INNOVATION STRATEGIES AND PERFORMANCE OF SOFTWARE START-UPS IN NAIROBI CITY COUNTY, KENYA

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DECLARATION

This research project is my original work and has not been submitted for a degree or any other award at any other university. No part of this research project may be reproduced without the permission of the author and/or Kenyatta University.

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This research project has been submitted for presentation with my approval as the University supervisor.

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DEDICATION

This research project is lovingly dedicated to my parents.

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I really want to express my gratefulness to the Almighty God and his grace, blessings, healthy state, and strength and the ability to finance the research project.

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ABBREVIATIONS AND ACRONYMS

CAC	Customer Acquisition Cost
GDP	Gross Domestic Product
ICT	Information Communication Technology
IT	Information Technology
NCC	Nairobi City County
SAAS	Software As A service
SACCO	Savings and Credit Cooperative
SMEs	Small and Medium Size Enterprises

OPERATIONAL DEFINITION OF TERMS

Innovation Strategies– is the capacity to develop new methods of enabling the company be ahead of the market trends with regards to technology, processes, marketing and financing.

Innovative Financing – This are the flexible and modern funding approaches that support the financial needs of start-ups. The concept reflects access to diverse funding sources, prudent utilization of available financial resources, the use of relationship-based financing options, and the support provided through government or policy initiatives that encourage financial innovation.

Marketing Innovation – These are new and creative approaches used to reach and engage customers. It involves the use of emerging marketing channels, deeper personalization and customer engagement, more effective product placement and distribution approaches, and pricing strategies that enhance competitiveness.

Performance – The overall success and sustainability of software start-ups. It is reflected through revenue growth, expansion of the customer base, strong customer retention, and the ability to achieve and maintain profitability.

Process Innovation - Improvements in the internal methods used to develop and deliver software. It is characterized by higher operational efficiency, reduced production or service delivery costs, improved product or service quality, and shorter development or operational cycle times.

Software Vendors- Firms that develop, distribute, or supply software products and solutions to individuals, businesses, or institutions that require them for operational, strategic, or commercial purposes.

Start-ups- Young, emerging firms characterized by early-stage operations, evolving structures, high growth potential, and significant reliance on external funding to support development, scale operations, and sustain market entry.

Technology Innovation- The development and enhancement of software products and features that improve functionality and delivery. The term reflects frequent product feature releases, strong customer adoption of new capabilities, revenue generated from newly introduced solutions, and greater speed and efficiency in software development and deployment.

ABSTRACT

Over the past ten years, Nairobi City County has gradually established itself as one of the main centres of innovation in Kenya and East Africa. The city has drawn many software start-ups, especially in financial, health, and agricultural technology. This progress has been supported by the growing use of mobile technology, the energy of a youthful business community, and the rise of collaborative spaces such as iHub. Together, these factors have encouraged the growth of mobile money services and cloud-based systems, helping start-ups design products that are easier and more appealing for users. Even with these advances, start-ups in Nairobi continue to face several challenges. Many still struggle to access external funding, develop strong management capacity, or raise capital during the early stages of growth. As a result, failure rates remain high, with some firms finding it difficult to stay competitive, retain customers, or maintain profitability. For many, innovation has become a key strategy for overcoming these barriers and improving survival**.** This study sought to investigate how innovation strategies influence the performance of software start-ups in Nairobi City County, as outlined in its general objective. Guided by this overarching aim, the study focused on four specific objectives, each addressing a distinct form of innovation. These specific objectives were to determine the effect of technology innovation strategies on the performance of software start-ups, to establish the effect of process innovation strategies, to determine the effect of marketing innovation strategies, and to examine the effect of innovative financing strategies on the performance of software start-ups in Nairobi City County, Kenya**.** It drew from Schumpeter's Theory of Innovation, the Resource Based View, and Porter's Five Forces Model to explain how innovation supports competitiveness and long-term performance. The study used a descriptive design and gathered data through structured questionnaires from founders, co-founders, chief technical officers, marketing managers, and customer support heads in fintech start-ups. Out of 186 questionnaires, 149 were returned, giving a strong response rate. Data were analysed using both descriptive and inferential statistics, including multiple regression analysis. Diagnostic tests confirmed that the assumptions of normality, linearity, and lack of multicollinearity were met. The findings revealed an R value of 0.743 and an R squared value of 0.552, showing that the four innovation strategies together explained 55.2 percent of the variation in start-up performance. Each innovation type had a positive and significant influence, with technological innovation showing the strongest effect, followed by process, marketing, and innovative financing. All null hypotheses were rejected at the 95 percent confidence level, confirming that innovation plays a vital role in improving start up performance. In conclusion, the study found that a combination of different innovation approaches can enhance competitiveness, efficiency, and long-term sustainability in fintech start-ups. Managers are encouraged to keep investing in technology, improve internal processes, use creative marketing, and explore diverse sources of financing to support growth. Policymakers and ecosystem players can strengthen this by improving access to finance, offering capacity building programs, and creating a supportive business environment. Although the study focused on fintech start-ups in Nairobi, the findings are relevant to other technology driven ventures across similar urban contexts. Future studies could expand to other regions and sectors to provide broader insights into how innovation shapes start up performance in Kenya and beyond.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

In the modern business environment, firm performance remains one of the most important concerns for managers, investors, and policymakers. It reflects how effectively a company achieves its goals in terms of profitability, efficiency, growth, and market competitiveness. According to Taouab & Issor (2019), performance determines the long-term sustainability of firms by showing how well they use their resources to deliver value to stakeholders. Across the world, businesses are increasingly facing unpredictable conditions caused by rapid technological change, dynamic customer preferences, and globalization. To remain competitive and resilient, firms are turning to innovation as a central strategy for improving performance. Innovation enables firms to create new products and services, improve their internal processes, and adapt to the fast-changing business environment (Tidd & Bessant, 2018).

Globally, digital transformation has accelerated innovation by reshaping industries and creating new opportunities for value creation. Economies that invest in innovation have experienced higher productivity and stronger competitiveness, particularly in technology-intensive sectors. Developing regions have also embraced innovation as a means of overcoming structural challenges such as resource limitations and weak market systems (Kerzner, 2022).In Africa, innovation-driven entrepreneurship is expanding rapidly, with start-ups increasingly using technology to address local social and economic challenges (Mkpojiogu et al., 2019). Despite this progress, many African firms still struggle to maintain consistent performance because of limited access to finance, insufficient technical capacity, and inadequate policy support (Odufuwa & Mureithi, 2023).

