Changes in the global economy and the business environment have compelled organizations to develop, choose, and execute strategies to respond to turbulence and achieve firms success (Fuertes *et al.*, 2020). These transformations occurring in the global economy have inspired numerous firms from developed and developing nations to pursue tactics that will allow them to expand their market, enhance customer satisfaction, and increase sales volume on a global level (Ahammad, Basu, Munjal, Clegg & Shoham, 2021). In addition, to enhance firm performance, firms have to possesses distinctive features to competitive in a volatile market and surpass its competitors (Zhang *et al.,* 2019: Cortes & Herrmann, 2021). However, the firm's internal resources, including assets and capabilities, (Hameed *et al*., 2018).

The literature in strategic management emphasizes utilization of an technological innovations strategies by an organization results to organizational success (Bagheri *et al*., 2019). These innovative strategies are typically implemented to enhance profitability, efficiency, and to establish a competitiveness. Ferreira *et al.,* (2021) document that the technological innovation strategies significantly influence the development of international competitiveness and the identification of methods to Improve efficiency and boost competitiveness on an international level. Subsequently, Wei *et al.,* (2014) posit technological innovation strategies allows companies to align technologies with market opportunities in order to expand their development.

SMEs are increasingly acknowledged as the vital function of technological innovation in driving their performance and competitiveness in the swiftly changing field of business today (Rahman Yaacob & Radzi., 2016: Gamage *et al.,* 2020). They dominate the global business sector,

accounting for over 95% of all enterprises worldwide and providing over 60% of the private sector's employment. Regionally, SMEs have encountered a variety of challenges, including a lack of general financial resources, changing consumer requirements, inability to access markets, and increased competition (Eggers, 2020: Gamage *et al.,* 2020). Inadequate business management skills and a lack of fundamental infrastructure, such as information management technology, are additional challenges that SMEs in Africa encounter (Kaplinsky & Morris, 2019: Zahoor *et al.,* 2023). Locally, the performance of SMEs Kenya's economy has been affected negatively by the same challenges as those faced by regional firms (KIPPRA, 2022: UNIDO, 2022).

1.1.1 Firm Performance

Leitão *et al.*, (2019) outline that firm performance is the capacity of an organization to effectively allocate its resources and create outputs that are in alignment with its goal that are meaningful to its stakeholders. The measurement of firm performance serves as a crucial metric for both SMEs, as well as large organizations (Rehman *et al.,* 2019). Assessment of firm performance is comprised of a diverse array of components, which are contingent upon factors including organization's industry, organizational structure, and the quality of its products and services provided (Joseph & Kibera, 2019).

The majority of research utilize financial performance measurements such as return on investment (ROI), return on equity (ROE), and profitability (Ciftci *et al.,* 2019; Koji *et al.,* 2020; Brahma *et al.,* 2021; Surya *et al.,* 2021: Al Hawaj & Buallay, 2022: Aguilera *et al.,* 2024). While undeniably crucial for organizations, it is not the primary factor that determines success or effectiveness. Moreover, there is an increasing acknowledgement of the necessity for a more extensive approach to assessing performance, which includes both financial and non-financial aspects such as customer satisfaction, market share, innovation capacity, staff involvement, and social

responsibility (Ayoor *et al.*, 2019: Napitupulu *et al.*, 2020). In spite of that, historically, the majority of strategic management studies have relied on both financial/non-financial metrics, including profitability, customer satisfaction, return on investment, and market share, as performance indicators (Javeed & Lefen, 2019: Arokodare & Asikhia, 2020).

This is consistent with the with the outcomes of a study conducted by Kori, Muathe and Maina (2020) which demonstrates that the implementation of balanced scorecard metrics that encompass both financial and non-financial perspectives is complementary when evaluating an organization's performance. Božić and Poola, (2023) classifies organizational performance indicators as effectiveness, that relates to the ability of an organization to deliver optimal service or product within an efficient framework, and efficiency and financial viability. Ali *et al.*, (2021) reports that indicators of customer satisfaction have consistently proven to be reliable predictors of long-term organizational performance and stable, long-term cash flows.

Extant empirical studies, which primarily concentrate on SMEs in across all sector, have demonstrated the firms performance measures as customer satisfaction, market share and sales volume growth (Eggers, 2020: Gamage *et al.,* 2020). However, some studies conceptualized firm performance as brand recognition (Nyambua, 2018: Keya, 2019), profit growth (Kaplinsky & Morris, 2019: Chege *et al.*, 2020). Therefore, the study employed market share, customer satisfaction, and sales volume as metrics that SMEs employed to evaluate their performance, as they were previously in use in the strategic management school of thought.

Market share acts as a key indicator of a firm's competitive position within its industry, reflecting its ability to capture a portion of the market demand relative to competitors (Biely & Van Passel, 2022). Customer satisfaction is paramount to the extent in which products or services offered by an enterprise meet or exceed the expectations of the consumer, as measured by the customer

satisfaction index. While sales volume is a measure of the physical output, or the number of products or services delivered to customers during a given timeframe.

1.1.2 Technological Innovations Strategies

Technological innovation is characterized as incremental, radical, product, and process innovations based on its level of innovation (Broughel & Thierer, 2019). The advancement of effective strategies to foster innovation and the implementation of measures to assess its impact are essential for businesses that are striving to remain competitive and ahead of the curve (Kiveu, Namusonge & Muathe., 2019). These strategies encompass a variety of methods, such as the cultivation of a culture of experimentation and creativity within the organization and the investment R&D. The concept of technological innovation strategies revolves around the deliberate and structured approach organizations undertake to harness technological advancements for competitive advantage and sustainable growth.

Ramadani *et al.,* (2019) indicates there are three categories into which technological innovations strategies can be categorized: product innovations (which introduce a new or enhanced commodity or service), process innovations (which introduce new approaches to the organization and integration of inputs while ensuring the production procedure is underway), and organizational innovation (which introduces a new or enhanced structure of the firm's resources). Moreover, Ferreira *et al.,* (2021) posited that technological innovation is linked to the generation, application, and diffusion of technologies, and encompasses activities that are designed to introduce new production methods or produce new products. In addition, Gamage *et al.,* (2020) concluded that product innovations, and market innovations increases as measures of technological innovations increases organization success.

Most scholars in strategic management school of thought, have conceptualized technological innovations strategies as product innovations, marketing innovations, organization innovations and process innovations (Rahman, Yaacob & Radzi., 2016: Ferreira *et al.,* 2021). The current study used marketing, product, organization and process innovations as measures of technological innovation strategies.

Product innovation entails product modification, product improvement, and the production of high-quality products that result in consumer satisfaction. Process innovations involve the creation and implementation of a new enhanced process, such as energy consumption or waste material management. Openness to introduce new marketing media, sales avenues, and distribution channels that other competitors are not using is a key component of marketing innovations. Organizational innovation is an activity that involves routine business practices, procedures, and networking, resulting in SMEs' efficient operation.

1.1.3 Small and Medium Enterprises in Bungoma County

The definitions and terminology of SMEs vary across countries (Rahman *et al.*, 2016). The primary criteria for distinguishing SMEs worldwide are size, full-time employees, and sales turnover. The SMEs in Kenya, account for 75% of all businesses and contribute 80 percent of the total employment (GOK, 2015: Zahoor *et al.,* 2023). This sector covers all sectors of the economy. The enterprises are social organizations that are intentionally designed to generate revenue, but they are subject to the influence of both their internal and external environments (Nyachoti, Machuki & Oteki, 2018: Mnyazi & Makhamara, 2023)

Bungoma County, situated in western Kenya, spans an approximate area of 2207 square kilometers. The region encompasses nine sub-counties, namely mt. Elgon, Kimilili, Sirisia, Kabuchai, Bumula, Kanduyi, Webuye East, Webuye West and Tongaren. There are 4264 licensed

SMEs in Bungoma county across different informal sectors indicates that services is home to the majority (84.5%), while manufacturing, agribusiness, and construction, mining, and quarrying each account for 11.8%, 3.3%, and 0.5%, respectively (County Government of Bungoma, 2019: KIPPRA, 2022). Twenty-six percent of the enterprises in Bungoma County are owned by young people (KNBS 2019).

Similar challenges confront SMEs in Bungoma as they do in other Kenyan counties. These challenges include an Excessive dependence on expensive technologies, as 83% of SMEs in Kenya rely on fuel-powered machines; A significant portion of entrepreneurs have limited education, with over 50% of SME owners considering primary school their highest level of education. Additionally, more than 70% of SMEs have not adopted information and communication technology (ICT) and lack ICT equipment (KNBS, 2019: Muthoka, 2022). These challenges have a detrimental implications for the performance of SMEs in Bungoma County. This was evidenced by a study conducted from 2017 to 2018, which concentrated on the performance of SMEs in Kenya, it was found that 58% of SMEs experienced a decrease in revenue, while 75% of SMEs reported employee reductions (Otieno, Namusonge & Mugambi, 2018: Muthoka, Kilika & Muathe, 2022) Furthermore, research by Kenya Climate Innovation, (2020) research, indicated that the sales and profit margins of SMEs had remained stable.

1.2 Statement of the problem

The Kenyan government's endeavors to foster industrialization, combat poverty and unemployment, and transition the nation to a middle-income status are partially contingent upon the expansion and development of the SMEs sector (Vision, 2030). To address this, the Bungoma government has developed and executed a variety of blueprints such as giving loans and credits to the SMEs, trainings and seminars to assist the SMEs in the county (County Government of

Bungoma, 2019). Additionally, through Vision 2030, the government of Kenya has implemented a series of reforms including National Industrialization Policy framework, buy Kenya build Kenya and manifesto on the big four agenda to help the growth and performance of SMEs enterprises in Kenya (GOK, 2023).

Despite the initiatives taken by the county government of Bungoma and the national government of Kenya to improve the performance of SMEs in Bungoma County, the performance of these enterprises has been steadily declining (Nyachoti, Machuki & Oteki 2018). Research conducted by Otieno *et al.*, (2018) from 2017 to 2018, on the performance of SMEs in Bungoma county, It was discovered that 58% of SMEs saw a decline in revenue, while 75% reported a reduction in their workforce. Moreover, research by Kenya Climate Innovation (2020) revealed that the sales and profit volumes of SMEs decreased between 2017 and 2019. Further, Muthoka (2022) reported that the performance of SMEs experienced a 59% decline in sales and profit growth.

