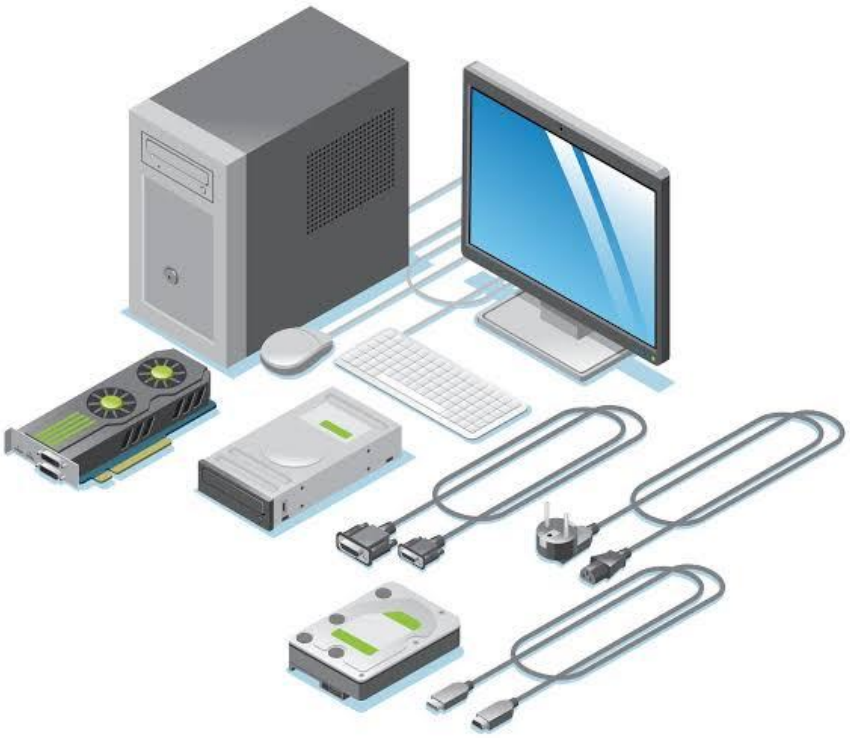
2026

STRATEGIC INNOVATION AND PERFORMANCE OF DISTRIBUTION SYSTEMS AMONG COMPUTER HARDWARE DISTRIBUTORS IN KENYA: THE MEDIATING ROLE OF OPERATIONAL EFFICIENCY



GEOFFREY KIMONGE MBOGO

International Journal of Scientific and Research Publications (ISSN: 2250-3153)

Publication Partner:
International Journal of Scientific and Research Publications (ISSN: 2250-3153)

STRATEGIC INNOVATION AND PERFORMANCE OF DISTRIBUTION SYSTEMS AMONG COMPUTER HARDWARE DISTRIBUTORS IN KENYA:

THE MEDIATING ROLE OF OPERATIONAL EFFICIENCY

A Research Monograph

GEOFFREY KIMONGE MBOGO

Master of Business Administration (Strategic Resource Management)

Taita Taveta University, Kenya

Publishing Partner:
IJSRP Inc.
www.ijsrp.org

ISSN 2250-3153
9 772250 315302

PREFACE

This monograph presents the findings of a research study examining the influence of strategic innovation on the performance of distribution systems among computer hardware distributors in Kenya. The study was conducted as a research project submitted to the Department of Business and Management Sciences in the School of Business, Economics and Social Sciences in partial fulfillment of the requirement for the award of Master in Business Administration (Strategic Resource Management) at Taita Taveta University.

The computer hardware distribution sector in Kenya is highly specialized and support-intensive, dominated by fourteen authorized distributors representing global manufacturers such as HP, Lenovo, Dell, Toshiba, APC, Mercer, and Epson. These firms serve as critical supply, service, and support channels for imported hardware and accessories across the country. Given the technical nature of the industry, distributors are required to maintain certified engineers, robust service infrastructure, and reliable logistics systems—requirements that have created high entry barriers and made strategic innovation a key determinant of competitiveness.

This study adopts a descriptive survey design and integrates quantitative and qualitative data from twenty senior managers across the fourteen licensed distributors. Guided by the Resource-Based View, Diffusion of Innovations Theory, and Dynamic Capabilities Theory, the research examines four dimensions of strategic innovation—supply chain (technological), process, product, and business model innovation—and assesses the mediating role of operational efficiency in translating innovation into improved distribution performance.

The findings reveal strong, positive, and statistically significant relationships between all dimensions of strategic innovation, operational efficiency, and distribution system performance. Process innovation emerged as the strongest predictor, explaining 90.1% of the variance in distribution system performance. The study also identifies key barriers to innovation adoption, including high costs of modernization, limited technical expertise, inconsistent manufacturer support, rapid technological change, and organizational resistance—particularly in family-owned

firms.

The monograph is structured to provide a comprehensive academic contribution that bridges theory and practice. Chapter One establishes the background, problem statement, objectives, and significance of the study. Chapter Two reviews the theoretical and empirical literature. Chapter Three details the research methodology. Chapter Four presents the results and findings. Chapter Five offers a synthesis of conclusions, recommendations, and policy implications. Appendices include the research instrument, list of registered distributors, workplan, and budget.

This work is intended for academic researchers, industry practitioners, policymakers, and students interested in strategic innovation, supply chain management, and ICT sector development in emerging economies. The author acknowledges the invaluable guidance of supervisors Dr. Patrick Kimaku and Dr. Irene Njeri, whose constructive feedback shaped the quality of this work. Gratitude is also extended to the management and staff of the fourteen computer hardware distribution firms who generously participated in this study.

Publication Partner:
International Journal of Scientific and Research Publications (ISSN: 2250-3153)

Copyright and Trademarks

Authors

Geoffrey Kimonge Mbogo
Master of Business Administration (Strategic Resource Management)
Taita Taveta University, Kenya
Reg. No: BE331-0408/2022
Email: kimongegm@gmail.com

Supervisors:
Dr. Patrick Kimaku, Ph.D.
Senior Lecturer
Department of Business and Management Sciences
Taita Taveta University, Kenya

Dr. Irene Njeri, Ph.D.
Lecturer
Department of Business and Management Sciences
Taita Taveta University, Kenya

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

A. Background of the Study

Innovation has been widely recognized as a critical driver of organizational competitiveness, resilience, and long-term growth in contemporary business environments. As markets become increasingly globalized and technologically dynamic, firms have been compelled to rethink how they design, manage, and deliver goods and services in order to remain competitive. Strategic innovation, which involves the deliberate alignment of innovation initiatives with an organization's long-term strategic direction, has therefore become essential for sustaining performance across industries (Brown, 2017; Chandler, 2020).

Distribution systems play a central role in translating innovation into tangible organizational outcomes. Efficient distribution systems ensure timely delivery, cost control, customer satisfaction, and market responsiveness. In technology-intensive industries such as computer hardware distribution, performance depends not only on product availability but also on logistics coordination, after-sales support, inventory accuracy, and responsiveness to rapidly changing customer needs. As a result, firms operating in this sector must continuously innovate their supply chains, processes, products, and business models to sustain operational efficiency and performance.

Kenya's computer hardware distribution sector is highly specialized and support-intensive. It is dominated by a small number of authorized distributors representing global manufacturers such as HP, Lenovo, Dell, Toshiba, APC, Mercer, and Epson. These firms act as official supply, service, and support channels for imported hardware and accessories across the country. Due to the technical nature of the industry, distributors are required to maintain certified engineers, robust service infrastructure, and reliable logistics systems. These requirements have created high entry barriers, limiting participation to a few capable firms and making strategic innovation a key determinant of competitiveness and distribution performance.

At the regional level, the East African Community (EAC) has experienced sustained growth in ICT adoption, driven by digitalization of public services, expansion of private sector ICT use,

and increased demand for computing equipment (EAC, 2022). Despite this growth, distribution systems across the region continue to face challenges such as infrastructural gaps, fragmented supply networks, and high logistics costs, which constrain operational efficiency and service reliability. These challenges highlight the need for innovation-driven distribution strategies that enhance coordination, reduce costs, and improve performance.

In Kenya, government-led digital transformation initiatives and increasing ICT penetration have stimulated demand for computer hardware across public institutions, private organizations, and households. However, the performance of distribution systems has remained uneven, particularly in terms of delivery timeliness, cost efficiency, inventory management, and market coverage. While many distributors have adopted various forms of innovation, there has been limited empirical evidence demonstrating how different dimensions of strategic innovation translate into improved distribution system performance, especially through operational efficiency. This gap provided the foundation for the present study.

Global Perspective of Strategic Innovation and Performance of Distribution Systems

Globally, firms have increasingly adopted strategic innovation as a means of enhancing distribution system performance in response to complex supply networks and rising customer expectations. Recent studies show that the use of digital technologies such as data analytics, artificial intelligence–enabled forecasting, automated warehousing, and integrated logistics platforms has significantly improved delivery speed, inventory accuracy, and cost efficiency (Xu et al., 2021; OECD, 2022).

Supply chain innovation has enabled firms to achieve end-to-end visibility, reduce stock-outs, and enhance coordination among suppliers, distributors, and customers. Process innovation, including lean logistics, workflow automation, and real-time order processing, has reduced operational redundancies and improved service responsiveness. Product innovation, through customization and value-added services, has enhanced demand predictability and customer satisfaction, thereby stabilizing distribution flows. In addition, business model innovation, such as e-commerce platforms and platform-based logistics, has expanded market reach and optimized resource utilization (Negi, 2021).

Empirical evidence from global distribution leaders demonstrates that the integration of these innovation dimensions enhances operational efficiency, which in turn strengthens distribution system performance. Firms that successfully align innovation initiatives with internal operational capabilities have been shown to achieve superior delivery reliability, customer satisfaction, and competitiveness. This global experience underscores the importance of examining innovation not as isolated practices, but as a strategic orientation that influences distribution performance through efficiency gains (Kumar et al., 2020).