In Kenya, innovation has been recognized as a major driver of industrial and economic growth. Government initiatives such as Vision 2030, the National ICT Policy, and the establishment of innovation hubs including iHub and Konza Technopolis have created an enabling environment for

start-ups (Ajuang', 2019). These developments have supported the rise of innovative ventures in sectors such as financial technology, health technology, and agricultural technology. However, the majority of these start-ups face significant performance challenges. Studies indicate that many Kenyan start-ups operate with limited capital, weak management systems, and difficulties in scaling operations (Chirchietti, 2017). The rapid pace of technological change further demands that these firms continuously innovate in order to remain relevant and competitive (Tidd & Bessant, 2018).

Nairobi City County, often referred to as the Silicon Savannah, has emerged as the center of Kenya's technology ecosystem. It hosts a growing number of software start-ups that play a vital role in driving digital transformation, employment creation, and economic diversification. These firms depend heavily on innovation in technology, processes, marketing, and financing to improve their performance and competitiveness (Skala & Skala, 2019). Yet, despite this potential, there is limited empirical understanding of how specific innovation strategies contribute to the performance of software start-ups. This study therefore seeks to examine the effect of innovation strategies on the performance of software start-ups in Nairobi City County, Kenya.

1.1.1 Firm Performance

Firm performance describes how well a company achieves its goals by using its resources in an effective and efficient way. It shows the extent to which a firm can convert its strategies and capabilities into measurable results such as profitability, growth, and competitiveness. Taouab & Issor (2019) view firm performance as a broad concept that combines both financial and non-financial outcomes, including operational efficiency, customer satisfaction, and market expansion. Wheelen et al. (2018) also point out that firms that perform well are those that can adapt quickly, sustain growth, and remain competitive in changing business environments.

While financial indicators such as profits, sales, and return on investment are the most common measures of performance, they do not provide the full picture of a firm's success. Modern scholars argue for a wider perspective that also considers how well a firm builds relationships, motivates employees, and innovates. Amir et al. (2023) explain that financial success must be supported by non-financial outcomes such as employee productivity and customer loyalty if a firm is to sustain

performance in the long term. This means that firm performance today goes beyond profits to include how effectively a firm aligns its internal operations and external relationships to achieve lasting competitiveness.

For innovation-driven firms, especially start-ups, performance is often defined by growth potential rather than current profits. Tidd & Bessant (2018) note that in industries such as software development, performance is reflected in how fast a company can attract and retain users, scale operations, and respond to market needs. Skala & Skala (2019) further add that for early-stage technology firms, metrics such as revenue growth, the number of customers acquired, and the rate of customer retention are strong indicators of overall performance because they capture both financial stability and market acceptance.

In this study, firm performance is measured using three key indicators: revenue growth, customer acquisition, and customer retention. Revenue growth represents the firm's ability to generate income from its products or services. Customer acquisition measures how effectively the firm attracts new users or clients, while customer retention shows its capacity to keep existing clients satisfied and loyal. Together, these indicators offer a practical and balanced way to understand performance among software start-ups, reflecting both their financial results and their success in building a sustainable customer base.

1.1.2 Innovation strategies

Innovation strategies describe how a business plans and carries out new ideas that make it more effective and competitive. In simple terms, they are the practical ways a firm uses creativity to improve what it offers and how it operates. As Tidd & Bessant (2018) explain, innovation allows a firm to renew itself continually so that it can respond to changing customer needs and market pressures. For any business, and especially for young ones, innovation is no longer a luxury, it is what keeps the doors open.

There are several ways a firm can innovate. One common form is technological innovation. This means introducing or improving technology to make products or services better. Firms that invest in technology often end up producing higher-quality outputs and serving customers faster (Opazo-Basáez et al., 2022). In a software start-up, for example, this could mean updating code libraries,

developing mobile applications, or using artificial-intelligence tools to enhance user experience. Another important area is process innovation, which is about improving how work is done. Kahn (2018) observes that process changes, such as simplifying approval steps or automating repetitive tasks, can reduce waste and increase reliability. For a small team with limited funds, even minor adjustments in workflow can free time for creative work and customer support. Marketing innovation focuses on how a firm presents its products and interacts with the market. Ungerman et al. (2018)note that marketing innovation might involve redesigning a product, adjusting prices, trying new promotional media, or finding fresh distribution routes. A start-up could, for instance, rely more on social-media campaigns, influencer marketing, or online communities to reach its customers directly and cheaply. The fourth dimension is innovative financing. Nakalembe et al. (2023) point out that many start-ups struggle with traditional lending requirements, so they look for alternative ways to raise money. Some attract venture-capital investors, others turn to crowdfunding platforms or seek government innovation grants. These options not only provide capital but also open doors to mentorship and strategic networks that young firms often need.

Altogether, technological, process, marketing, and financial innovations give a business a balanced way to improve performance. A firm that encourages new thinking, operates efficiently, communicates well with its market, and manages finances creatively is more likely to survive and grow. In this study, innovation strategies refer to the combined efforts through which software start-ups in Nairobi City County apply technology, streamline operations, reach customers, and secure financial support to enhance their overall performance.

1.1.3 Start-ups in Nairobi City County

A start-up is a young business created to develop and grow a new idea in an uncertain environment. It usually begins with a small team, limited resources, and a vision to offer a product or service that solves a specific problem in a new way. Blank & Dorf (2013) describe a start-up as a temporary organization formed to search for a repeatable and scalable business model. In practice, this means that start-ups spend much of their early stages experimenting, testing markets, and refining their ideas until they find a model that works.

Across the world, start-ups differ in purpose and ambition. Ries (2011) identifies four main types. Lifestyle start-ups are founded by people who want to turn personal interests into small businesses.

Small business start-ups focus on serving local markets and maintaining steady growth. Scalable start-ups are designed to grow quickly, often attracting investors who fund expansion. Social start-ups, on the other hand, are motivated by the need to solve social or environmental problems. Of these, scalable start-ups play the biggest role in driving technology and innovation because they combine creativity with rapid growth potential.