Empirical literature on previous research in diverse contexts indicates that the construct done on individual components of technological innovations strategies in Europe, Asia, US, SMEs, textile, hospitality, restaurants, manufacturing, banking (Chege, Wang & Suntu, 2020: Awan, Arnold & Gölgeci, 2021: Noone, lin & Sharma, 2024). Further, Multiple studies in the empirical literature have indicated that the findings exhibit similarities to those in other sectors on matters pertaining low methodological rigor resulting from use of use of non-probability sampling techniques, use of secondary data only, exploratory research design and small sample sizes for data collection (López-Cabarcos *et al.,* 2019: Waheed *et al,* 2019: Naveed *et al,* 2022).

Additionally, most studies did not incorporate several indicators of technological innovation strategies to explain the combined effects of the technological innovation strategies on performance (Donbesuur *et al,* 2020: Quaye & Mensah, 2019: Mikalef & Krogstie, 2020).

Similarly, technological innovation strategies were conceptualized as either dependent, independent variable or mediating variable (Na, Kang & Jeong, 2019: Udriyah, Tham & Azam, 2019: Waheed *et al,* 2019). Therefore, there is a lack of consistency in the studies. Therefore, the purpose of this study is to investigate the effect of technological innovation strategies on performance of SMEs in Bungoma County, Kenya.

1.3 Objectives of the Study

1.3.1 General Objective

To investigate the effect of technological innovations strategies on performance of small and medium enterprises in Bungoma County, Kenya.

1.3.2 Specific Objectives

i. To examine the effect of product innovations on performance of small and medium enterprises in Bungoma County, Kenya.
ii. To assess the effect of process innovations on performance of small and medium enterprises in Bungoma County, Kenya.
iii. To determine the effect of marketing innovations on performance of small and medium enterprises in Bungoma County, Kenya.
iv. To determine the effects of organizational innovations on performance of small and medium enterprises in Bungoma County, Kenya.

1.4 Research Questions

i. What is the effect of product innovation on performance of small and medium enterprises in Bungoma County, Kenya?
ii. To what extent does process innovations affect performance of small and medium enterprises in Bungoma County, Kenya?
iii. How does marketing innovations influence performance of small and medium enterprises

in Bungoma County, Kenya?

iv. To what extent does organization innovations affect performance of small and medium enterprises in Bungoma County, Kenya?

1.5 Significance of the Study

The research will be important to the owners and managers of SMEs in order to acquire a thorough knowing the process by which technological innovation strategies can furnish the essential resources to improve their performance and endure the dynamic challenges presented by the business environment. By understanding the factors hindering optimal performance, enterprise owners can design targeted interventions aimed at improving access to resources, enhancing infrastructure, or mitigating regulatory hurdles that impede the expansion and advancement of SMEs.

Moreover, the study is important to the academicians in that it provides information on performance of SMEs in Bungoma County, Kenya by providing an enhanced comprehension of the underlying concepts of technological innovations strategies. The interactions of technological innovation strategies and performance is important in promoting profits and increase in market share and customer satisfaction within SMEs enterprises in Bungoma County. This investigation's findings will additionally provide advantages to scholars and researchers as they serve as a foundation for scientific inquiries into the literature, owing to their comprehension of the subject matter concerning the interrelationships among the variables under investigation.

The results of the investigation will be used to guide the formulation of policy by providing information on the impact of technological innovations, including product, process, marketing, and organizational innovations, on the performance of SMEs. Consequently, the formulation of policies by the county government that alleviate the pressure on SMEs and the development of

programs that enhance the capacity of SMEs to mitigate various forms of pressure will be facilitated. The same knowledge and information will be beneficial to other institutions that are dedicated to assisting SMEs.

1.6 Scope of the Study

The goal of this investigation was to evaluate how technological innovation strategies influences performance SMEs in Bungoma County, Kenya. The measures of technological innovation strategies include product, process, marketing, and organizational innovations. Whilst market share, customer satisfaction and sales volume was used to measure firm performance. The guiding theories are the RBV theory, dynamic capabilities theory, theory of innovation and technology organization environment framework.

The population of interest composed of owners of SMEs in Bungoma County, Kenya. Where data was gathered at one specific time. A similar approach was used by Muathe, (2010). Respondents were interviewed at a single point during the fieldwork period, which spans from September to November 2024. This timeframe ensures data collection during a representative period, capturing seasonal variations and potential fluctuations in business operations.

1.7 Limitations of the Study

Several challenges were anticipated in this study. First, the documentation of SMEs in Bungoma County, Kenya, is inadequate. Consequently, the professional opinions of owners and managers, coupled with the findings and observations from prior studies, were reflected in self-report data. Additionally, the study was restricted by the scarcity of research studies on technological innovation strategies among SMEs in Kenya, which was to prevent the provision of comparable data and recommendations for relevant study methodologies. An exhaustive empirical and

literature review was conducted to evaluate research conducted by other researchers in order to address this constraint.

In addition, the owners of SMEs in Bungoma County exhibited suspicion and reluctance in divulging the necessary information about their performance. The constraint was successfully addressed by presenting substantiating evidence that the data in question was intended for scholarly purposes, as demonstrated by the provision of a research license obtained from the NACOSTI. Secondly, the location of respondents from SMEs in Bungoma County was challenging to determine during the data collection period. However, this limitation was addressed by obtaining information from the county government of Bungoma website.

1.8 Organization of the Study

The study comprised five main chapters along with a preliminary section. Chapter one presented introductory details along with the contextual background of the study's subject matter. It covered elements like the problem statement, objectives, hypothesis, significance and limitations. Moving to chapter two, it delved into the empirical literature and the foundational theories. Chapter three, on the other hand, addressed the research design, unit of analysis and observation, data gathering, analysis, and research ethics. Chapter four presented the study findings and discussion while chapter five summarizes the study conclusions, recommendations and suggestions for additional research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section conducted an analysis of the link between the performance of SMEs in Bungoma County, and the research metrics related to technological innovation strategies. The theories underpinning this study grounded the present investigation. Furthermore, a conceptual structure that demonstrated the interconnectedness of the variables under investigation as they are conceptualized.

2.2 Theoretical Literature Review

The section below demonstrates the most appropriate theory for the study. Various theories may be used to anchor the study variable, but the most relevant theories that anchored the study were RBV, dynamic capabilities theory, theory of innovation and technology organization environment framework.

2.2.1 Resource Based View

The framework came into existence during the early 1950s due to the contributions by Penrose, in 1959. According to the RBV fundamental argument, a company's internal environment and resources are attributes of firm heterogeneity (Ismail *et al.,* 2020). Significance development of RBV by Wernerfelt, (1984) proposed that acquiring diverse and unique firms' resources is necessary for exceptional performance and efficiency for achieving long-term competitiveness. A firm's performance is contingent upon its distinctive resources and capabilities, which are specific to each enterprise and influence their performance.

The SMEs in Bungoma County should find a way on how to utilize extensive collection of resources to increase the sales volume and market share. The ability to transform resources into

advantages is known as capability (Nothnagel, 2008). According to Barney (1997), the economic value of an organization's resources and capabilities is grounded in its ability to either decrease the firm's costs or enhance its revenues, relative to a scenario where the firm lacks those resources. Therefore, technological innovations strategies that should be implemented by SMEs in Bungoma County should hold significant value due to their unique characteristics of being inimitable and non-substitutable, which ultimately contribute to the creation of superior performance. Prominent academics have been provided with a multitude of resources and cited in numerous discussions regarding the formulation of strategies to construct RBV theories within the domain of strategic management (Al-Shammari, Banerjee & Rasheed, 2022).

The RBV examines the firm's resources and capabilities, subsequently addition to the argument that all these resources both tangible and intangible secure and sustain a competitive edge within the same environment. Although numerous studies have provided support for the notion that these resources are crucial for firm performance, the theory has been unable to sufficiently clarify the disparity between how firms achieve performance and how they convert these resources into capabilities (Kristoffersen *et al.,* 2021). Additionally, the theory only caters for internal firm resources leaving out the external firm resources. The theory anchors the firm performance variable and the technological innovations strategies.

2.2.2 Dynamic Capabilities Theory

It is a theoretical framework that builds upon the resource-based perspective of the firm (Gregory *et al.,* 2019). It was initially proposed by Teece and Pisano, (1994) with the aim of providing an explanation for how firms might enhance their ability to adapt and take advantage of quickly evolving technology landscapes. The theory document that, the firm's ability to actively utilize its internal and external resources to bring about desired transformation is the basis for this theory's

perception of the ability to change (Muthoka, 2022). Dynamic capacities theory clarifies the long-term viability of businesses by illustrating how firms can mitigate competitive risks by reallocating their resources (Teece *et al.*, 2008). According to this view, performance is determined by distinct processes formed by assets such as marketing capabilities. An organization has the potential to enhance its performance by promptly adapting to the dynamic changes in its environment, encompassing factors such as competition and customer needs *(*Yu *et al.,* 2017).

The theory regards dynamic capabilities as an intangible resource (Teece *et al.*, 2008). The dynamic capabilities theory's resource perspective improves the RBV. Nevertheless, the theory diverges from the RBV in that it emphasizes the dynamic and perpetual evolution of the external environment, whereas the RBV regarded it as immutable (Fabrizio *et al.*, 2022). SMEs in Bungoma County can utilize dynamic capabilities to analyze the environment, comprehend the market, and identify and capitalize on opportunities. The enterprise resources are essential for achieving a rapid response to the competitive environment by gathering information on swiftly evolving technological innovation strategies and acquiring knowledge for production innovation (Fainshmidt *et al.*, 2019).

However, the capability to enhance the efficiency of product innovation has been realized via the acquisition of comprehensive and varied knowledge using external collaborations (Lee & Yoo, 2019). Therefore, in order to be effective, the theory must align enterprise resources with the appropriate environmental context. Dynamic capabilities also contribute to firm performance by utilizing resources to deliver daily routines and enhancing the enterprise dynamic capabilities.