Regional Perspective of Strategic Innovation and Performance of Distribution Systems

Across Africa, distribution systems operate in environments characterized by infrastructural limitations, fragmented supply chains, and high transportation costs. These challenges have historically constrained distribution performance, particularly in technology-driven sectors. However, recent studies indicate that strategic innovation has emerged as a practical mechanism for overcoming these constraints (AfDB, 2022).

Supply chain innovations such as GPS-enabled tracking, digital logistics platforms, and mobile-based order management systems have improved delivery coordination and visibility in countries such as Kenya, Nigeria, and South Africa. Process innovations, including outsourcing logistics functions and forming partnerships with third-party logistics providers, have enhanced efficiency and expanded market reach. Product innovation, particularly the bundling of ICT hardware with maintenance and support services, has enabled firms to serve price-sensitive markets more effectively. Business model innovations, such as mobile-money-enabled payments and hybrid distribution channels, have further improved accessibility and inclusivity (Eton et al., 2025).

Despite these advances, many African firms continue to struggle to convert innovation initiatives into measurable performance improvements due to financial constraints, skills gaps, and weak institutional support. This regional context highlights the importance of operational efficiency as a mechanism through which innovation can be transformed into improved distribution outcomes.

Kenyan Perspective of Strategic Innovation and Performance of Distribution Systems

Kenya has positioned itself as a regional ICT hub, supported by sustained investments in digital infrastructure and technology-driven economic initiatives. The computer hardware

distribution industry plays a critical role in supporting this digital ecosystem by ensuring the availability, reliability, and support of ICT equipment across the country (Magrini et al., 2025).

Authorized distributors have increasingly adopted innovations such as automated order management systems, digital warehousing, logistics partnerships, and online sales platforms. Process innovations such as workflow automation, e-invoicing, and integrated inventory systems have been introduced to reduce lead times and operational errors. Product innovation has involved hardware bundling, customization, and enhanced after-sales services, while business model innovation has expanded distribution channels to include e-commerce and hybrid delivery models (Heinemann, 2023).

However, despite these initiatives, distributors continue to face performance challenges, including high logistics costs, delayed deliveries, inventory inaccuracies, uneven market coverage, and resistance to organizational change. These challenges suggest that innovation alone may be insufficient unless it is effectively aligned with internal operational efficiency. This situation underscores the need for empirical research examining how strategic innovation influences distribution system performance within the Kenyan computer hardware distribution context.

B. Problem Statement

Kenya's computer hardware distribution sector has expanded alongside the growth of the digital economy, yet the performance of distribution systems remains constrained by persistent inefficiencies. Authorized distributors continue to experience challenges such as high logistics costs, fragmented supply chains, inventory management inefficiencies, delayed deliveries, and uneven market coverage. These challenges undermine customer satisfaction, cost efficiency, and competitiveness within a highly technical and support-intensive industry.

Although distributors have increasingly adopted strategic innovation practices, including supply chain digitization, process automation, product enhancement, and new business models, many firms have struggled to translate these initiatives into consistent improvements in distribution system performance. Existing empirical studies (Karanja & Muturi, 2020; Mwangi, 2022;

Githinji, 2022) have largely focused on manufacturing firms or general ICT service providers, with limited attention to the specialized ICT hardware distribution context in Kenya. Furthermore, prior research has examined innovation dimensions in isolation and has rarely tested the mediating role of operational efficiency. This has created limited contextual understanding of how innovation investments should be structured to improve distribution outcomes in Kenya's ICT hardware distribution sector.

Therefore, this study examined the influence of strategic innovation—specifically supply chain, process, product, and business model innovation—on the performance of distribution systems among computer hardware distributors in Kenya, while assessing the mediating role of operational efficiency.

C. Objectives of the Study

General Objective

To examine the influence of strategic innovation on the performance of distribution systems among computer hardware distributors in Kenya.

Specific Objectives

i. To determine the effect of supply chain innovation on the performance of distribution systems among computer hardware distributors in Kenya.

ii. To examine the effect of process innovation on the performance of distribution systems among computer hardware distributors in Kenya.

iii. To assess the effect of product innovation on the performance of distribution systems among computer hardware distributors in Kenya.

iv. To evaluate the effect of business model innovation on the performance of distribution systems among computer hardware distributors in Kenya.

v. To determine the mediating effect of operational efficiency on the relationship between

strategic innovation and distribution system performance among computer hardware distributors in Kenya.

D. Research Hypotheses

H_{01}: Supply chain innovation has no significant effect on the performance of distribution systems among computer hardware distributors in Kenya.

H_{02}: Process innovation has no significant effect on the performance of distribution systems among computer hardware distributors in Kenya.

H_{03}: Product innovation has no significant effect on the performance of distribution systems among computer hardware distributors in Kenya.

H_{04}: Business model innovation has no significant effect on the performance of distribution systems among computer hardware distributors in Kenya.

H_{05}: Operational efficiency does not significantly mediate the relationship between strategic innovation and distribution system performance among computer hardware distributors in Kenya.

E. Significance of the Study

The findings of this study provide valuable insights to managers of computer hardware distribution firms by identifying which dimensions of strategic innovation most effectively enhance operational efficiency and distribution system performance. This information supports informed decision-making on innovation investments aimed at improving delivery reliability, customer satisfaction, and competitiveness.

From a policy perspective, the study offers evidence-based insights to policymakers and regulators involved in Kenya's ICT and logistics sectors, such as the Communications Authority of Kenya (CAK), Kenya National Bureau of Statistics (KNBS), and the Ministry of Information, Communications and the Digital Economy, informing the design of innovation-supportive

frameworks and infrastructure development initiatives. Academically, the study contributes to theory by integrating the Resource-Based View, Diffusion of Innovations Theory, and Dynamic Capabilities Theory to explain how innovation translates into performance through operational efficiency.

F. Scope of the Study

The study focused on examining the influence of strategic innovation on the performance of distribution systems among licensed computer hardware distributors in Kenya. At the time of the study, there were 14 licensed and authorized computer hardware distribution firms registered by the Communications Authority of Kenya (CAK). These firms represent global manufacturers such as HP, Lenovo, Dell, Toshiba, APC, Mercer, and Epson.

The unit of analysis was the firm, while the unit of observation comprised managers and supervisors directly involved in operations, logistics, marketing, and strategic management. The total target population consisted of 25 eligible managers and supervisors across the 14 firms, all of whom were involved in implementing innovation initiatives and overseeing distribution performance.

The study covered the period from January 2023 to September 2025, capturing recent innovation trends and operational dynamics within the sector. The scope was limited to supply chain, process, product, and business model innovation, operational efficiency, and distribution system performance within the Kenyan ICT hardware distribution industry.

2. LITERATURE REVIEW

A. Theoretical Literature Review

This chapter reviews studies related to strategic innovation and the performance of distribution systems. The review focuses on the four dimensions of strategic innovation—supply chain innovation, process innovation, product innovation, and business model innovation—and their influence on distribution system performance. It also examines operational efficiency as a mediating variable. The purpose of the review is to establish existing knowledge, identify methodological and contextual gaps, and justify the need for the current study within Kenya's computer hardware distribution industry.

Resource-Based View (RBV)

The Resource-Based View, advanced by Barney (1991), posits that firms achieve sustainable competitive advantage through valuable, rare, inimitable, and non-substitutable resources. Strategic innovation capabilities and operational efficiency constitute internal strategic resources that enhance distribution system performance.

The RBV emphasizes that organizations differ in terms of the resources they control and that these differences can persist over time due to resource immobility (Barney, 1991). In the context of computer hardware distributors, resources such as advanced supply chain technologies, skilled human capital, proprietary logistics systems, and strong supplier relationships are critical in driving superior performance (Grant, 1996). These resources enable firms to innovate effectively across supply chains, processes, products, and business models.

Furthermore, RBV underscores the importance of capability development, where firms not only possess resources but also have the ability to deploy them efficiently (Teece, Pisano, & Shuen, 1997). Strategic innovation, therefore, becomes a higher-order capability that integrates various organizational resources to create value. For instance, firms that leverage data analytics in inventory management or adopt automated warehousing systems are better positioned to enhance distribution efficiency and responsiveness (Porter, 1985).

In this study, operational efficiency is conceptualized as a key firm capability derived from the effective utilization of strategic resources (Barney, 1991). It acts as a mechanism through which innovation translates into improved distribution performance. Thus, RBV provides a strong foundation for understanding how internal capabilities in innovation and efficiency drive competitive advantage in distribution systems.

Diffusion of Innovations Theory (DOI)

Diffusion of Innovations Theory, developed by Rogers (2003), explains how new ideas and technologies are adopted within organizations. In this study, adoption of supply chain technologies, process automation, and digital business models reflects innovation diffusion within ICT hardware distribution firms.

The theory outlines five key attributes that influence the adoption of innovations: relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003). These attributes determine the rate and extent to which innovations are embraced within an organization. For example, computer hardware distributors are more likely to adopt supply chain management systems if they perceive them to improve efficiency (relative advantage), align with existing systems (compatibility), and are easy to implement (low complexity) (Tornatzky & Klein, 1982).

DOI also categorizes adopters into innovators, early adopters, early majority, late majority, and laggards (Rogers, 2003). This categorization is important in understanding how different firms within the distribution sector respond to innovation. Leading firms may act as innovators or early adopters by implementing advanced technologies such as real-time tracking systems or AI-driven demand forecasting, while others may adopt such innovations later (Premkumar, 2003).

Additionally, the theory highlights the role of communication channels and social systems in influencing adoption decisions (Rogers, 2003). In the Kenyan ICT distribution sector, industry networks, partnerships, and competitive pressures may accelerate the diffusion of innovative practices across firms (Zhu, Kraemer, & Xu, 2006).

