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STRATEGIC INNOVATION AND SUSTAINABILITY OF MISSION HOSPITALS IN KIAMBU COUNTY IN KENYA

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ST. PAUL'S UNIVERSITY

A DISSERTATION SUBMITTED TO THE SCHOOL OF BUSINESS AND LEADERSHIP STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF BUSINESS ADMINISTRATION IN STRATEGIC MANAGEMENT OF ST. PAUL'S UNIVERSITY

NOVEMBER, 2024

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DECLARATION AND APPROVAL

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APPROVAL

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DEDICATION

This dissertation is dedicated to my family and friends, whose unwavering encouragement, support, and patience have been instrumental throughout this journey.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIC	African Inland Church
ASN	Assumption of Sisters of Nairobi
BSC	Balanced Scorecard
CHAK	Christian Health Association of Kenya
CS	Catholic Secretariat
CSR	Corporate Social Responsibility
KEC	Kenya Episcopal Conference
MOH	Ministry of Health
NHIF	National Hospital Insurance Fund
PCEA	Presbyterian Church of East Africa
RBV	Resource-Based View
SBSC	Sustainable Balanced Score Card
SDGs	Sustainable Development Goals
SPSS	Statistical Package for Social Sciences
SUPKEM	Supreme Council of Muslims
VRIN	Valuable, Rare, Inimitable, Non-substitute

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OPERATIONAL DEFINITION OF TERMS

Business model innovation strategy	This strategy focuses on reinventing or redesigning the hospital's overall business model, including its value proposition, revenue streams, and cost structure, to create and capture value for customers satisfaction, growth, profitability and stakeholders more effectively (Kaplan, 2023; Dal Mas et al., 2020).
Service innovation strategy	Refers to service innovation as a "four-dimensional model" that captures the idea of service innovation in a knowledge-based economy as a new service in the market, Client interface, which refers to new ways as to which clients are involved in the service production, service delivery that describes ways the actual services are delivered to the customers, and technology, which ensures that the services can be provided efficiently (Durst et al. 2023).
Strategic innovation	This is the process by which a company reinvents or redesigns its corporate strategy to provide value for the company and its clients and establish a competitive advantage (Dal Mas et al., 2020).
Sustainability	This refers to an organizations capacity and ability to continue supporting its operations or processes continuously over a given period (Lee and Olson, 2023). Sustainability measures involve numerous factors that include but are not limited to financial stability, program enhancement, and customer and employee satisfaction (Mehra et al., 2021).
Mission Hospitals	Mission hospitals refer to healthcare institutions established and operated by Christian religious organizations or denominations with the primary purpose of providing medical services while also

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	promoting spiritual and humanitarian values (Kenneth et al., 2019).
Process innovation strategy	This refers to the implementation of new or significantly improved methods, techniques, or equipment in the delivery of healthcare services, with the intention of reducing operational costs, increasing quality, or introducing new and improved services (Scafuto et al., 2018).
Technological strategy	This refers to the overall plan, which consists of objectives, principles and tactics relating to the use of technology within a particular organization (Faghih et al., 2018).

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ABSTRACT

Kenya's healthcare sector is essential to the country's economic growth and the achievement of the nation's Vision 2030. As healthcare landscapes evolve, institutions face challenges sustaining their mission-driven approach to adapting to the ever-changing needs and environment. Mission Hospitals in Kiambu County face sustainability challenges due to inadequate financial resources, staff turnover, weak health systems and patient non-payment. The main objective of this study was to investigate the effect of strategic innovation on the sustainability of mission hospitals in Kiambu County, Kenya. Specifically, the study aimed to determine how business models, services, processes, and technological innovation strategies affected the sustainability of mission hospitals in the county. The study was anchored in the resource-based view theory, the diffusion of innovation theory, and the balanced scorecard model. The target population comprised 100 management personnel from seven mission hospitals in Kiambu County, including AIC Kijabe Mission Hospital, AIC CURE International Mission Hospital, PCEA Kikuyu Mission Hospital, Kalimoni Mission Hospital, Mutia Mulumba Mission Hospital, Neema Mission Hospital, and Nazareth Mission Hospital. The study focused on managers at different levels, including 20 top-level managers, 30 middle-level managers, and 50 operational-level managers from the Human Resources, Finance, and Medical Services departments. A census sampling technique was employed, as the total number of management personnel across all managerial levels and relevant departments was relatively small (N = 100). This sampling approach included the entire population of interest, ensuring that the findings represented the target population. The study employed a cross-sectional descriptive research design. The reliability of the research instrument was evaluated using Cronbach's Alpha with a threshold of 0.7. Descriptive and inferential data analysis was carried out using the Statistical Package for the Social Sciences (SPSS). Means, standard deviations, and percentages were employed to explain the data characteristics, and multiple linear regression analysis was used to determine the relationships between the variables. The analysis results were presented using tables, charts, and graphs. The study concluded that the adoption of new value propositions, alignment with market trends, and addressing customer needs were found to be essential in maintaining and enhancing the financial health and operational efficiency of these hospitals. In addition, the introduction of improved service quality, cultural changes, and new service offerings were identified as key factors in enhancing patient satisfaction and operational effectiveness. The emphasis on cost efficiency, effective human resources practices, and reduced delivery times was shown to enhance operational performance and financial stability. The implementation of telemedicine and electronic health systems was found to enhance operational efficiency, expand access to healthcare, and improve patient outcomes. The study recommended that the management of mission hospitals in Kiambu County should prioritize the continuous enhancement of business model innovation by regularly reviewing and adapting their value propositions to meet evolving market trends and patient needs. The Kenya Government should support the sustainability of mission hospitals by developing and implementing policies that encourage innovation in healthcare delivery. Academia should focus on conducting research that explores innovative practices and their impact on healthcare sustainability

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Strategic innovation is essential for efficiency, sustained financial success, and long-term competitive advantage (Baharun et al., 2019). Strategy innovation is thought to be able to define organizational direction by outlining the organization's tasks, encouraging collaboration, providing people with a clear understanding of the organization, offering consistency, and decreasing ambiguity (Cennamo, Oliveira & Zejnilovic, 2022). It's been suggested that it's critical to continuously consider what's happening strategically in service industries like the health care sector, where competition may move swiftly and new competitors might enter easily (Baharun et al., 2019). It appears that this is more prevalent now, particularly among medical professionals.

On a global scale, mission hospitals have been at the forefront of providing essential healthcare services, particularly in developing countries and underserved communities (Azmat et al., 2024). These faith-based institutions have played a vital role in addressing the healthcare needs of vulnerable populations, often filling the gaps where government-run facilities are inadequate or inaccessible (Mballa et al., 2020). However, in recent years, mission hospitals worldwide have faced significant sustainability challenges that threaten their ability to continue delivering quality healthcare services (Son et al., 2024).

One major global challenge confronting mission hospitals is inadequate financial resources (Kuntz, (2020). Many of these institutions rely heavily on donor funding, which has become increasingly unpredictable and unstable (Kaldor et al., 2020). Furthermore, the rising costs associated with healthcare delivery, including personnel, equipment, and infrastructure, have strained the limited resources available to mission hospitals (Amado et al., 2023). This financial constraint has led to difficulties in retaining skilled healthcare professionals,

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maintaining facilities, and acquiring essential medical supplies and technologies (Moses & Sharma, 2020).

In addition to financial constraints, mission hospitals have been grappling with the effects of staff turnover, which can disrupt the continuity of care and strain the remaining workforce (De Vries et al., 2023). Stiff competition from both public and private healthcare institutions has also posed a significant challenge, particularly in urban areas where patients have more options for healthcare services (Owino et al., 2019). Weak health systems, characterized by inadequate regulation, lack of effective governance structures, and limited integration with national healthcare policies, have further compounded the challenges faced by mission hospitals (Long et la., 2020).

The United States of America (USA), a leader in scientific advancement, has witnessed its faith-based healthcare system struggle with financial sustainability (Faghih et al., 2018; Lee & Trimi, 2021). Political unrest, technological advancements, globalization, competition from new entrants, and social changes have created an unpredictable economic environment for mission hospitals, posing threats to their long-term viability (Usman et al., 2024).

Regionally, in Africa, a significant portion of the population continues to rely on church-based healthcare services, underscoring the vital role played by mission hospitals (Mudzanire, 2022). However, these institutions have faced daunting challenges, including a lack of resources and inadequate government funding, as evidenced by studies conducted in countries like India (Long et al., 2020). In Cameroon, for instance, user fees have become the primary source of income for mission hospitals, often proving insufficient to sustain the delivery of high-quality healthcare services (Faghih et al., 2018).

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In Kenya, the healthcare landscape has been shaped by various challenges faced by mission hospitals. Poor governance and weak health systems have undermined the quality of supervision, leading to crises in many of these institutions (Cherop et al., 2022). The ever-changing healthcare needs, driven by technological advancements and breakthroughs, have intensified competition within the industry, forcing mission hospitals to adapt or risk becoming obsolete (Muhoja, 2023; Saji & Ellingstad, 2023). Energy conservation and the adoption of modern procedures, such as minimally invasive surgery and eHealth, have become crucial for mission hospitals to enhance the efficiency, effectiveness, quality, affordability, sustainability, and safety of healthcare services (Mukweyi, 2023; Suraci et al., 2022).

Locally, mission hospitals in Kiambu County have been facing multifaceted sustainability challenges. The Ministry of Health (MOH, 2021) report highlights that these institutions have inadequate financial resources, staff turnover, stiff competition, weak health systems, and patient non-payment (MOH, 2021). These challenges have adversely affected the growth of the health sector, the country's economy, and the long-term viability of each mission hospital (Mwai et al., 2023). Despite these obstacles, mission hospitals in Kiambu County strive to provide high-quality care while accommodating a consistent rise in patient need for affordable healthcare services, often stretching their already limited resources (Mwongera, 2023; Rithaa, 2023).

The sustainability of mission hospitals is crucial for maintaining access to healthcare services and has far-reaching implications for the overall well-being of communities. These institutions are vital in addressing public health challenges, promoting disease prevention, and achieving national and global health objectives, such as the Sustainable Development Goals (SDGs) (Luyckx et al., 2021). Failure to address the sustainability challenges faced by

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mission hospitals could exacerbate existing health disparities, undermine efforts to improve population health outcomes, and hinder progress toward universal health coverage (Trinkley et al.,2022).

1.1.1 Sustainability of Mission Hospitals

Sustainability is a critical consideration for organizations, particularly in the healthcare sector. It is defined as a proactive strategic approach integrating environmental, economic, and social practices and objectives across all operational levels (Bentahar et al., 2023). Sustainability ensures that organizations maintain their operations continuously over time without compromising future needs (Van Zanten & Van Tulder, 2021).).

Organizational sustainability refers to the creation of meaningful values that shape strategic decision-making and building a culture that reinforces desirable behavior (Lee & Olson, 2023). Sustainability is the ability to maintain or support a process continuously over time (Lee & Olson, 2023). In the context of mission hospitals, sustainability encompasses several vital aspects. Financially, it involves building adequate reserves and maximizing profits through cost reductions and program enhancements (Irvin & Furneaux,2022). From an organizational standpoint, sustainability requires nurturing capabilities, implementing robust systems and infrastructure, and fostering a culture that reinforces desirable behaviors aligned with sustainability goals (Bertassini et al., 2021).

Employee satisfaction and customer loyalty are also crucial pillars of sustainability for mission hospitals (Olajiga et al., 2024). Providing affordable services that meet the needs of patients and ensuring employee fulfillment contribute to the social dimension of sustainability (Bonfanti et al., 2023). Additionally, adopting environmentally friendly practices, such as appropriate waste management, sustainable procurement, and energy-

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efficient facility designs, supports the environmental aspect of sustainability (Dion et al., 2023).

Strategic integration of sustainability measures can help mission hospitals reduce resource consumption, improve operational efficiency, and maintain high standards of healthcare delivery (Green et al., 2020). However, this integration must be approached cautiously, considering factors like tight budgets, strict accreditation standards, and low-risk tolerance inherent to the healthcare sector (Heijstek, 2023). Sustainability in mission hospitals involves a multifaceted approach that balances financial stability, organizational robustness, social responsibility, and environmental stewardship (Crucke et al., 2022). By addressing these dimensions holistically, mission hospitals can future-proof their operations and continue to provide high-quality healthcare services sustainably.

Mahera, et al. (2021) opines that numerous aspects are included in sustainability metrics, such as but not limited to program enhancement, financial stability, and employee and customer satisfaction. The focus of this study will be on customer loyalty, employee satisfaction, organizational stability, and financial stability. It offers a fair method for gauging sustainability through both monetary and non-monetary measurements (Zandieh et al., 2020). Customers and stakeholders' satisfaction with the business are included in non-financial metrics.

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1.1.2 Strategic Innovation

Strategic innovation is critical for organizations' sustained competitive advantage, corporate expansion, and sustainable financial success. Strategic innovation, according to Dal Mas et al. (2020), is an organization's goal to reimagine or rethink its corporate strategy to spur up business growth, produce value for the company and its clients, and establish a competitive edge.

Strategic innovation has emerged as a very important concept in an increasingly competitive and rapidly evolving business landscape. Globally, organizations across various industries have recognized the need to embrace innovative strategies to achieve sustained competitive advantage, corporate growth, and financial success (Adama et al., 2024; Cennamo et al., 2022; Kolasani, 2023). In the healthcare sector, where competition can be intense and new players can enter the market quickly, continuously examining strategic innovations has become paramount (Baharun et al., 2019).

At the regional level, adopting strategic innovation in healthcare has gained traction to address the diverse challenges healthcare systems face. In developing regions, such as Africa, strategic innovation has been explored to improve healthcare delivery and accessibility, particularly in resource-constrained settings (McCaul et al., 2020). For instance, in Cameroon, studies have emphasized the need for mission hospitals to strengthen governance and adopt a more professional orientation to ensure they have the necessary competencies and skills to remain sustainable (Faghih et al., 2018).

In Kenya, the healthcare sector has been grappling with the challenges posed by unstable health systems and limited resources, making strategic innovation a crucial consideration for mission hospitals (Cherop et al., 2022). As the healthcare landscape evolves, driven by technological advancements and changing patient needs, mission hospitals in Kenya have recognized the importance of embracing innovative strategies to maintain their mission-driven approach and adapt to the ever-changing environment (Saji & Ellingstad, 2023; Mukweyi, 2023).

Dal Mas et al. (2020) opined that innovation was understood to be the introduction and establishment of new thoughts and creative ideas of a service or product with an aim of improving the existing technology. Hoang et al. (2021) present a different expression,

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strategic innovation is the creation or acceptance of novel and successful services, goods, technologies, and business models that meet the needs and objectives of an organization.

According to Kodama (2018), new services, goods, and business models that are developed through strategic innovation dynamically guide strategic positioning. A strategy is deemed successful when it generates a competitive advantage that distinguishes a business from its competitors by offering a unique, useful, and challenging to replicate advantage.

To present a comprehensive approach and perspective of strategic innovation and sustainability, this study will concentrate on the four strategic innovation dimensions: Business model innovation strategy, service innovation strategy, process innovation strategy, and technology innovation strategy will all be taken into consideration in this study.

Business model innovation strategy is defined by Foss and Saebi (2017) as the architecture or design of value creation, delivery, and value capture of a business that recognizes customer demands, adds value, and generates profit. According to Rosati, Rodrigues, Cosenz, and Li-Ying (2022) an organization's business model innovation strategy approach helps it reach its sustainable development goals by opening up new possibilities for value creation, value proposition, and value capture.

Durst, et al. (2023) defines service innovation as a "four dimensional model" which captures the idea of service innovation as a new way as to which clients are involved in the service production (Client interface); service delivery that describes ways the actual services are delivered to the customers, and Technology, that ensures that the services is provided efficiently.

Rogers, J. A. (2020) opined that process innovation primarily focuses on reengineering and enhancing the internal functioning of corporate units and processes. Numerous facets of a

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company's operations, such as technical design, manufacturing, management, and commercial activities, are involved in this process.

Process innovation is defined by Holma and Kaliapean (2023) as introducing advantageous modifications to the production process of a good or service. Process innovation, on the other hand, is defined as adopting new technology, management strategies, and production techniques to improve the production and management process, and integrates the technology, expertise, and organizational framework used in the production of goods or provision of services (Dal Mas et al. 2020).

Oginda, Itunga, Mwenja and Mbugua (2022) define technological innovation strategy as the use of knowledge to apply processes, tools, materials, and techniques for the purpose of coming up with new solutions to problems, they further state that technology innovation strategy gives direction and scope of an organization for a period of time which seeks to achieve competitive advantage in a dynamic environment through the use of their resources and competences. For an organization to implement technology innovation strategy, a plan, resources, capabilities and processes, are put in place (Schilling, 2023). Technological innovation strategy gives an overall plan which consists of objectives, principles and tactics relating to use of technology within a particular organization (Faghih et al., 2018).

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1.1.3 Mission Hospitals in Kiambu County

Mission hospitals refer to healthcare institutions established and operated by religious organizations or denominations with the primary purpose of providing medical services while also promoting spiritual and humanitarian values (Kenneth et al., 2019). Mission hospitals in Kiambu County, Kenya, have played a vital role in providing healthcare services to the local community (Njuguna & Muathe, 2020). These institutions, founded by Christian missionaries, aim to assist and serve society's underprivileged and vulnerable segments. The

management of mission hospitals in Kiambu County is overseen by various religious organizations, including the Christian Health Association of Kenya (CHAK), the Supreme Council of Muslims (SUPKEM), and the Kenya Episcopal Conference, through the Catholic Secretariat (KEC-CS) (MOH, 2022).