2.2.3 Theory of Innovation

It was formulated by Joseph Schumpeter, in 1934. Joseph Schumpeter's theory of innovation, expounded notably in his work "Capitalism, Socialism, and Democracy" (1942), presents a

groundbreaking perspective on the transformative dynamics of capitalism. Central to Schumpeter's thesis is the notion of "creative destruction," wherein innovation serves as the primary source of economic progress. The theory posits entrepreneurs as the agents of change, by introducing innovative products, processes, or business models that disrupt existing established markets (Cristescu & Nerișanu, 2021). Schumpeter identifies various forms of innovation, including product, process, market, and organizational innovations, each contributing to the continuous renewal of economic activity (Callegari & Nybakk, 2022).

Moreover, Schumpeter argues that while successful innovators may temporarily gain monopoly power, they eventually face challenges from competitors or new innovations, resulting in cycles of technological change and economic upheaval (Malerba & McKelvey, 2020). Schumpeter's theory underscores the vital role of entrepreneurship and the dynamic interplay between innovation, competition, and economic growth in capitalist societies. Product value addition enhances institutional performance. This further expands the market size of the institution or firm's products. Guerrero and Siegel (2024)) contended that innovative strategies result in a first-mover advantage, which is contingent upon the strategic decisions made by the institution, through the application of the theory of innovation. This theory was essential for the establishment of technological innovation strategies and performance variables within the context of SMEs in Bungoma County, Kenya.

2.2.4 Technology Organization Environment Framework

The framework was first implemented by Tornatzky and Fleischer, in 1990. Organizational studies and management use the technology organization environment (TOE) as a framework to understand the link between the external environment, organizational structure, and technology (Awa *et al.,* 2017). It underscores the interplay and influence of these three elements within an

organization. Technology refers to the tools, techniques, and knowledge that an organization uses to transform inputs into outputs (Ahmed, 2020). The organizational component of TOE theory refers to an organization's internal structure, processes, and culture. The external environment is a collection of factors that exist outside the organization and affect its operations and strategic decisions. This encompasses economic trends, technological advancements, societal changes, competition, industry regulations, and market conditions.

The TOE theory provides a comprehensive framework for organizations to develop and execute effective technological innovation strategies (Malik *et al.,* 2021). Organizations can cultivate an environment that is conducive to innovation, align their technological investments with strategic objectives, and overcome obstacles presented by external factors by taking into account the interplay between technology characteristics, organizational dynamics, and the external environment (Wulandari *et al.,* 2020). Additionally, the use of TOE theory improves organizations' ability to innovate in a strategic and sustainable manner in a global economy that is becoming more intricate and competitive. Therefore, the TOE framework provided a more comprehensive explanation for the acceptance of innovations in technology.

The TOE model generally assumes a consistent connection among technology, organization, and environment throughout the duration (Permadi & Fathussyaadah, 2021). However, in reality, progress in technology, revolutionary breakthroughs, and changes in market circumstances may rapidly make conventional alignments obsolete (Hwang *et al.,* 2016). Critics contend that the model should include more dynamic features to accommodate the ongoing requirement for adaptability and flexibility in today's unpredictable business situations. Furthermore, critics have questioned the TOE model's suitability for various organizational contexts and industries

(Saghafian *et al.,* 2021). Critics argue that the varying regulatory environments, organizational structures, and technologies specific to each industry may restrict the model's generalizability.

2.3 Empirical Literature Review

This section provides an empirical literature review based on individual concepts of technological innovation strategies: product, process, marketing, organizational innovations on performance.

2.3.1 Product Innovations and Performance

A research undertaken by López-Cabarcos *et al.*, (2019) examines the integration of tacit knowledge resources into product innovation, and firm performance in 521 industrial organizations in Portugal with over 50 employees. The Portuguese National Institute of Statistics was the source of the data. At the conclusion of the data collection procedure, 153 organizations had submitted responses, which accounted for 29% of the study group. Employing hierarchical regression analysis and SEM. Product innovation positively influenced firm performance in a positive way. The research was undertaken in Portugal which is an already economically developed market. Moreover, the study was conducted in industrial organizations with more than 50 employees which is structurally and operationally different from SMEs in Bungoma County, Kenya. The study uses secondary data for data analysis that does not capture the current market treads.

Moreover, Noone, Lin and Sharma (2024) discusses adhocracy culture as a critical internal resource that operators can utilize to accelerate the incremental product innovation of US restaurants. The degree of the relationship on incremental product innovation and firm performance is moderated by firm size, which is a contextual factor. The study employed purposive sampling to identify a sample size of 10 respondents, utilizing a sequential exploratory design and mixed methods Adhocracy culture positively impacted firm performance through the degree of

incremental product innovation, as evidenced by the results of two empirical studies. The exploratory research design employed in the study should not be considered conclusive in nature but gives insights. Additionally, purposive sampling is straightforward to implement, but it frequently leads to biased results because it is dependent on the accessibility and availability of participants, rather than the systematic selection of a diverse and representative sample. Moreover, the study was conducted in restaurants in US which is structurally and operationally different from SMEs in Bungoma County, Kenya

In addition, Chege, Wang and Suntu, (2020) on the correlation between technology innovation and the performance of SMEs in Tharaka-Nithi County, Kenya, with a particular emphasis on the influence of product innovation. A random sampling procedure and structural equation modeling were implemented to select a sample of 297 enterprises for the analysis. Product innovation was defined as the process of enhancing, modifying, or adding value to a product. The results suggest that technology innovation positively impacted the performance of firms. The study was conducted among SMEs in Tharaka Nithi County as compared to the current study that will be conducted in SMEs in Bungoma County.

2.3.2 Process Innovations and Performance

Process innovations facilitate the creation of production and product processes that are eco-friendly. A study conducted by, Awan, Arnold and Gölgeci (2021) on the influence of buyer-driven knowledge activities on green product and process innovation in manufacturing firms in Pakistan. Simple random sampling techniques were employed to select a sample of 239 manufacturing firms. A response rate of 36.1% was achieved, as 239 valid responses were received out of 650 questionnaires that were sent. The findings suggested that buyer-driven knowledge activities have a more significant positive influence on green product innovation than green process innovation.

The response rate of 36.1 % out of the estimated population was relatively very small and results of the finding cannot be generalized using this sample size. Mugenda and Mugenda, (2003) advocate for a sample response rate of 50%, which would be appropriate for data analysis.

Subsequently, Mikalef and Krogstie, (2020) discusses the potential impact of big data analytics on a company's incremental and radical process innovation capabilities. The study was founded on a on the resource-based view (RBV). The survey data from 202 chief information officers and IT administrators working in Norwegian companies is analyzed using qualitative comparative analysis. The results indicate that the importance of big data analytics resources varies depending on the combination of contextual factors, with certain configurations resulting in strong levels of both incremental and radical process innovation capabilities. Norway is an already economically developed market. Moreover, the study is anchored using RBV theory only in which the arguments are based on the internal environment and resources of a firm. The study should also have rough in another theory to capture both internal and external environment and bring about desired change in a firm.

In addition, Cirera and Sabetti, (2019) discusses the expansion of employment and innovation in the service and manufacturing sectors. The survey employs a stratified sampling, under which firms are categorized by industry, size, and location. Large and medium-sized firms are disproportionately represented. The final data set includes samples from enterprises across 53 countries in the manufacturing and service industries, covering four major regions: Africa, Europe-Central Asia, the Middle East and North Africa, and South Asia. There were more than 15,000 firms included in the data analysis that were aggregated cross-sections and contained sufficient information on employment and innovation. The results suggested that firms engage in innovation activities, including organization, process and product innovations, enables to decompose

employment growth. Data was collected form from 53 countries in the manufacturing and service sectors while the current study data will be collected in SMEs in Bungoma County, Kenya.

2.3.3 Marketing Innovations and Performance

A study conducted by Further, Na, Kang and Jeong (2019) examined the Correlations between sustainable competitive advantage and marketing innovation, in South Korea. A structural model was employed to analyze a sample of 400 respondents who were selected through convenience sampling. According to the findings, the marketing innovation's product and communication innovations had a significant effect on the enduring competitive advantage. The research used convenience sampling is straightforward to implement, but it frequently leads to biased results because it is dependent on the accessibility and availability of participants, rather than the systematic selection of a diverse and representative sample.

Similarly, Udriyah, Tham and Azam (2019) examined the effect of market orientation and marketing innovations on business performance and competitive advantage. The sample size consists of 150 textile SMEs in Selangor, Malaysia. The investigation was analyzed using path analysis. The outcome indicates that competitive advantage was significantly and positively impacted by marketing innovation and market orientation. Malaysia is an already economically developed market. In addition, the study was conducted in textile industry which is structurally and operationally different from SMEs in Bungoma County, Kenya.

Moreover, Quaye and Mensah (2019) on marketing innovation and competitive advantage of manufacturing SMEs in Ghana. Stratified random sampling technique was employed to acquire data from 591 manufacturing firms in Ghana. The study hypotheses were tested using a structural equation model to determine the results. The research determined that water, beverage, detergent, and metal fabrication SMEs can achieve a sustainable market advantage through marketing

innovation. Researchers conducted the investigation among the manufacturing SMEs firms in Ghana while the current investigation will be conducted in SMEs in Bungoma County, Kenya. The findings utilize innovations in product design and packaging, promotion, retail, and pricing as metrics for marketing innovation. The product design could be more closely correlated to product innovation measures.

2.3.4 Organizational Innovations and Performance

Waheed *et al,* (2019) conducted a study to examine human resource management practices on innovation performance in the IT firms of Pakistan, with organizational innovation serving as a mediating factor. Data obtained from organizations that are semi-government-based and rely on information technology. The data was collected using the convenience and snowball sampling technique. The 1100 employees were disseminated the questionnaires for over six months, and 632 responses were collected that were entirely valid. Innovation performance positively impacted human resource management practices. The intervening role of organizational innovation was also identified. The study was conducted among the IT sector which is structurally and operationally different from SMEs in Bungoma County, Kenya. In addition, the research used convenience sampling and snowball sampling, which is straightforward to implement, but it frequently leads to biased results because it is dependent on the accessibility and availability of participants, rather than the systematic selection of a diverse and representative sample.