In this study, DOI theory explains how various forms of strategic innovation—supply chain,

process, product, and business model innovations—are adopted and implemented within firms. It provides a framework for understanding how these innovations spread and ultimately impact distribution system performance.

Dynamic Capabilities Theory (DCT)

Dynamic Capabilities Theory (Teece, 2018) emphasizes a firm's ability to integrate, build, and reconfigure internal and external competencies in rapidly changing environments. Operational efficiency reflects the firm's dynamic capability to transform innovation into improved distribution performance.

DCT extends the Resource-Based View by focusing not just on resource possession but on the firm's ability to adapt and renew its resource base in response to environmental changes (Eisenhardt & Martin, 2000). In highly dynamic sectors such as ICT hardware distribution, firms must continuously update their processes, technologies, and business models to remain competitive. This requires sensing opportunities, seizing them through strategic investments, and transforming organizational processes accordingly (Teece, 2007).

The theory identifies three core components of dynamic capabilities: sensing (identifying opportunities and threats), seizing (mobilizing resources to capture opportunities), and transforming (reconfiguring operations to sustain competitiveness) (Teece, 2007). For instance, a distributor may sense the need for faster delivery systems, invest in automated logistics (seizing), and restructure its distribution network (transforming) to enhance efficiency.

Operational efficiency, in this regard, is not merely an outcome but a dynamic capability that enables firms to continuously optimize their processes and align innovation with performance goals (Eisenhardt & Martin, 2000). It plays a mediating role by ensuring that innovations are effectively translated into tangible performance improvements in distribution systems.

In this study, DCT is particularly relevant in explaining how firms leverage strategic innovation to adapt to changing market conditions and improve distribution performance. It supports the examination of operational efficiency as a mediator, highlighting its role in bridging the gap between innovation and performance outcomes.

B. Empirical Literature Review

Supply Chain Innovation and Distribution System Performance

Saberi, Kouhizadeh, Sarkis, and Shen (2019) conducted a quantitative study titled "Blockchain Technology and Supply Chain Sustainability." The study adopted a survey research design targeting manufacturing and logistics firms in Asia and Europe. The objective was to examine how digital supply chain innovations influence efficiency and transparency. The findings showed that digital tracking systems significantly improved delivery reliability, inventory accuracy, and coordination across distribution networks.

Karanja and Muturi (2020) carried out a study titled "Supply Chain Innovation and Operational Performance of Manufacturing Firms in Kenya." Using a descriptive research design, the study targeted 132 supply chain managers from Kenyan manufacturing firms. The study found that supply chain innovations such as automated inventory systems and supplier integration significantly enhanced delivery speed and cost efficiency.

A study by Xu, Zhang, and Feng (2021) titled "Digital Supply Chain Innovation and Firm Performance" employed a cross-sectional design among logistics firms in China. The objective was to assess the effect of digital supply chain tools on distribution efficiency. The findings revealed that firms that adopted real-time tracking and data analytics experienced reduced lead times and improved distribution responsiveness.

Mwendwa (2021) conducted a study in Kenya titled "ICT Adoption and Distribution Performance of SMEs." The study used a mixed-methods approach targeting 90 SME distributors. The findings indicated that ICT-enabled supply chain innovations significantly reduced order fulfillment time and improved customer satisfaction.

OECD (2022), in an empirical policy study on global distribution systems, reported that firms investing in supply chain innovation achieved superior coordination and resilience. The study concluded that supply chain innovation directly enhances distribution system performance, particularly in technology-intensive sectors.

Research gap: Although these studies confirm the importance of supply chain innovation, most focus on manufacturing or general SMEs. Limited empirical work exists on specialized ICT hardware distributors in Kenya, particularly examining supply chain innovation alongside other innovation dimensions.

Process Innovation and Distribution System Performance

Christopher (2016) conducted a longitudinal study titled "Logistics and Process Innovation in Distribution Systems." The study examined global logistics firms using case study analysis. The findings showed that workflow redesign and automation significantly improved delivery reliability and reduced operational costs.

Ngugi (2020) carried out a study titled "Process Innovation and Operational Performance of SMEs in Kenya." Using a descriptive survey design targeting 110 SME managers, the study found that firms that adopted process automation and continuous improvement practices reported higher efficiency and faster service delivery.

Al-Shammari (2021) conducted a quantitative study among logistics firms in the Middle East titled "Process Innovation and Supply Chain Performance." The study used regression analysis and established that process innovation had the strongest direct effect on distribution performance compared to other innovation types.

Gakure, Mwangi, and Njoroge (2019) studied "Organizational Culture and Process Innovation in Kenyan Firms" using a mixed-methods design. The population included operational managers in logistics and distribution firms. The findings revealed that process innovation significantly enhanced operational efficiency but was constrained by resistance to change and skills gaps.

Damanpour (2014) conducted a meta-analysis of process innovation studies across industries. The findings demonstrated that process innovation produces immediate operational benefits, often without the need for mediating variables.

Research gap: Existing studies strongly link process innovation to performance, but few have

tested whether operational efficiency mediates this relationship within ICT hardware distribution firms in Kenya.

Product Innovation and Distribution System Performance

Mwangi (2022) conducted a study titled "Product Innovation and Competitive Performance of ICT Firms in Kenya." Using a survey design among 85 ICT firms, the study found that product enhancement and customization significantly improved market reach and customer retention.

Njoroge (2021) examined "Product Differentiation and Distribution Efficiency among Kenyan SMEs." The study employed a correlational design and found that innovative product offerings reduced inventory stagnation and improved distribution planning.

Lau, Yam, and Tang (2019) studied "Product Innovation and Supply Chain Performance" using a cross-national survey of electronics firms. The findings showed that product standardization and modular design improved inventory turnover and distribution predictability.

Kiragu and Wambugu (2020) conducted a Kenyan study on "Product Innovation and Operational Efficiency in Hardware Firms." The study used a descriptive design and established that distributors offering bundled hardware and after-sales services achieved better distribution coordination.

UNCTAD (2021), in an empirical assessment of African ICT markets, found that product innovation enhanced competitiveness but required efficient distribution systems to realize performance gains.

Research gap: While product innovation has been widely studied, limited research has examined how it influences distribution performance through operational efficiency within Kenya's ICT hardware distribution sector.

Business Model Innovation and Distribution System Performance

Githinji (2022) conducted a study titled "Business Model Innovation and Performance of ICT Firms in Kenya." Using a survey design among ICT distributors, the findings showed that firms adopting e-commerce and hybrid distribution models experienced expanded market coverage and improved delivery efficiency.

Muturi and Wanjiru (2021) examined "Digital Business Models and SME Performance in Kenya." The study employed regression analysis and found that innovative pricing models and digital channels significantly improved distribution reach.

Ndung'u (2020) studied "Market Innovation and Distribution Performance of SMEs in Nairobi County." The findings indicated that firms using digital marketing platforms achieved faster order processing and wider distribution networks. Teece (2018) conducted an empirical review of dynamic capabilities and business model innovation across industries. The study concluded that firms that reconfigured their business models achieved superior operational and distribution performance. World Bank (2023), in a Kenyan ICT sector assessment, found that business model innovation was a critical driver of SME competitiveness but required efficient operations to sustain performance.

Research gap: Despite evidence supporting business model innovation, few studies have examined its combined effect with other innovation dimensions on distribution system performance among specialized ICT hardware distributors.

Operational Efficiency as a Mediating Variable

Eisenhardt and Martin (2000) conducted an empirical study on dynamic capabilities and performance and established that operational efficiency mediates the relationship between innovation and organizational outcomes.

Farouk and Tanti (2019) studied "Operational Efficiency as a Mediator between Innovation and Firm Performance" using a survey of logistics firms. The findings confirmed partial mediation effects.

Karanja and Muturi (2020) found that operational efficiency explained how supply chain

innovation translated into improved performance among Kenyan firms.

OECD (2022) emphasized that innovation without operational efficiency often fails to yield sustainable performance gains.

AfDB (2022) reported that African SMEs struggle to convert innovation into performance due to weak operational systems, highlighting the mediating role of efficiency.

Research gap: Although operational efficiency has been recognized as a mediator, limited empirical studies have tested this role across multiple innovation dimensions within Kenya's ICT hardware distribution sector.

C. Conceptual Framework

The conceptual framework for this study positions strategic innovation as the independent variable, comprising four dimensions: supply chain (technological) innovation, process innovation, product innovation, and business model (market) innovation. Distribution system performance serves as the dependent variable, measured through delivery timeliness, customer satisfaction, market coverage, service reliability, and sales growth. Operational efficiency functions as the mediating variable, channeling the effects of strategic innovation on distribution performance through cost reduction, delivery turnaround time, resource utilization, inventory accuracy, and system reliability.

The framework is grounded in three theoretical perspectives: the Resource-Based View (Barney, 1991), which posits that internal capabilities drive competitive advantage; Diffusion of Innovations Theory (Rogers, 2003), which explains how innovations are adopted and spread within organizations; and Dynamic Capabilities Theory (Teece, 2018), which emphasizes the firm's ability to reconfigure resources in response to environmental change. Together, these theories provide a robust foundation for understanding how strategic innovation, channeled through operational efficiency, enhances distribution system performance in the Kenyan ICT hardware distribution context.

D. Research Gap

The reviewed empirical literature demonstrates that strategic innovation is a critical driver of organizational and distribution system performance across different contexts. Studies conducted globally, regionally, and within Kenya confirm that supply chain, process, product, and business model innovations contribute positively to efficiency, competitiveness, and service delivery. However, the strength and nature of these relationships vary depending on industry context, organizational capabilities, and the extent to which innovation initiatives are aligned with internal operational processes.