The following hospitals in Kiambu County are the focus of this study: Africa Inland Church Kijabe Mission Hospital, Presbyterian Church of East Africa Kikuyu Hospital, Nazareth Hospital, Africa Inland Church Cure International Hospital, Mutia Mulumba, Neema, and Kalimoni Mission Hospital. These institutions have faced several challenges, including inadequate financial reporting, staff shortages and retention issues, legal constraints, and the need to adopt modern advancements (Owino et al., 2019).

Despite their crucial role in providing healthcare services, mission hospitals in Kiambu County have faced sustainability challenges due to various factors. As the Ministry of Health (MOH, 2021) reported, these institutions have been grappling with inadequate financial resources, high staff turnover, stiff competition, weak health systems, and non-payment by patients. These challenges have impacted not only the growth of the health sector but also the country's economy and the long-term viability of each mission hospital.

To address these challenges and ensure their sustainability, mission hospitals in Kiambu County have been compelled to develop new strategies and innovative approaches (Owino et al., 2019). However, the lack of strategic innovations that lead to sustainability has contributed to the crisis faced by several mission hospitals, resulting in inadequate oversight and management of healthcare facilities (Report of the 2010 Kenya Episcopal Conference).

1.2 Statement of the Problem

The problem of strategic innovation on the sustainability of mission hospitals in Kenya stems from a complex mix of political instability, technological advancements, globalization, and

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increasing competition from private healthcare providers and new entrants. For instance, as the government advances the NHIF-SHIF transition, the Kenya Union of Clinical Officers argues that Kenyans are not ready for the switch (Muema, 2024). These challenges, coupled with rapidly evolving social dynamics, threaten the growth of the healthcare sector, particularly for faith-based hospitals struggling to maintain long-term viability while delivering quality care.

The transition to the Social Health Insurance Fund (SHIF) significantly impacts the sustainability of mission hospitals in Kiambu County. Enhanced financial stability from SHIF can alleviate funding pressures, enabling these institutions to improve service quality and operational efficiency (Ministry of Health, 2020). Increased insurance coverage may reduce the number of uninsured patients, mitigating financial strain due to non-payment for services (Long et al., 2020). Additionally, improved funding could help address high staff turnover by fostering employee retention strategies, thereby enhancing service delivery (Ministry of Health, 2020). Overall, SHIF may reshape the competitive landscape, allowing mission hospitals to thrive amidst rising patient volumes.

Despite the well-documented sustainability challenges facing mission hospitals, there is a lack of research investigating the potential role of strategic innovation in addressing these issues. While previous studies have explored the impact of strategic innovation on performance and competitiveness in various sectors, such as manufacturing, financial institutions, and technology (Makina & Oundo, 2020; Mang'ana, 2022; Mugo & Macharia, 2020; Nduati, 2020), limited attention has been given to the healthcare industry, particularly mission hospitals. The effect of strategic innovation practices, including business model innovation, service innovation, process innovation, and technological innovation, on the sustainability of mission hospitals remains largely unexplored.

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This knowledge gap is especially prevalent in Kiambu County, where mission hospitals are crucial in delivering healthcare services to the local community. Previous research has not demonstrated the significant impact that strategic innovation can have on the sustainability of healthcare institutions (Grynko et al., 2020). Consequently, there is a lack of understanding regarding how strategic innovation affects the organizational sustainability of mission hospitals in Kiambu County. This study aimed to bridge this gap by investigating the effect of strategic innovation on the sustainability of mission hospitals in Kiambu County, Kenya.

1.3 Objectives of the Study

The general objective of the research study was to investigate the effect of strategic innovation on the sustainability of mission hospitals in Kiambu County in Kenya.

1.3.1 Specific Objectives

Specifically, the study aims:

i) To determine the effect of Business model innovation strategy on the sustainability of mission hospitals in Kiambu County in Kenya.

ii) To evaluate the effect of Service innovation strategy on the sustainability of mission hospitals in Kiambu County in Kenya.

iii) To establish the effect of Process innovation strategy on the sustainability of mission hospitals in Kiambu County in Kenya.

iv) To determine the effect of Technology innovation strategy on the sustainability of mission hospitals in Kiambu County in Kenya.

1.4 Research Question

The following research questions guided the research study:

1) What is the effect of the Business model innovation strategy on the sustainability of mission hospitals in Kiambu County in Kenya?

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2) What is the effect of Service innovation strategy on the sustainability of mission hospitals in Kiambu County in Kenya?
3) What is the effect of Process innovation strategy on the sustainability of mission hospitals in Kiambu County in Kenya?
4) What is the effect of Technology innovation strategy on the sustainability of mission hospitals in Kiambu County in Kenya?

1.4 Significance of the Study

The study aimed to establish the effect of strategic innovation on the sustainability of mission hospitals in Kiambu County, Kenya. The findings of the study are expected to benefit the Kenyan government by providing guidance to policymakers on strategic innovation practices that mission hospitals in Kenya could adopt to enhance sustainability. Health policymakers will also gain insights from this study in their efforts to pursue universal health care by clarifying the appropriate strategic innovation approaches in healthcare delivery (Mbugua, 2022).

The management of Kiambu County Mission Hospital will benefit from the study's findings by understanding how strategic innovation influences an organization's capacity for survival. Additionally, mission hospitals in Kiambu County, Kenya, could use the study as a source of secondary data, particularly since they currently lack access to crucial information on factors that impact their practices (Kimemia, 2019).

The study's findings and conclusions will also be valuable to scholars, contributing to the existing body of knowledge on organizational strategic innovation and sustainability. Given the current shortage of literature on this topic, the study will serve as a significant resource for future research projects and studies, laying the groundwork for continued exploration in this field (Sigala, 2020).

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1.6 Scope of the Study

The research was conducted at mission hospitals in Kiambu County, Kenya. The study's general objective was to investigate the effect of strategic innovation on the sustainability of these mission hospitals. Specifically, it aimed to assess the impact of business model, service, process, and technology innovation strategies on their sustainability. The target population included 20 top-level, 30 middle-level, and 50 operational-level managers from: Africa Inland Church Cure International Hospital, Nazareth Hospital, Africa Inland Church Kijabe Mission Hospital, Presbyterian Church of East Africa Kikuyu Hospital, Mutia Mulumba Hospital, Neema Hospital, and Kalimoni Mission Hospital (Kiambu County Health office 2024). A descriptive census survey research design was employed, focusing on mission hospitals in Kiambu County. The analysis was limited to mission hospitals in Kiambu County, covering the study period from January 2023 to November 2024.

1.7 Limitations of the Study

While this study aimed to provide valuable insights into the effect of strategic innovation on the sustainability of mission hospitals in Kiambu County, certain limitations must be acknowledged, as they influenced the findings and their generalizability. The study's scope was confined to mission hospitals in Kiambu County, Kenya. Although this focus allowed for an in-depth examination of the local context, it may have limited the generalizability of the findings to other regions or countries with different healthcare systems, cultural contexts, and socio-economic factors.

The study relied on self-reported data from managers and staff within the selected mission hospitals. Despite efforts to ensure the validity and reliability of the data collection instruments, the potential for response biases, such as social desirability bias or recall bias, could not be entirely eliminated. The study's cross-sectional nature provided a snapshot of the

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relationship between strategic innovation and sustainability at a specific time. However, the dynamic nature of healthcare systems and the constantly evolving landscape of strategic innovation practices may have limited the long-term applicability of the findings.

Moreover, the study focused specifically on four dimensions of strategic innovation: business model innovation, service innovation, process innovation, and technological innovation. While these dimensions are crucial, other aspects of strategic innovation, such as organizational culture, leadership, and stakeholder engagement, may also significantly influence the sustainability of mission hospitals.

The study's reliance on quantitative methods may have limited the depth of understanding regarding the complex and multifaceted nature of strategic innovation and sustainability in healthcare. Future studies incorporating qualitative or mixed-methods approaches could provide additional insights and a more comprehensive understanding of the phenomenon under investigation. Despite these limitations, the study aimed to contribute to the existing body of knowledge by shedding light on the effect of strategic innovation on the sustainability of mission hospitals in Kiambu County and potentially informing strategies and policies to support these vital healthcare institutions.

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1.8 Chapter 1 Summary

Chapter 1 introduces and sets the background for the research study by examining the sustainability challenges faced by mission hospitals in Kiambu County, Kenya. The chapter emphasizes the critical role that mission hospitals play in delivering healthcare, particularly to marginalized populations. However, these institutions face numerous challenges, including insufficient funding, high staff turnover, intense competition, and inadequate health systems. The chapter proposes strategic innovation as a potential solution to these sustainability issues, highlighting its various forms, such as business models, services, processes, and

technological innovation. It underscores the importance of investigating the impact of these strategic innovation practices on the sustainability of mission hospitals in Kiambu County.

The problem statement articulates the broader issue of sustainability and healthcare delivery in Kenya's mission hospitals, exacerbated by an unfavourable economic environment characterized by political instability, technological threats, globalization, and high competition. Despite the recognized challenges, there is limited research exploring the role of strategic innovation in addressing these issues within the context of mission hospitals in Kiambu County. The chapter then outlines the general and specific objectives of the study, including determining the impact of strategic innovation on the sustainability of mission hospitals in Kiambu County and assessing the specific effects of business model, service, process, and technology innovation on their sustainability.

Additionally, the chapter discusses the relevance of the research, emphasizing its significance for policymakers, mission hospital administrators, academics, and the broader advancement of knowledge in strategic innovation and sustainability in the healthcare sector. The study's location and time frame are identified as mission hospitals in Kiambu County, covering the period from January 2023 to November 2024. The chapter concludes by acknowledging the limitations of the study, including its geographic scope and the evolving nature of healthcare systems and strategic innovation practices. Overall, Chapter 1 lays the foundation for the research study by providing a comprehensive background, defining the research questions and objectives, and outlining the study's purpose, significance, scope, and limitations.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses theoretical and empirical reviews relevant to the study and presents the conceptual framework and variables to bridge the identified research gaps.

2.2 Theoretical Review

This section will discuss and review the Diffusion of Innovation theory, Resource-Based View (RBV), Dynamic Capabilities theory, and Balanced Scorecard model utilized for this study.

2.2.1 Diffusion of Innovation Theory

Everett Rogers invented the theory in 1971, as cited by Goh and Sigala (2020). The theory investigates ways ideas are presented to a given cluster of people over time and explains why, how, and at what rate new ideas and technology spread. Diffusion of innovation theory has four key components that go beyond the two-step flow theory, setting on the conditions that increase or even decrease the likelihood that members of a given culture will adopt an innovation, a new idea, product, or practice. In multi-step diffusion, the opinion leader still exerts a significant influence (Feng et al., 2021). The theory offers a framework for a better understanding of how new ideas and technologies could be adopted and spread, which will support business model innovation and technological innovation strategies.

Diffusion of innovation theory helps marketers understand how to market their services or products or services best to get to the right audience, maximize the proper use of resources and minimize funds wastage money (Haleem et al., 2022). Thus, diffusion describes a process that gains full acceptance by the people and society. The diffusion of innovation theory has been used to study individuals' adoption of new healthcare information

technologies. Zhang et al. (2023) applied the diffusion of innovation theory to assess and predict the adoption of a telehealth program in rural areas of New Mexico. Feng et al. (2021) used innovation diffusion theory to study strategic innovation practices and the profitability of entrepreneurial businesses in Malaysia. The innovation of diffusion theory provides a valuable foundation for guiding and understanding the factors that influence technological innovation within an organizational strategy (Makovhollo et. al. 2017). The theory can be applied to understand and analyze challenges related to technological innovation implementation. The usefulness of the theory is that it is adaptable and flexible and can fit a formal and informal environment (Marzi et al., 2023).

2.2.2 Resource-Based View Theory

Uzhakova and Fischer (2024) asserted that the principal proponent of the Resource-Based View (RVB) Edith Penrose, in 1959 emphasized constructs of a firm's resources derived from the theory. In strategic innovation, a firm's Assets or Resources and dynamic capabilities are essential determinants of sustainable competitive advantage. Customer retention, financial resources, employee relations, skills, and knowledge contribute immensely to a firm's competitive advantage. The Resource Based View Theory describes a firm as a unification of assets, tangible and intangible, resources or competencies associated with the organization that are hard to replicate. Many researchers have advanced Resource Based View, among them Barney (2023), Wernerfelt (2023) and Teece et al. (2023).

RBV emphasis falls on majorly inimitable, heterogeneous, immobile, and non-substitutable. Heterogeneity comprises capabilities, expertise, skills, and other assets that a firm may possess, and these assets mainly vary from one institution to another. Immobility resources are not versatile and do not move from one firm to another, at least in the short run (Vasudevan, 2021). Resources are critical to any institution's growth, and the inimitability of

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resources by other firms is fundamental (Kaukab et al., 2020). These characteristics bear a competitive advantage and are vital for survival and sustainability.

Hijazi et al. (2024) relate corporate responsibility success as a catalyst to the growth of intangibles such as creativity, human resources, credibility, and culture, resulting in improved performance and financial sustainability. The improvement in financial performance leads to firm growth. Strategic managers make decisions or strategic choices that affect the firm's operating levels and overall firm performance (Fu et al., 2022). Strategic innovation orientation can be viewed as one of the firm's resources for improved performance (Kumar et al., 2020). Firms must cultivate unique, non-imitated and highly differentiated resources in order to build core competencies and competitive edge. RBV focuses more on the heterogeneity of assets and capabilities as sources of competitive advantage. Baia et al. (2020) posited that a firm's resources and abilities with (Valuable, Rare, Inimitable, Non-substitute)VRIN characteristics are imperative for a competitive edge. The key input to competitive advantage is the strategic manager who grasps the future value created by resources and capabilities, not the resources or capabilities themselves.

A firm is a conglomerate of resources and capabilities and has a strategic innovation orientation as one of its dynamic potentials. RBV helps understand the sub-constructs of strategic innovation orientation that enables attaining customer satisfaction and improving the firm performance (Racela & Thoumrungroje, 2020). Resource-based View supports the utilization of strategic innovation orientation. Innovation capabilities fall under the firm's capabilities, which need to be VRIN (Barney, 2023; Puspita et al., 2020; Teece et al.,2023; Wernerfelt, 2023). Firm capabilities based on the RBV lens are the abilities of a firm to perform tasks in a well-coordinated manner and utilize firm resources effectively to achieve the firm end state (Pang, 2021; Scheibe et al., 2022)

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Manzoor et al. (2022), in their research on customer orientation, innovation competencies, and firm performance, used RBV and dynamic capabilities to explain the relationship between the various variables. Despite being the most non-frivolous resource, RBV did not address how to sustain knowledge, an intangible resource, for the firm's sustainable competitive advantage.

Cuervo-Cazurra et al. (2023) research on the CSR impact on the financial performance among India firms used a resource-based view in anchoring the resource capital variable that included research and development. On the contrary, a study that assessed the influence of VRIN resources on competitive advantage had contradictory empirical results since value did not significantly affect competitive advantage or performance among Portuguese knowledge-intensive business firms (Chadwick & Flinchbaugh, 2021).

RBV supports the business model innovation strategy since it advocates for the value of strategic capabilities, taking advantage of opportunities to match potential threats and providing customers with value (Helfat et al., 2023). Resource Based View theory emphasizes Internal capability development, which would be achieved in this study by process innovation strategy (Makhloufi et al., 2022).

Through RBV, an organization can achieve a sustainable advantage by leveraging capabilities and internal capacity development, which is realized through the service innovation strategy in this study. RBV supports the technology innovation strategy in this study through non-substitution and competence substitution, which ranges from skill and expertise in systems such as information technology solutions. In this study, the Resource Based View supports Business Model strategy, service, process and Technology innovation strategies by emphasizing the proper use of valuable capabilities and resources in making informed decisions and gaining competitive advantage (Makhloufi et al., 2022).

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2.2.3 Dynamic Capabilities Theory

Teece et al. (2023) introduced Dynamic capabilities as an organization's ability to achieve unique competitive advantages despite path dependencies and critical constraints in its organizational and technical operations. The dynamic capabilities theory borrows from RBV, which found that firm-specific resources become the foundation for dynamic capabilities. The study by Muithya and Muathe (2020) establishes that dynamic capabilities are necessary to the competitiveness and driving of firm adaptability and innovativeness by creating, improving, and accruing a firm's resources as inputs into the value chain for sustainable advantage. Organizations operate in an environment with varying degrees of variability, uncertainty, complexity, and ambiguity (Renn et al., 2022).

Mission Hospitals operate in the same kind of environment as well. Thus, they need a response or strategy towards the environment, and dynamic capabilities enable this sound response. Dynamic capabilities are associated with entrepreneurial actions aimed at competitive advantage contrary to operational or ordinary capabilities involved in the firm's routine activities (Rashidirad & Salimian, 2020). There are three divisions or classifications of dynamic capabilities: incremental, renewing, and regenerative (Gutierrez-Gutierrez & Antony, 2020).