Naveed *et al,* (2022) on the correlation between organizational culture and efficacy of the banking sector in Pakistan through organizational innovation. Data were collected from 280 employee that operate in Pakistan's banking sector in two phases. Following the deductive approach, the investigation implemented a non-probability purposive sampling methodology. The results suggested that organizational effectiveness is positively influenced by organizational culture. The

study was conducted among the banking sector which is structurally and operationally different from SMEs in Bungoma County, Kenya. Moreover, the research used nonprobability sampling technique, which is straightforward to implement, but it frequently leads to biased results because it is dependent on the accessibility and availability of participants, rather than the systematic selection of a diverse and representative sample.

Consequently, Donbesuur *et al,* (2020) investigated on correlation between international performance and technological and organizational innovation of SMEs in Ghana. Utilizing institutional theories and dynamic capability. Employing SEM on a sample of 204 internationalized SMEs that operate in Ghana. The results of the analysis indicate that the international performance of SMEs is jointly enhanced by high levels of technological and organizational innovation. The study was conducted among the SMEs firms in Ghana, which is a broader context and is structurally and operationally different from SME sector in Bungoma County, Kenya.

2. 4 Summary of the Literature Review

The table typically presents an overview of key findings, knowledge gaps, and trends extracted from the existing body of research relevant to the variable at study.

Table 2.1 Summary of the Literature Review

Author(s)	Objectives	Findings	Research Gaps	Research gap filled by the current study
López-Cabarcos *et al.*, (2019)	The integration of tacit knowledge resources into product innovation, and firm performance in 521 industrial organizations in Portugal.	Positive correlation between firm performance, and product innovation.	Undertaken in Portugal which is an already economically developed market. Conducted within the industrial firms, which is operationally and structurally distinct SMEs in Bungoma County. Used secondary data for data collection. The response rate of 153 organizations out of 521 estimated population was relatively very small and results of the finding cannot be generalized using this sample size.	Will be undertaken in Kenya, which is considered a developing market. Will be undertaken in SMEs in Bungoma County. Will use primary data to capture market treads. The sample size will meet 50% threshold that Mugenda and Mugenda, (2003) advocates for.

Noone, Lin and Sharma (2024)	Adhocracy culture as a critical internal resource that operators can utilize to accelerate the incremental product innovation of U.S. restaurants	Adhocracy culture positively impacted firm performance through product innovation	Use purposive sampling technique. Conducted in restaurants in the US which differ structurally and operationally from SMEs in Bungoma County. Uses exploratory research design and gives conclusions.	Use stratified random sampling technique. Will be conducted in SMEs in Bungoma County. It will use explanatory and descriptive research design.
Chege, Wang and Suntu, (2020)	Technology innovation and the performance of SMEs in Tharaka-Nithi County, Kenya	Technology innovation has a positive impact on the performance of firms	The study was conducted among SMEs in Tharaka Nithi county.	Will be conducted in SMEs in Bungoma County.
Awan, Arnold and Gölgeci (2021)	Influence of buyer-driven knowledge activities on green product and process innovation in manufacturing firms in Pakistan.	Buyer-driven knowledge activities have a more significant positive influence on green product innovation than green process innovation.	The response rate of 36.1 % out of the estimated population was relatively exceedingly small and results of the finding cannot be generalized using this sample size.	The sample size will meet 50% threshold that Mugenda and Mugenda, (2003) advocates for.
Mikalef and Krogstie, (2020)	The potential impact of big data analytics on a company's incremental and radical process	Importance of big data analytics resources varies depending on the combination of contextual factors, with certain configurations resulting in high levels	Anchored using RBV theory only that captures only internal environment.	The study will incorporate RBV and dynamic theory. Will be conducted in Kenya, which is considered a developing market.

	innovation capabilities.	of incremental and radical process innovation capabilities.	Conducted in Norway which is an already economically developed market.	
Cirera and Sabetti, (2019)	Expansion of employment and innovation in the service and manufacturing sectors.	The results suggested that firms engage in innovation activities, including organization, process and product innovations, are enables to decompose employment growth.	Data was collected form from 53 countries in the manufacturing and service sectors while the current study data will be collected in SMEs in Bungoma county, Kenya.	Will be conducted in SMEs in Bungoma County.
Quaye and Mensah (2019)	Marketing innovation and competitive advantage of manufacturing SMEs in Ghana.	The research determined that water, beverage, detergent, and metal fabrication SMEs can achieve a sustainable market advantage through marketing innovation.	Conducted in in manufacturing SMEs in Ghana. Utilizes innovations in product design and packaging, promotion, retail, and pricing as metrics for marketing innovation.	Will focus on SMEs in Bungoma County. Current study will use branding, advertising and distribution as measures of marketing innovation.
Na, Kang and Jeong (2019)	Correlations between sustainable competitive advantage and marketing innovation, in South Korea	Sustainable competitive advantage was significantly influenced by both the product and communication innovation of the marketing innovation.	Convenience sampling technique was used which is less superior compared to probability sampling.	Will use stratified random sampling technique, a probability sampling technique.

Udriyah, Tham and Azam (2019)	Market orientation and marketing innovation on business performance and competitive advantage.	Competitive advantage was significantly and positively impacted by marketing innovation and market orientation.	Conducted within textile industries in Malaysia develop economic market compared to Kenyan Market.	Will focus on SMEs enterprises in Bungoma County.
Donbesuur *et al,* (2020)	The correlation between international performance and technological and organizational innovation of SMEs in Ghana.	International performance of SMEs is jointly enhanced by high levels of technological and organizational innovation	Conducted among the SMEs firms in Ghana, which is a broader context and is structurally and operationally different from small and medium enterprises in Bungoma county, Kenya.	Will focus on SMEs in Bungoma County.
Waheed *et al,* (2019)	Human resource management practices on innovation performance in the IT industry of Pakistan, with organizational innovation serving as a mediating factor.	Innovation performance positively impacted human resource management practices. The intervening role of organizational innovation was also identified.	Used the convenience sampling technique and the snowball sampling technique. Conducted in the IT industry which is structurally and operationally different from small and medium enterprises in Bungoma county, Kenya.	Will use explanatory and descriptive research design. Will focus on SMEs in Bungoma county, Kenya.

Naveed *et al,* (2022)	The correlation on organizational culture and efficacy of the banking sector in Pakistan through organizational innovation	Organizational effectiveness is positively influenced by organizational culture; consequently, mediated by organizational innovation	Conducted in the banking sector in Pakistan, which is structurally and operationally different from SMEs in Bungoma county, Kenya. Uses non-probability sampling technique.	Will focus on SMEs in Bungoma county, Kenya. Will use explanatory and descriptive research design.

Source: Author (2024)

2. 5 Conceptual Framework

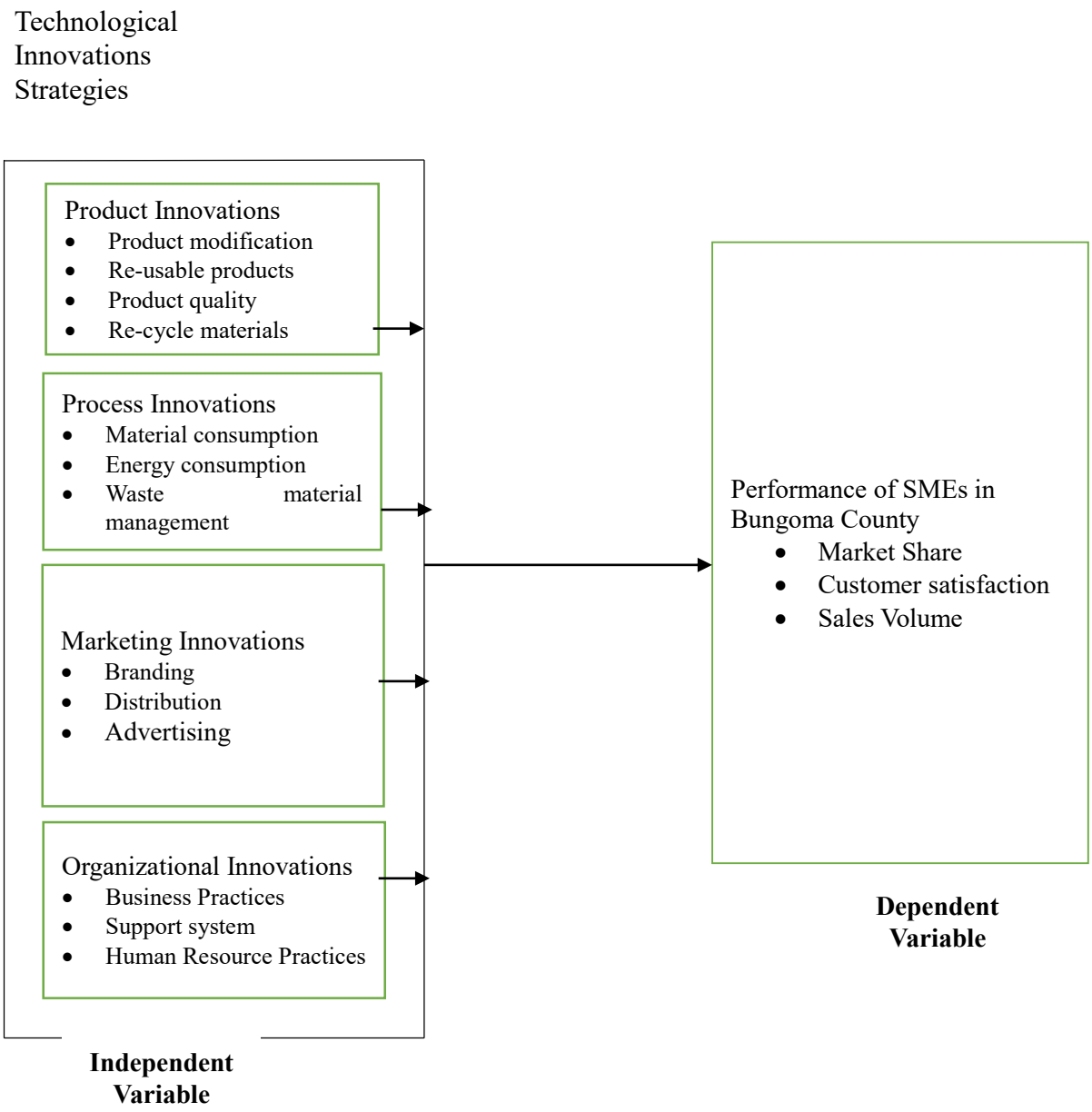

Figure 2:1 Conceptual Framework

Source: Author (2024)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

In the section on research methodology, topics such as the research design, target population, sample size, method and procedure for data collection, pilot testing, the validity and reliability, and how the data will be analyzed and displayed were discussed in depth.