Most existing studies have focused on manufacturing firms or general service sectors, with limited empirical attention given to the ICT hardware distribution industry, which is highly specialized, technical, and support-intensive. In particular, few studies have examined authorized computer hardware distributors representing multinational manufacturers such as HP, Lenovo, Dell, Toshiba, APC, Mercer, and Epson, despite their critical role in supporting national digital transformation efforts.

Additionally, the majority of prior research has examined innovation dimensions independently, without assessing their combined influence on distribution system performance. Even fewer studies have empirically tested the mediating role of operational efficiency in explaining how strategic innovation translates into improved distribution outcomes. This has resulted in limited contextual understanding of how innovation-driven strategies can be effectively leveraged to enhance distribution performance within Kenya's ICT hardware sector.

Therefore, this study addressed the identified gaps by examining the influence of strategic innovation—specifically supply chain, process, product, and business model innovations—on the performance of distribution systems among registered computer hardware distributors in Kenya, while assessing operational efficiency as a mediating variable. By doing so, the study provided empirical and contextual insights that contribute to theory, managerial practice, and policy formulation within the ICT distribution industry.

3. RESEARCH METHODOLOGY

This chapter describes the methodology used to examine the influence of strategic innovation on the performance of distribution systems among computer hardware distributors in Kenya. It outlines the research design, target population, sampling approach, data collection instruments, measurement of study variables, data collection procedures, validity and reliability considerations, data analysis techniques, and ethical considerations adopted in the study. Structural Equation Modeling (SEM) was considered but not used due to the small sample size. Future research should use SEM to test causal relationships more robustly.

A. Research Design

The study adopted a descriptive survey research design. This design was appropriate because it enabled the collection of quantitative and qualitative data from respondents at a single point in time and facilitated the examination of relationships among strategic innovation, operational efficiency, and distribution system performance. The descriptive survey design also supported the use of statistical techniques such as correlation, regression, and mediation analysis to establish patterns and associations among the study variables.

B. Target Population and Sampling

The target population comprised computer hardware distribution firms licensed by the Communications Authority of Kenya (CAK). At the time of the study, there were 14 registered and authorized distributors representing global manufacturers such as HP, Lenovo, Dell, Toshiba, APC, Mercer, and Epson.

Within these firms, the unit of observation consisted of managers and supervisors directly involved in operations, logistics, marketing, and distribution management. These respondents were considered suitable because of their direct involvement in implementing innovation initiatives and managing distribution system performance. Across the 14 firms, there were 25 eligible managers and supervisors, forming the total target population for the study.

Given the small and specialized nature of the target population, the study adopted a census

approach. A census was appropriate because it allowed the inclusion of all licensed computer hardware distributors without introducing sampling error.

C. Data Collection Instruments

Data were collected using a structured questionnaire comprising both closed-ended and open-ended questions. The questionnaire was organized into sections covering demographic information, supply chain innovation, process innovation, product innovation, business model innovation, operational efficiency, and distribution system performance.

Closed-ended items were measured using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), to capture the extent to which respondents agreed with statements relating to the study variables. Open-ended questions were included to capture qualitative insights on challenges and contextual factors influencing innovation adoption and distribution performance.

D. Measurement of Variables

The study variables were operationalized using indicators adapted from relevant empirical literature and aligned with the study objectives.

Supply chain innovation was measured using indicators such as adoption of digital tracking systems, automated logistics and warehousing, supplier integration, and real-time inventory visibility.

Process innovation was measured through workflow redesign, process automation, reduction of operational errors, use of integrated information systems, and employee involvement in process improvement.

Product innovation was assessed using indicators such as introduction of new or improved hardware, customization, product bundling, after-sales services, and warranty enhancements.

Business model innovation was measured using new sales channels, innovative pricing

structures, strategic partnerships, and value-added service offerings.

Operational efficiency was measured through cost reduction, delivery turnaround time, resource utilization, efficiency, inventory accuracy, and system reliability.

Distribution system performance was measured using delivery timeliness, customer satisfaction, market coverage, competitiveness, service reliability, and sales growth.

All variables were measured using a five-point Likert scale.

E. Data Analysis

Collected data were coded and analyzed using the Statistical Package for Social Sciences (SPSS) Version 28. Both descriptive and inferential statistical techniques were employed. Descriptive statistics included frequencies, percentages, means, and standard deviations to summarize respondent characteristics and variable responses. Inferential analysis involved Pearson correlation analysis to assess relationships among variables, multiple regression analysis to examine the influence of strategic innovation dimensions on distribution system performance, and bootstrapped mediation analysis to test the mediating role of operational efficiency. The results were presented using tables and figures to enhance clarity and interpretation.

Open-ended findings of the unstructured responses indicated that there were a number of barriers to innovation adoption in computer hardware distributors in Kenya. The greatest challenge was the expensive nature of modernization and the regular upgrades of the technology which most companies could not afford. Another key investigation identified by the respondents is a high staff training and skills deficiency which slows effective adoption of new systems. Poor support by manufacturers, especially in the supply of spare parts in time, also derails operations. The accelerated rates of technological development present more pressure on small companies that want to follow. Lastly, innovation is hampered by organizational resistance particularly in family-owned businesses. These aspects put the quantitative findings into context with practical constraints preventing the depth of innovation despite favorable perceptions.

F. Ethical Considerations

Ethical approval was obtained from the relevant university authorities prior to data collection. Permission was also sought from participating firms before administering the questionnaires.

Respondents were informed about the purpose of the study and their right to participate voluntarily. Confidentiality and anonymity were strictly maintained, and no identifying information was disclosed. All data collected were used solely for academic purposes and securely stored throughout the research process.

4. RESULTS AND FINDINGS

This chapter presents the results of the data analysis undertaken to examine the influence of strategic innovation on the performance of distribution systems among computer hardware distributors in Kenya. The chapter starts with the summary of the demographic features of the respondents and then the descriptive statistics of the study constructs in detail. The most important inferential tests such as the reliability test, correlation analysis, regression modeling and mediation tests are also given to establish the nature and strength of the relationships between the variables.

A. Response Rate and Demographics

Out of the 25 targeted managers and supervisors across the 14 licensed computer hardware distribution firms, 20 completed questionnaires were returned, representing an 80% response rate. This response rate is considered adequate for statistical analysis, particularly given the small and specialized nature of the target population, and is consistent with organizational-level survey research standards.

Table 4.1: Summary of Response Rate

Category	Number	Percentage
Questionnaires distributed	25	100.0
Questionnaires returned	20	80.0
Questionnaires not returned	5	20.0
Usable questionnaires	20	80.0

Table 4.2 shows that 20 respondents were involved in the study, with 65% male and 35% female. The majority were aged 35–44 years (60%), 15% were 25–34, and 25% were 55 and above. In terms of education, 45% held a bachelor's degree, 25% a diploma, 25% a master's, and 5% a doctorate. Participants' positions included directors/senior managers (45%), middle managers (20%), supervisors (15%), and operations/logistics staff (20%). All respondents were from small firms with fewer than 50 employees.

B. Descriptive Analysis

Technological Innovation

The descriptive findings indicate a strong positive orientation toward technological innovation among registered computer hardware distributors in Kenya. Regarding the statement that the firm frequently adopts new technologies, 17 respondents agreed (50% strongly agree, 35% agree), 1 respondent was neutral (5%), and 2 respondents disagreed (10%). On the use of digital platforms such as e-commerce, ERP, and CRM systems, 18 respondents agreed (60% strongly agree, 30% agree), 1 respondent was neutral (5%), and 1 respondent disagreed (5%). Concerning whether technology adoption reduced supply-chain delays, 18 respondents agreed (65% strongly agree, 25% agree), 1 respondent was neutral (5%), and 1 respondent disagreed (5%). Finally, on whether IT investments improved customer service, 18 respondents agreed (60% strongly agree, 30% agree), 1 respondent was neutral (5%), and 1 respondent disagreed (5%). Overall, the results demonstrate high levels of agreement across all items, suggesting that technological innovation is widely implemented and perceived to enhance operational and distribution performance within the sector.

Process Innovation

The findings show strong agreement regarding the role of process innovation in enhancing distribution performance. On whether continuous process improvements enhance efficiency, 17 respondents agreed (55% strongly agree, 30% agree), 1 respondent was neutral (5%), and 2 respondents disagreed (10%). Regarding automation streamlining distribution activity, 17 respondents agreed (60% strongly agree, 25% agree), 1 respondent was neutral (5%), and 2 respondents disagreed (10%). On whether logistics processes have been redesigned to reduce costs, 17 respondents agreed (55% strongly agree, 30% agree), 2 respondents were neutral (10%), and 1 respondent disagreed (5%). Finally, 18 respondents agreed (60% strongly agree, 30% agree) that process improvements enhance flexibility, 1 respondent was neutral (5%), and 1 respondent disagreed (5%). Overall, the results indicate that process innovation is widely adopted and positively perceived as improving efficiency, cost control, and flexibility.

Product Innovation

The results indicate strong support for product innovation among the surveyed ICT hardware distributors. Regarding the frequent introduction of new or improved hardware products, 17 respondents agreed (60% strongly agree, 25% agree), 2 respondents were neutral (10%), and 1 respondent disagreed (5%). On whether product customization is a key focus, 17 respondents agreed (55% strongly agree, 30% agree), 2 respondents were neutral (10%), and 1 respondent disagreed (5%). Concerning the view that new product launches enhance competitiveness, 18 respondents agreed (65% strongly agree, 25% agree), 1 respondent was neutral (5%), and 1 respondent disagreed (5%). Similarly, 18 respondents agreed (60% strongly agree, 30% agree) that innovative product offerings expanded the customer base, while 1 respondent was neutral (5%) and 1 respondent disagreed (5%). Overall, the findings demonstrate that product innovation is widely practiced and perceived as enhancing competitiveness and market expansion.