Africa has witnessed a steady rise in start-up activity over the past decade. A youthful population, greater internet access, and the spread of mobile technology have encouraged entrepreneurship across the continent. Countries such as Nigeria, Kenya, South Africa, and Egypt have emerged as leading hubs for digital innovation. Kenya, in particular, has built a strong reputation as one of Africa's top start-up destinations. According to StartupBlink (2021), the country ranks among the top five start-up ecosystems on the continent, supported by better digital infrastructure, skilled talent, and supportive government initiatives such as Vision 2030 and the Kenya Innovation Agency (KENIA).

Nairobi City County sits at the centre of this ecosystem and is often called the "Silicon Savannah." The city hosts a vibrant mix of entrepreneurs, incubators, and investors that make it the heart of Kenya's technology innovation. Facilities such as iHub, Nairobi Garage, and Gearbox have become spaces where young developers share ideas, access mentorship, and connect with investors (Muathe et al., 2022). These networks help transform ideas into viable businesses, creating opportunities for growth and employment.

Among Nairobi's start-ups, software start-ups stand out for their role in shaping the digital economy. These firms build software applications for different sectors, including finance, health, agriculture, and education. Adetunji et al. (2017) note that software start-ups are valued for their flexibility, creativity, and potential for rapid expansion. The success of products such as M-Pesa has inspired many local developers to design digital solutions tailored to African users. With strong mobile penetration and increasing internet access, software firms have found a fertile ground to grow.

Even so, many of these start-ups still struggle to achieve sustainable performance. Ngungi (2021) observes that limited access to capital, a shortage of managerial skills, and challenges in scaling operations continue to hinder their success. Some firms close after only a few years due to

inconsistent revenues and high operational costs. Others struggle to convert innovative ideas into sustainable business models. These challenges show that having innovative products is not enough; start-ups must also adopt effective innovation strategies to turn creativity into measurable business results.

In this study, software start-ups in Nairobi City County are viewed as key players in Kenya's digital transformation. They not only create jobs but also contribute to technological progress and service efficiency. Understanding how innovation strategies influence their performance can provide valuable insights for improving start-up survival rates and enhancing the competitiveness of Kenya's innovation ecosystem.

1.2 Statement of the problem

Innovation is often seen as the heart of business growth. Around the world, companies that innovate tend to perform better, adapt faster, and stay competitive. Yet, in many developing countries, start-ups still find it difficult to turn new ideas into real business success. This is especially true for software start-ups that depend heavily on innovation to survive in fast-changing markets. Having a creative idea or a new technology is one thing; turning it into consistent performance is another (Tidd & Bessant, 2018).

Kenya's technology sector has grown quickly over the past decade, and Nairobi City County has become its main innovation centre. The Communications Authority of Kenya (2024) notes that the ICT sector contributes roughly 10 percent to the national GDP, with software and digital services making up a large portion. Even with this progress, many start-ups struggle to stay afloat. According to StartupBlink (2021) , nearly 70 percent of Kenyan start-ups shut down within three years. Most of these firms begin with promising ideas but face challenges when it comes to scaling operations, managing costs, or keeping customers.

Researchers suggest that part of this problem lies in weak or poorly defined innovation strategies. Muathe et al. (2022) observe that many start-ups innovate in one area, such as technology, but neglect others like process improvement, marketing, or financing. Some adopt new technologies simply to keep up with competitors, without aligning them to long-term goals. As a result, innovation becomes fragmented—lots of activity but little measurable impact on firm performance.

In Nairobi's software sector, innovation is common, but the results are inconsistent. Ngungi, (2021) points out that many firms introduce new apps and services but still struggle to grow revenue or retain customers. Others depend too much on external funding and cannot sustain operations once that support ends. It seems that the real problem is not the lack of innovation, but the absence of effective innovation strategies that connect technology, processes, marketing, and finance in ways that drive performance.

Previous studies have explored start-up growth in Kenya (Ajuang', 2019; Karitu et al., 2022), but most have focused on broad entrepreneurial challenges rather than on how specific innovation strategies influence firm performance. Few have examined how technological, process, marketing, and financial innovations interact to improve results such as revenue growth, customer acquisition, or customer retention. This gap in understanding makes it hard for entrepreneurs and policymakers to know which innovation efforts truly matter.

For this reason, this study focuses on examining how innovation strategies affect the performance of software start-ups in Nairobi City County. It seeks to find out which forms of innovation have the strongest influence on performance and how start-ups can use them to grow sustainably. The study hopes to provide practical insights that can help new firms improve their competitiveness and long-term survival in Kenya's rapidly evolving technology industry.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of this study was to investigate the effect of innovation strategies on performance of Software start-ups in Nairobi City County, Kenya.

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1.3.2 Specific Objectives

This following specific objectives guided this study:

1. To determine the effect of technology innovation strategies on performance of software start-ups in Nairobi City County, Kenya.

2. To establish the effect of process innovation strategies on performance of software start-ups in Nairobi City County, Kenya.
3. To determine the effect of marketing innovation strategies on performance of software start-ups in Nairobi City County, Kenya.
4. To examine the effect of innovative financing strategies on performance of software start-ups in Nairobi City County, Kenya.

1.4 Research Hypothesis

There is no significant effect of technology innovation strategies on performance of software start-ups in Nairobi City County, Kenya.

H01: There is no significant effect of technology innovation strategies on performance of software start-ups in Nairobi City County, Kenya.

H02: There is no significant effect of process innovation strategies on performance of software start-ups in Nairobi City County, Kenya.

H03: There is no significant effect of marketing innovation strategies on performance of software start-ups in Nairobi City County, Kenya.

H04: There is no significant effect of innovative financing strategies on performance of software start-ups in Nairobi City County, Kenya.

1.5 Significance of the Study

Innovation plays a vital role in helping start-ups survive, grow, and remain competitive. However, many software start-ups in Nairobi still struggle to turn innovative ideas into strong performance. This study is therefore important because it provides insights into how different innovation strategies influence the success of such firms. The findings can help entrepreneurs, investors, policymakers, and researchers understand what drives performance in Kenya's growing technology ecosystem.

For entrepreneurs and start-up founders, the study will offer practical guidance on how to design and implement effective innovation strategies. By understanding which types of innovation; technological, process, marketing, or financial; have the greatest impact, start-ups can make better decisions about where to focus their resources and how to sustain growth.

For investors and financial institutions, the study will provide information that can help them evaluate the potential of software start-ups more accurately. This understanding can guide funding decisions, reduce investment risks, and promote more targeted support for innovation-driven firms.