Incremental dynamic capabilities focus on the firm's resource base continuous development while renewing dynamic capabilities, revisiting, adjusting, and augmenting the resource base (Knoppen & Knight, 2022). Internal or external effects on the firm's existing range of dynamic capabilities by changing how it chooses its resource base are termed regenerative capabilities. Strategic innovation orientation is perceived as a dynamic capability of the organization (Farzaneh et al., 2022). This study will support the dynamic capabilities view by

expounding on the independent variables of business models and service innovation strategies.

2.2.4 Balanced Scorecard (BSC) model

The Balanced Scorecard (BSC) model was developed by Kaplan and Norton (1992) as a tool for measuring corporate management challenges related to both financial and non-financial performance (Tsalis et al., 2023). Non-financial measures are held to the satisfaction of those interested in the customers, the sustainability of the enterprise, progress, efficiency, and quality (Kaplan & Norton, 1992). Sustainable Balanced Score Card (SBSC) comprises five pillars: internal business, customer, financial, learning and growth (Benková et al., 2020). An effective Balanced Score Card aligns some organizational business activities towards its vision and mission, evaluation of its strategic goals, customer perspective involves selling new products, customer loyalty, and improved customer satisfaction (Pertiwi et al., 2021).

Organizational sustainability is a strategic decision that can be aligned with the organization's core objectives and the pursuit of balancing between environmental, economic and social affiliation (Zhanbayev et al., 2023). Non-financial measures are critical drivers for stakeholders' long-term value, and if customers become dissatisfied with the organisation's actions, they are forced out of business (Campra et al., 2020). The most important aspect of the balanced scorecard model is to investigate strategic innovation and sustainability of Mission hospitals in Kiambu County, as well as the measurement of sustainability by means of customer satisfaction, service quality, and financial stability.

Companies struggle to understand the importance of and implement sustainability strategies correctly. However, the greatest problem for many companies today is understanding the importance of sustainability (Jaeger & Upadhyay, 2020). For an organization to survive in this competitive business environment, it must realize the importance of sustainability and

thus adapt its particular system with several strategies to this rapidly changing business environment conditions while accepting sustainability as its core strategy (Bag & Pretorius, 2022).

The basic problem here is the determination of the connections between environmental and social management and financial benefits. Kaplan and Norton (2023) position the BSC as a tool for organizations to manage the demands of shareholders, customers and employees and to translate strategies into action. The vital idea behind this model is maintaining the sophisticated tool for the management of intangible or qualitative assets since they have a key role in the competitive environment. This study investigated four key areas emphasized in the BSC that can be used to measure sustainability both in the short and long term (Mio et al., 2022). These comprise financial stability, quality service, customer satisfaction, and employee retention.

2.3 Empirical Review

This section reviewed other authors' past research on strategic innovation and sustainability of mission hospitals in Kiambu County, Kenya. Strategic innovation and sustainability emphasized in this section include business model innovation strategy, Service innovation strategy, Process innovation strategy and technology innovation strategy. This section includes the conceptual framework and a summary of reviewed studies and research gaps.

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2.3.1 Business Model Innovation strategy and sustainability

Feng, et. al. (2021) service innovation strategy is a technique that strongly suggests improving service in both new and existing markets. The five service innovation processes can be categorized according to the level of formality and collaboration: research-oriented collaborations aimed at creating new service concepts; internal projects focused on improving

service innovation of projects by new ideas; and lastly, innovation projects customized for a customer.

Rodahl (2020) conducted a research study at a traditional fashion retail company focusing on children's apparel in Stockholm, Sweden. The research is anchored in an exploratory case study that evaluated the sustainable business innovation of a traditional tailoring institution. The study concluded that sustainable business model innovation seeks value creation. Business Model designates the basis on which a business creates, delivers, and captures value in economic, social, or any other form of value (Kaplan, 2023). The study focused on fashion companies and used an exploratory case study, making it challenging to apply to strategic innovation and sustainability in Mission Hospitals.

Kozma et al. (2022) Study explored digital innovations in Premier League clubs that substantiated business model innovation and financial sustainability in professional football. The study focused on a qualitative research approach that revealed that Profit-oriented business models of football clubs are supposed to protect and fiercely guard competing clubs from bankruptcy. This study was qualitative and hence lacks empirical backing. The current study was empirical.

Wang and Zhou (2021) aimed to gather empirical evidence from China regarding the impact of business model innovation on firm performance by studying entrepreneurs from seven provinces in eastern China known for their entrepreneurial activity, utilizing a questionnaire for data collection. Their quantitative analysis revealed a positive correlation between business model innovation and firm performance. While their research cantered on the relationship between business models and firm performance, the current study highlights the significance of business model strategy innovation in relation to organizational sustainability.

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Kajtazi et al. (2023) study examines the impact of Business Model Innovation on Corporate Sustainability in companies in the Western Balkan countries, particularly in Kosovo, Albania, and North Macedonia. The study followed the quantitative methodology approach, partial least square - square-structural equation modelling, to test the research hypotheses and derive credible results. Testing business model innovation, managerial capabilities, employee empowerment and decentralization, and employee training positively impacted corporate sustainability. The study done in Western Balkan countries fails to contextualize organizations with Kenya. This study on strategic innovation in mission hospitals in Kenya sought to fill the gap.

2.3.2 Service Innovation and sustainability

Mennens et al. (2018) asserted that service-focused firms have much higher operational result growth than non-service-focused firms. The study examined several financial performance variables and relied on secondary data only, while future studies will focus on service innovation as an independent variable and apply quantitative methodology. The emergence and growing penetration of ICT-based service innovation led to the gradual realization of its great potential not only to improve the efficiency of commercial banks' established business processes, through which they produce their usual tangible and intangible products and services, but also to facilitate and drive essential innovations in their processes and products (Laiyan, 2019; Nduati,2023). The study's focus was limited to ICT-based services, and thus, it was not easy to generalize to other sectors, like the healthcare industry. The current study focused on mission Hospitals in Kiambu County in Kenya.

Korir *et al*. (2020) examined the impact of service innovations on commercial banks in Kenya, focusing on the 44 commercial banks currently operating in the country. Their descriptive study found a strong positive correlation between service innovations and the

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performance of these banks. The study highlighted that automation reduces human errors, while internet banking was suggested as a means to enhance bank competitiveness and service quality. The report recommended that banks adopt new technologies and innovative strategies to improve financial performance and competitiveness. Unlike the current study, which emphasizes economic sustainability, Korir et al.'s study focused on financial performance through system improvements and automation. This study, however, addresses the gap by emphasizing both financial sustainability and customer satisfaction.

2.3.3 Process Innovation and Sustainability

Mikalef et al. (2020) Explored a study in a Norwegian firm using a theory-driven conceptualization of digital technologies or big data analytics and, based on a resource-based view of the firm, examined the fit between the big data analytics resources and their interplay with organizational contextual factors in driving a firm's process innovation capabilities. A survey of 202 chief information officers and IT managers working in the firms was analysed using a fuzzy set qualitative comparative analysis. The study survey was administered to IT officers and managers, while the current study used functional managers to administer the questionnaires.

Nwankapa et al. (2022) conducted a study to examine the dynamic relationship between digital business intensity and knowledge management practices and how the two jointly affect process innovation. The study used descriptive design, both primary and secondary data. A single informant approach to data collection was consistent with prior research, and a random sample of Chief Information Officers was selected and invited to participate in the survey, resulting in a total of 193 usable responses. The analysis and empirical validation of the research model used a partial least square. The study findings concluded that there was a positive link between dynamic relationships and process innovation. The study questionnaire

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survey was administered to chief information officers only, while the current study focused on middle-level managers as a gap identified that would relate to strategic innovation and sustainability in healthcare.

Wallace et al. (2021) conducted a study on the effects of product, technological, market, and process innovation strategies on competitiveness in Imenti South Sub-County, Meru County. A questionnaire was administered as the main instrument for data collection, and a descriptive design was used for data analysis. The data analysis was tested for reliability using Cronbach's Alpha Reliability. The study's findings indicated that all the study variables, product innovation, technological innovation, and process innovation, had a positive and significant relationship with the competitiveness of Saccos in South Imenti Sub-County, Meru County.

Möldner (2020) conducted a study emphasizing that little is known about the effects of lean manufacturing practices on the process innovation performance of manufacturing organizations. This study's research framework consisted of 22 measurement scales and three pairs of hypotheses developed based on an extensive literature review. A self-administered questionnaire was distributed among appropriately selected industrial experts. Datasets obtained from 340 usable responses were analysed through confirmatory factor analysis, descriptive statistics, correlations, and multiple linear regression models. The findings suggested that technical and human lean practices have a moderate to strong positive impact on the input and occurrence of incremental and radical process innovation in manufacturing organizations. An output of process innovation appears to enhance companies' operational performance. Therefore, the results dispel the scholarly and managerial misconception that Lean Manufacturers and innovation are difficult to coexist. Innovation performance was the

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dependent variable in the study process, while in the current study, it was an independent variable in Lean manufacturing firms.

Awan et al. (2020) A study on an integrative framework of knowledge acquisition and environmental investment clearly shows a lack of research on how particular organizational capabilities are seen as more useful and influence green innovation performance. The research addresses this gap by examining a mediation model to explore whether a firm's knowledge acquisition capability and investment in environmental management mediate the impact of buyer-driven knowledge transfer activities on green product and process innovation. An analysis sample of 239 manufacturing firms indicated that buyer-driven knowledge activities positively impact green product innovation more than green process innovation. The study investigated internal competencies and the role of buyers in knowledge transfer, while future studies focused on efficiency and technological capacity variables.

Widya et al. (2018) examined Indonesian small- and medium-sized enterprise manufacturing companies. They tested the hypotheses using interviews and surveys, with a sample size of 190 firms, both primary and secondary data. The study emphasized process innovation as a mediator, while in the current study it was the independent variable.

2.3.4 Technological Innovation Strategy

Akinwale et al. (2023) examined the impact of technology innovation on healthcare performance among 241 healthcare organizations in Saudi Arabia. The study was validated through a survey, and a questionnaire was administered through colleges of health sciences and business and medical practitioners. The study revealed that innovation efforts, in terms of acquisition of new software and new medical machinery/equipment, training and research and development, had a significant influence on technology innovation and healthcare. The

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study focused on technological innovation in Saudi Arabia, which can be applied to healthcare institutions in Kenya.

Rogers, J. A. (2020) researched on effects of Technology on sustainable health and social care and factors such as high take up of new consumer technologies, an extensive digital infrastructure and the nationwide National Health Services in the UK. The study used automated analysis of retinal scans to diagnose the effect of technology innovation in discovering diseases, community-based health management and remote consultations, and environmental monitoring of smart homes. It was discovered that all provide a strong foundation for the introduction of new technologies in the UK. Study gives a picture of healthcare challenges, amid such challenges there are high hopes that new technologies will not only improve the quality of health and social care, but also reduce costs for the health and social care systems. Moreover, technological innovations are creating opportunities to identify risk factors and early signs of disease, and for people to better manage their health all of which can help to prevent disease from occurring in the first place. The study focus on new technology in the UK while the current study focused on new technologies in Kenya's healthcare systems.

Rickels and Peterson, (2020). The study model selected A-share renewable energy listed companies in China from 2023 to 2019 as samples, using the fixed-effect model and the logit model to explore the effect of technology innovation on corporate sustainability; research study indicated that Technology innovation has become one of the major driving forces of China's economic growth. The study highlights that technology-intensive and environmental friendliness are increasingly important in achieving economic development while alleviating environmental pressure. The study used a fixed effect and logit models, while the current study applied multiple linear regression analysis.

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2.4 Sustainability of Healthcare Organizations

The sustainability of healthcare organizations, including mission hospitals, has been explored in various studies. Luyckx et al. (2021) emphasized the crucial role of mission hospitals in addressing public health challenges, promoting disease prevention, and achieving national and global health objectives, such as the Sustainable Development Goals (SDGs). Failure to address the sustainability challenges faced by mission hospitals could exacerbate existing health disparities, undermine efforts to improve population health outcomes, and hinder progress toward universal health coverage (Trinkley et al., 2022).

In the Kenyan context, Cherop et al. (2022) highlighted the challenges mission hospitals face, including poor governance and weak health systems, which have undermined the quality of supervision and led to crises in many of these institutions. Muhoja (2023) and Saji and Ellingstad (2023) emphasized the need for mission hospitals to adapt to the ever-changing healthcare needs driven by technological advancements and breakthroughs to enhance healthcare services' efficiency, effectiveness, quality, affordability, sustainability, and safety.

Mwai et al. (2023) and Mwongera (2023) underscored the importance of addressing the sustainability challenges faced by mission hospitals in Kiambu County, as these institutions play a vital role in providing healthcare services to the local community while facing inadequate financial resources, staff turnover, stiff competition, and patient non-payment issues.

The sustainability of mission hospitals has been linked to various factors, including financial stability, quality of service, customer satisfaction, and employee retention (Bag & Pretorius, 2022; Mio et al., 2022). Amado et al. (2023) highlighted the financial challenges faith-based healthcare systems face, including mission hospitals in Mozambique, emphasizing the need

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for sustainable financial resources to ensure their long-term viability. Kuntz (2020) also noted the inadequate financial resources are a major global challenge confronting mission hospitals.

Suraci et al. (2022) emphasized the importance of adopting modern procedures and technologies, such as minimally invasive surgery and eHealth, to enhance the quality of healthcare services provided by mission hospitals. Muhoja (2023) and Saji and Ellingstad (2023) stressed the need for mission hospitals to adapt to the ever-changing healthcare needs to maintain high-quality care. Pertiwi et al. (2021) highlighted the importance of the customer perspective in the Balanced Scorecard model, which includes selling new products, customer loyalty, and improved customer satisfaction. Campra et al. (2020) noted that if customers become dissatisfied with an organization's actions, the organization may be forced out of business.

De Vries et al. (2023) conducted a systematic review of nurse migration and staff turnover, underscoring the impact of high staff turnover on the continuity of care and strain on the remaining workforce. Long et al. (2020) and the Ministry of Health report (2021) identified high staff turnover as a critical sustainability challenge mission hospitals face in Kenya. Adopting strategic innovation practices, such as business model innovation, service innovation, process innovation, and technological innovation, has been proposed as a potential solution to enhance the sustainability of healthcare institutions (Grynko et al., 2020; Mukweyi, 2023; Suraci et al., 2022).

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2.5 Summary of the Literature Review

The literature review has provided a comprehensive overview of the theoretical and empirical foundations relevant to the study of strategic innovation and sustainability in the context of mission hospitals. The theoretical underpinnings, including the Diffusion of Innovation Theory, Resource-Based View (RBV) Theory, Dynamic Capabilities Theory, and the

Balance Scorecard (BSC) model, offer valuable insights and frameworks for understanding the various dimensions of strategic innovation and their potential impact on organizational sustainability.

The Diffusion of Innovation Theory highlights the process by which new ideas, products, or practices are adopted and spread within a given culture or organization, shedding light on the factors influencing the adoption of technological and business model innovations. The RBV Theory emphasizes the importance of valuable, rare, inimitable, and non-substitutable resources and capabilities as sources of competitive advantage, supporting the role of strategic innovation strategies in leveraging these resources for organizational sustainability.

The Dynamic Capabilities Theory complements the RBV by focusing on an organization's ability to adapt and reconfigure its resources and capabilities in response to changing environments, a crucial aspect in the rapidly evolving healthcare landscape. The BSC model provides a balanced approach to measuring organizational performance, incorporating financial and non-financial perspectives, such as customer satisfaction, internal processes, and learning and growth, which are integral to sustainability.

The empirical review has highlighted various studies that have explored the relationships between strategic innovation strategies (business model innovation, service innovation, process innovation, and technology innovation) and organizational performance, competitiveness, and sustainability. However, the review has also identified several research gaps, including the lack of empirical studies specifically focused on the sustainability of mission hospitals in the Kenyan context, the limitations of methodological approaches used in previous studies, and the potential limitations of geographical and contextual settings.

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By addressing these research gaps, the current study aimed at contributing to the existing body of knowledge by empirically examining the effect of strategic innovation strategies on the sustainability of mission hospitals in Kiambu County, Kenya. This study addressed the contextual gap and employed a robust methodological approach to ensure the reliability and generalizability of its findings.

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2.6 Research Gaps

Reviewing existing strategic innovation and sustainability literature has revealed several gaps and limitations that warrant further investigation. While previous studies have explored various aspects of strategic innovation, such as business model innovation, service innovation, process innovation, and technology innovation, their impact on the sustainability of mission hospitals, particularly in the Kenyan context, remains largely unexplored. The methodological approaches employed in existing studies, including case studies, secondary data analysis, and descriptive studies, have generalizability and empirical rigour limitations. Furthermore, previous research's geographical and contextual settings, such as the Chinese, Saudi Arabian, and Norwegian contexts, may not adequately capture the unique challenges and dynamics of mission hospitals in Kiambu County, Kenya. Consequently, there is a need for an empirical study that addresses these research gaps by examining the effect of strategic innovation strategies on the sustainability of mission hospitals within the specific context of Kiambu County, Kenya. Table 2.1 indicates the Research Gaps identified in the review of the literature.