Market / Business Model Innovation

The findings demonstrate strong agreement regarding market and business model innovation among ICT hardware distributors. On whether the firm explores new markets, 17 respondents agreed (55% strongly agree, 30% agree), 2 respondents were neutral (10%), and 1 respondent disagreed (5%). Concerning regular updates of marketing strategies, 18 respondents agreed (60% strongly agree, 30% agree), 1 respondent was neutral (5%), and 1 respondent disagreed (5%). Regarding the adoption of innovative pricing and promotions, 17 respondents agreed (55% strongly agree, 30% agree), 2 respondents were neutral (10%), and 1 respondent disagreed (5%). Finally, 18 respondents agreed (60% strongly agree, 30% agree) that market innovation expanded distribution channels, while 1 respondent was neutral (5%) and 1 respondent disagreed (5%). Overall, the results indicate that business model and market innovations are widely practiced and perceived to enhance market reach and distribution effectiveness.

Operational Efficiency

The results indicate very high levels of operational efficiency among the surveyed ICT hardware distributors. Regarding minimization of distribution costs, 19 respondents agreed (15% agree, 80% strongly agree), while 1 respondent (5%) was neutral. Similarly, 19 respondents agreed (15% agree, 80% strongly agree) that inventory systems are effective and reliable, with

only 1 respondent (5%) remaining neutral. On whether delivery times meet customer expectations, 19 respondents agreed (30% agree, 65% strongly agree), while 1 respondent (5%) was neutral. Finally, all respondents expressed agreement that efficiency improves customer satisfaction, with 18 respondents (90%) strongly agreeing and 2 respondents (10%) agreeing. Overall, the findings demonstrate that operational efficiency is strongly embedded within the firms and is closely associated with improved distribution performance and customer satisfaction.

Distribution System Performance

The findings indicate a strong positive assessment of distribution system performance among the surveyed firms. Regarding timely delivery, 18 respondents agreed (70% strongly agree, 20% agree), 1 respondent was neutral (5%), and 1 respondent disagreed (5%). On whether distribution efficiency improves profitability, 18 respondents agreed (65% strongly agree, 25% agree), 1 respondent was neutral (5%), and 1 respondent disagreed (5%). Similarly, 18 respondents agreed (70% strongly agree, 20% agree) that the firm responds quickly to changes in customer demand, while 1 respondent was neutral (5%) and 1 respondent disagreed (5%). Concerning expansion of the distribution network, 17 respondents agreed (60% strongly agree, 25% agree), 2 respondents were neutral (10%), and 1 respondent disagreed (5%). Finally, 16 respondents agreed (70% strongly agree, 10% agree) that innovation improves overall distribution performance, 3 respondents were neutral (15%), and 1 respondent disagreed (5%). Overall, the results demonstrate that distribution systems are perceived as efficient, responsive, and profitability-enhancing, with innovation playing a significant contributory role.

C. Diagnostic Tests

Normality Test

The normality of the data was assessed using the Shapiro-Wilk test and visual inspection of histograms and normal Q-Q plots. The results indicated that the data were approximately normally distributed, with Shapiro-Wilk p-values greater than 0.05 for all key variables, satisfying the normality assumption required for regression analysis.

Multicollinearity Test

Multicollinearity among independent variables was examined using the Variance Inflation Factor (VIF) and tolerance values. VIF values ranged from 4.462 to 37.19, with most values below the conventional threshold of 10. However, product innovation (VIF = 32.317) and market innovation (VIF = 37.19) showed elevated multicollinearity, which is addressed by interpreting individual regression models alongside the joint model. The high correlation between product and market innovation (r = 0.98) explains this overlap, and the study acknowledges this limitation in the interpretation of results.

Heteroscedasticity Test

Heteroscedasticity was tested using the Breusch-Pagan test and visual inspection of scatterplots of residuals versus predicted values. The results indicated no severe heteroscedasticity, suggesting that the error terms had constant variance across levels of the independent variables.

Linearity Test

Linearity between independent variables and the dependent variable was assessed through scatterplots and partial regression plots. The relationships were found to be sufficiently linear, supporting the use of multiple regression analysis.

D. Inferential Statistics

Correlation Analysis

Table 4.11 presents the correlation results used to test hypotheses H_{01} to H_{05} by examining the strength and statistical significance of the relationships between the innovation variables and distribution system performance:

i) H_{01}: Supply chain innovation has no significant effect on the performance of distribution systems among computer hardware distributors in Kenya. Technological innovation (representing supply chain innovation) is strongly and positively correlated with distribution system performance ($r = .83$, $p = .000$). Since $p < 0.01$, H_{01} is rejected. This indicates that supply chain innovation significantly affects distribution system performance.

ii) H_{02}: Process innovation has no significant effect on the performance of distribution systems

among computer hardware distributors in Kenya. Process innovation shows a strong positive and statistically significant relationship with distribution system performance ($r = .95$, $p = .006$). As $p < 0.01$, H_{02} is rejected.

iii) H_{03}: Product innovation has no significant effect on the performance of distribution systems among computer hardware distributors in Kenya. Product innovation is positively and significantly correlated with distribution system performance ($r = .87$, $p = .000$). Therefore, H_{03} is rejected.

iv) H_{04}: Business model innovation has no significant effect on the performance of distribution systems among computer hardware distributors in Kenya. Market innovation (representing business model innovation) is strongly and significantly correlated with distribution system performance ($r = .90$, $p = .000$). Since $p < 0.01$, H_{04} is rejected.

v) H_{05}: Operational efficiency does not significantly mediate the relationship between strategic innovation and distribution system performance among computer hardware distributors in Kenya. Operational efficiency is strongly and significantly correlated with distribution system performance ($r = .87$, $p = .000$) and is also significantly correlated with technological innovation ($r = .75$, $p = .000$), process innovation ($r = .88$, $p = .023$), product innovation ($r = .63$, $p = .003$), and market innovation ($r = .66$, $p = .002$). Since all p-values are below 0.05, H_{05} is rejected.

Regression Analysis of Direct Effects

The joint effect of supply chain innovation, process innovation, product innovation, and business model innovation on distribution system performance was tested using multiple regression analysis. The overall regression model was statistically significant ($p < 0.001$), explaining 95.5% of the variance in distribution system performance ($R^2 = 0.955$). This indicates that strategic innovation dimensions collectively have a strong and significant effect on distribution system performance.

Process innovation had a strong positive effect ($\beta = 0.780$, $p < .001$), indicating improved efficiency. Technological innovation showed a weak negative coefficient ($\beta = –0.299$, $p = .048$), likely due to predictor overlap rather than a real effect. Product innovation ($p = .224$) and market

innovation (p = .694) were not significant in the joint model due to multicollinearity.

Individual regression models revealed significant positive effects for each innovation dimension:

Technological innovation strongly predicts distribution system performance (B = 0.754, p < .001), explaining 68.2% of the variation. Process innovation is the strongest single predictor (B = 0.816, p < .001), explaining 90.1% of the variation. Product innovation has a significant positive effect (B = 0.960, p < .001), accounting for 75.9% of the variance. Market innovation significantly predicts distribution system performance (B = 0.804, p < .001), explaining 81.2% of the variance.

This finding confirms that strategic innovation, when implemented holistically, significantly enhances delivery timeliness, customer satisfaction, service reliability, and market competitiveness. The findings support the Dynamic Capabilities Theory, which suggests that organizations that integrate innovation capabilities achieve superior performance outcomes.

E. Mediation Analysis

Mediators were examined individually to isolate their specific indirect effects and provide clearer interpretation of the mechanisms through which the independent variable influences the dependent variable. Testing them one by one also reduces the risk of multicollinearity, which can inflate standard errors and obscure the unique contribution of each mediator when multiple mediators are included in a single model. Additionally, analyzing mediators separately allows for practical insights into which specific pathways are significant, supporting targeted interventions and clearer reporting for readers.

Technological Innovation Mediation

The mediating role of operational efficiency in the relationship between technological innovation and distribution system performance was examined. The total effect of technological innovation on distribution system performance was significant (B = 0.7543, p < 0.001), indicating that technological innovation strongly enhances distribution system outcomes. When operational efficiency was included as a mediator, the direct effect remained significant (B =

0.3638, p = 0.0187), while the indirect effect through operational efficiency was also significant (BootLLCI = 0.0212, BootULCI = 0.9016). This suggests that operational efficiency partially mediates the effect of technological innovation, meaning that part of the impact of technological innovation on distribution system performance is transmitted through improved operational efficiency.

Process Innovation Mediation

The total effect of process innovation on distribution system performance was significant (B = 0.816, p < 0.001), showing a strong positive influence. However, when accounting for operational efficiency, the indirect effect was not significant (BootLLCI = -0.208, BootULCI = 0.81), although the direct effect remained highly significant (B = 0.7073, p < 0.001). This indicates that operational efficiency does not significantly mediate the effect of process innovation on distribution system performance, implying that the influence of process innovation is largely direct rather than operating through enhanced operational efficiency.

Market Innovation Mediation

In the case of market innovation, the total effect on distribution system performance was significant (B = 0.8043, p < 0.001). The direct effect remained significant after including operational efficiency as a mediator (B = 0.5183, p < 0.001), and the indirect effect was also significant (BootLLCI = 0.0375, BootULCI = 0.6434). This pattern demonstrates that operational efficiency partially mediates the relationship, suggesting that market innovation improves distribution system performance both directly and indirectly by enhancing operational efficiency.

Product Innovation Mediation

Product innovation had a significant total effect on distribution system performance (B = 0.9603, p < 0.001). The direct effect remained significant (B = 0.5928, p < 0.001), while the indirect effect through operational efficiency was also significant (BootLLCI = 0.0405, BootULCI = 0.8756), indicating partial mediation. This shows that product innovation contributes to distribution system performance not only directly but also through its positive effect on operational efficiency.