For policymakers and government agencies, the study will contribute evidence that can be used to shape programs and policies supporting start-ups. Strengthening the link between innovation and firm performance can help the government create a more supportive business environment and encourage sustainable job creation in the technology sector.

Finally, for academia and future researchers, the study will add to the growing body of knowledge on innovation and performance in developing economies. It will provide a useful reference for future studies seeking to explore similar relationships in other sectors or regions.

1.6 Scope of the Study

This study focused on software start-ups operating in Nairobi City County, Kenya. Nairobi was selected because it had the highest concentration of technology firms, investors, and innovation hubs in the country. The study examined how four types of innovation strategies; technology, process, marketing, and innovative financing; affected the performance of software start-ups within this ecosystem.

In terms of content, the study concentrated on three key indicators of firm performance: revenue growth, customer acquisition, and customer retention. Other factors such as leadership style, organizational culture, or external market conditions were not examined, as they fell outside the boundaries of this research.

The study targeted software start-ups that had been established between 2013 and 2023. This ten-year period captured the phase during which Kenya's digital economy experienced the fastest growth. Although the study considered firms formed during that period, the research design was cross sectional, meaning that data were collected at a single point in time rather than over multiple years. The aim was to understand how innovation strategies related to firm performance at the time of the study.

Geographically, the study was limited to Nairobi City County. While software start-ups existed in other regions of Kenya, NCC represented the country's main innovation hub and provided the most suitable base for examining software start-ups. The findings therefore reflected the conditions in Nairobi and could be cautiously generalized to other similar technology ecosystems in Kenya.

1.7 Organization of the Study

This project was organized into five chapters, each addressing a specific aspect of the study. Chapter one presented the introduction to the study. It covered the background, statement of the problem, objectives, research questions, significance, scope, and organization of the study. These sections provided the foundation and justification for the research. Chapter two reviewed the relevant literature. It discussed theoretical and conceptual perspectives on innovation strategies and firm performance, and highlighted the existing knowledge gaps that the study sought to address. Chapter three described the research methodology. It explained the research design, target population, sampling procedures, data collection instruments, and the methods that were used to ensure validity and reliability. The chapter also outlined the data analysis techniques that were employed in interpreting the findings. Chapter four presented and discussed the study findings. It included data analysis, interpretation, and discussion of results in relation to the study objectives and the reviewed literature. Chapter five provided the summary, conclusions, and recommendations of the study. It summarized the key findings, drew conclusions based on those findings, and made recommendations for entrepreneurs, policymakers, and future researchers.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed literature related to innovation strategies and firm performance. It focused on theoretical, empirical, and conceptual perspectives that informed the study. The chapter first discussed theories that explained the relationship between innovation strategies and firm performance, then examined previous empirical studies on the same. It also identified the research gaps that emerged from the reviewed studies and presented the conceptual framework that guided the study.

2.2 Theoretical Literature Review

This section reviewed the three theories that grounded the study: Schumpeter's Theory of Innovation, the Resource Based View, and Porter's Five Forces. Each theory was discussed and linked to the study variables to show how innovation strategies related to firm performance.

2.2.1 Schumpeter's Theory of Innovation

Schumpeter's Theory of Innovation explained that innovation was the main force behind economic progress and firm growth. Schumpeter (1934) viewed entrepreneurs as agents of change who introduced new combinations of resources that transformed markets and industries. He described five main forms of innovation: the introduction of a new product, the adoption of new production methods, the discovery of new markets, the identification of new sources of raw materials, and the creation of new organizational structures. Through these actions, innovation caused what he called creative destruction; a process where new firms and technologies displaced old ones, creating new opportunities and patterns of performance.

In the context of this study, Schumpeter's theory provided a foundation for understanding how innovation strategies shaped firm performance among software start-ups. Technological innovation reflected Schumpeter's first and second dimensions of innovation, since it involved developing new software products and applying new methods in product design and service

delivery. Start-ups that introduced unique digital applications or used modern programming tools were able to improve quality, attract customers, and gain competitive advantage.

Process innovation also connected closely with Schumpeter's view of improved production methods. In software firms, process innovation included the use of agile project management, automation, or continuous integration systems to enhance productivity. These improvements reduced operational costs and turnaround time, leading to better firm performance (Tidd & Bessant, 2018).

Marketing innovation aligned with Schumpeter's notion of opening new markets or finding new ways to reach customers. Software start-ups that used creative branding, social media engagement, and digital campaigns were able to attract new users and expand their customer base. By appealing to untapped markets and differentiating their products, these firms improved their sales and profitability (Sahi et al., 2022).

Financial innovation related to Schumpeter's view that successful entrepreneurs found new ways of acquiring and utilizing capital. For software start-ups, this involved adopting alternative financing models such as venture capital, crowdfunding, and revenue-sharing platforms. Access to innovative financing allowed these firms to scale faster, invest in technology, and sustain operations in competitive markets (Murenga & Njuguna, 2020).

Schumpeter's Theory of Innovation supported this study by showing that firms which adopted diverse innovation strategies were more likely to achieve superior performance. It explained the dynamic relationship between innovation and firm success, emphasizing that continuous creation and improvement were essential for competitiveness in rapidly changing industries such as software development.

2.2.2 Resource Based View (RBV)

The Resource Based View (RBV) of the firm, developed by Barney (1991), explained that differences in firm performance arose from the unique resources and capabilities that each firm possessed. According to this theory, a firm achieved and maintained a competitive advantage when its resources were valuable, rare, inimitable, and non-substitutable. These resources enabled the firm to design and implement strategies that competitors could not easily duplicate. The RBV

therefore placed emphasis on internal factors rather than external market conditions as the main drivers of superior performance.

In relation to this study, the RBV provided an important framework for understanding how internal innovation strategies contributed to firm performance among software start-ups. Technological innovation represented a valuable and rare resource because it reflected the firm's technical know-how and capacity to develop new or improved products. Start-ups that invested in research and development, skilled developers, and proprietary software gained a technological edge that enhanced their competitiveness and market value (Arshi et al., 2021). Such capabilities were difficult for competitors to imitate, making them a source of sustainable advantage.

Process innovation also fit within the RBV because it involved internal improvements in efficiency and productivity. Start-ups that developed unique workflows, adopted advanced project management systems, or used automation tools created internal processes that delivered faster and higher quality results (Griva et al., 2023). These processes were often embedded within the organization's culture and routines, making them hard for other firms to copy. As a result, process innovation contributed to consistent performance improvements and operational excellence.