3.2 Research Design

Doyle *et al*, (2020) posit that research designs are not without imperfections, yet the integration of multiple designs can effectively mitigate the limitations inherent in each design. The current investigation used descriptive research designs that is cross-sectional in nature. Saunders *et al.*, (2011) asserts that descriptive research serves as a foundation for qualitative studies, as it offers a comprehensive overview and valuable insights into the variables that warrant quantitative examination.

3.3 Target Population

The target population involved all the SMEs in Bungoma County licensed by Bungoma County government as of the year 2024. There are 4264 licensed SMEs in Bungoma county across different informal sectors such as agribusiness, manufacturing, service, and construction, mining, and quarrying (County Government of Bungoma, 2019: KIPPRA, 2022).

Table 3.1 Distribution of Target Population

Category per SMEs Sub-sector	Population	Percentages
Agriculture	86	2.02
Manufacturing	24	0.56
Hotels	927	21.74
Education institution	1476	34.62
ICT Services	31	0.73
Retailer	1571	36.84
Distributor	31	0.73
Construction	118	2.77
Total	4264	100

Source: (County Government of Bungoma, 2023)

3.4 Sampling Design and Procedure

The study utilized a proportionate stratified and random sampling technique. Proportionate Stratified sampling is a method that pertains to the selection of samples from each stratum in proportion to the frequency of their occurrence in the population (Casteel & Bridier, 2021). It works by dividing the population into discrete subgroups, or strata, based on specific characteristics. The results become more generalizable as each subgroup was adequately represented in the final sample. Conversely, random sampling involves the selection of representatives from the entire population, ensuring that each individual has an equal chance of

being selected. The study identified SMEs across different sectors in Bungoma County, Therefore, using both proportionate stratified and random sampling technique a sample size of 366 owners and managers in each SMEs in Bungoma County was utilized.

The sample size was computed using Yamane's formula of 1967 using variables such as n for sample size, N for population size, and e for the margin of error. The formula was utilized with a confidence level of 95% and a margin of error of 0.05 (e).

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

Where n = Sample size

N = Population

e = Level of significance

$\frac{4264}{1+4264(0.05)^2}$ = 366

Table 3.2 Distribution of Sample

Category per SMEs Sub-sector	Population	Multiplier	Sample	Percentage (%)
Agriculture	86	0.086	7	1.91
Manufacturing	24	0.086	2	0.55
Hotels	927	0.086	80	21.86

Education institution	1476	0.086	126	34.43
ICT Services	31	0.086	3	0.82
Retailer	1571	0.086	135	36.88
Distributor	31	0.086	3	0.82
Construction	118	0.086	10	2.73
Total	4264	0.086	366	100

Source: (Author, 2024)

3.5 Data collection Instrument

Secondary data was gathered through documented reviews of published sources about SMEs in Kenya and Bungoma County. A structured questionnaire was implemented to acquire primary data. Questionnaires were disseminated to the head of owners and managers of SMEs in Bungoma County. According to (Mugenda & Mugenda, 2003), a data collection tool is an essential tool that requires the guidance of an expert while developing it. The variables' information was evaluated using Likert scale, with 1 indicating completely disagree and 5 indicating strongly agree. Section A included three questions from questions 1-6 about the respondent's general information. Section B, C, D, E included questions that delved into above the technological innovation strategies including product, process, marketing and organizational innovations respectively. Finally, section F entailed firm performance.

3.6 Validity and Reliability Research Instrument

A pilot study was undertaken using a sample size of 37 participants in SMEs in Bungoma County. This aligns with the recommendation put forth by Mugenda and Mugenda (2003) that pilot studies should ideally have a sample size ranging from 10% to 20% of the total sample size. In order to choose 16 participants for the pilot study, the researcher used 10% of the total sample size. The participants who participated in the pilot survey were excluded from the final sample of the study.

3.6.1 Validity Test

Validity refers to how well research instruments measure what they are intended to assess. Content validity pertains to how comprehensively these instruments cover the theoretical concepts or subject matter being studied. Achieving content validity involves defining the relevant domains through literature reviews and creating indicators based on prior research (Fingland *et al.,* 2021)

Face validity was employed to evaluate the effectiveness of the items in a research instrument in measuring the intended outcome. The instrument was evaluated in the pilot study by presenting it to a select group of SME respondents. The respondents completed the questionnaire, and an analysis was conducted to ensure that their answers reflect the intended items. This process facilitated adjustments to enhance the research instrument.

Construct validity refers to the extent to which research tools accurately assess the theoretical constructs or characteristics that the study aims to measure (Degroote *et al.,* 2020). The study translated the conceptual constructs into measurable variables and establish the procedures for measuring these variables.

3.6.2 Reliability test

The concept of reliability is concerned with the degree to which a research instrument produces consistent results in subsequent trials (Cooper & Schindler, 2011). In order to ensure optimal

instrument reliability within the scope of this study, the primary data collection responsibilities was undertaken by the researcher themself, with the involvement of well-trained and motivated research assistants being limited to select instances. The participants received the initial questionnaires on two separate occasions, with a time gap of one week between each administration. This interval was necessary to facilitate the assessment of the questionnaires' reliability. Cronbach's Alpha was used to determine the research instrument's dependability (Swami *et al.,* 2017). Cronbach's alpha is a statistical tool used to evaluate the internal consistency or reliability of a research instrument by calculating the average correlation between its items. It is considered acceptable when the coefficient level reaches or exceeds 0.7.

Table 3.3 Reliability test

	Cronbach Alpha	No. of Items	Remarks
Product innovations	.816	5	Reliable
Process innovations	.845	5	Reliable
Marketing innovations	.822	5	Reliable
Organization Innovations	.794	5	Reliable
Firm performance	.879	4	Reliable

Source: (Author, 2024)

3.7 Data collection procedure

The preliminary steps preceding fieldwork entail acquiring the requisite authorization from the National Commission for Science, Technology, and Innovation, along with a letter of introduction from Kenyatta University. The questionnaire was accompanied by a cover letter that provided a comprehensive explanation of the research study's objectives and extend an invitation to potential

respondents to participate. The research questionnaires were distributed to SMEs owners in Bungoma County.

A research assistant was employed to aid in the collection of data for the study. The researcher administered a one-day training session in order to acquaint the research assistant with the research tool prior to starting data collection. The questionnaires was shared utilizing a drop-off and retrieval approach. The data was collected in 3 months in the year 2024.

3.8 Data analysis and presentation

Data analysis refers to the systematic examination and interpretation of unprocessed data, with the aim of arranging and structuring it in a manner that facilitates the extraction of valuable insights and meaningful information (Saunders *et al.,* 2008). Data editing, coding, classification, and tabulation are all part of the data processing stage, while analysis involves calculating and interpreting the data to derive conclusions (Kothari, 2004). In order to fulfill the research aims, the primary data obtained from questionnaires were subjected to analysis using descriptive statistics within the SPSS version 22. The mean and standard deviation were used as descriptive statistics for data analysis.

3.9 Empirical Model

Cooper and Schindler (2011) recommend using a multiple regression model to predict the values of a dependent variable when multiple independent variables are involved. Regression analysis is used to analyze continuous data (Kinyua, 2015: Gakii, 2023). In the present investigation, the dependent variable was measured on a continuous scale; consequently, multiple regression was determined to be the most appropriate method. The study utilized a multiple linear regression model to examine the association between the dependent and independent variables. Inferential statistics was applied to make inferences or predictions about the population based on sample data,

employing methods such as correlation analysis, regression analysis, and hypothesis testing (Kinyua, 2015). SPSS version 22 was utilized to analyze the descriptive and inferential statistics derived from the primary data collected via questionnaires. To ascertain the extent to which the variable technological innovation strategies account for the variance in firm performance, the adjusted R2 value was computed. Multiple linear regression models was utilized to obtain a coefficient for technological innovation strategies components and their accompanying P-values. The empirical model outlined below was utilized.

$FP = \beta o + \beta 1PRI + \beta 2PCI + \beta 3MI + \beta 4OI + \varepsilon$ ……. (3.1)

Where:

FP = Firm Performance

PRI = Product Innovations

PCI = Process Innovations

MI = Marketing Innovations

OI = Organizational Innovations

$\beta 1 – \beta 4$ = Coefficients of the independent variables PRI, PCI, MI and OI respectively

βo = Constant

ε = the error term

3.10 Ethical issues

By following the university's research ethics guidelines, this study adhered to ethical conduct. Before beginning field work, the study was registered with the National Council for Science, Technology, and Innovation and was granted a research permit. During data collection, the researcher provided respondents with a detailed explanation of the study's objective and relevance, as well as reassurances of confidentiality.

CHAPTER FOUR

RESEARCH FINDING AND DISCUSSIONS

4.1 Introduction

The section presented feedback gotten from the questionnaire that includes demographic feedback, and feedback on statement from various metrics of this study variables. Means and standard deviations were used in descriptive statistics, which were presented in tables.

4.2 Response rate

Table 4.1 below shows the response rate of all who participated in the data collection survey.

Table 4.1 Response Rate

Response Rate	Frequent	Percent (%)
Completed questionnaires	280	76.5%
Unreturned Questionnaires	86	23.5%
Total	**366**	**100**

Source: Research Data, (2024)

There were a total of 366 questionnaires distributed to the owner-operators and supervisors of each SMEs in Bungoma County. The 280 respondents who responded accounted for 76.5% of the total, while 86 of the respondents did not participate in the exercise or did not fully complete the questionnaire which equates to 23.5%. The response rate is deemed appropriate for the research objectives, as Sekaran and Bougie (2019) propose that a response rate of 60% or higher is considered satisfactory. The response rate findings are summarized in Table 4.1.

4.3 Demographic information

The bio data was collected on gender, age, number of employees, duration of employment and the level of education.

4.3.1 Gender

The investigation examined the diverse genders that had participated in the research. The outcomes are given in table 4.2 below.