5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter discusses the study findings in detail in the context of the research objectives and available literature. It integrates quantitative and qualitative results to explain how strategic innovation influences distribution system performance among computer hardware distributors in Kenya. The chapter is structured into the following subtopics: the effects of supply chain, process, product, and business model innovations; the mediating role of operational efficiency; synthesis of mixed-methods findings; study limitations; conclusions; recommendations; policy implications; and areas for further research.

A. Summary of Findings

Effect of Supply Chain (Technological) Innovation

The research established a robust and statistically significant correlation between technological innovation and distribution performance ($B = 0.7543$, $p < .001$), meaning that companies that embrace digital platforms, automated processes, and advanced IT tools have higher performance in distribution channels in terms of timeliness in delivering goods, responsiveness in customer service, and the growth of distribution networks. These findings are consistent with global evidence that technological innovation can make logistics efficient. OECD (2022) notes that ICT-enabled supply chains enhance supply chain transparency, decrease stock-outs, and integrate distribution channels. The fact that the connection in this study exists in a partial way with operational efficiency mediating only some of the impact supports the resource-based theory, which asserts that technology can only enhance performance when backed by competent internal procedures (Barney, 1991). Nonetheless, qualitative results showed obstacles such as expensive modernization, frequent upgrades, lack of technical support, and rapid technological transformation. UNCTAD (2022) identified that African SMEs tend to face heavy expenses of technology adoption, resulting in limited sustainability of adoption due to resource constraints.

Effect of Process Innovation

Process innovation emerged as the best single predictor of distribution performance ($B = 0.816$, $p < .001$; $R^2 = 0.90$). The innovative techniques used to enhance distribution speed, reliability, and responsiveness were continuous process improvement, automation, redesign of

workflow, and cost-reduction strategies. This finding is consistent with lean management and process reengineering concepts, which identify that redesigned workflows have a direct positive effect on operational outcomes (Hammer and Champy, 1993). Al-Shammari (2021) and Ngugi (2020) also found that process innovation, particularly logistics streamlining, has the most significant effect on distribution performance in SMEs since it has an immediate operational effect. It is important to note that operational efficiency did not play a significant mediating role in this relationship. This implies that process innovations are effectively improvements in operations themselves; therefore, their returns are obtained directly rather than indirectly. This is consistent with Damanpour (2014), who claims that process improvements tend to generate efficiencies on their own, without the need for any other organizational conditions. Qualitative results revealed that companies continuously update working processes to correspond to customer requirements and technological shifts, though some reported problems like lack of employee training and internal opposition to change, which Gakure et al. (2019) revealed play a significant role in the uptake of process innovation in Kenyan SMEs.

Effect of Product Innovation

The results demonstrated a strong positive effect of product innovation on distribution system performance ($B = 0.9603$, $p < .001$), with operational efficiency partially mediating the relationship. Companies that implemented new or bespoke hardware products were found to have better competitiveness, increased customer base, and easier distribution planning. These results align with supply-chain management literature proving that product innovation improves demand predictability, lowers obsolescence, and facilitates more streamlined inventory movement (Christopher, 2016). Product customization was identified as a key strategy in the sampled firms, supported by Lau et al. (2019), who state that customization enhances customer loyalty, thereby stabilizing distribution volume. The partial mediation indicates that better product designs and offerings help improve efficiency in handling, stocking, or distribution of new product lines. This is consistent with Kiragu and Wambugu (2020), who contend that Kenyan hardware companies can enjoy operational benefits under modernized product lines because they can easily be standardized and procurement is simplified. Qualitative data also indicated that small distributors are not able to afford the cost of regular upgrades, which the African Development Bank (2022) mentioned as a challenge for hardware importers who must meet high costs of R&D and compliance.

Effect of Business Model (Market) Innovation

The research revealed that the effect of business model innovation is high and significant ($B = 0.8043$, $p < .001$), and it is partially mediated through operational efficiency. These findings conform to the Dynamic Capabilities Theory (Teece, 2018), which holds that organizations should reorganize markets, channels, and customer engagement patterns to remain competitive. Kenyan research (Muturi and Wanjiru, 2021; Ndung'u, 2020) demonstrates that SMEs implementing strategic use of social media marketing, flexible pricing, and new market channels achieve better distribution results. The importance of digital marketing and market exploration in this study was particularly high and aligned with World Bank (2023) results showing that digital platforms have become key to competitiveness in Kenya's ICT industry. Respondents indicated increased reliance on online platforms including WhatsApp, Facebook Marketplace, and Instagram as distribution channels, in line with global trends observed by UNDP (2022). The partial mediation suggests that business model innovation leads to better efficiency in business operations with respect to improved demand forecasting, increased customer reach, and order flows. Qualitative answers also pointed to factors like low marketing budgets and resistance to change, particularly among family-owned companies.

Mediating Effect of Operational Efficiency

The mediation analysis showed that technological, product, and market innovation had partial mediation by operational efficiency, while process innovation had no mediation. These findings provide insightful information on the impact of innovation on distribution results. Partial mediation means that certain innovations promote performance partially as they help increase internal efficiency by improving workflow, reducing operational errors, and managing inventory better. This follows efficiency theory stating that organizational performance enhances when internal operations are streamlined (Farouk and Tanti, 2019). However, process innovation lacks mediation, which implies that these innovations have a direct impact on distribution returns without mediation. These lessons coincide with Kenya's general ICT development plan (World Bank, 2023), which identifies innovation-driven efficiency as one of the fundamental factors contributing to organizational competitiveness.

The qualitative results, which indicate high prices of modernization, lack of technical

competence, lack of manufacturer support, rapid technological change, and resistance to change within the organization, give significant background information upon which to draw the quantitative results. These are the same themes reported in general structural issues in African SMEs (UNCTAD, 2022; AfDB, 2022), which can be used to interpret trends like the negative coefficient of technological innovation in the multivariate model. Although quantitative data indicate that all dimensions of innovation produce strong positive outcomes in terms of distribution performance, qualitative information indicates that it is not easy to maintain these innovations without adequate finances, ongoing employee training, consistent technical backup, and organizational culture that supports such innovations.

B. Conclusions

The combination of technological, process, product, and business model innovations is important in improving the performance of distribution systems of computer hardware distributors in Kenya. Operational efficiency partially mediates the enhancement of delivery speed and customer service by technological innovation. The best predictor is process innovation, whereby the smoothness of workflow and automation have a direct positive impact on reliability and cost effectiveness. Providing stability to flows of inventory and raising customer satisfaction, product innovation enhances competitiveness, whereas market innovation enriches distribution access through flexible prices, digital marketing, and extended channels. In the majority of instances, operational efficiency improves these relations and serves as a central process connecting innovation with improved performance.

Although these positive effects are significant, the study uncovers that a number of practical obstacles restrict the achievement of innovation benefits. The slow optimization and adoption of innovative practices is caused by high modernization costs, fast technological shifts, lack of technical capabilities, poor manufacturer support, and organizational resistance that is more prevalent in family-owned firms. To make the most of the strategic value of innovation in the Kenyan hardware distribution industry, these constraints need to be addressed.

C. Recommendations

Managerial Recommendations

First, firms should enhance adoption of supply chain technologies such as digital tracking systems, ERP platforms, and automated logistics solutions. Since technological innovation significantly improves distribution performance, organizations should allocate adequate resources toward acquiring and maintaining modern ICT infrastructure. However, given the high cost of adoption, firms are encouraged to adopt scalable and cloud-based solutions that reduce upfront capital expenditure while maintaining efficiency.

Second, management should prioritize process innovation as a core operational strategy, given that it emerged as the strongest predictor of distribution performance. Firms should continuously redesign workflows, automate repetitive tasks, and adopt lean management practices to reduce operational inefficiencies. Additionally, organizations should invest in employee training and change management programs to minimize resistance and enhance successful implementation of new processes.

Third, firms should invest in product innovation strategies, including product customization, bundling, and frequent updates of hardware offerings. This will enhance competitiveness and stabilize demand, thereby improving distribution planning and inventory management. Companies should also collaborate closely with manufacturers to ensure access to innovative and market-relevant products at sustainable costs.

Fourth, firms should embrace business model innovation, particularly through the use of digital sales channels such as e-commerce platforms, social media marketplaces (e.g., WhatsApp, Facebook, Instagram), and hybrid distribution models. Expanding into digital platforms will improve market reach, customer engagement, and responsiveness. Firms should also explore flexible pricing models and value-added services to remain competitive in a dynamic market.

Policy Recommendations

The study highlights structural challenges that require policy-level intervention. Government and regulatory bodies should:

i. Provide financial incentives (tax reliefs, subsidies, or grants) to support SMEs in adopting modern technologies.

ii. Promote capacity-building programs to enhance digital skills and innovation capabilities among SMEs.

iii. Improve ICT infrastructure and internet accessibility to facilitate digital transformation.

iv. Encourage public-private partnerships to support innovation ecosystems in the ICT distribution sector.

Operational Recommendations

Given the mediating role of operational efficiency, firms should focus on strengthening internal operational systems to maximize the benefits of innovation. Organizations should:

i. Improve inventory management systems to enhance accuracy and reduce stock-outs.

ii. Streamline order processing and delivery systems to reduce turnaround time.

iii. Enhance resource utilization through automation and data-driven decision-making.

iv. Establish performance monitoring systems to track efficiency indicators.

D. Limitations of the Study

First, the study focused exclusively on fourteen licensed computer hardware distributors in Kenya, with a sample of twenty respondents. While the census approach was appropriate given the small population size, the findings may not be fully generalizable to other industries, unlicensed distributors, or countries with different institutional environments. This limitation was partially mitigated by the specialized nature of the sector, where all licensed firms share similar operational characteristics and regulatory requirements.