Marketing innovation could also be understood through the RBV lens. A firm's marketing knowledge, creativity, and brand management skills were considered intangible resources that created differentiation. Software start-ups that developed innovative marketing campaigns or adopted new digital engagement strategies were able to attract and retain customers more effectively (Griva et al., 2023). Their brand strength and customer relationships became valuable, rare, and hard to imitate resources that improved performance.

Financial innovation was viewed as an internal capability that helped firms secure and manage resources efficiently. Access to venture capital, the use of flexible payment models, and effective financial planning allowed software start-ups to fund product development, invest in talent, and sustain growth. These financial capabilities were often based on managerial skills and strategic partnerships, which were unique to individual firms (Murenga & Njuguna, 2020).

Resource Based View therefore, explained how innovation strategies functioned as internal resources that strengthened firm performance. Firms that developed strong technological, process,

marketing, and financial capabilities were able to achieve higher growth, improved customer satisfaction, and greater profitability. The RBV therefore supported this study by showing that firm performance depended largely on how effectively internal innovation resources were developed and utilized.

2.2.3 Porter's Five Forces theory

Porter's Five Forces Theory was developed by Michael Porter in 1980. While Schumpeter's Theory of Innovation and the Resource Based View focused on internal resources and innovation, Porter's Five Forces Theory offered a different perspective by examining the external environment in which software start-ups competed. The theory stated that the competitive dynamics within an industry were shaped by five key forces: the threat of new entrants, the position of suppliers in the industry, the position of buyers in the industry, competition arising from substitute products, and the intensity of rivalry among existing firms and organizations (Porter, 1980). These forces were central to strategy formulation for software start-ups operating in Nairobi City County, which had become a fast-growing technology hub.

This framework was particularly relevant because barriers to entry in the software industry were relatively low, meaning that new players could easily enter the market (Aksoy, 2019). Start-ups therefore needed to create new value continuously; not only in technology, but also in operations, product positioning, and funding models; to remain competitive and prevent potential entrants from eroding their market share (Alvarez & Barney, 2017)

Supplier power also influenced the performance of these firms. It was often more difficult for suppliers, particularly those offering specialized cloud-based tools or exclusive technical expertise, to negotiate favourable terms when their numbers were few relative to the many buyers (Chen et al., 2021) Software start-ups could manage supplier power through innovative approaches to procurement and partnership management, which helped reduce costs and improve performance.

Customers, on the other hand, tended to hold significant bargaining power because of the wide range of options available to them. As a result, software start-ups had to focus on customer service, user experience, and continuous product improvement to maintain customer loyalty and retention (Vaznyte & Andries, 2019). The high rate of technological advancement also created a strong

threat of substitutes, compelling firms to introduce new products and features frequently to meet changing market needs.

Finally, intense competition within Nairobi's growing technology ecosystem required start-ups to remain agile and strategic. Many firms faced pressure to innovate across all business functions in order to stay relevant. By applying Porter's Five Forces framework, software start-ups were able to recognize the external pressures they faced, formulate appropriate strategies, and improve their performance in the market.

Porter's Five Forces Theory was therefore pertinent to this study because it emphasized the external pressures acting on start-ups. While internal innovation capabilities were critical for high performance, the ability to manage competition and market forces outside the firm was equally vital for long term success. The theory enriched this research by connecting internal processes with external environmental dynamics, providing a comprehensive view of what contributed to the performance of software start-ups in Nairobi City County.

2.3 Empirical Literature Review

Past studies showing the relationship between the independent variables (technology innovation, process innovation, marketing innovation and innovative financing) and the performance of various organizations were used in identifying the knowledge gaps for this study.

2.3.1 Technology Innovation and Performance

Technology innovation has been widely recognized as a key driver of firm performance. It involves the introduction and use of new technologies, products, and production methods that improve efficiency and competitiveness. Schumpeter (1934) viewed technology innovation as the foundation of business success because it disrupts existing markets and creates new ones. This form of innovation allows firms to respond effectively to changing customer needs and market trends, leading to improved performance outcomes such as profitability, growth, and customer satisfaction.

Empirical studies have shown that technology innovation plays a significant role in enhancing firm performance. According to Gunday et al. (2011), firms that implemented technological innovations

achieved higher sales growth and operational efficiency. Their study, which was conducted among manufacturing firms in Turkey, revealed that product and process innovations significantly contributed to improved profitability. Similarly, Calantone et al. (2015) established that firms that adopted new technologies were better able to develop unique products, which helped them sustain a competitive advantage in dynamic markets.

Locally, Kiveu and Ofafa (2017) examined the influence of technological innovation on performance among small and medium enterprises (SMEs) in Kenya. Their findings indicated that the use of digital tools, software automation, and online platforms enhanced productivity, cost efficiency, and customer engagement. Likewise Ngungi (2021) observed that software start-ups in Nairobi City County that consistently updated their technologies and invested in research and development recorded improved growth and market penetration. These studies demonstrated that technology adoption allowed firms to build agility and adapt quickly to technological shifts.

However, several studies presented mixed findings. For instance, Njuguna (2018) argued that technological innovation did not automatically translate into higher performance if firms lacked complementary skills or resources to implement new technologies effectively. Similarly, Kamau and Muriithi (2020) found that while innovation was positively correlated with performance, the impact was moderated by the firm's strategic orientation and market environment. These findings suggested that technological innovation alone was not sufficient; it needed to be aligned with the firm's strategic goals and capabilities.

A key limitation of most previous studies was their focus on established manufacturing and service firms, with limited attention to start-ups. Moreover, few studies explored how multiple dimensions of innovation strategies interacted to influence performance. This created a contextual and conceptual gap that the present study sought to fill by examining the effect of technological innovation, along with process, marketing, and financial innovations, on the performance of software start-ups in Nairobi City County.

2.3.2 Process Innovation and Performance.

Processes in a business were described as a series of activities that transformed inputs into outputs that delivered value to customers. They represented structured sequences of activities that occurred over time and space with defined inputs and outputs (Anand et al., 2013). Each process typically involved specific attributes and a logical flow of steps aimed at accomplishing a particular task. They were pivotal in managing organizational operations and delivering valuable outcomes.