Table 4.2 Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	149	53.2	53.2	53.2
	Male	131	46.8	46.8	100.0
	Total	280	100.0	100.0	

Source: Research Data, (2024)

The findings suggest that males comprise 46.8 percent of the respondent group, as illustrated in Figure 4.2 above, while females comprise 53.2 percent. This demonstrates a proportionate incorporation of the genders, making sure that the study sample accurately reflects the overall population and that there is no gender bias associated with gender-specific characteristics or behaviors.

4.3.2 Age of Employees

The study investigated the age of employees in each private health insurance and outcome highlighted in table 4.3 below.

Table 4.3 Age of Employees in Each SME

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25-34	90	32.1	32.1	32.1

	35-44	87	31.0	31.0	63.1
	45-54	53	19.0	19.0	82.1
	55-64	50	17.9	17.9	100.0
	Total	280	100.0	100.0	

Source: Research Data, (2024)

A large percentage of the SMEs employees in Bungoma County were between the age brackets of 25 and 34, constituting 32.1 percent. The next age groups were those between 35-44 at 31 percent, 45-54 at 19 percent, and 55-64 at 17.9 percent. In each SME, the employees varied widely in age.

4.3.3 Number of employees

The study investigated the number of employees in each SMEs in Bungoma County and the outcome is highlighted in table 4.4 below.

Table 4.4 Number of Employees in your SME

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 15	120	42.9	42.9	42.9
	16-30	63	22.5	22.5	65.4
	31-45	38	13.6	13.6	79
	46-60	39	13.9	13.9	92.9
	Over 60	20	7.1	7.1	100.0
	Total	280	100.0	100.0	

Source: Research Data, (2024)

A large percentage of SMEs had employees below 15, constituting 42.9 percent. This was followed by those who had between 16-30 number of employees at 22.5 percent, between 31-45 at 13.6

percent, 46-60 at 13.9 percentage and over 60 at 7.1 percent. There was a diverse range in number of employees in each SME.

4.3.4 Duration of Employed

The study examined the duration of employment that each respondent, as summarized in table 4.5 below.

Table 4.5 Duration *of Employed*

		Frequency	Percent
Valid	2 years and below	67	23.9
	3 -6 years	95	33.9
	7-10 years	53	19.0
	11-14 years	42	15.0
	15 years and above	23	8.2
	Total	280	100.0

Source: Research Data, (2024)

A large percentage of respondents had been employed for a duration between 3-6 years constituting 33.9 percentage. Followed by those employed for a duration of 2 years and below at 23.9 percent, between 7-10 years at 19 percent, between 11-14 years at 15 percent and 15 years and above at 8.2 percent.

4.3.5 Level of Education

The education level of each respondent was examined, as summarized in table 4.6 below.

Table 4.6 Level of Education

		Frequency	Percent
Valid	Primary School	34	12.1
	Secondary School	98	35.0
	Tertiary education	64	22.9

	College diploma/certificate	54	19.3
	University degree	30	10.7
	Total	280	100.0

Source: Research Data, (2024)

A large percentage of respondents had attained secondary school education level constituting 35 percent, followed by those who have attained tertiary education at 22.9 percent, college diploma/certificates at 19.3 percent, primary school level at 12.1 percent and university degree at 8.2 percent.

4.4 Descriptive Statistics

Details on descriptive statistics on the metrics of technological innovation strategies and firm performance of SMEs in Bungoma County, Kenya are presented below. The analysis incorporated descriptive measures, encompassing means and standard deviation, and were presented on a scale of 1-5.

4.4.1 Product Innovations

The research aimed to determine the impact product innovations on firm performance of SMEs in Bungoma County. Table 4.7 presents the means and standard deviations for all the measures of product innovations.

Table 4.7 Product Innovations

Questions on product innovations	Mean	Std. Deviation
My enterprise offers quality products.	3.93	2.202
My enterprise is able to modify the products/service they offer to satisfy the customers.	2.97	1.354
My customers are not easily influenced to change to other enterprises that offer the same services or for the same product.	4.17	1.033
My enterprise offers various services/ products.	4.23	1.728

The enterprise collects feedback from the customers and suppliers to help them in product development.	4.02	1.302
Aggregate score	**3.86**	**1.524**

Source: Research Data, (2024)

The overall average mean score for product innovations was 3.86 and aggregate standard deviation of 1.524 whereby the most respondents concurred that product innovations influences performance of SMEs in Bungoma County. A high average score of 4.23 was recorded on how enterprise offers various services/ products with a high deviation of 1.728. Additionally, there was consensus that customers are not easily influenced to change to other enterprises that offer the same services or for the same product at an average score of 4.17 and a standard deviation of 1.033. It was subsequently supported by the agreement that the enterprise collects feedback from the customers and suppliers to help them in product development with a mean of 4.02 and a high standard deviation of 1.302.

There was consensus that the enterprise offers quality products with an average mean score of 3.93 and a high standard deviation of 2.202. Lastly, there was a disagreement that the enterprise is able to modify the products/service they offer to satisfy the customers with a mean of 2.97 and a standard deviation of 1.354. These results concur with the research conducted by López-Cabarcos *et al.,* (2019) demonstrating a positive relationship between Product innovation and firm performance. Correspondingly, the results are also supported by Chege, Wang and Suntu, (2020) who observed technological innovation strategies as measures of product innovations as crucial for organizational performance.

4.4.2 Process Innovations

The research aimed to ascertain the impact of process innovations on firm performance of SMEs in Bungoma County. Table 4.8 presents the means and standard deviations of all the measures of process innovations.

Table 4.8 Process Innovations

Questions on process innovations	N	Mean	Std. Deviation
We have a good system on waste material management.	280	3.80	1.629
Our enterprise has incorporated new methods in waste material management.	280	3.29	.986
We have new ways and procedures in energy consumption to avoid wastage.	280	3.34	.903
Material consumption has improved our market growth and increased our sales volume.	280	4.10	1.332
Process innovation has improved internal efficiency.	280	3.10	1.133
Aggregate score	**280**	**3.53**	**1.197**

Source: Research Data, (2024)

The overall average mean score for process innovations was at 3.53 and aggregate standard deviation of 1.197 whereby the most respondents concede that process innovations influences performance of SMEs in Bungoma County. A high average score of 4.10 with a standard deviation of 1.332 was attained by those who agreed on material consumption has improved our market growth and increased our sales volume. This was subsequently supported by respondents who

agreed to the statement that they have a good system on waste material management at a mean of 3.80 and a standard deviation of 1.629. Subsequently, there was agreement made on facts that they have new ways and procedures in energy consumption to avoid wastage, enterprises have incorporated new methods in waste material management, process innovation has improved internal efficiency at a mean score of 3.34, 3.29, 3.10 and standard deviation of .903, .986 and 1.133 respectively.

The results align with the findings of Awan, Arnold and Gölgeci (2021) that suggested that process innovation is influenced by the buyer-driven knowledge. In addition, Cirera and Sabetti, (2019) suggested that firms engage in innovation activities, including organization, process and product innovations, enables to decompose employment growth**.**

4.4.3 Marketing Innovations

The research aimed to determine the impact of marketing innovations on performance of SMEs in Bungoma County. Table 4.9 presents the mean and standard deviations of all the measures of marketing innovations.

Table 4.9 Marketing Innovations

Questions on marketing innovations	N	Mean	Std. Deviation
My enterprise uses social media channels to market our product	280	4.36	1.208
We have a good distribution channel that enables our product to reach the end user.	280	3.86	1.154
We promote our product through proper delivery channels.	280	4.12	1.215

Our product is well differentiated from our competitors.	280	4.13	1.045
We package our product/services very well to attract customers.	280	4.02	1.002
Aggregate score	**280**	**4.098**	**1.125**

Source: Research Data, (2024)

The overall average mean score for market segmentation strategy was 4.098 and aggregate standard deviation of 1.125, with the majority whereby of the respondents concede with the statements enterprises uses social media channels to market their product, products are well differentiated from their competitors**,** they promote their product through proper delivery channels and they package their product/services very well to attract customers by a mean score of 4.36, 4.13, 4.12, 4.02, and a standard deviation of 1.208, 1,.045, 1.215, 1.002 respectively. In addition, there was moderate agreement to the statement that they have a good distribution channel that enables their product to reach the end user at a mean score of 3.86 and a standard deviation of 1.154.

These results concur with the research conducted by Na, Kang and Jeong (2019) that suggested marketing innovation's and communication innovations had a substantial effect on the sustainable competitive advantage**.** The results align with the findings of Udriyah, Tham and Azam (2019) that indicated**,** competitive advantage was significantly and positively impacted by marketing innovation and market orientation**.** SMEs can achieve a sustainable market advantage through marketing innovation **(**Quaye & Mensah, 2019).

4.4.4 Organizational Innovations

The research aimed To establish the impact of organizational innovations on performance of SMEs in Bungoma County. Table 4.10 presents the mean and standard deviations of all the measures of organizational innovations.

Table 4.10 Organizational Innovations

Questions on organizational innovations	N	Mean	Std. Deviation
My enterprise has routine practices that guide the daily operations.	280	4.17	1.086
We are open to new routines.	280	4.22	.969
We have procedures that guide the daily operations.	280	3.95	.997
We value networking with other business enterprises within our reach.	280	4.12	1.087
We have frequent interactions with other organizations to share knowledge.	280	4.08	1.207
Aggregate score	**280**	**4.108**	**1.069**

Source: Research Data, (2024)

The aggregate mean score for organizational innovations was 4.108 and aggregate standard deviation of 1.069, with the most respondents agreeing with the statements they are open to new routines, the enterprise has routine practices that guide the daily operations, they value networking with other business enterprises within our reach, they have frequent interactions with other organizations to share knowledge and they have procedures that guide the daily operations with a mean score of 4.22, 4.17, 4.12, 4.08, 3.95 and a standard deviation of .967, 1.086, 1.087, 1.207 and .997 respectively.

This outcome corresponds with the conclusions of Waheed *et al,* (2019) that organizational innovations positively impacted human resource management practices. Naveed *et al,* (2022) results suggested that organizational innovations is positively influenced by organizational culture. Further, Donbesuur *et al,* (2020) concluded that international performance of SMEs is jointly enhanced by high levels of technological and organizational innovation.