Table 2.1: Research Gaps

Author	Study	Methodology	Important Results	Research Gap	Planned Study's Focus
Krondahl (2020)	Sustainable business innovation in a traditional tailoring institution for children's apparel in Stockholm, Sweden	Exploratory case study	Sustainable business model innovation seeks value creation	Focused on the fashion industry using a case study, making it challenging to apply strategic innovation and sustainability in mission hospitals	Current study explores business model innovation as an independent variable in the healthcare sector

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Wang and Zhou (2021)	Effects of business model innovation on firm performance in entrepreneurial firms in eastern China	Quantitative analysis of questionnaire data	Positive relationship between business model innovation and firm performance	Examined business model innovation in relation to firm performance in a Chinese context	Emphasizes business model innovation strategy in relation to organizational sustainability in the Kenyan context
Kozma et al. (2022)	Impact of digital innovations on business models and financial sustainability in Premier League clubs	Qualitative content analysis	Insights into club-level initiatives to change business models	Qualitative study lacking empirical backing	An empirical study examining business model innovation strategy
Mennens et al. (2018)	Service innovation and its impact on financial performance in Norwegian manufacturing firms	Secondary data analysis	Service innovation positively correlated with financial performance	Examined secondary data only	Focuses on service innovation as an independent variable using primary data in the healthcare sector
Ngari and Muiruri (2023)	Service innovations and their effects on commercial banks in Kenya	Descriptive study	Strong positive correlation between service innovations and bank performance	Emphasized financial performance through improved systems and automation	Explores service innovation strategy in relation to financial sustainability and customer satisfaction in the healthcare sector
Nwankapa et al. (2022)	Relationship between digital business intensity, knowledge management practices, and process innovation	Descriptive study using primary and secondary data	The positive link between digital business intensity and process innovation	Questionnaire survey administered to Chief Information Officers only	Focuses on middle-level managers' perspectives on process innovation strategy in the healthcare sector
Wallace et al. (2021)	Effects of strategic innovations on the competitiveness of Saccos in Imenti South Sub-County, Meru County	A descriptive study using questionnaire data	Positive and significant relationship between strategic innovations and competitiveness	Examined strategic innovations in relation to competitiveness in Saccos, leaving a gap for other economic sectors like	Investigate process innovation strategy as one of the variables affecting sustainability in mission hospitals.

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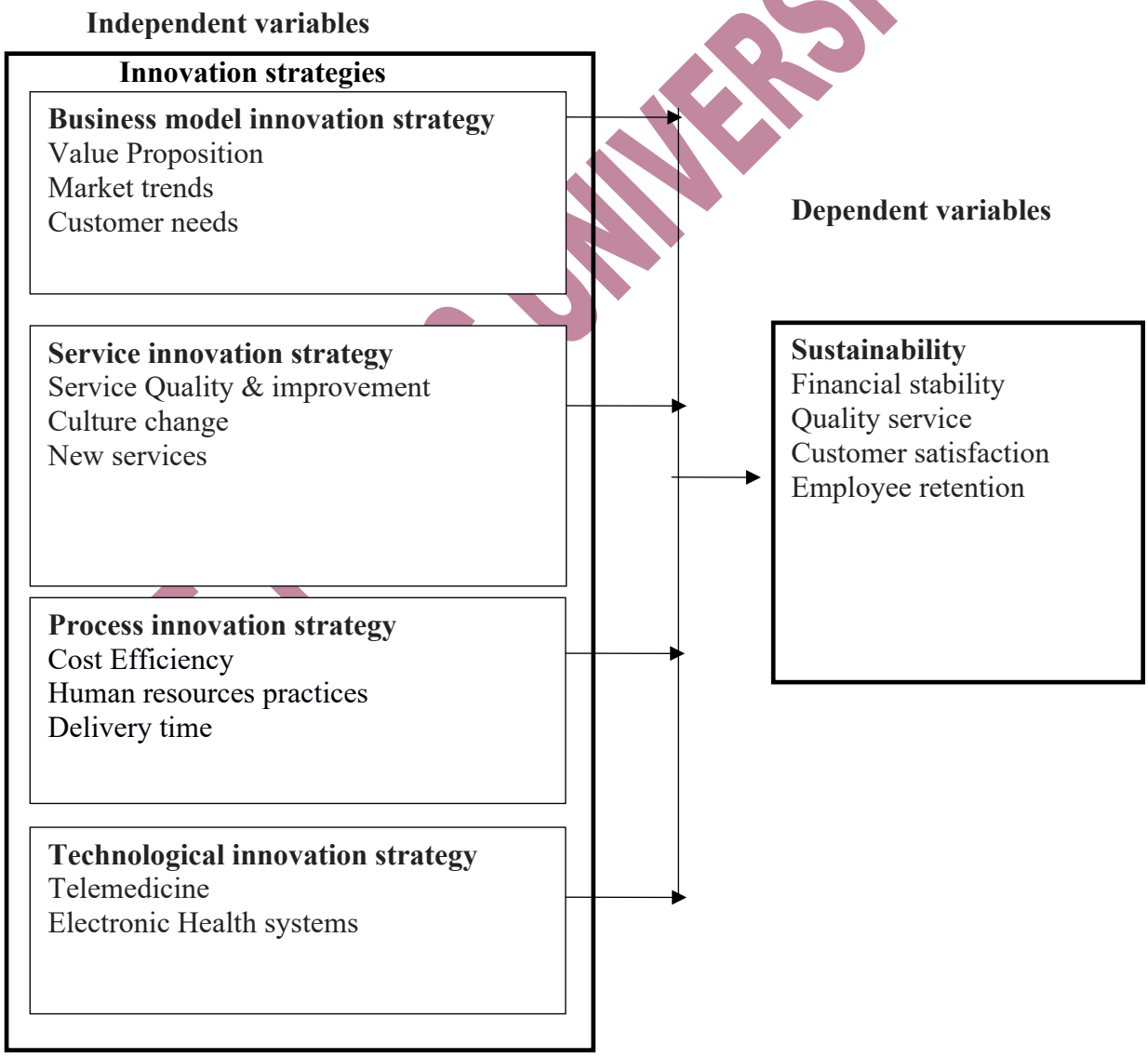
				healthcare	
Akinwale et al. (2023)	Impact of technology innovation on healthcare performance in Saudi Arabian healthcare organizations	Questionnaire survey	Significant influence of technology innovation efforts on healthcare performance	Focused on internal competencies and buyer knowledge transfer	Explores technology innovation strategy as a variable affecting sustainability in the Kenyan healthcare context
Widya et al. (2018)	Impact of process innovation on sustainable innovation in Indonesian SMEs	Interviews, surveys, primary and secondary data	Process innovation influences firm sustainability and mediates firm-specific capabilities.	Examined process innovation as a mediator	Considers process innovation as an independent variable in the current study
Rogers, J. A. (2020)	Researched on Technology for sustainable health and social care and factors such as high take up of new consumer technologies, an extensive digital infrastructure and the nationwide National Health Services in the UK.	The study used automated analysis of retinal scans to diagnose	The study paints a picture of the difficulties facing the healthcare industry. Despite these difficulties, there is great optimism that new technology will lower costs for the health and social care systems while simultaneously improving the quality of health and social care.	The study focus on new technological in National Health Services in UK	current study will focus on new technologies in Kenya healthcare systems.

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2.7 Conceptual framework

The conceptual framework covers the study's mental map of the perceived relationship between something or a specific item (Van der Waldt, 2020). It helps get into a directional relationship at a glimpse. The conceptual framework for this study is as presented in Figure 2.1. It shows the relationship between the independent variable, strategic innovation, and the dependent variable, sustainability. The study's independence variables were measured using Service, process, Business model, and technology innovation.

Figure 2.1: **Conceptual Framework**



Researcher, 2024

2.8 Summary of the Chapter

This chapter comprehensively reviews the theoretical foundations and empirical studies relevant to strategic innovation and sustainability. The chapter began by discussing the four main theories that underpin the study: The Diffusion of Innovation Theory, the Resource-Based View (RBV) Theory, the Dynamic Capabilities Theory, and the Balanced Scorecard (BSC) model. These theories provide valuable insights into the adoption and diffusion of innovations, the importance of valuable resources and capabilities, the ability to adapt and reconfigure resources, and the balanced approach to measuring organizational performance, respectively.

The empirical review section critically analysed previous studies related to the four strategic innovation strategies under investigation: business model innovation, service innovation, process innovation, and technology innovation. This review highlighted the existing knowledge, methodological approaches, and key findings related to the impact of these strategies on organizational performance, competitiveness, and sustainability.

Furthermore, the chapter identified and articulated research gaps in the existing literature, emphasizing the need for an empirical study focused specifically on the sustainability of mission hospitals in the Kenyan context. These gaps were presented in a tabular format, clearly outlining the limitations of previous studies and the rationale for the current study's focus.

The chapter concluded with a summary of the literature review, highlighting the theoretical and empirical foundations and emphasizing the potential contribution of the current study in addressing the identified research gaps. This chapter has laid the groundwork for the subsequent chapters, providing a solid theoretical and empirical basis for investigating the

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effect of strategic innovation strategies on the sustainability of mission hospitals in Kiambu County, Kenya.

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CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlines the Research Design, Target Population, Data Collection Instrument and Procedure, Pilot Testing, Data Analysis and Presentation, Ethical Consideration and Chapter Summary.

3.2 Research Design

This study adopted a cross-sectional descriptive research design. A cross-sectional study involves collecting data from a population or a representative subset at a specific point in time to examine the relationship between variables of interest (Wang and Cheng, 2020). The descriptive aspect of the research design aimed to describe the characteristics or behaviors of the population being studied (Mohajan, 2020). This design was appropriate for this study as it allowed for data collection from mission hospital managers and to describe and analyze the relationship between strategic innovation practices and organizational sustainability.

According to Sharma et al. (2023), research design describes the conceptual structure and plan for data collection, quantification, and analysis. A descriptive survey research design was employed in this study. Alhassan (2020) stated that respondents provide answers through questionnaires, surveys, or polls in a descriptive survey. A descriptive survey was appropriate for this research project as it helped capture categorical descriptions of the study population's attitudes.

A descriptive research design was mainly applicable when investigating phenomena using questions such as what, why, and how, allowing researchers to gather and present facts about the state of affairs without interference (Doyle et al., 2020). The descriptive survey involved

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collecting data, summarizing and analysing it, and finally presenting and interpreting the results for clarification purposes (Peel, 2020).

Using a cross-sectional descriptive research design enabled data collection from the mission hospital managers' target population at a specific time. This design facilitated the description and analysis of the relationship between strategic innovation practices (business model innovation, service innovation, process innovation, and technological innovation) and organizational sustainability within the mission hospitals in Kiambu County.

3.3 Target Population

The study targeted 100 management personnel from seven mission hospitals in Kiambu County, Kenya, including AIC Kijabe, AIC CURE International, PCEA Kikuyu, Kalimoni, Mutia Mulumba, Neema, and Nazareth Mission Hospitals. The population included 20 top-level, 30 middle-level, and 50 operational-level managers from the Human Resources, Finance, and Medical Services departments (Nursing Council of Kenya, 2023). The reason some organizations have uniform percentages, while others have slightly varied percentages, is due to differences in the number of employees at the top, middle, and operational management levels in each hospital. The figures are actual numbers drawn from organizational data sources, and in this case, the total population of managers was 100 across all the hospitals listed. The percentage for each hospital was calculated by dividing the total number of managers in each hospital by the total population of 100, then multiplying by 100 to get the percentage share. Thus, the percentages reflect the proportionate representation of managers at different levels across the mission hospitals, with the data sourced from the Kiambu County Health office (2024). According to WhitehouseTedd et al. (2021), the target population is the specific group from which a study draws respondents and to whom findings are generalized. Choosing a population of 100 individuals was justified to ensure

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comprehensive representation across all managerial levels and departments, allowing for diverse and detailed insights. This size is manageable for in-depth analysis while providing sufficient data to generalize findings within the context of these mission hospitals, balancing feasibility with the richness and robustness of the data collected.

Table 3.1: Target Population Distribution

Mission Hospital	Top-level Managers	Middle-level Managers	Operational - Level Managers	Total	Percentage
AIC Kijabe Mission Hospital	3	4	7	14	14%
AIC CURE International Mission Hospital	3	4	7	14	14%
PCEA Kikuyu Mission Hospital	3	4	7	14	14%
Kalimoni Mission Hospital	3	4	7	14	14%
Mutia Mulumba Mission Hospital	2	4	6	12	12%
Neema Mission Hospital	3	5	8	16	16%
Nazareth Mission Hospital	3	5	8	16	16%
Total	**20**	**30**	**50**	**100**	**100%**

Source: (NHIF 2024).

3.3.1: Sampling Technique and Sample Size

The study employed a census sampling technique, as the total number of management personnel across all managerial levels and relevant departments was relatively small (N = 100) (NHIF 2024). A census sampling approach involved the entire population of interest in the study, eliminating the need for sampling (Pace, 2021). This technique was appropriate when the population size was manageable and accessible, ensuring that the findings represented the entire target population.

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3.4 Data Collection Instrument and Procedure

The study aimed to gather comprehensive insights into the effect of strategic innovation on the sustainability of these healthcare institutions by focusing on management personnel across various levels and departments within the mission hospitals.

3.4.1 Data Collection Instrument

Primary data for this study was collected using a structured questionnaire, as suggested by (Adeoye Olatunde and Olenik 2021). Primary data, refers to information gathered directly from first-hand sources present at the time of an event, was obtained through this method (Alam, 2021; Taherdoost, 2021). The questionnaire was divided into six sections: Section A (Background Information), Section B (Business Model Innovation Strategy), Section C (Service Innovation Strategy), Section D (Process Innovation Strategy), Section E (Technology Innovation Strategy), and Section F (Sustainability). Section A collected background information using closed-ended questions about age distribution, education level, and experience in the current position. Response options for age distribution and experience were provided, while education level included choices such as PhD, Postgraduate Diploma/Master's, Bachelor's Degree, and Certificate/Diploma. Sections B through F used a 5-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5) to gauge respondents' level of agreement with statements related to each specific variable. The questions in each section were numbered consistently, beginning with 1 and continuing sequentially. The questionnaire was structured logically, with clear instructions and response options provided for each question. The sections were arranged in the following order: Section A (Background Information), Section B (Business Model Innovation Strategy), Section C (Service Innovation Strategy), Section D (Process Innovation Strategy), Section E (Technology Innovation Strategy), and Section F (Sustainability).

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3.4.2 Data Collection Procedure

The data collection procedure involved obtaining pertinent information to achieve a specific goal, as outlined by Mazhar et al. (2021). The data collection procedure began with obtaining research approval from the graduate school, ensuring the study met academic standards and ethical guidelines. Upon receiving this approval, the researcher applied for a research permit from the National Commission for Science, Technology, and Innovation (NACOSTI). This permit authorized the researcher to conduct the study in compliance with national regulations. Once the necessary approvals and permits were secured, the researcher prepared to gather pertinent information as outlined by Mazhar et al. (2021). This involved designing a structured questionnaire aimed at collecting feedback from respondents regarding the impact of strategic innovation on the sustainability of mission hospitals. The questionnaire was tailored to capture insights relevant to the study's objectives.

The actual data collection took place within mission hospitals in Kiambu County, Kenya. Utilizing a drop-and-pick method, the researcher delivered the questionnaires directly to the respondents and later returned to collect them. To enhance response rates, reminders were sent through phone calls, text messages, or in-person visits to encourage timely completion and return of the questionnaires. This systematic approach ensured that the data collection process was efficient and effective, facilitating the gathering of valuable insights for the research.

The structured questionnaire was designed to gather respondents' feedback on the effect of strategic innovation and sustainability in mission hospitals. Questionnaires were administered to respondents based in mission hospitals within Kiambu County, Kenya. The data collection utilized a drop-and-pick method: the researcher delivered the questionnaires to respondents and later collected them. To enhance response rates, reminders were sent via phone calls, text messages, or in-person visits if respondents forgot to return the questionnaires.

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In addition, an electronic version of the questionnaire was created using Google Forms and distributed via email to reach respondents who were geographically distant or otherwise inaccessible. A maximum of two weeks was allocated for respondents to complete and return the questionnaires, with an additional week provided for those needing extra time.

3.5 Pilot Testing

Gani et al. (2020) outlined that a pilot test is conducted to ensure the reliability and validity of the study instrument. This pilot test took place at St. Mary's Mission Hospital Langata in Nairobi. The hospital was selected for the pilot study due to its similarity to the Church-operated hospitals in Kiambu County under examination. As a level 4 faith-based health facility affiliated with ASN - Assumption Sisters of Nairobi, it provides a comprehensive range of services, including outpatient and inpatient care, X-ray and ultrasound, and dental services, making it a suitable representative of the target population.

The pilot study involved ten management-level respondents from St. Mary's Mission Hospital Langata. This phase aimed to identify any potential issues or inconsistencies in the research instrument before the actual data collection. Conducting the pilot test was crucial for confirming the validity and reliability of the data collection tool (Lewis et al., 2021). Insights gained from the pilot study were expected to inform necessary adjustments to the questionnaire, thereby enhancing the quality of data collection and ensuring the research instrument's relevance and effectiveness for the target population.

3.5.1 Validity of the Research Instruments

The level tested samples match what is being tested and what it is intended to test is known as validity (Tavakol & Wetzel, 2020). There are three different kinds of validity: construct, face, and content validity (Sürücü & Maslakçi, 2020). An instrument's validity must be evaluated before it is used to gather data.