Majimbo (2021) examined strategic innovation and performance among oil-marketing firms in Nairobi City County. The results revealed that implementing new workflow management systems led to increased sales and improved operational efficiency within the sector. Although the firms did not provide incentives to employees for making improvements in their work, they still supported ongoing enhancements in their activities. The introduction of new systems in these firms led to higher efficiency within the oil-marketing industry. The research, however, had a contextual gap because it was based on oil-marketing firms.

Mung'ora & Kiiru (2019) investigated how innovation strategies influenced the performance of savings and credit cooperatives in Nyeri County. The study collected data through a census, using unstructured questionnaires that allowed respondents full freedom in their answers. The results showed that process innovation improved the performance of the SACCOs by shortening waiting hours, reducing operational costs, and enhancing overall efficiency. The research concluded that process innovation was an important indicator of SACCO performance but noted a contextual gap since it focused on financial cooperatives.

According to Hong et al. (2019), who studied more than 150 manufacturing firms, process innovation enhanced production efficiency by 20 percent and reduced production costs by 15 percent. Product quality increased by 18 percent, research and development expenses by 12 percent, and financial returns by an average of 25 percent. However, the study might not reflect the latest dynamics and innovation strategies relevant to manufacturing firms in China. The authors therefore recommended more manufacturing-oriented research with a geographical focus that considers the peculiarities of software start-ups in Nairobi City County, which differs significantly from China's manufacturing context.

Similarly, Yang & Lee (2020) examined the association between process innovation and organizational performance in the South Korean service industry. Studying 200 organizations, they found that process innovation improved operational effectiveness by 22 percent, customer satisfaction by 30 percent, and overall organizational performance by 17 percent. However, the findings could not be generalized to software start-ups in Nairobi City County, as the technological development and market conditions in South Korea differ greatly from those in Nairobi. The study thus underscored the need for literature focusing on the contextual conditions of software start-ups in Nairobi City County.

2.3.3 Marketing Innovation and Performance

Marketing innovation played a pivotal role in driving the success and effectiveness of software start-ups. Traditional marketing approaches were being reshaped by technological advancements, changing consumer behaviours, and the dynamic nature of the software industry. As a start-up grew, it differentiated itself, established brand identity, and effectively communicated the unique value of its solutions. Marketing innovation enabled start-ups to achieve these objectives by leveraging data-driven insights, personalization, automation, and modern communication channels.

According to Ungerman et al. (2018), marketing innovation was one of the non-technological innovations. It recognized that relying solely on conventional marketing strategies was insufficient to guarantee prosperity and competitiveness within saturated markets. Marketing innovation was particularly useful in product development because it helped organizations understand customer needs, allowing start-ups to adapt swiftly and save costs. In their study, Ungerman et al. (2018) found that about 20.5 percent of businesses in the Czech Republic had embraced innovative approaches within their marketing strategies. Among these, 70 percent directed their efforts toward new media or methods for communicating marketing messages, 53 percent focused on enhancing design or packaging, 40.9 percent introduced fresh techniques for product placement, and 21.4 percent centred innovation around product and service valuation.

A noteworthy observation was the difference in innovation levels between large corporations and small to medium-sized enterprises. Larger firms exhibited a stronger tendency (60.4 percent) toward modifying product designs and packaging, while smaller firms showed a more modest level of 49.3 percent (Ungerman et al., 2018). Similarly, a clear contrast was evident between foreign-controlled companies and domestically owned businesses. Specifically, 59.1 percent of foreign-controlled enterprises employed inventive sales and product-placement strategies, whereas domestic firms utilized such innovative marketing practices in only 37.1 percent of cases. The study, however, had a contextual gap as it was based on SMEs in the Czech Republic rather than software start-ups in Nairobi City County.

Jeng & Pak (2016) investigated the effects of innovative marketing on business performance based on firm size. Their research revealed that larger companies in the United States benefited more from marketing innovations, while small firms that invested in similar initiatives experienced limited or even declining performance results. This indicated that firm resources and market positioning played a significant moderating role in the effectiveness of marketing innovation.

Lee et al. (2019) also conducted research focusing on the relationship between innovative marketing and an enterprise's technological level. Their findings highlighted a positive correlation between marketing innovation and high-technology enterprises, emphasizing the influence of both transformative and incremental innovations. However, for firms operating at lower technological levels, marketing innovation was less effective in enhancing the benefits of gradual innovation activities on overall performance. The study, however, had a contextual limitation as it was based in the United States.

In a related study, Srinivasan et al. (2016) explored the effects of innovative marketing across online and offline domains. The findings showed that online marketing, enhanced by innovation, outperformed offline methods by about 15 percent. Within the online domain, notable growth was observed in public relations, while paid advertising exhibited a decline. Srinivasan et al. (2016) also examined the effects of marketing innovation on the traditional 4Ps; product, price, place, and promotion. The study revealed that the most substantial transformation occurred in product distribution (60 percent), followed by pricing strategies (20 percent), and marketing

communication, particularly advertising (5 percent). The research, however, had a methodological gap as it adopted an exploratory design, which limited generalization of the findings.

2.3.4 Innovative Financing and Performance

According to Umar et al. (2020), innovative financing did not only involve mechanisms for raising funds but also mechanisms that improved the utilization of those funds. In a study conducted by Atun et al. (2012), financing mechanisms were found to innovate each step of the financial value chain, including resource mobilization, accumulation, distribution, direction, and deployment. The aim was to provide significant funds swiftly to developing and middle-income economies to address pressing health-related challenges. However, international innovative financing yielded relatively modest resources compared to traditional donor aid. The real innovation lay in integrated financing structures that efficiently connected these stages, mobilized funds, and improved program performance in those nations. The research, however, had a contextual gap since it focused on the health sector.

Brancati (2015) conducted a study on innovative financing and the role of relationship lending for SMEs and found that small and medium-sized enterprises (SMEs) not only innovated less and faced greater financial constraints, but their innovative behaviour was also strongly influenced by their financial status. Establishing strong relationships with banks helped these firms overcome financial barriers to innovation. Using firm-specific indicators, Brancati (2015) discovered a significant nonlinear effect that was more pronounced in smaller firms, suggesting that such businesses gained substantial benefits from banks' specialized knowledge; particularly when introducing new products and processes. The study, however, had a contextual gap because it was based on SMEs and not software start-ups.