4.4.5 Firm Performance of Small and Medium Sized Enterprises.

This section presents the results for descriptive analysis of data on firm performance of SMEs in Bungoma County. Table 4.11 presents the mean and standard deviations of all the measures on a scale of 1-5.

Table 4.11 Firm Performance of SMEs

Questions on Firm Performance	N	Mean	Std. Deviation
Our enterprise has increased the market share over years since adoption of different technological innovation strategies.	280	3.02	1.155
Customers are pleased with the services and products we provide.	280	3.31	.908
Our number of customers has increased for the last three years.	280	3.67	.660
Over sales volume have continuously grown for the last three years.	280	3.02	.572
Aggregate score	**280**	**3.26**	**.824**

Source: Research Data, (2024)

The aggregate mean score for firm performance of SMEs was 3.26 and low aggregate standard deviation of .824. There was moderate agreement by respondent that the number of customers has risen over the past three years, with a mean of 3.67 and a low standard deviation of .572. To a reasonable consensus, as demonstrated by a mean of 3.31 and a standard deviation of .908 demonstrated that most respondents agreed to the statement customers are pleased with the services and products we provide. Furthermore, the results indicated enterprise has increased the market share over years since adoption of different technological innovation strategies and over years enterprises have continuously grown the sales volume for the last three years with a mean of 3.02 and a standard deviation of and 1.155 .572 respectively.

4.5 Inferential Statistics

Inferential statistics is necessary because it allows to draw meaningful predictions and inferences about a larger population using data obtained from a sample (Muathe, 2010). This approach goes beyond simply describing data; it enables researchers and analysts to determine patterns, relationships, and potential causal links that could apply broadly, not just to the observed group.

4.5.1 Regression analysis

It was tested to show whether product, process, marketing and organizational innovations effect on firm performance of SMEs in Bungoma County. The finding were displayed in the model summary in Table 4.12.

Table 4.12 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.629[a]	.806	.799	.399

Source: Research Data, (2024)

The model summary outcomes in Table 4.12 shows the adjusted R square as .799 which demonstrates that the independent variables collectively explained 79.9 percent of all the variations in the impact of technological innovation strategies on the performance of SMEs in Bungoma County. The results also implied that 20.1 percent of all variations in the firm performance of SMEs could be contributed by other elements other than technological innovation strategies.

Table 4.13 Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.244	4	2.561	16.044	<.001[b]
	Residual	15.644	98	.160		
	Total	25.888	102			

a. Dependent Variable: firm performance

b. Predictors: (Constant), product innovations, process innovations, marketing innovations, organizational innovations.

Source: Research Data, (2024)

The findings presented in Table 4.13 indicate that the regression model demonstrates statistical significance (F-statistic = 16.044, p-value = 0.001). This implies that the relationships among product innovations, process innovations, marketing innovations, and organizational innovations have a statistically significant impact on the performance of SMEs in Bungoma County.

4.5.2 Regression Coefficients

Table 4.14 Regression coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.023	.356		2.871	.005
	Product innovations	.246	.058	.023	3.242	.002

	Process innovations	.243	.063	.338	3.878	.001
	Marketing innovations	.204	.060	.332	3.428	.001
	Organizational innovations	.282	.067	.112	1.225	.001

Source: Research Data, (2024)

Table 4.14 above indicated holding product, process, marketing and organizational innovations constant, the firm performance of SMEs in Bungoma County would be a factor of 1.023. An increase in one unit of product innovations results in a unit increase in firm performance at a factor of 0.246. An increase in one unit of process innovations result in a unit rise in firm performance at a factor of 0.243. An increase in one unit of marketing innovations results in a unit rise in firm performance at a factor of 0.204. An increase in one unit of organizational innovations results in a unit rise in firm performance at a factor of 0.282.

Therefore, the established regression model was $Y = 0.246X_1 + 0.243X_2 + 0.204X_3 + 0.282X_4 + \varepsilon$
Were.

Y =Firm performance

X_1 = Product innovations

X_2 = Process innovations

X_3 = Marketing innovations

X_4 = Organizational innovations

ε = Error terms

Regression coefficient indicated that product innovations had a substantial and significant effect with firm performance of SMEs (r=0.246, p=0.002). The study finds support finding from a study by López-Cabarcos *et al.*, (2019) that suggested that the product innovations influences performance. On the other hand, process innovations had a substantial and significant effect with

firm performance of SMEs (r=0.243, p=0.001). This agreeing with Awan, Arnold and Gölgeci (2021) findings that indicated that buyer-driven knowledge activities have a more significant positive influence on process innovation. Moreover, the marketing innovations had a positive and substantial effect with the firm performance of SMEs (r=0.204, p=0.001). Supported, by Udriyah, Tham and Azam (2019) that indicates that competitive advantage was significantly and positively impacted by marketing innovation. Furthermore, organizational innovations had a positive and significant effect with firm performance (r=0.282, p=0.001). This agreeing with Naveed *et al,* (2022) study that suggested that organizational innovations substantially impacted performance by enhancing flexibility, efficiency, and responsiveness to market demands. Their study emphasized that innovative organizational practices such as restructuring workflows, adopting advanced technologies, and fostering a culture of continuous improvement enable firms to better allocate resources, streamline processes, and improve decision-making organizational innovations influences performance.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The section encompasses a summary of the findings, the study's conclusions, recommendations for enhancing practices and shaping policies, and suggestions for future research.

5.2 Summary

Primarily the goal of the study was to investigate the effect of technological innovation strategies on performance of SMEs in Bungoma County, Kenya. While the studies specific objectives were to examine the effect of product, process, marketing and organizational innovations on performance of SMEs in Bungoma County, Kenya. The research used descriptive research design and used a population of the SMEs in Bungoma County licensed by Bungoma County government as of the year 2024. The structured research questions that were established yielded a number of findings.

As per the objective number one, the investigation determined that SMEs in Bungoma County performed better with an introduction of product innovations. Offering various products and services is considered one of the critical factors in sustaining performance by SMEs in Bungoma County. Additionally, performance was achieved by ensuring the products are of quality. Moreover, the objective number two, the investigation found that, process innovations influenced firm performance of SMEs in Bungoma County. This performance was achieved by ensuring enterprises have a good system on waste material management and have incorporated new methods in waste material management.

As per the objective number three, the investigation determined that marketing innovations influenced firm performance of SMEs in Bungoma County. The study revealed that social media channels and proper delivery channels have helped the SMEs to an increase in market share. Lastly

on objective number four, the investigation determined that organizational innovations influenced firm performance of SMEs in Bungoma County. The study revealed that, SMEs were able to network with other business enterprises within their reach and share knowledge.

5.3 Conclusion of the Study

First and foremost, this investigation concludes that there may be additional variables that influence the firm performance of SMEs in addition to those examined. This was captured by the linear regression. The first objective concluded that the introduction of a production innovations significantly improved the firm performance of SMEs in Bungoma County. By adopting innovative products, SMEs can differentiate themselves in competitive markets, meet evolving customer needs, and tap into new revenue streams. This fosters growth, customer satisfaction, and market share expansion. Additionally, Innovations have the potential to optimize operational efficiency, lower costs, and improve the quality of the products or services that are delivered, all of which may contribute to increased profitability.

The second objective concluded that the implementation of a process innovations influenced the firm performance of SMEs in Bungoma County. By adopting new or improved processes, such as automation, streamlined workflows, or advanced technologies, SMEs can increase output while minimizing resource usage. This leads to faster waste material management control, better resource allocation, and improved quality control.

The third objective highlighted that implementation of a marketing innovation had an advantageous influence on the firm performance of SMEs in Bungoma County. By adopting creative marketing strategies such as digital marketing, social media campaigns, or targeted promotions SMEs can improve their visibility and engage with customers more effectively. In Kenya, where competition among SMEs is intense, marketing innovations allow firms to stand

out, create stronger customer relationships, and respond quickly to market trends. These innovations help SMEs attract new customers but also retain existing ones, boosting overall market share

Lastly, the fourth objective detailed that the implementation of organizational innovations had an advantageous influence on the firm performance of SMEs in Bungoma County. By enhancing internal efficiency, fostering adaptability, and improving decision-making processes. Adopting innovations that include changes in good networks by enterprises, frequent interactions with other enterprises to share knowledge, and good routine practices, help SMEs become more agile and responsive to market dynamics.

5.4 Recommendations of the study

The first recommendation is that SMEs in Bungoma County should enhance their performance through product innovations, they should focus on continuous market research to identify changing consumer needs and emerging trends. By developing products that address specific market gaps, SMEs can differentiate themselves and attract new customers. It is advisable that SMEs invest in research and development even at a small scale, to foster creativity and enable the creation of innovative products that offer unique value propositions.

Based on the second finding, SMEs in Kenya should prioritize adopting technology-driven solutions that streamline operations, reduce costs, and increase productivity. This includes investing in affordable automation tools, digital platforms for financial management, and efficient supply chain systems. Collaborating with local or international partners to access training and technical expertise can help SMEs adopt best practices in process management.

Moreover, the study recommends to enhance firm performance through marketing innovations, SMEs in Kenya should leverage digital platforms such as e-commerce, mobile marketing,

websites, and social media to reach a broader and more targeted customer base. By embracing data-driven marketing strategies, such as personalized advertising and customer segmentation, SMEs can tailor their messaging to specific audience needs, improving customer engagement and conversion rates. Collaborating with influencers and utilizing content marketing can help build brand visibility and trust.

Finally, the findings recommend, SMEs should focus on creating more flexible and efficient organizational structures. This can be achieved by adopting flatter hierarchies that promote faster decision-making and better communication. Empowering employees through skill development, training, and greater autonomy can lead to a more innovative and engaged workforce. SMEs should also embrace leadership styles that encourage collaboration and adaptability, ensuring the business can quickly respond to market changes.

5.4.1 Suggestion for Further Research

The research suggests conducting additional studies that focus on metrics other than technological innovation strategies and firm performance. The study also recommends conducting additional research to explore counties in Kenya beyond Bungoma County.

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APPENDICES

Appendix I: Introductory Letter

Mr. Brian Itolondo Khadiakala
Kenyatta University
P.O.BOX 43844-00100
NAIROBI

Dear Sir/Madam

RE: REQUEST TO COLLECT ACADEMIC DATA

I am an MBA scholar at Kenyatta University undertaking a research project on Technological Innovation Strategies on Performance. The requested data will be used to gather information On SMEs in in Bungoma County, Kenya. For the sole purpose of academic research, the information that you supply will be kept completely confidential and combined with data from other SMEs.