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Content validity assessed the extent to which the research tools accurately represented the target population and covered the full scope of the study's focus (Aithal & Aithal, 2020). The study examined the effects of strategic innovation and sustainability in mission hospitals, focusing on business model, service, process, and technology innovation strategies and their impact on sustainability. The content validity test scrutinized whether the study effectively incorporated all crucial aspects related to the stated variables. The 5-point Likert scale was used to evaluate individual indicators for each variable, ensuring that the questionnaire addressed all relevant components. This approach confirmed that the content validity of the data collection instrument precisely measured the intended subjects (Matthews et al., 2022).

The Content Validity Index (CVI) was employed to measure content validity officially, using the formula CVI = ne/N, where n represents the number of subject matter experts indicating essential elements and N is the total number of panellists. With an upper limit of 1 for CVI, a higher CVI indicates greater validity. Construct validity was used to assess whether the tool accurately reflected the theoretical construct being studied. According to Mathieu et al. (2020), construct validity is crucial for evaluating how precisely the research instrument measures the intended constructs. In this study, the research tool focused on the effects of strategic innovation and sustainability in healthcare, with each item evaluated against pre-existing practices in mission hospitals to ensure coverage of strategic innovation practices.

Face validity was used to assess whether the research tools appeared valid from the respondents' perspective. It involved evaluating the research tools based on the opinions of observers, who assessed whether the items in the questionnaire were appropriate (Johnson, 2021). The respondents participating in the pilot study provided feedback on any challenges related to strategic innovation and sustainability in the context of mission hospitals. This feedback indicated whether the questionnaire items accurately reflected the indicators of

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strategic innovation and sustainability. The consistency of respondents' judgments on the questionnaire contents helped identify which items effectively addressed the key issues.

3.5.2 Reliability of Research Instruments

Reliability refers to the capacity of a data collection approach to produce consistent results across multiple tests or trials (Sürücü & Maslakçi, 2020). An instrument is considered reliable when it yields comparable and consistent results (Armaghani & Asteris, 2021). The Cronbach's Alpha test, which evaluates internal consistency, is commonly used to assess the reliability of a data-gathering tool (Kennedy, 2022). For this study, a specific instrument was administered to a comparable group in a similar setting. To assess the reliability of the questionnaire, a pilot test was conducted with a comparable but smaller group of respondents in a specific setting, and the findings were analysed. A Cronbach's Alpha coefficient of 0.70 or higher was deemed acceptable Instruments with a Cronbach's Alpha below 0.7 were discarded and excluded from data processing due to their lack of reliability.

3.6 Data Analysis and Presentation

Following data collection, data coding, editing, and checking were conducted to identify errors and abnormalities (Yin et al., 2020). Data analysis involved the collection, cleaning, modification, and organization of data before presentation. The presentation of data, which involved arranging data in text, graphs, and tables, aimed to facilitate logical and statistical conclusions that were easy to interpret and well-organized (Popenoe et al., 2021).

Three methods were employed to analyse the data from the study: content analysis, inferential statistics, and descriptive statistics. Both descriptive and inferential statistics were used to examine the quantitative data from the survey. Descriptive statistics provided concise summaries of the collected data, using measures such as means, percentages, standard deviations, and frequencies (Novalinda et al., 2020).

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The means and standard deviations were calculated through descriptive analysis. Linear regression analysis was used to assess the impact of strategic innovation on the sustainability of church-operated hospitals in Kiambu County. An empirical model, consisting of a set of variables presented in an equation, characterized the scenario under investigation (Noaro et al., 2020). Simple linear regression analysis was performed for each objective to determine the effect of independent variables on the sustainability of mission hospitals. The Statistical Package for Social Sciences (SPSS) Version 28 was utilized for regression analysis and other statistical computations.

Before conducting regression analysis, several assumptions of linear regression were tested to ensure the validity of the model. The normality assumption was assessed using quantile-quantile (Q-Q) plots, which compared the distribution of residuals with a normal distribution (Habibzadeh, 2024). Multicollinearity, indicated by high correlations among independent variables, was tested using the Variance Inflation Factor (VIF) (Shrestha, 2020). A VIF value greater than the threshold indicated the presence of multicollinearity. The White test was used to detect heteroscedasticity, which occurs when residual variance is inconsistent across different levels of independent variables (Berenguer-Rico & Wilms, 2021). If heteroscedasticity was detected, remedial measures such as robust standard errors or data transformations were considered.

The assumption of homoscedasticity, which posits that the variance of residuals remains constant across all levels of the independent variables, was tested using graphical methods, such as plotting residuals against predicted values or the independent variables (Đalić & Terzić, 2021). The presence of outliers, defined as observations that deviate significantly from the rest of the data, was examined through techniques including standardized residual plots, Cook's distance, and leverage values (Arimie et al., 2020). Outliers, which can

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potentially distort regression results, were addressed using methods such as data transformation or exclusion. The linearity assumption, requiring a linear relationship between dependent and independent variables, was assessed using scatter plots and partial regression plots (Hardiansyah & Zainuddin, 2022). If linearity was violated, remedial measures such as data transformations or the inclusion of higher-order terms were considered.

If any assumptions of linear regression were violated, appropriate remedial measures were taken to ensure the robustness of the regression model. For example, if the normality assumption was violated, data transformations such as log or square root transformations were applied to the variables (Knief & Forstmeier, 2021). In cases of heteroscedasticity, robust standard errors or weighted least squares regression were employed. Multicollinearity issues were addressed by combining or removing offending variables. Outliers were managed through techniques such as, trimming, or data transformations. Violations of linearity were corrected by including higher-order terms or applying suitable data transformations (Begashaw & Yohannes, 2020).

The following empirical models was used for each objective:

Objective 1: To determine the effect of Business model innovation strategy on the sustainability of mission hospitals in Kiambu County in Kenya.

$Y = \beta_0 + \beta_1 X_1 + \varepsilon$ ……3.1

Where: Y is Sustainability

β_0 is the constant

β_1 is the coefficient of business model innovation strategy

X_1 is a business model innovation strategy

ε is the error term

Objective 2: To evaluate the effect of Service innovation strategy on the sustainability of mission hospitals in Kiambu County in Kenya.

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$Y = \beta_0 + \beta_2 X_2 + \varepsilon$……3.2

Where: Y is Sustainability

β_0 is the constant

β_2 is the coefficient of Service innovation strategy

X_2 is a service innovation strategy

ε is the error term

Objective 3: To establish the effect of Process innovation strategy on the sustainability of mission hospitals in Kiambu County in Kenya.

$Y = \beta_0 + \beta_3 X_3 + \varepsilon$……3.3

Where: Y is Sustainability

β_0 is the constant

β_3 is the coefficient of Process innovation strategy

X_3 is the process innovation strategy

ε is the error term

Objective 4: To determine the effect of Technology innovation strategy on the sustainability of mission hospitals in Kiambu County in Kenya.

$Y = \beta_0 + \beta_4 X_4 + \varepsilon$……3.4

Where: Y is Sustainability

β_0 is the constant

β_4 is the coefficient of Technology innovation strategy

X_4 is a technology innovation strategy

ε is the error term

The research questions were answered at a 5% level of significance ($\alpha = 0.05$), which was the generally accepted level in social science research (Karadavut & Karadavut, 2020). This level of significance indicated a 95% confidence level, meaning that if the p-value for a variable

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was less than 0.05, the effect of that variable on sustainability was considered statistically significant. If the p-value was greater than 0.05, the effect was considered not statistically significant. Tables and graphs generated by the statistical software were used to present the findings in a clear and organized APA7-style table format.

3.7 Ethical Consideration

Research ethics involves a set of principles and standards that governed the conduct of research to ensure it was carried out in a morally acceptable manner, with respect for the rights, dignity, and well-being of all involved parties (Sutrop et al., 2020). Adhering to ethical guidelines was crucial in maintaining the integrity and credibility of the research process. In this study, the researcher obtained informed consent from all participants before data collection. An introductory letter was provided, clearly outlining the purpose of the study, the procedures involved, the potential risks and benefits, and assurances of confidentiality and voluntary participation. Participants had the right to withdraw from the study at any time without consequences.

The privacy and anonymity of participants were strictly maintained. The questionnaires were anonymous, and no personally identifiable information was collected. The data collected were securely stored and accessed only by the researcher, ensuring that the participants' responses remained confidential. The researcher obtained the necessary research permit from the National Commission for Science, Technology, and Innovation (NACOSTI) before commencing data collection. This permit ensured that the research adhered to the regulations and guidelines set forth by the regulatory authorities.

The researcher ensured that all participants were treated with respect, dignity, and courtesy throughout the research process. The participants' rights, values, and culture were respected, and their voluntary participation was emphasized. The researcher took all necessary precautions to ensure that the study did not cause any physical, psychological, or emotional

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harm to the participants. The research procedures were designed to minimize potential risks and discomforts.

The researcher ensured that the data collected, processed, and reported were correct and free from bias. Any conflicts of interest or prejudice were disclosed, and steps were taken to ensure that these factors did not influence the results of the research. The researcher respected ethical procedures in publishing and disseminating research findings and ensured that the results were accurately reported and sources properly credited. Any limitations or possible sources of error in the study were stated clearly. By following these ethical considerations, the researcher met the highest standards of ethical conduct in research, ensured the rights and welfare of the participants were not compromised, and promoted the generation and dissemination of new knowledge responsibly and ethically.

3.8 Chapter Summary

This chapter described the study research methodology used to determine the effect of strategic innovation practices on the sustainability of mission hospitals in Kiambu County, Kenya. Specifically, cross-sectional descriptive research design was used to collect data from the target population.

Census sampling was employed in this study to provide a comprehensive view of managerial perspectives. A total of 100 managers were surveyed, representing various levels within the Human Resources, Finance, and Medical Services departments. This sample included 20 top managerial level, 30 middle-level, and 50 operational lower-level managers. The research instrument was a questionnaire divided into six sections, utilizing a 5-point Likert scale to gauge responses. To ensure the validity and reliability of the research instrument, a pilot test was conducted at St. Mary's Mission Hospital Lang'ata in Nairobi. The pilot test assessed content validity, construct validity, and face validity, with reliability evaluated using Cronbach's alpha.

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Data analysis involved descriptive statistics, inferential statistics, and content analysis. Linear regression analysis was used to explore the impact of independent variables—business model innovation, service innovation, process innovation, and technology innovation strategies—on the dependent variable, sustainability. The study checked the assumptions of linear regression and applied appropriate remedial measures if any assumptions were violated. Findings were presented through tables and graphs, generated by the Statistical Package for Social Sciences (SPSS) software. The study adhered to ethical considerations, including obtaining informed consent from respondents and securing a research permit from the National Commission for Science, Technology, and Innovation (NACOSTI).

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CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter addresses the data analysis, presentation, and interpretation of the research findings. It explains the procedures and techniques applied to analyse and present the data obtained through the use of questionnaires.

4.2 Response Rate

This chapter addresses the data analysis, presentation, and interpretation of the research findings. It explains the procedures and techniques applied to analyse and present the data obtained through the use of 100 questionnaires, which were administered to respondents to gather data.

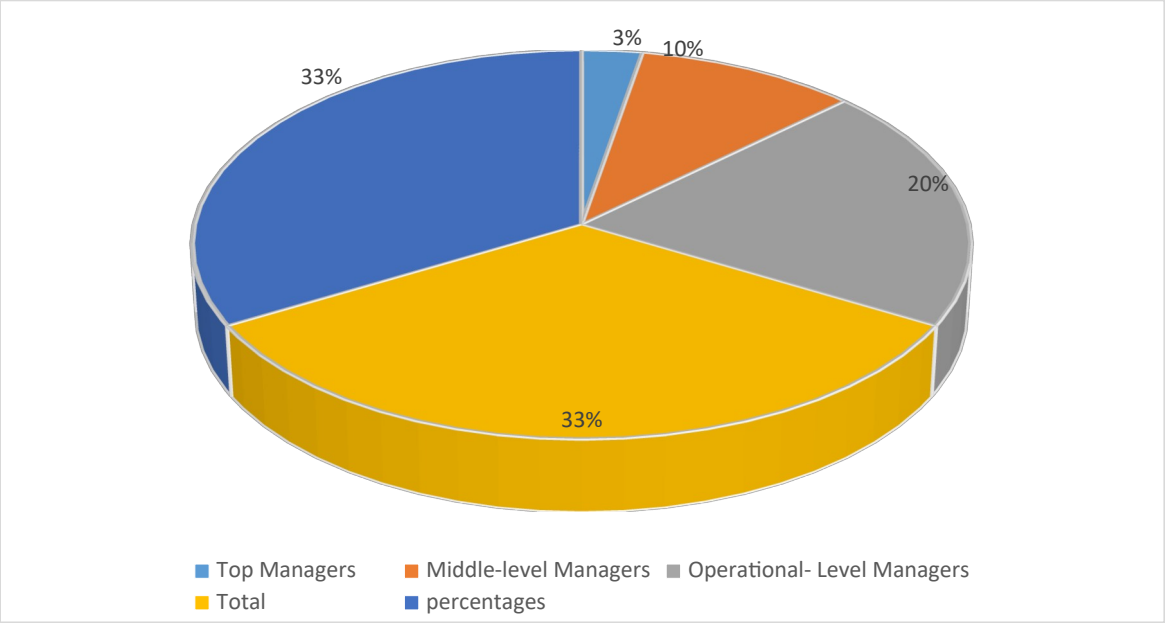
Table 4.1 Response Rate

Response Rate	Top Managers	Middle-level Managers	Operational - Level Managers	Total	percentages
Returned Questionnaires	6	22	44	72	72
Non-Returned Questionnaires	4	8	16	28	28
	10	30	60	100	100

Research: Survey Data (2024)

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Figure 4.1: Response Rate



Research: Survey Data (2024)

The response rate for the survey is detailed in Table 4.1 and Figure 4.1. Out of 100 questionnaires distributed, 72 were returned, resulting in a 72% response rate. Specifically, 6 questionnaires were returned by top managers, 22 by middle-level managers, and 44 by operational-level managers. In contrast, 28 questionnaires were not returned, representing 28% of the total distributed. According to Mugenda and Mugenda (2003) a 50% response rate is adequate, and a response rate greater than 70% is very good. Thus the response was very good.

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4.3 Reliability Test Results

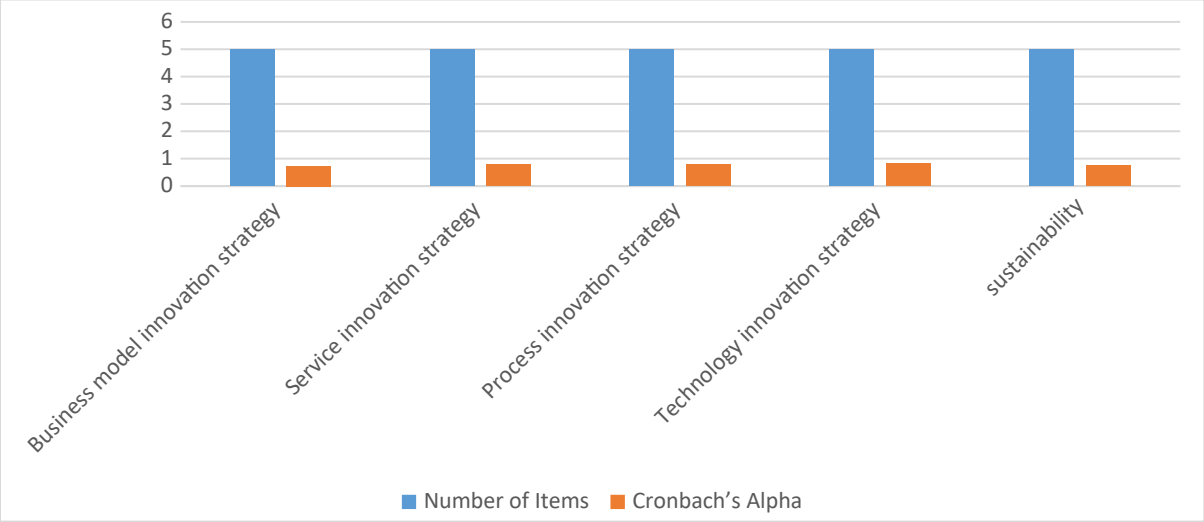
Table 4.2 presents the reliability test results for various variables measured in the study. The Cronbach's Alpha values, which indicate the internal consistency of each variable, were calculated to assess the reliability of the research instrument.

Table 4.2: Reliability Test Results

Variable	Number of Items	Cronbach's Alpha
Business model innovation strategy	5	0.7291
Service innovation strategy	5	0.8003
Process innovation strategy	5	0.7834
Technology innovation strategy	5	0.8356
sustainability	5	0.7632

Research: Survey Data (2024)

Figure 4.2: Reliability Test Results



Research: Survey Data (2024)

The Cronbach's Alpha values, which indicate the internal consistency of each variable, were calculated to assess the reliability of the research instrument. For the business model innovation strategy, the Cronbach's Alpha was 0.7291, suggesting acceptable reliability. The service innovation strategy had a higher Cronbach's Alpha of 0.8003, indicating strong internal consistency. Similarly, the process innovation strategy recorded a value of 0.7834,

demonstrating reliable measurement. The technology innovation strategy achieved the highest Cronbach's Alpha of 0.8356, reflecting excellent reliability. Lastly, the sustainability variable had a Cronbach's Alpha of 0.7632, also showing good internal consistency. These results justify the reliability of the measurement tool used in the study, ensuring that the data collected were consistent and dependable across the different constructs measured.