Second, the study relied on self-reported questionnaire data, which may be subject to response bias including social desirability effects, exaggeration of innovation practices, or understatement

of performance challenges. To address this concern, the researcher triangulated quantitative findings with qualitative open-ended responses, cross-checked extreme values, and emphasized anonymity and confidentiality to encourage honest reporting.

Third, the cross-sectional design captured data at a single point in time and could not fully establish long-term causal relationships between innovation adoption, operational efficiency gains, and performance improvements. This limitation was partially addressed by asking respondents to reflect on changes observed over the preceding two-year period, providing a quasi-longitudinal perspective. Future research should employ true longitudinal designs to capture temporal dynamics.

Fourth, high multicollinearity among innovation variables, particularly between product and market innovation ($r = .98$), influenced the joint regression results and made it difficult to isolate the individual effect of each innovation dimension when entered simultaneously. This limitation was addressed by reporting both joint and individual regression models, and by interpreting results with explicit acknowledgment of multicollinearity effects.

Fifth, external factors such as government policy changes, infrastructure developments, and global supply chain disruptions were not included as control variables but may influence distribution system performance. The study partially addressed this by focusing on licensed distributors operating under uniform regulatory conditions, and by capturing qualitative insights on external challenges through open-ended questions.

E. Policy Implications

First, government agencies should support ICT distributors through tax incentives and innovation support programs to encourage adoption of digital technologies.

Second, policymakers should invest in logistics infrastructure to improve supply chain efficiency.

Third, training programs should be developed to improve digital and innovation skills among

ICT sector employees.

Fourth, government and industry partnerships should be strengthened to improve technical support and knowledge transfer.

These measures will enhance operational efficiency and distribution performance within Kenya's ICT sector.

Recommendations for Further Research

Future research should address the limitations of this study by including larger sample sizes across multiple countries to improve generalizability. Longitudinal designs could be employed to capture the long-term effects of strategic innovation on distribution performance. Additional mediating or moderating variables, such as organizational culture or employee competence, should be considered to provide a more comprehensive understanding of innovation mechanisms. Structural Equation Modeling (SEM) could be used to test causal relationships, and similar studies could be conducted in other ICT sectors to broaden contextual insights.

REFERENCES

African Development Bank Group. (2022). African economic outlook 2022: Supporting climate resilience and a just energy transition in Africa. African Development Bank.

Azmi, K. H. M., Radzi, N. A. M., Azhar, N. A., Samidi, F. S., Zulkifli, I. T., & Zainal, A. M. (2022). Active electric distribution network: Applications, challenges, and opportunities. IEEE Access, 10, 134655-134689.

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99–120.

Brown, T. (2017). Innovation and competitive advantage: Global perspectives. Harvard Business Press.

Chandler, A. D. (2020). Strategy and structure in modern organizations. Oxford University Press.

Chesbrough, H. W. (2003). Open innovation: The new imperative for creating and profiting from technology. Harvard Business School Press.

Christopher, M. (2016). Logistics and supply chain management: Strategies for reducing cost and improving service (5th ed.). Pearson Education.

Communications Authority of Kenya. (2022). Annual report on licensed ICT and computer hardware distributors in Kenya. CAK.

East African Community Secretariat. (2022). Regional ICT infrastructure and innovation development report. EAC.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? Strategic Management Journal, 21(10–11), 1105–1121.

Eton, M., Ocan, J., Ogwel, B. P., & Andama, F. A. (2025). Mobile Money and the Dynamics of Income Inequality: Evidence from Arua City, Uganda. Business Perspective Review, 7(1), 162-177.

Ferlito, R., & Faraci, R. (2022). Business model innovation for sustainability: A new framework. Innovation & Management Review, 19(3), 222-236.

Githinji, S. (2022). The impact of business model innovation on ICT firm performance in Kenya. International Journal of Business Research, 8(3), 112–124.

Grant, R. M. (1996). Toward a knowledge-based theory of the firm. Strategic Management Journal, 17(S2), 109–122. https://doi.org/10.1002/smj.4250171110

Heinemann, G. (2023). Business model of online trade. In The new online trade: Business models, business systems and benchmarks in e-commerce (pp. 65-177). Wiesbaden: Springer Fachmedien Wiesbaden.

Karanja, M., & Muturi, W. (2020). Supply chain innovation and organizational performance among manufacturing firms in Nairobi. International Journal of Supply Chain Management, 9(4), 15–26.

Kenya National Bureau of Statistics. (2023). Kenya economic survey 2023. KNBS.

Kenyatta, P., & Mwangi, A. (2022). Strategic innovation and competitiveness in Kenya's ICT distribution industry. African Journal of Business and Management, 14(2), 67–79.

Kothari, C. R. (2014). Research methodology: Methods and techniques (2nd ed.). New Age International.

Kumar, V., Jabarzadeh, Y., Jeihouni, P., & Garza-Reyes, J. A. (2020). Learning orientation and

innovation performance: The mediating role of operations strategy and supply chain integration. Supply Chain Management: An International Journal, 25(4), 457-474.

Magrini, C., Nicolas, J., Berg, H., Bellini, A., Paolini, E., Vincenti, N., ... & Bonoli, A. (2021). Using internet of things and distributed ledger technology for digital circular economy enablement: The case of electronic equipment. Sustainability, 13(9), 4982.

Mugenda, O. M., & Kimani, P. (2021). Process innovation and operational performance among Kenyan ICT firms. Journal of Business Innovation, 7(2), 90–106.

Mugenda, O. M., & Mugenda, A. G. (2012). Research methods: Quantitative and qualitative approaches. Acts Press.

Mwangi, J. (2022). Product innovation and competitiveness of technology-based firms in Nairobi County. Journal of Management and Strategy, 13(1), 45–56.

Negi, S. (2021). Supply chain efficiency framework to improve business performance in a competitive era. Management Research Review, 44(3), 477-508.

Porter, M. E. (1985). Competitive advantage: Creating and sustaining superior performance. Free Press.

Premkumar, G. (2003). A meta-analysis of research on information technology implementation in small business. Journal of Organizational Computing and Electronic Commerce, 13(2), 91–121. https://doi.org/10.1207/S15327744JOCE1302_02

Rogers, E. M. (2003). Diffusion of innovations (5th ed.). Free Press.

Saberi, S., Kouhizadeh, M., Sarkis, J., & Shen, L. (2019). Blockchain technology and its relationships to sustainable supply chain management. International Journal of Production Research, 57(7), 2117–2135.

Shcherbakov, V., & Silkina, G. (2021). Supply chain management open innovation: Virtual integration in the network logistics system. Journal of Open Innovation: Technology, Market, and Complexity, 7(1), 54.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. Strategic Management Journal, 28(13), 1319–1350. https://doi.org/10.1002/smj.640

Teece, D. J. (2018). Business models and dynamic capabilities. Long Range Planning, 51(1), 40–49. https://doi.org/10.1016/j.lrp.2017.06.007

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. Strategic Management Journal, 18(7), 509–533.

Tornatzky, L. G., & Klein, K. J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. IEEE Transactions on Engineering Management, EM-29(1), 28–45. https://doi.org/10.1109/TEM.1982.6447463

Wernerfelt, B. (1984). A resource-based view of the firm. Strategic Management Journal, 5(2), 171–180. https://doi.org/10.1002/smj.4250050207

Zhu, K., Kraemer, K. L., & Xu, S. (2006). The process of innovation assimilation by firms in different countries: A technology diffusion perspective on e-business. Management Science, 52(10), 1557–1576. https://doi.org/10.1287/mnsc.1050.0487

APPENDICES

Appendix I: Research Questionnaire

Dear Respondent,

I am a postgraduate student at Taita Taveta University conducting a study titled: "Strategic Innovation and Performance of Distribution Systems of Computer Hardware Distributors in Kenya."

This questionnaire seeks your honest opinion on how different forms of innovation affect the performance of distribution systems. The information you provide will be used strictly for academic purposes, and your responses will be treated with utmost confidentiality.

Kindly do not write your name anywhere on this questionnaire.

Thank you very much for your time and cooperation.

Sincerely,
Geoffrey Kimonge Mbogo
Researcher

Section A: Demographic Information

1. Gender: ☐ Male ☐ Female ☐ Other

2. Age Bracket: ☐ Below 25 ☐ 25–34 ☐ 35–44 ☐ 45–54 ☐ 55 and above

3. Level of Education: ☐ Diploma ☐ Bachelor's Degree ☐ Master's Degree ☐ Doctorate ☐ Other

4. Position in Organization: ☐ Director/Senior Manager ☐ Middle Manager ☐ Supervisor ☐

Operations/Logistics Staff ☐ Other

5. Size of the Firm: ☐ Small (Below 50) ☐ Medium (51–249) ☐ Large (250+)

Sections B–D: Likert Scale Statements

Please indicate your level of agreement using the scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

B1. Technological Innovation

1. Our firm frequently adopts new technologies to improve distribution efficiency. [1] [2] [3] [4] [5]

2. Digital platforms (e.g., e-commerce, ERP, CRM) are widely used in managing distribution. [1] [2] [3] [4] [5]

3. Technology adoption has significantly reduced delays in our supply chain. [1] [2] [3] [4] [5]

4. Investment in IT systems has improved customer service. [1] [2] [3] [4] [5]

B2. Process Innovation

1. We continuously improve processes to enhance efficiency. [1] [2] [3] [4] [5]

2. Automation has streamlined our distribution activities. [1] [2] [3] [4] [5]

3. Our logistics processes are regularly redesigned to reduce costs. [1] [2] [3] [4] [5]

4. Process improvements have enhanced flexibility in meeting customer needs. [1] [2] [3] [4] [5]

B3. Product Innovation

1. We frequently introduce new or improved hardware products. [1] [2] [3] [4] [5]

2. Product customization is a key focus of our distribution strategy. [1] [2] [3] [4] [5]

3. New product launches enhance our competitiveness. [1] [2] [3] [4] [5]

4. Innovative product offerings have expanded our customer base. [1] [2] [3] [4] [5]

B4. Market Innovation

1. Our firm explores new markets for growth opportunities. [1] [2] [3] [4] [5]

2. Marketing strategies are regularly updated. [1] [2] [3] [4] [5]

3. We adopt innovative approaches in pricing and promotions. [1] [2] [3] [4] [5]

4. Market innovation has helped us expand distribution channels. [1] [2] [3] [4] [5]

Section C: Operational Efficiency

1. Our firm has minimized distribution costs through efficiency measures. [1] [2] [3] [4] [5]

2. Inventory management systems are effective and reliable. [1] [2] [3] [4] [5]

3. Our delivery times meet customer expectations consistently. [1] [2] [3] [4] [5]

4. Operational efficiency has improved customer satisfaction. [1] [2] [3] [4] [5]

Section D: Distribution System Performance

1. Our distribution system ensures timely delivery to customers. [1] [2] [3] [4] [5]

2. Distribution efficiency has enhanced our overall profitability. [1] [2] [3] [4] [5]

3. We can respond quickly to changes in customer demand. [1] [2] [3] [4] [5]

4. Our distribution network has expanded significantly in recent years. [1] [2] [3] [4] [5]

5. Innovation has positively impacted the overall performance of our distribution system. [1] [2] [3] [4] [5]

Section E: Open-ended Question

In your opinion, what is the greatest innovation challenge faced by computer hardware distributors in Kenya?