Pu et al. (2021) examined the role of innovative finance and technological integration among SMEs and found that such strategies enhanced sustainability and overall performance. The study also revealed that government intervention played a mediating role, emphasizing the importance of policy implementation to support reliable digital financial services, streamline business transactions, and encourage IT adoption. The research, however, had a methodological gap, as it employed an experimental research design that limited the generalizability of its findings.

2.4 Summary of Knowledge Gaps

Table 2. 1: Summary of Knowledge Gaps

Author(s) & Year	Focus of the Study	Key Findings	Research Gaps Identified	Focus of the Current Study
Violet Kasevu (2017)	Innovation strategies and competitive advantage among commercial banks in Kenya.	The study found that process, product, and market innovations influenced competitive advantage; however, technology innovation emerged as the strongest determinant of competitiveness among commercial banks. It concluded that banks that consistently updated their technology platforms achieved higher efficiency and customer retention.	Contextual gap: The study was conducted among commercial banks, whose structure, regulation, and innovation capacity differ significantly from software start-ups. It also emphasized competitive advantage rather than firm performance, creating a conceptual gap related to dependent variable definition.	This study focused on software start-ups in Nairobi City County, examining how four innovation strategies (technological, process, marketing, and financial) jointly influenced firm performance.
Maingi (2020)	Effect of innovation strategies on performance of real estate firms in Mavoko Sub-County, Kenya.	The study revealed that incorporating innovative processes, product uniqueness, technology integration, and advanced customer	Contextual gap: The research focused on real estate firms in Mavoko Sub-County, where innovation occurs in physical infrastructure, not digital solutions. The competitive	This study focused on software start-ups in Nairobi City County within the technology sector, where innovation strategies differ by

		service strategies improved performance by up to 90.3%. The research also showed that firms that embraced continuous innovation recorded better market growth and profitability.	and environmental dynamics of the real estate sector differ from those of software start-ups in Nairobi's technology ecosystem. Conceptual gap: The study did not consider financial innovation as a variable.	nature and pace.
Muriuki Nahashon Mung'ora (2020)	Innovation strategies and performance of savings and credit cooperatives (SACCOs) in Nyeri County, Kenya.	The study found that adoption of innovation strategies—especially technological and process innovation—explained a significant proportion of performance outcomes among SACCOs. It highlighted that service automation and improved customer interfaces boosted SACCO efficiency.	Contextual gap: Conducted in the financial sector, which is highly regulated and structurally different from software start-ups. Conceptual gap: Focused primarily on financial and process innovation while excluding marketing and technological innovation relevant to software enterprises.	This study analysed technological, process, marketing, and financial innovations as a combined model influencing firm performance among software start-ups in NCC.
Mark Mwongela (2021)	Critical factors influencing growth of technology-based SMEs: Case of software-as-a-service (SaaS)	The study established that technology innovation positively affected SME growth and scalability. It	Methodological gap: The study used simple random sampling, which limited representativeness and may have excluded	This study employed stratified random sampling to ensure inclusivity of different start-

	providers in Nairobi, Kenya.	further revealed that cloud-based solutions enhanced service delivery and customer experience, boosting firm competitiveness.	important subgroups of technology firms. Conceptual gap: It focused on firm growth rather than overall firm performance metrics such as profitability and market share.	up categories and measured firm performance using financial and non-financial indicators.
Susan Major Okundi (2022)	Innovation strategies and entrepreneurial performance of selected SMEs in Nakuru Town East Sub-County, Kenya.	The study showed that product, process, organizational, and marketing innovations collectively improved entrepreneurial performance of SMEs. It concluded that firms adopting integrated innovation approaches achieved stronger market presence and profitability.	Contextual gap: The study was conducted among manufacturing SMEs in Nakuru, which differ from software start-ups in terms of innovation type, capital intensity, and operating environment. Conceptual gap: The study excluded financial innovation as a performance determinant.	This study focused on software start-ups in NCC, incorporating financial innovation alongside other innovation dimensions.
Brancati (2015)	Innovation financing and the role of relationship lending for SMEs.	The study found that SMEs with stronger banking relationships were better able to overcome financing barriers and undertake innovation. It revealed that limited access to capital	Methodological gap: Relied on secondary financial data, limiting contextual interpretation. Conceptual gap: Focused solely on financial innovation and relationship lending without integrating	This study integrated financial, technological, process, and marketing innovations to provide a holistic view of how innovation strategies affected firm

		constrained innovation intensity among smaller firms.	technological, process, or marketing innovations.	performance in start-ups.
Pu et al. (2021)	Innovative finance, technological adaptation, and SME sustainability: Mediating role of government support during the COVID-19 pandemic.	The study found that SMEs that adopted innovative financing models and technology integration improved sustainability during crises. Government support significantly strengthened this relationship.	Methodological gap: Used experimental design, limiting generalizability. Contextual gap: Conducted outside Kenya, where institutional and financial environments differ. Conceptual gap: Focused on sustainability rather than performance outcomes.	This study applied a descriptive cross-sectional design suitable for the Nairobi start-up context, examining firm performance rather than sustainability outcomes.

Source: Author (2025)