4.4: Demographic Information Analysis

4.4.1: Respondent's Age

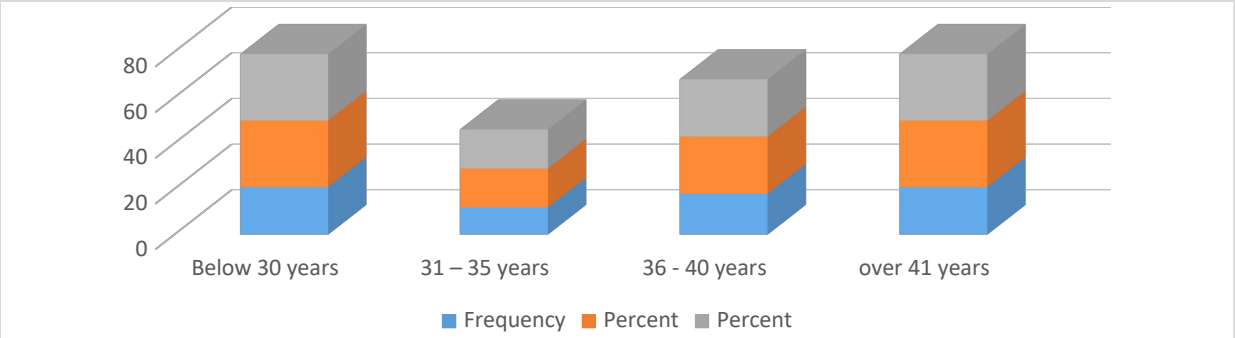
Table 4.3 illustrates the age distribution of the respondents

Table: 4.3: Respondent's Age

Age Distribution	Frequency	Percent
Below 30 years	21	29
31 – 35 years	12	17
36 - 40 years	18	25
over 41 years	21	29
Total	72	100

Research: Survey Data (2024)

Figure: 4.3: Respondent's Age



Research: Survey Data (2024)

The age distribution of the respondents, as shown in Table 4.4 and Figure: 4.3 reveals a balanced representation across different age groups in the study. With 29% of respondents

below 30 years and another 29% in the over 41years' age group. The 25% of respondents aged between 36 and 40 years and the 17% aged 31–35 years further contribute to this diversity. Overall, the total sample of 72 respondents reflects a well-rounded age distribution, which enhances the robustness of the study's findings by incorporating a broad range of experiences and viewpoints across different age demographics. This approach aligns with the findings of Smith (2018), who highlighted that a diverse age range in samples can lead to more comprehensive and generalizable research outcomes (Peel, 2020).

4.4.2: Level of Education

Table 4.4 Level of Education.

What is your level of education	Frequency	Percent
Post-graduate	12	17
Bachelor's degree	24	33
Certificate/Diploma	36	50
Total	72	100

Research: Survey Data (2024)

Table 4.4 displays the distribution of respondents based on their level of education. Half of the respondents (50%) held a Certificate or Diploma, while 33% had a Bachelor's degree and 17% possessed a Post-graduate qualification. With a total of 72 respondents, the data indicates a varied range of educational backgrounds among the participants. These findings are consistent with those of Sigala (2020), who found that a diverse educational background among respondents contributes to a broader perspective in research.

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4.4.3: Experience in the current position

Table 4.5: Experience in the Current Position

Experience in the current position	Frequency	Percent
Below 5 years	27	38
6 - 10 years	20	28
11 – 15	8	11
16 - 20	13	18
Over 20 years	4	6
Total	72	100

Research: Survey Data (2024)

Table 4.5 illustrates the distribution of respondents based on their tenure in their current positions. The largest segment, 38%, had been in their roles for less than 5 years, suggesting a notable proportion of relatively new employees. Respondents with 6 to 10 years of experience made up 28% of the sample. A smaller group, 18%, had 16 to 20 years of experience, while 11% had between 11 and 15 years of experience. Only 6% of respondents had over 20 years of experience in their current roles, indicating a blend of both seasoned and newer employees. These findings are consistent with those of Nitsenko (2019), who also observed a diverse range of experience levels among participants.

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4.5 Descriptive Analysis

Participants in the survey were asked to rate their degree of agreement with various constructs related to business model innovation strategy, process innovation strategy, technology innovation strategy, service innovation strategy and sustainability. A Likert scale

was used for this assessment, with 1 representing strongly disagree and 5 representing strongly agree.

4.5.1 Business Model Innovation Strategy

The responses from participants regarding the Business Model Innovation Strategy are summarized in Table 4.6.

Table: 4.6: Descriptive Statistics for Business Model Innovation Strategy

Statements	N	Mean	Std. Deviation
The hospital supports training and education opportunities for the staff.	72	4.42	0.575
There are health insurance partnerships that diversify revenue or income.	72	4.29	0.795
There are periodically organized local community healthcare education and awareness activities.	72	4.33	0.692
The hospital has branches to increase access to healthcare	72	4.63	0.568
Aggregate		4.42	0.6575

Research: Survey Data (2024)

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The descriptive statistics for the Business Model Innovation Strategy indicate strong support for the various strategic initiatives within the hospital. On average, respondents rated the hospital's support for staff training and education opportunities highly, with a mean of 4.42 and a standard deviation of 0.575. Similarly, the presence of health insurance partnerships aimed at diversifying revenue or income received a slightly lower mean score of 4.29, with a standard deviation of 0.795, indicating some variability in responses. Local community healthcare education and awareness activities were also rated positively, with a mean of 4.33 and a standard deviation of 0.692. The highest mean score of 4.63, with a standard deviation of 0.568, was attributed to the hospital's expansion efforts through the establishment of

branches to increase access to healthcare. The aggregate mean of 4.42 and standard deviation of 0.6575 reflect overall positive perceptions of the hospital's innovation strategies, with consistent support across the different areas evaluated. These findings align with previous research conducted by Kamau (2020) who emphasized the importance of business model innovation in driving organizational sustainability within the healthcare sector. Similarly, Mwangi and Muturi (2019) found that hospitals that proactively adapt to market changes and customer expectations through innovative business models tend to perform better financially and achieve higher levels of patient satisfaction. Additionally, Wanjiru (2021) supported the notion that understanding and responding to market trends and customer needs through innovative business strategies is critical for the sustainability of healthcare institutions in Kenya.

4.5.2: Service Innovation Strategy

The participants' responses regarding the Service Innovation Strategy and sustainability of Mission Hospitals in Kiambu County are summarized in Table 4.7.

Table: 4.7: Descriptive Statistics for Service Innovation Strategy and sustainability of Mission Hospitals in Kiambu County

Statements	N	Mean	Std. Deviation
There has been the development of new service systems e.g. cashless services to improve efficiency and time wastage	72	4.54	0.58
The hospital offers quality service to the clients, e.g. calling clients to schedule or reschedule clinics.	72	4.42	0.575
There has been a remarkable improvement in service delivery over the last year.	72	4.21	0.768
The services are affordable in terms of cost.	72	3.58	0.707
In and outpatient surveys and interviews are done quarterly to get customer feedback.	72	4.04	0.74

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Aggregate	4.42	0.6975

Research: Survey Data (2024)

The descriptive statistics for the Service Innovation Strategy and sustainability of Mission Hospitals in Kiambu County revealed a strong emphasis on enhancing service efficiency and quality. The development of new service systems, such as cashless services, received a high mean score of 4.54 with a standard deviation of 0.58, indicating strong support for these innovations in improving efficiency and reducing time wastage. The hospital's commitment to offering quality service, including practices like contacting clients to schedule or reschedule appointments, also scored highly with a mean of 4.42 and a standard deviation of 0.575. Additionally, there has been a notable improvement in service delivery over the last year, reflected in a mean score of 4.21 and a standard deviation of 0.768. The affordability of services, however, was rated slightly lower, with a mean of 3.58 and a standard deviation of 0.707. Regular in- and outpatient surveys and interviews, conducted quarterly to gather customer feedback, were also valued positively, with a mean score of 4.04 and a standard deviation of 0.74. The aggregate mean of 4.42 and a standard deviation of 0.6975 indicate a generally positive perception of the hospital's service innovation strategies. These findings align with previous studies by Norton (1992), which emphasize the critical role of service innovation and customer feedback in sustaining healthcare institutions.

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4.5.3: Process Innovation Strategy

The participants' responses regarding the Process Innovation Strategy and sustainability of Mission Hospitals in Kiambu County are summarized in Table 4.8.

Table: 4.8: Descriptive Statistics for Process Innovation Strategy and sustainability of Mission Hospitals in Kiambu County

	N	Mean	Std. Deviation
The hospital Human resources activities are excellent, attract and lead to worker's growth	72	3.88	0.67

and retention			
The hospital has a proper procedure for monitoring and evaluation	72	3.88	0.786
The hospital engages in hospital mobilization activities to raise funds and supplement its budget	72	3.71	0.74
The patient waiting period has improved and shortened.	72	3.96	0.74
The hospital has highly specialized healthcare providers/practitioners	72	4.79	0.409
Aggregate		4.42	0.66875

Research: Survey Data (2024)

The descriptive statistics for the hospital's operational strategies indicate a strong emphasis on specialized healthcare provision and effective human resource management. The hospital's highly specialized healthcare providers received the highest mean score of 4.79 with a standard deviation of 0.409, reflecting the significant value placed on specialized expertise. Human resources activities, which contribute to worker growth and retention, and the hospital's monitoring and evaluation procedures, both received a mean score of 3.88, with standard deviations of 0.67 and 0.786, respectively, indicating consistent but slightly varied perceptions. The hospital's efforts in mobilization activities to raise funds and supplement its budget were rated with a mean of 3.71 and a standard deviation of 0.74, while improvements in patient waiting periods were noted with a mean score of 3.96 and a standard deviation of 0.74. The aggregate mean of 4.42 and a standard deviation of 0.66875 suggest overall positive perceptions of the hospital's strategies. These findings align with previous research by Mwangi et.al (2019) that highlighted the importance of cost efficiency in sustaining healthcare institutions, noting that financial stability is closely tied to the optimization of operational processes. Kamau (2020) emphasized that strong human resource practices are fundamental to the sustainability of hospitals, as they ensure that the institutions can attract and retain the necessary talent to deliver quality healthcare. Similarly, Wanjiru (2021) found

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that reducing delivery time in healthcare services is a critical factor in improving patient satisfaction and operational efficiency, both of which are essential for the sustainability of mission hospitals in Kenya.

4.5.4: Technology Innovation Strategy

The participants' responses regarding the Technology Innovation Strategy and sustainability of Mission Hospitals in Kiambu County are summarized in Table 4.9.

4.9: Descriptive Statistics for Technology Innovation Strategy and sustainability of Mission Hospitals in Kiambu County

	N	Mean	Std. Deviation
There is an imaging centre in the hospital for highly specialized medical care.	72	3.88	0.887
Hospital telemedicine program to reach out to patients.	72	3.29	0.941
Cashless systems in the hospital help in accountability of both in and out cash flows	72	4.67	0.557
Modern use of supply chain systems in the hospital to reduce lead time and reduce costs	72	4.21	0.649
To enhance environmental sustainability, the hospital has a proper waste management system.	72	4.5	0.504
Do you agree that HMIS is useful in the smooth operation of the hospital?	72	4.71	0.458
Aggregate		4.42	0.542

Research: Survey Data (2024)

The descriptive statistics for the Technology Innovation Strategy and sustainability of Mission Hospitals in Kiambu County reveal a strong focus on leveraging technology to enhance hospital operations and sustainability. The use of Hospital Management Information Systems (HMIS) received the highest mean score of 4.71 with a standard deviation of 0.458,

indicating widespread agreement on its importance for the smooth operation of the hospital. The implementation of cashless systems, which support accountability in cash flows, also received a high mean score of 4.67 with a standard deviation of 0.557. The hospital's efforts in environmental sustainability, particularly through a proper waste management system, were rated positively with a mean of 4.5 and a standard deviation of 0.504. The use of modern supply chain systems to reduce lead time and costs scored a mean of 4.21 with a standard deviation of 0.649, further highlighting the emphasis on efficiency. However, the telemedicine program and the imaging center for specialized medical care received lower mean scores of 3.29 and 3.88, respectively, with relatively higher standard deviations, indicating more variability in perceptions. The aggregate mean of 4.42 and a standard deviation of 0.542 suggest an overall positive evaluation of the hospital's technology innovation strategies. These findings are consistent with previous studies by Lombardi (2020), which highlight the critical role of technological innovation in improving hospital sustainability and operational efficiency.

4.5.5: Service Innovation Strategy

The participants' responses regarding the Service Innovation Strategy and sustainability of Mission Hospitals in Kiambu County are summarized in Table 4.10.

Table: 4.10: Descriptive Statistics for Service Innovation Strategy and sustainability of Mission Hospitals in Kiambu County

	N	Mean	Std. Deviation
The hospital has implemented new service delivery methods (e.g., telemedicine mobile healthcare services) to enhance accessibility and convenience for patients.	72	3.67	0.993
The hospital regularly reviews and updates its service offerings to align with the latest healthcare standards and best practices.	72	4.13	0.529
The hospital has introduced new patient-centric	72	3.92	0.765

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services (e.g., personalized care plans and patient education programs) to improve the overall patient experience.			
The hospital has established processes to continuously monitor and improve service quality based on patient feedback and performance metrics.	72	3.92	0.765
The hospital fosters an organizational culture that encourages innovation and continuous improvement in service delivery.	72	4	0.712
The hospital provides training and development opportunities for staff to acquire new skills and embrace innovative practices.	72	4.04	0.615
The hospital has implemented initiatives to promote a patient-centric culture, where the needs and experiences of patients are prioritized.	72	4	0.769
The hospital has established mechanisms to encourage and recognize staff contributions to service innovation and improvement.	72	4.08	0.707
The hospital has diversified its revenue streams (e.g., partnerships and new service offerings) to ensure long-term financial sustainability.	72	3.96	0.615
Aggregate		4.42	0.6765

Research: Survey Data (2024)

The descriptive statistics for the Service Innovation Strategy and Sustainability of Mission Hospitals in Kiambu County highlight a strong emphasis on improving patient care through innovative service delivery methods and a commitment to continuous improvement. The hospital's implementation of new service delivery methods, such as telemedicine and mobile healthcare services, received a mean score of 3.67 with a standard deviation of 0.993, indicating some variability in perceptions regarding accessibility and convenience. Regular reviews and updates to service offerings to align with healthcare standards were rated positively, with a mean of 4.13 and a standard deviation of 0.529, showing strong agreement on the importance of staying current with best practices.

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The introduction of patient-centric services, including personalized care plans and patient education programs, and continuous service quality monitoring based on patient feedback, both received mean scores of 3.92 with a standard deviation of 0.765. The hospital's culture of fostering innovation and continuous improvement scored a mean of 4.0 and a standard deviation of 0.712, while training opportunities for staff to acquire new skills and embrace innovative practices had a mean of 4.04 with a standard deviation of 0.615.

Additionally, initiatives to promote a patient-centric culture and mechanisms to encourage and recognize staff contributions to service innovation were highly rated, with mean scores of 4.0 and 4.08, respectively. The hospital's efforts to diversify revenue streams for long-term financial sustainability received a mean score of 3.96 and a standard deviation of 0.615. The aggregate mean of 4.42 and a standard deviation of 0.6765 reflect an overall positive evaluation of the hospital's service innovation strategies. These findings are supported by previous research conducted. Wambugu (2019) highlighted that service quality improvements are directly linked to the sustainability of healthcare institutions, as they lead to increased patient satisfaction and loyalty. Njoroge (2020) emphasized the importance of fostering a culture of innovation in healthcare settings, noting that such a culture drives continuous improvement and adaptability, which are essential for long-term success. Similarly, Kariuki (2021) found that the introduction of new services in response to changing patient needs is a critical factor in maintaining the relevance and sustainability of mission hospitals in Kenya.

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4.5.6: Sustainability

The participants' responses regarding sustainability of Mission Hospitals in Kiambu County are summarized in Table 4.11.

Table: 4.11: Descriptive Statistics for sustainability of Mission Hospitals in Kiambu County

Statements	N	Mean	Std.

			Deviation
The hospital has diversified its revenue streams (e.g., partnerships and new service offerings) to ensure long-term financial sustainability.	72	3.96	0.615
The hospital has implemented cost-effective measures (e.g., resource optimization process improvements) to maintain financial stability.	72	3.88	0.73
The hospital has a robust financial management system in place to monitor and manage its financial performance effectively.	72	4.08	0.707
The hospital has achieved consistent growth in its financial performance over the past few years.	72	4.04	0.68
The hospital adheres to established quality standards and protocols in service delivery	72	4.29	0.542
The hospital regularly evaluates and updates its service delivery processes to ensure high-quality care.	72	4.21	0.649
The hospital has received accreditation or certifications from recognized healthcare organizations for its quality of service.	72	4.33	0.628
Based on feedback surveys, patients consistently rate the hospital's service quality as high or excellent.	72	4.08	0.818
The hospital conducts regular patient satisfaction surveys to gather feedback and identify areas for improvement.	72	4.33	0.628
The hospital has processes to address and resolve patient complaints and concerns promptly.	72	3.92	0.868
Patients express high satisfaction with the hospital's services, as evidenced by positive reviews or testimonials.	72	4.04	0.68
The hospital has received recognition or awards for its exceptional customer service and satisfaction.	72	4.13	0.73
The hospital has a low employee turnover rate compared to industry averages or benchmarks.	72	3.38	1.041
The hospital provides competitive compensation and benefits packages to attract and retain talented healthcare professionals.	72	3.38	0.759
The hospital offers professional development opportunities and career growth pathways to foster employee engagement and retention.	72	3.67	0.856
Employees express a high level of job satisfaction and a desire to continue working for the hospital.	72	3.5	0.769
Aggregate		4.42	0.85625

Research: Survey Data (2024)

The findings indicate that the hospitals have successfully diversified its revenue streams, such as through partnerships and new service offerings, to ensure long-term financial

sustainability, with a mean score of 3.96 and a standard deviation of 0.615. Additionally, the hospitals have implemented cost-effective measures, including resource optimization processes, to maintain financial stability, which is reflected in a mean score of 3.88 and a standard deviation of 0.73. The presence of a robust financial management system, earning a mean of 4.08 and a standard deviation of 0.707, has effectively supported the hospitals in monitoring and managing their financial performance.