Best regards,

Brian Itolondo Khadiakala

Appendix II: Research Questionnaire

Section: A: General Information

1. Position held in the enterprise ……

2. Gender.

Male [ ]

Female [ ]

3. Age

18-25 [ ]

26-31 [ ]

32-40 [ ]

Over 41 [ ]

4. Number of employees in your firm

Below 15 [ ]

16-30 [ ]

31-45 [ ]

46-50 [ ]

Over 50 [ ]

5. For what duration have you been employed or working at the enterprise?

2 years and below [ ]

3 -6 years [ ]

7-10 years [ ]

11-14 years [ ]

15 years and above [ ]

6. What is the greatest level of education you have attained?

Primary school level [ ]

Secondary school Level [ ]

Tertiary education [ ]

College diploma/certificate [ ]

University degree [ ]

SECTION B: Product Innovations

7. To what degree do you believe product innovation has influenced the performance of your enterprise? Here are some statements;(1=completely disagree, 2= Disagree, 3= Somewhat agree, 4= Agree and 5= Completely Agree)

Details	**1**	**2**	**3**	**4**	**5**
My enterprise offers quality products.					
My enterprise is able to modify the products/service they offer to satisfy the customers.					
My customers are not easily influenced to change to other enterprises that offer the same services or for the same product.					
My enterprise offers various services/ products.					

The enterprise collects feedback from the customers and suppliers to help them in product development.					

SECTION C: Process Innovations

8. To what degree do you believe process innovation has influenced the performance of your enterprise? Here are some statements;(1=completely disagree, 2= Disagree, 3= Somewhat agree, 4= Agree and 5= Completely Agree)

Details	**1**	**2**	**3**	**4**	**5**
We have a good system on waste material management.					
Our enterprise has incorporated new methods in waste material management.					
We have new ways and procedures in energy consumption to avoid wastage.					
Material consumption has improved our market growth and increased our sales volume.					
Process innovation has improved internal efficiency.					

SECTION D: Marketing Innovations

9. How much do you concur with the following statement on scales of;(1=completely disagree, 2= Disagree, 3= Somewhat agree, 4= Agree and 5= Completely Agree)

Details	**1**	**2**	**3**	**4**	**5**

My enterprise uses social media channels to market our product.					
We have a good distribution channel that enables our product to reach the end user.					
We promote our product through proper delivery channels.					
Our product is well differentiated from our competitors.					
We package our product/services very well to attract customers.					

SECTION E: Organizational Innovations

10. To what degree do you believe marketing innovation has influenced the performance of your enterprise? Here are some statements;(1=completely disagree, 2= Disagree, 3= Somewhat agree, 4= Agree and 5= Completely Agree)

Details	**1**	**2**	**3**	**4**	**5**
My enterprise has routine practices that guide the daily operations.					
We are open to new routines.					
We have procedures that guide the daily operations.					
We value networking with other business enterprises within our reach.					

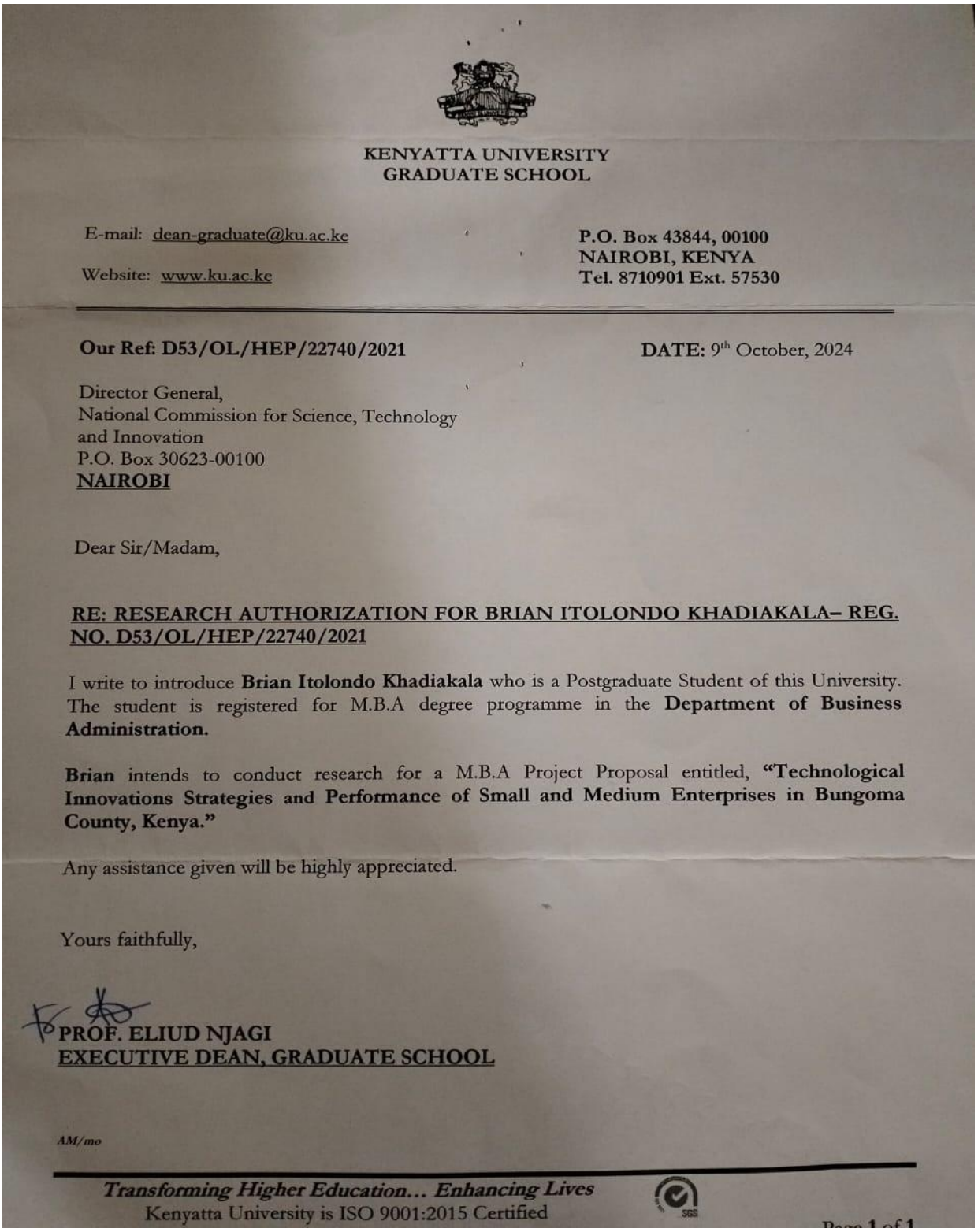
We have frequent interactions with other organizations to share knowledge.					

SECTION F: Firm Performance

11. To what degree do you believe in the statements below on the relationship between technological innovation strategies and firm performance? Here are some statements;(1=completely disagree, 2= Disagree, 3= Somewhat agree, 4= Agree and 5= Completely Agree)

Details	**1**	**2**	**3**	**4**	**5**
Our enterprise has increased the market share over years since adoption of different market penetration strategies.					
Customers are pleased with the services and products we provide.					
Our number of customers has increased for the last three years.					
Over sales volume have continuously grown for the last three years.					

Appendix III: Letter of Introduction to National Commission for Science, Technology, and Innovation



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/HEP/22740/2021 **DATE:** 9th October, 2024

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

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR BRIAN ITOLONDO KHADIAKALA– REG. NO. D53/OL/HEP/22740/2021

I write to introduce **Brian Itolondo Khadiakala** who is a Postgraduate Student of this University. The student is registered for M.B.A degree programme in the **Department of Business Administration.**

Brian intends to conduct research for a M.B.A Project Proposal entitled, **"Technological Innovations Strategies and Performance of Small and Medium Enterprises in Bungoma County, Kenya."**

Any assistance given will be highly appreciated.

Yours faithfully,

PROF. ELIUD NJAGI
EXECUTIVE DEAN, GRADUATE SCHOOL

AM/mo

Transforming Higher Education... Enhancing Lives
Kenyatta University is ISO 9001:2015 Certified

Page 1 of 1

Appendix IV: Approval of Research

KENYATTA UNIVERSITY
GRADUATE SCHOOL

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

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 810901 Ext. 4150

Internal Memo

FROM: Executive Dean, Graduate School

DATE: 9th October, 2024

TO: **Brian Itolondo Khadiakala**
C/o Business Administration Dept.

REF: D53/OL/HEP/22740/2021

SUBJECT: APPROVAL OF RESEARCH PROJECT PROPOSAL

This is to inform you that Graduate School Board at its meeting of 19th September, 2024 approved your Research Project Proposal for the M.B.A Degree Entitled, **"Technological Innovations Strategies and Performance of Small and Medium Enterprises in Bungoma County, Kenya."**

You may now proceed with your Data Collection, Subject to Clearance with Director General, National Commission for Science, Technology and Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking and progress report Forms per semester. The Forms are available at the University's Website under Graduate School webpage downloads.

Also, please ensure that you publish article(s) from your project before submitting it to Graduate School for examination as per the Commission for University Education and Kenyatta University guidelines.

Thank you.

ANNBELL MWANIKI
FOR: EXECUTIVE DEAN, GRADUATE SCHOOL

c.c. Chairman, Business Administration.

Supervisors:

1. Dr. Stephen Muathe
   C/o Department of Business Administration
   Kenyatta University

AM/mo

Appendix V: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **906189**

Date of Issue: **13/November/2024**

RESEARCH LICENSE

This is to Certify that Mr.. Brian Itolondo Khadiakala of Kenyatta University, has been licensed to conduct research as per theprovision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Bungoma on the topic: TECHNOLOGICAL INNOVATIONS STRATEGIES AND PERFORMANCE OF SMALL AND MEDIUM ENTERPRISES IN BUNGOMA COUNTY, KENYA for the period ending : 13/November/2025.

License No: **NACOSTI/P/24/42137**

906189

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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See overleaf for conditio