_____

_____

_____

Thank you.

Appendix II: List of Registered Computer Hardware Distributors in Kenya (CAK, 2025)

Below is the list of 14 registered distributors representing multiple international manufacturers such as HP, Lenovo, Dell, Toshiba, APC, Mercer, and Epson in Kenya's ICT distribution industry.

No.	Distributor Name	Represented Manufacturers	Registered Location
1	Mitsumi Distribution Ltd	HP, Lenovo, Dell	Westlands, Nairobi
2	Mustek East Africa Ltd	Toshiba, Epson, APC, Mercer	Parklands, Nairobi
3	ICTECH Distribution	HP, Lenovo, Dell, Huawei	Mombasa Road, Nairobi
4	CopierForce Kenya Ltd	HP, Lenovo	Nairobi
5	Wasili Communications Ltd	Dell, APC	Nairobi
6	Crescent Distribution Services Ltd	Epson	Westlands, Nairobi
7	Glantix Solutions Ltd	Dell, HP	Moi Avenue, Nairobi
8	Shopit Kenya Ltd	Dell, HP, Lenovo	Nairobi CBD
9	Technology Today Ltd	HP, Lenovo	Westlands, Nairobi
10	Agile Cloud Ltd	Lenovo	Nairobi
11	Computech Ltd	HP, Dell	Nairobi
12	Bright Technologies Ltd	Lenovo, HP	Kimathi Street, Nairobi
13	Victorock Kenya Ltd	Toshiba	Westlands, Nairobi
14	SAI Office Supplies Ltd	Epson, APC	Industrial Area, Nairobi

Note: Several distributors represent multiple manufacturers. The industry is highly specialized and support-intensive, with only a few firms possessing the technical capacity, authorization, and infrastructure required for national-level distribution and service operations (CAK, 2025).

Appendix III: Workplan

Table A3.1: Research Activity Schedule (Gantt Chart)

Activity	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Proposal Development	■■■■■■■■					
Research Instrument Development		■■■■■■■■				
Data Collection		■■■■■■■■	■■■■■■■■	■■■■■■■■		
Data Analysis			■■■■■■■■	■■■■■■■■		
Report Writing				■■■■■■■■	■■■■■■■■	
Review and Submission					■■■■■■■■	

Key Milestones:

Milestone	Target Date	Deliverable
Proposal defense approval	End of Month 3	Approved research proposal
Ethical clearance obtained	Month 3	TTU ethics approval letter
Pilot study completed	End of Month 3	Validated questionnaire
Data collection completed	End of Month 5	20 completed questionnaires
Data analysis completed	Mid Month 6	SPSS output and tables
First draft to supervisors	Week 3, Month 6	Complete chapters 1-5
Final submission	End of Month 6	Bound research project

Legend: ■■■■■■■■ = Activity period

Appendix IV: Budget

Table A4.1: Research Budget

Item	Quantity	Unit Cost (KES)	Total Cost (KES)
A. Stationery and Materials			
Printing paper (reams)	5	500	2,500
Binding (thermal, 3 copies)	3	1,500	4,500
Flash drive (for data backup)	2	800	1,600
Pens and notebooks	10	50	500
Printer ink cartridges	2	2,000	4,000
Sub-total A			13,100
B. Data Collection Expenses			
Transport to distributor firms (Nairobi)	14 trips	1,500	21,000
Transport to supervisor meetings (Voi/Wundanyi)	6 trips	800	4,800
Respondent refreshments	20	300	6,000
Communication (calls, emails, WhatsApp)	1	2,000	2,000
Sub-total B			33,800
C. Software and Analysis			
SPSS Version 28 (student license)	1	5,000	5,000
Internet bundles (data analysis period)	3 months	2,500	7,500
Sub-total C			12,500
D. Accommodation and Meals			
Fieldwork accommodation (Nairobi, 3 nights)	3	3,500	10,500
Meals during fieldwork	3 days	1,500	4,500
Sub-total D			15,000
E. Miscellaneous			
Contingency (10% of total)	---	---	7,440

Sub-total E	7,440
GRAND TOTAL	81,840

Funding Source: Self-sponsored (Geoffrey Kimonge Mbogo, Reg. No. BE331-0408/2022)

Table A4.2: Budget Justification

Budget Item	Justification
Stationery and materials	Required for proposal printing, questionnaire duplication, final report production, and data storage. Three bound copies are mandatory for examination purposes at Taita Taveta University.
Data collection expenses	The 14 licensed computer hardware distributors are located across Nairobi (Westlands, Parklands, Mombasa Road, Industrial Area, CBD). Multiple visits are required for questionnaire distribution, follow-up, and retrieval. Transport costs cover matatu/bus fares and occasional taxi for distant locations.
Software and analysis	SPSS Version 28 is required for descriptive statistics, correlation analysis, multiple regression, and bootstrapped mediation analysis. Internet connectivity is essential for downloading software updates, accessing online journals, and communicating with supervisors.
Accommodation and meals	Three overnight stays in Nairobi are necessary to maximize data collection efficiency and minimize repeated transport costs between Voi/Wundanyi and Nairobi.
Contingency	A 10% contingency provision accounts for price fluctuations, unexpected transport needs, and additional printing requirements that may arise during the research process.

GLOSSARY

A

AfDB — African Development Bank. A multilateral development finance institution that supports economic growth and social progress in Africa.

B

Business Model Innovation — Changes in the way a firm creates, delivers, and captures value, including new pricing mechanisms, revenue structures, market channels, and customer engagement approaches (Ferlito & Faraci, 2022).

C

CAK — Communications Authority of Kenya. The regulatory body responsible for licensing and overseeing ICT and telecommunications services in Kenya.

D

Diffusion of Innovations Theory (DOI) — A theory developed by Rogers (2003) explaining how new ideas and technologies are adopted within organizations, based on attributes such as relative advantage, compatibility, complexity, trialability, and observability.

Distribution Systems — The integrated set of activities, processes, and networks involved in moving products from manufacturers or importers to end users (Azmi et al., 2022).

Dynamic Capabilities Theory (DCT) — A theory emphasizing a firm's ability to integrate, build, and reconfigure internal and external competencies in rapidly changing environments (Teece, 2018).

E

ERP — Enterprise Resource Planning. Integrated software systems used to manage core business processes including finance, HR, manufacturing, and supply chain.

I

ICT — Information and Communication Technology. Technologies used for communication, information processing, and digital service delivery.

K

KNBS — Kenya National Bureau of Statistics. The principal agency of the Government of Kenya responsible for collecting, compiling, analyzing, and disseminating statistical information.

M

Mediation — A statistical process examining whether the relationship between an independent variable and dependent variable is transmitted through an intermediate (mediating) variable.

N

Normality — A statistical assumption that data follow a normal (bell-shaped) distribution, required for valid application of parametric tests such as regression analysis.

O

OECD — Organisation for Economic Co-operation and Development. An international organization that works to build better policies for better lives.

Operational Efficiency — The extent to which a firm utilizes its resources optimally to achieve

high output levels while minimizing costs, waste, and operational errors (Negi, 2021).

P

Process Innovation — Purposeful improvements in internal operational procedures, workflows, and service delivery methods aimed at increasing efficiency, consistency, and reliability (Brown, 2017).

Product Innovation — The development of new products or the improvement of existing products and related services in order to meet changing customer needs and enhance market competitiveness.

R

RBV — Resource-Based View. A strategic management theory positing that firms achieve sustainable competitive advantage through valuable, rare, inimitable, and non-substitutable resources (Barney, 1991).

Resource-Based View — See RBV.

S

SPSS — Statistical Package for Social Sciences. A software package used for statistical analysis in social science research.

Strategic Innovation — A firm's deliberate and long-term orientation toward adopting and integrating innovation initiatives aligned with its overall strategic direction to achieve sustainable competitive advantage (Chandler, 2020).

Supply Chain Innovation — The adoption of new technologies, systems, partnerships, or structural arrangements that enhance the coordination and flow of goods, information, and

financial resources across the supply chain (Shcherbakov & Silkina, 2021).

T

TTU — Taita Taveta University. A public university in Kenya where this research was conducted.

U

UNCTAD — United Nations Conference on Trade and Development. A permanent intergovernmental body established by the United Nations General Assembly.

V

VIF — Variance Inflation Factor. A measure used to detect the severity of multicollinearity in regression analysis. Values above 10 indicate problematic multicollinearity.

INDEX

K

L

M

N

O