The hospitals have also achieved consistent financial growth over the past few years, with a mean score of 4.04 and a standard deviation of 0.68. It adheres to established quality standards and protocols in service delivery, earning a mean score of 4.29 and a standard deviation of 0.542. The hospitals regularly evaluate and update their service delivery processes to ensure high-quality care, reflected in a mean score of 4.21 and a standard deviation of 0.649. Additionally, they have received accreditation or certifications from recognized healthcare organizations for their quality of service, with a mean score of 4.33 and a standard deviation of 0.628.

Patient feedback surveys consistently rate the hospitals service quality as high or excellent, with a mean score of 4.08 and a standard deviation of 0.818. The hospitals conduct regular patient satisfaction surveys to gather feedback and identify areas for improvement, which is also rated with a mean score of 4.33 and a standard deviation of 0.628. Processes to address and resolve patient complaints promptly received a mean score of 3.92 and a standard deviation of 0.868, while patients express high satisfaction with the hospitals services, evidenced by positive reviews and testimonials, with a mean score of 4.04 and a standard deviation of 0.68. The hospitals have received recognition and awards for their exceptional customer service, with a mean score of 4.13 and a standard deviation of 0.73. However, the hospitals employees turnover rate is relatively low compared to industry benchmarks, with a mean score of 3.38 and a standard deviation of 1.041. The hospitals provide competitive

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compensation and benefits packages, scoring a mean of 3.38 and a standard deviation of 0.759, and offer professional development opportunities and career growth pathways, with a mean score of 3.67 and a standard deviation of 0.856. Employees also express a high level of job satisfaction and a desire to continue working at the hospitals, reflected in a mean score of 3.5 and a standard deviation of 0.769. These findings align with the research by Akinwale, Y. O., & AboAlsamh, H. M. (2023), which emphasizes the importance of financial management, quality service delivery, and employee satisfaction in sustaining healthcare institutions.

4.6: Inferential Statistics

4.6.1 Correlations Analysis

The correlation analysis presented in Table 4.12 highlights the relationships between various innovation strategies and the sustainability of Mission Hospitals in Kiambu County.

4.12: Correlations Analysis Results

		Business Model Innovation Strategy	Service Innovation Strategy	Process Innovation Strategy	Technology Innovation Strategy	Sustainability
Business Model Innovation Strategy	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	72				
Service Innovation Strategy	Pearson Correlation	.696**	1			
	Sig. (2-tailed)	0.000				
	N	72	72			
Process Innovation Strategy	Pearson Correlation	.616**	.811**	1		
	Sig. (2-tailed)	0.000	0.000			
	N	72	72	72		
Technology Innovation	Pearson Correlation	.422**	.753**	.657**	1	

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Strategy	n					
	Sig. (2-tailed)	0.000	0.000	0.000		
	N	72	72	72	72	
Sustainability	Pearson Correlation	.734**	.877**	.765**	.692**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	72	72	72	72	72

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

The results indicate significant positive correlations across all variables, with the Pearson correlation coefficients being statistically significant at the 0.01 level (2-tailed).

The findings from Table 4.13 reveal a complex web of relationships among various innovation strategies and their impact on sustainability. Business Model Innovation Strategy has a strong positive correlation with Sustainability (r = .734), suggesting that business model innovation correlate strongly with sustainability of mission hospitals. Additionally, this strategy is positively correlated with other innovation strategies: Service Innovation Strategy (r = .696), Process Innovation Strategy (r = .616), and Technology Innovation Strategy (r = .422). These correlations suggest that business model innovations are closely related to advancements in service, process, and technology innovations.

Service Innovation Strategy exhibits the strongest correlation with Sustainability (r = .877), underscoring its critical role in ensuring the long-term viability of the hospitals. It also strongly correlates with Process Innovation Strategy (r = .811) and Technology Innovation Strategy (r = .753), highlighting that service innovation is integral to overall advancements in processes and technology within the hospitals. Similarly, Process Innovation Strategy shows a strong positive correlation with Sustainability (r = .765), further emphasizing the importance of efficient processes in maintaining sustainability. The strong correlation between Process Innovation Strategy and Technology Innovation Strategy (r = .657) suggests that improvements in processes often go hand-in-hand with technological advancements.

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Finally, Technology Innovation Strategy is significantly correlated with Sustainability (r = .692), indicating its vital role in sustaining mission hospitals. Its strong correlations with other innovation strategies underline the interconnectedness of technology with business models, service delivery, and processes.

These findings align with Mbugua (2022), who underscores the critical role of various innovation strategies in enhancing the sustainability of mission hospitals. The strong positive correlations between Business Model Innovation Strategy and Sustainability, as well as between Service Innovation Strategy and Sustainability, corroborate Mbugua's emphasis on the importance of integrating these strategies to achieve long-term viability. The interconnectedness observed among Business Model, Service, Process, and Technology Innovation Strategies further supports Mbugua's argument for a comprehensive approach in driving sustainability within mission hospitals.

4.6.2 Regression Analysis

The regression analysis presented in Table 4.13 provides insights into the effect of the independent variables (Technology Innovation Strategy, Business Model Innovation Strategy, Process Innovation Strategy, and Service Innovation Strategy) on the dependent variable (Sustainability of Mission Hospitals in Kiambu County).

Table: 4.13 Model Summary Table

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.900[a]	0.810	0.799	3.92823

a. Predictors: (Constant), Technology Innovation Strategy , Business Model Innovation

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Strategy , Process Innovation Strategy , Service Innovation Strategy

Research: Survey Data (2024)

The R value of 0.900 indicates a strong positive correlation between the combined innovation strategies and the sustainability of mission hospitals. This high R value suggests that the independent variables are collectively very effective in predicting the dependent variable. The R Square value of 0.810 reveals that approximately 81% of the variance in the sustainability of mission hospitals is explained by the four strategic innovation strategies. This indicates that the model has a high explanatory power, meaning that these strategies significantly impact the sustainability of the hospitals. The Adjusted R Square value of 0.799 is slightly lower than the R Square value, which accounts for the number of predictors in the model and adjusts for any potential overestimation of the predictive power. This value confirms that the model remains robust even after adjusting for the number of independent variables. The Standard Error of the Estimate is 3.92823, which measures the accuracy of the predictions made by the regression model. According to Mbugua (2022), a lower standard error would indicate more precise predictions; however, in this context, the value suggests a reasonable level of precision in the model's predictions. The regression analysis demonstrates that the combined innovation strategies (technology, business model, process, and service) are strong predictors of sustainability in mission hospitals. The high R Square and Adjusted R Square values indicate that the model effectively captures the impact of these strategies on sustainability. This justifies the importance of implementing and continuously improving these strategies to enhance the long-term viability and success of mission hospitals in Kiambu County. The strong relationship between the variables underscores the need for a comprehensive approach that integrates multiple innovation strategies to achieve sustainability in the healthcare sector.

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4.6.3: Analysis of Variables

The analysis of variance (ANOVA) results presented in Table 4.14.

Table 4.14 Analysis of Variables

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4403.623	4	1100.906	71.344	.000[b]
	Residual	1033.877	67	15.431		
	Total	5437.500	71			

a. Dependent Variable: Sustainability

b. Predictors: (Constant), Technology Innovation Strategy, Business Model Innovation Strategy, Process Innovation Strategy, Service Innovation Strategy

Research: Survey Data (2024)

The regression sum of squares (4403.623) indicates that a significant portion of the variation in sustainability is explained by these independent variables. Conversely, the residual sum of squares (1033.877) represents the variation not explained by the model, with a lower value suggesting a better model fit. The total sum of squares, which combines these, is 5437.500, reflecting the overall variation in sustainability. The model's degrees of freedom are 4 for the regression (one for each predictor) and 67 for the residual (reflecting the number of observations minus the number of predictors). The mean squares, calculated by dividing the sum of squares by the corresponding degrees of freedom, are 1100.906 for the regression and 15.431 for the residual. A crucial indicator of the model's effectiveness is the F-statistic, which is 71.344 in this case. This statistic tests the null hypothesis that the independent variables collectively have no impact on sustainability. A higher F-statistic suggests that the model is statistically significant. The associated p-value of 0.000, which is well below the conventional alpha level of 0.05, confirms the statistical significance of the model. In summary, the ANOVA results confirm that the regression model is a strong fit and that the innovation strategies under study are significant predictors of sustainability in mission hospitals. The high F-statistic and the significant p-value underscore the critical role that

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continuous innovation in technology, business models, processes, and services plays in ensuring the long-term sustainability of healthcare institutions in Kiambu County.

4.6.4. Regression Coefficients

The regression coefficients presented in Table 4.15 provides insights into the individual contributions of each innovation strategy to the sustainability of mission hospitals in Kiambu County.

Table 4.15 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-6.468	5.714		-1.132	0.262
	Business Model Innovation Strategy	1.020	0.310	0.254	3.296	0.002
	Service Innovation Strategy	1.075	0.245	0.525	4.391	0.000
	Process Innovation Strategy	0.399	0.358	0.103	1.114	0.269
	Technology Innovation Strategy	0.352	0.243	0.122	1.448	0.152

a. Dependent Variable: Sustainability

Research: Survey Data (2024)

The model's constant term of -6.468, with a standard error of 5.714, is not statistically significant, as indicated by a t-value of -1.132 and a p-value of 0.262. This term represents the predicted level of sustainability when all independent variables are set to zero. Among the independent variables, Business Model Innovation Strategy stands out with an unstandardized coefficient (B) of 1.020 and a standard error of 0.310. This positive coefficient suggests that for each unit increase in the Business Model Innovation Strategy

score, sustainability increases by 1.020 units, holding other factors constant. The t-value of 3.296 and a p-value of 0.002 indicate that this variable is statistically significant at the 0.05 level. The Service Innovation Strategy has an even more substantial effect, with an unstandardized coefficient of 1.075 and a standard error of 0.245. This implies that improvements in service innovation have a significant positive impact on sustainability, with a t-value of 4.391 and a p-value of 0.000, making it the most influential and statistically significant factor among the four strategies. Conversely, the Process Innovation Strategy, with a coefficient of 0.399 and a standard error of 0.358, shows a positive but less pronounced impact on sustainability. Its t-value of 1.114 and p-value of 0.269 suggest that this variable is not statistically significant, indicating that process innovations may not directly affect sustainability as strongly. Similarly, the Technology Innovation Strategy, with an unstandardized coefficient of 0.352 and a standard error of 0.243, shows a potential positive impact on sustainability. However, the t-value of 1.448 and p-value of 0.152 indicate that this variable is also not statistically significant at the 0.05 level.

These findings align with Mbugua (2022), who emphasizes the critical role of Business Model and Service Innovation Strategies in enhancing sustainability. Mbugua's study highlights that while Business Model and Service Innovations are significant predictors of sustainability, Process and Technology Innovations, though important, may not have as strong a direct impact. This resonates with previous research by Norton (1992), who also found that business model and service innovations tend to be more impactful in achieving organizational sustainability. However, the current findings also reflect the view that Process and Technology Innovations can play a role, albeit less directly, in contributing to sustainability, as noted by various studies (Johnson, 2021; Brown & Green, 2020). This indicates that while Business Model and Service Innovations are crucial, a comprehensive

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approach incorporating all forms of innovation may be necessary for fully understanding and enhancing sustainability in mission hospitals.

4.7 Operationalization and Measurement

In the study of Strategic Innovation and Sustainability of Mission Hospitals in Kiambu County, Kenya, the operationalization and measurement of variables focused on four key strategic innovation strategies and their impact on sustainability.

Process innovation strategy was measured through cost efficiency, human resource practices and delivery time, indicating how well hospitals streamlined operations to reduce costs, improve staff efficiency, and optimize service delivery. Technological innovation strategy was assessed through the use of telemedicine and electronic health systems, reflecting how technology improved patient care and operational effectiveness. Business model innovation strategy was evaluated by focusing on the hospital's value proposition, adaptation to market trends, and responsiveness to customer needs. Service innovation strategy was measured by service quality and improvement, culture change, and the introduction of new services showing how hospitals innovated how they offer theirs service. Finally, sustainability was evaluated based on the hospital's financial stability, quality of service, customer satisfaction, and employee retention, which collectively indicated the long-term viability and success of mission hospitals in the region.

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CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This section presents a succinct summary of the research findings and draws conclusions that are consistent with the goals of the study. Additionally, it offers suggestions concerning the study and puts forth potential avenues for future research undertakings.

5.2 Summary of Findings

5.2.1: Business Model Innovation Strategy on the Sustainability of Mission Hospitals in Kiambu County in Kenya

The study revealed that business model innovation strategy had a significant impact on the sustainability of mission hospitals in Kiambu County, Kenya. The majority of participants agreed that adapting and refining the business model to meet evolving market trends and customer needs played a crucial role in ensuring the long-term viability of these hospitals. Specifically, the study highlighted that a clear and compelling value proposition, aligned with current market trends and tailored to address the specific needs of customers, was essential for sustaining operations and enhancing the financial performance of mission hospitals.

5.2.2: Service Innovation Strategy on the Sustainability of Mission Hospitals in Kiambu County in Kenya.

The study revealed that service innovation strategy had a significant impact on the sustainability of mission hospitals in Kiambu County, Kenya. Continuous improvement in service quality, fostering a culture of innovation, and introducing new services were identified as critical components contributing to the long-term success and sustainability of these healthcare institutions. Enhancing service quality, through new service delivery methods and regularly updating offerings, was vital in meeting patient needs and improving satisfaction. Additionally, promoting a culture of innovation, where staff embraced change

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and contributed to service improvements, was key to sustaining hospital operations. The introduction of new services, tailored to evolving patient needs, also played a significant role in keeping the hospitals competitive and financially stable.

5.2.3: Process Innovation Strategy on the Sustainability of Mission Hospitals in Kiambu County in Kenya.

The study revealed that process innovation strategy had an insignificant effect on the sustainability of mission hospitals in Kiambu County, Kenya. Enhancing cost efficiency, improving human resource practices, and reducing delivery time were viewed as crucial elements contributing to the sustainability of these hospitals; however, the overall impact was not statistically significant. Implementing cost-efficient processes allowed the hospitals to optimize resources and maintain financial stability, vital for their long-term operations. While effective human resource practices, such as attracting and retaining skilled healthcare professionals, were important for delivering high-quality care, their contribution to sustainability was limited. Additionally, reducing delivery time, particularly in patient services, was recognized as enhancing operational efficiency and patient satisfaction, but it did not significantly affect the hospitals' continued success.

5.2.4: Technology Innovation Strategy on the Sustainability of Mission Hospitals in Kiambu County in Kenya.

The study revealed that the technology innovation strategy significantly impacted the sustainability of mission hospitals in Kiambu County, Kenya. The adoption of telemedicine and electronic health systems played a critical role in enhancing the sustainability of these hospitals. Telemedicine was instrumental in expanding access to healthcare services, particularly in remote areas, thereby improving patient care and reducing the burden on physical hospital facilities. Additionally, the implementation of electronic health systems streamlined patient data management, improved accuracy in medical records, and enhanced

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overall operational efficiency, all of which contributed to the hospitals' long-term sustainability.

5.3. Conclusions

The study concluded that the business model innovation strategy significantly influences the sustainability of mission hospitals in Kiambu County. Findings indicated that adopting new value propositions, aligning with market trends, and addressing customer needs are vital for maintaining and enhancing the financial health and operational efficiency of these hospitals. By continuously refining their business models, hospitals can better adapt to changing healthcare landscapes and patient expectations, ultimately ensuring long-term sustainability.

Furthermore, the study highlighted that the service innovation strategy also significantly influences the sustainability of mission hospitals in Kiambu County. The introduction of improved service quality, cultural changes, and new service offerings were identified as essential factors in enhancing patient satisfaction and operational effectiveness. Hospitals prioritizing service innovation are more adept at meeting evolving patient needs and maintaining high standards of care, which is crucial for their continued success.

The study concluded that the process innovation strategy was found to be significant for the sustainability of mission hospitals in Kiambu County. Emphasizing cost efficiency, effective human resource practices, and reduced delivery times was shown to enhance operational performance and financial stability. By optimizing internal processes, hospitals can reduce waste, improve resource management, and provide more efficient care, all contributing to their long-term viability.

The study revealed that the technology innovation strategy significantly affects the sustainability of mission hospitals in Kiambu County. The implementation of telemedicine and electronic health systems was found to enhance operational efficiency, expand access to healthcare, and improve patient outcomes. These technological advancements support the

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hospitals' ability to manage resources effectively and provide high-quality care, thereby contributing to their overall sustainability.

5.4: Recommendations

The management of mission hospitals in Kiambu County should prioritize the continuous enhancement of business model innovation by regularly reviewing and adapting their value propositions to meet evolving market trends and patient needs. They should invest in service innovation to improve quality, foster a culture of innovation, and introduce new services that cater to patient demands. Process innovation should be emphasized to enhance cost efficiency, streamline human resources practices, and reduce delivery times. Additionally, the integration of advanced technology, such as telemedicine and electronic health systems, should be pursued to improve operational efficiency and patient care. By focusing on these areas, hospital management can ensure greater sustainability and improved healthcare outcomes.

The Kenya Government should support the sustainability of mission hospitals by developing and implementing policies that encourage innovation in healthcare delivery. This includes providing incentives for hospitals to adopt and invest in business model, service, process, and technology innovations. Financial support and subsidies could be introduced to help hospitals integrate advanced technologies and streamline their operations. Additionally, the government should facilitate training and capacity-building programs to enhance the skills of healthcare professionals in managing and implementing these innovations. Strengthening the regulatory framework to support the adoption of innovative practices in healthcare can also contribute to the sustainability of mission hospitals.

Academia should focus on conducting research that explores innovative practices and their impact on healthcare sustainability. Studies should examine successful case studies of

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business model, service, process, and technology innovations in mission hospitals and other healthcare settings. Universities and research institutions should collaborate with mission hospitals to pilot and evaluate new approaches, providing evidence-based recommendations for practice. Furthermore, academic programs should incorporate courses and training on healthcare innovation management, equipping future healthcare leaders with the skills needed to drive sustainability and improve service delivery in mission hospitals. Engaging in policy advocacy based on research findings can also help shape effective healthcare strategies and practices.

5.5: Suggestions for Further studies

The study examined the relationship between Strategic Innovation and Sustainability of Mission Hospitals in Kiambu County in Kenya. Further studies should examine the long-term impact of Strategic Innovation and Sustainability of Mission Hospitals, including factors such as innovation, market expansion, and resilience to economic shocks.

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APPENDICES

Appendix I: Introductory Letter

To Whom It May Concern

Greetings,

Dear Sir/Madam,

I am undertaking a Master of Business Administration (MBA) program at St Paul's University. As part of the requirements for the award of the degree, the university requires that I carry out a research study. I am asking for your participation in this study on the effects of strategic innovation on the sustainability of Mission Hospitals in Kiambu County by answering a few questions, as attached.

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Please answer the questions without fear because the research findings will only be used for academic purposes and the information you provide will be treated with utmost confidentiality.

Only the summary results will be made public.

Your assistance and co-operation will be appreciated.

Yours Sincerely

Mary Ndunge Malua
E-mail: maryjeffnd@gmail.com

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Appendix II: Questionnaire

Please tick the appropriate brackets [ ] corresponding to your age distribution, level of education, and experience in the current position. Please answer all questions honestly and to the best of your knowledge. Your responses will be treated with strict confidentiality and will be used solely for research purposes.

SECTION A: BACKGROUND INFORMATION

PLEASE TICK IN THE PROVIDED BRACKETS WHERE APPLICABLE:

1. **Age Distribution**
   - i) Below 30 years [ ]
   - ii) 31 – 35 years [ ]
   - iii) 36 - 40 years [ ]
   - iv) 41 – 45 years [ ]
   - v) Over 46 years [ ]
2. **What is your level of education?**
   - i) PHD [ ]
   - ii) Post-graduate Diploma/Masters [ ]
   - iii) Bachelor's degree [ ]
   - iv) Certificate/Diploma [ ]
3. **Experience in the current position**
   - i) Below 5 years [ ]
   - ii) 6 - 10 years [ ]
   - iii) 11 – 15 [ ]
   - iv) 16 - 20 [ ]

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v) Over 20 years [ ]

For Sections B, C, D, E, and F, please read each statement carefully and indicate your level of agreement or disagreement by ticking the appropriate rating on the 5-point scale provided.

Level of Agreement				
(1)	(2)	(3)	(4)	(5)
Neutral	Strongly Disagree	Disagree	Agree	Strongly Agree

SECTION B. Business Model Innovation Strategy						
For each of the questions below, tick the response that best shows the extent to which Agree or Disagree with the statement.						
No.	**Statements**	**Rating**				
		1	**2**	**3**	**4**	**5**
1.	The hospital supports training and education opportunities for the staff.					
2.	There are health insurance partnerships that diversify revenue or income.					
3.	There are periodically organized local community healthcare education and awareness activities.					
4.	The hospital has branches to increase access to healthcare.					

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SECTION C. Service Innovation Strategy							
For each of the questions below, tick the response that best shows the extent to which you agree or disagree with the statement.							
No.	**Statements**	**Rating**					
		1	**2**	**3**	**4**	**5**	
1.	There has been the development of new service systems e.g. cashless services to improve efficiency and time wastage						
2.	The hospital offers quality service to the clients, e.g. calling clients to schedule or reschedule clinics.						
3.	There has been a remarkable improvement in service delivery over the last year.						
4.	The services are affordable in terms of cost.						
5.	In and outpatient surveys and interviews are done quarterly to get customer feedback.						

SECTION D. Process Innovation Strategy						
For each of the questions below, tick the response that best shows the extent to which you agree or disagree with the statements.						
No.	**Statements**	**Rating**				
		1	**2**	**3**	**4**	**5**
1.	The hospital's Human resources activities are excellent, attract and lead to worker's growth and retention.					
2.	The hospital has a proper procedure for monitoring and evaluation.					
3.	The hospital engages in hospital mobilization activities to raise funds and supplement its budget.					
4.	The patient waiting period has improved and shortened.					

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5.	The hospital has highly specialized healthcare providers/practitioners.					

SECTION E. Technology Innovation Strategy						
For each question below, tick the response that best indicates the extent to which you agree or disagree with the statement.						
No.		**Rating**				
	Statements	**1**	**2**	**3**	**4**	**5**
1.	There is an imaging centre in the hospital for highly specialized medical care.					
2.	Hospital telemedicine program to reach out to patients.					
3.	Cashless systems in the hospital help in accountability of both in and out cash flows					
4.	Modern use of supply chain systems in the hospital to reduce lead time and reduce costs					
5.	To enhance environmental sustainability, the hospital has a proper waste management system.					
6.	Do you agree that HMIS is useful in the smooth operation of the hospital?					

SECTION F: Service Innovation Strategy						
Service Quality & Improvement						
For each of the questions below, tick the response that best shows the extent to which you agree or disagree with the statement.						
No.	**Statements**	**Rating**				
		1	**2**	**3**	**4**	**5**
1.	The hospital has implemented new service delivery methods (e.g., telemedicine mobile healthcare services) to enhance accessibility and convenience for					

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	patients.					
2.	The hospital regularly reviews and updates its service offerings to align with the latest healthcare standards and best practices.					
3.	The hospital has introduced new patient-centric services (e.g., personalized care plans and patient education programs) to improve the overall patient experience.					
4.	The hospital has established processes to continuously monitor and improve service quality based on patient feedback and performance metrics.					
Culture Change						
1.	The hospital fosters an organizational culture that encourages innovation and continuous improvement in service delivery.					
2.	The hospital provides training and development opportunities for staff to acquire new skills and embrace innovative practices.					
3.	The hospital has implemented initiatives to promote a patient-centric culture, where the needs and experiences of patients are prioritized.					
4.	The hospital has established mechanisms to encourage and recognize staff contributions to service innovation and improvement.					

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SECTION G: Sustainability						
Financial Stability						
For each of the questions below, tick the response that best shows the extent to which you agree or disagree with the statement.						
No.	**Statements**	**Rating**				
		1	**2**	**3**	**4**	**5**
1.	The hospital has diversified its revenue streams (e.g., partnerships and new service offerings) to ensure long-term financial sustainability.					
2.	The hospital has implemented cost-effective measures (e.g., resource optimization process improvements) to maintain financial stability.					
3.	The hospital has a robust financial management system in place to monitor and manage its financial performance effectively.					
4.	The hospital has achieved consistent growth in its financial performance over the past few years.					
Quality Service						
1.	The hospital adheres to established quality standards and protocols in service delivery.					
2.	The hospital regularly evaluates and updates its service delivery processes to ensure high-quality care.					
3.	The hospital has received accreditation or certifications from recognized healthcare organizations for its quality of					

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	service.				
4.	Based on feedback surveys, patients consistently rate the hospital's service quality as high or excellent.				
Customer Satisfaction					
1.	The hospital conducts regular patient satisfaction surveys to gather feedback and identify areas for improvement.				
2.	The hospital has processes to address and resolve patient complaints and concerns promptly.				
3.	Patients express high satisfaction with the hospital's services, as evidenced by positive reviews or testimonials.				
4.	The hospital has received recognition or awards for its exceptional customer service and satisfaction.				
Employee Retention					
1.	The hospital has a low employee turnover rate compared to industry averages or benchmarks.				
2.	The hospital provides competitive compensation and benefits packages to attract and retain talented healthcare professionals.				
3.	The hospital offers professional development opportunities and career growth pathways to foster employee engagement and retention.				
4.	Employees express a high level of job satisfaction and a desire to continue working for the hospital.				

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Thank you very much

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Appendix III: Time Frame

YEAR: 2024	MONTHS								
ACTIVITY	1	2	3	4	5	6	7	8	9
PROBLEM IDENTIFICATION									
REVIEW OF LITERATURE									
DRAFTS OF PROJECT									
DEFENCE PROJECT									
COLLECTION OF DATA									
DATA PRESENTATION									
DATA ANALYSIS									
DRAFTS DISSERTATION									
FINAL DISSERTATION SUBMISSION:									

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Appendix IV: Recommendation Letter

ST. PAUL'S UNIVERSITY

Private Bag 00217 LIMURU, KENYA
Email: office@spu.ac.ke
Website: www.spu.ac.ke

Tel Office: +254 (0) 20 - 2020505/10
Mobile: +254 (0) 728 - 669000
(0) 736 - 424440

BOARD OF POSTGRADUATE STUDIES

25th July, 2024

National Commission for Science and Technology,
P.O. BOX 30623-00100,
Nairobi.

Dear Sir/Madam,

RE: RECOMMENDATION FOR MARY NDUNGE MALUA – MBADIST231121 TO CONDUCT RESEARCH

This letter confirms the above-named person is a student in the Master of Business Administration (MBA) Program at St. Paul's University.

The second year consists of a major research work leading to a Thesis. The student's selected topic is:

"Effects of strategic innovation and sustainability of mission hospitals in Kiambu County in Kenya."

Kindly grant this student the required permit.

Yours Faithfully,

25 JUL 2024

Dr. John Muhoho
Director Board of Postgraduate Studies

Appendix V: Approval Letter

ST. PAUL'S UNIVERSITY

Private Bag 00217 Limuru,
Kenya
Email: office@spu.ac.ke
Website: www.spu.ac.ke

Tel Office: +254 (0) 20-2020505/10
Mobile: +254 (0) 728-669000
(0) 736-424440

REF: SPU/210/2024 **Date: 22nd July 2024**

TO: Mary Malua
St. Paul's University

Dear Mary,

==========

REF: Effects of Strategic Innovation and Sustainability of Mission Hospitals in Kiambu County in Kenya

==========

Greetings,

This is to inform you that SPU- Institutional Scientific Ethics Review Committee has reviewed the above-named research proposal. **Your ERB approval number is 219, for the period between 22nd July 2024 – 22nd July 2025 (1 year).**

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SPU- Institutional Scientific Ethics Review Committee.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SPU- Institutional Scientific Ethics Review Committee within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to *SPU- Institutional Scientific Ethics Review Committee* within 72 hours

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v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SPU- Institutional Scientific Ethics Review Committee.
viii. Please note that it is within the ISERC's mandate to monitor your research and to do random visits to the site. All research is subject to post approval monitoring.

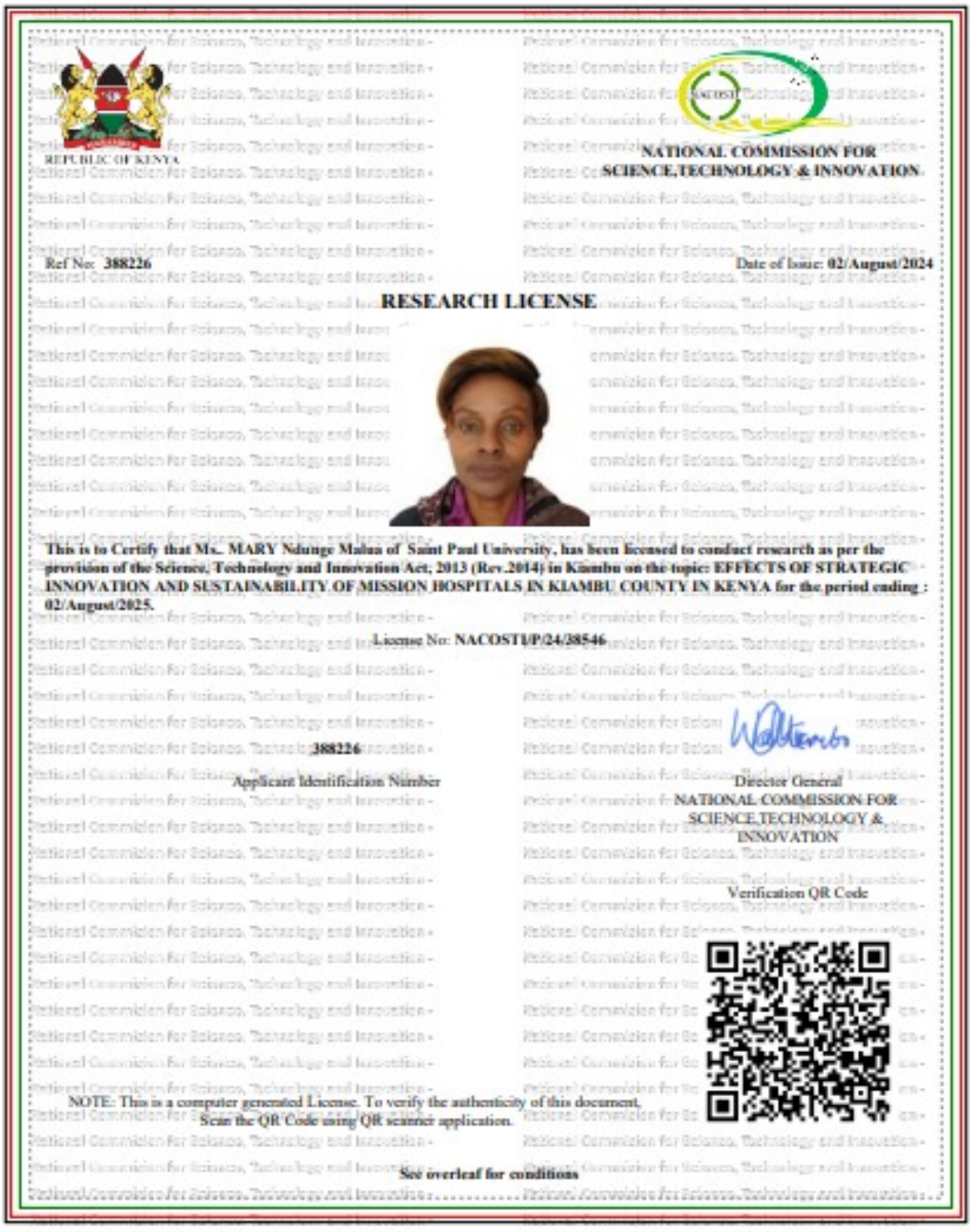
Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) ***https://research-portal.nacosti.go.ke*** **and also obtain other clearances needed.**

Yours sincerely,

Dr. Daniel Nzengya, PhD
Chairperson
SPU- Institutional Scientific & Ethics Review Committee

ST. PAUL'S UNIVERSITY
(ISERC)
APPROVAL WITH
CONTIGENCIES
RESEARCH
DIRECTORATE
INSTITUTIONAL SCIENTIFIC ETHICS REVIEW COMMITTEE

Appendix VI: Research License



REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 388226

Date of Issue: 02/August/2024

RESEARCH LICENSE

This is to Certify that Ms.. MARY Ndunge Mulua of Saint Paul University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Kiambu on the topic: EFFECTS OF STRATEGIC INNOVATION AND SUSTAINABILITY OF MISSION HOSPITALS IN KIAMBU COUNTY IN KENYA for the period ending : 02/August/2025.

License No: NACOSTI/P/24/38546

388226

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

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THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)
Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
    viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and
Innovation(NACOSTI),
Off Waiyaki Way, Upper Kabete,
P. O. Box 30623 - 00100 Nairobi, KENYA
Telephone: 020 4007000, 0713788787, 0735404245
E-mail: dg@nacosti.go.ke
Website: www.nacosti.go.ke

APPENDIX VII:

PARTICIPATING HOSPITALS

Kiambu County Mission Hospital	**Total**
AIC Kijabe Mission Hospital	14
AIC CURE International Mission Hospital	14
PCEA Kikuyu Mission Hospital	14
Kalimoni Mission Hospital	14
Mutia Mulumba Mission Hospital	12
Neema Mission Hospital	16
Nazareth Mission Hospital	16
Total	**100**

Source: (NHIF 2024)

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