2.5 Conceptual Framework

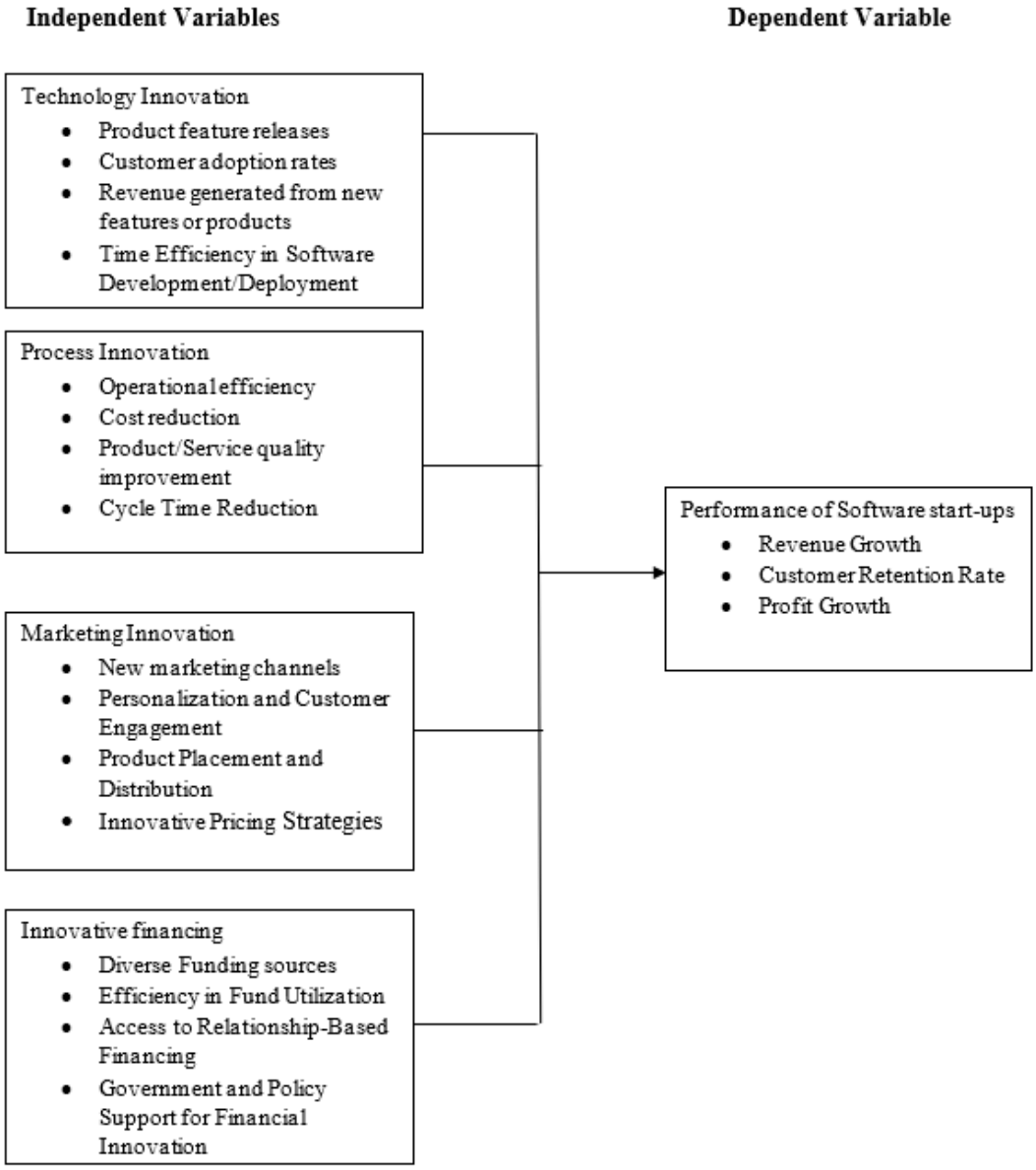

Figure 2.1: Conceptual framework

Source: Author (2025)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presented the research methodology that was used to achieve the objectives of the study. It described the research design, target population, sampling technique, data collection instruments, validity and reliability testing, data collection procedures, data analysis methods, and ethical considerations. The study adopted a descriptive cross-sectional research design to determine the relationship between innovation strategies and firm performance among software start-ups in Nairobi City County.

The research focused on firms that were operational between 2013 and 2023 to capture insights from start-ups that had been active within this period. However, data were collected at a single point in time, aligning the study with a cross-sectional design.

3.2 Research Design

As stated by Asenahabi (2019), research design is the systematic plan or blueprint for conducting a study. It involves planning an all-encompassing study protocol that outlines the research questions, criteria for case selection, method for data collection and a structured organizational approach. The goal is to provide a comprehensive and well-structured framework for conducting rigorous and systematic case study investigations. To investigate the study problem, a descriptive research design was used. According (Indu & Vidhukumar, 2019), descriptive research design aims to describe conditions or events as they naturally occur without manipulating the study variables. It involved the collection of information about already existent conditions in a population and problems that exist. The descriptive research design offered distinct advantages for this study, primarily through its ability to provide a detailed and comprehensive understanding of software start-ups in Nairobi City County. It was cost-effective and minimally intrusive, making it a practical approach for observing the software start-ups in their natural operational settings. The study collected both quantitative and qualitative data from the targeted respondents. Quantitative data included numeric measures such as revenue and active users, which were used to asses firm performance for these software start-ups. Qualitative data captured insights into process efficiency

and quality metrics that was used to measure process innovation, sales channels and brand awareness (used to measure marketing innovation), as well as funding sources and risk-sharing mechanisms (used to measure financial innovation).

3.3 Target Population

The term population in a set of objects with a certain characteristic which a researcher is interested in studying or drawing conclusions about (Stratton, 2021). Since it's impossible to collect data from an entire population because of constraints such as time and budget, sampling is used to gather data which is then presumed to represent the target population. This study had a target population of 93 software start-ups in Nairobi City County, in the Fintech category, as listed in the Kenya Association of Start-Ups (2023) and the Kenya National Bureau of Statistics (2023) (See Appendix II). Respondents included the founder/co-founder, Chief Technology Officer, Head of Customer Support, and marketing manager from each firm. This yielded a total population of 348 potential respondents**.** These individuals were selected because they possessed in-depth knowledge of their organization's innovation strategies and performance outcomes.

The population distribution across these four respondent categories was derived from the Kenya Start-up Ecosystem Directory (2023) and verified through the researcher's compiled sampling frame (Appendix II). The distribution was summarized in Table 3.1.

Table 3. 1: Target Population Distribution by Respondent Category

Respondent Category	**Total(N)**	**Percent(%)**
Founder/ Co-Founder	125	36.0
Chief Technical Officer	79	22.7
Head of customer support	76	21.8
Marketing manager	68	19.5
Total	**348**	**100**

Source: Kenya Start-up Ecosystem Directory (2023)

3.4 Sample Size

Budgetary constraints and time limitations are some of the obstacles associated with every researcher. Therefore, it was necessary to focus on a subgroup of the overall target population, commonly referred to as a sample (Blumberg et al., 2014). The sampling process helped simplify the selection of a genuinely representative subset of the population under investigation. Sampling can be either probabilistic, where every element has an equal chance of being chosen, or non-probabilistic, involving specific inclusion and exclusion criteria (Stratton, 2021). In this study, the sample size was established using probability sampling with a combination of stratified random sampling and the Yamane formula (Yamane, 1973).

The sample size for the study was 186, following this formula:

$n = N / [1 + N (e)^2]$,

Where; n = represented the sample size,

N = is the population size (348 respondents)

e = indicated the margin of (0.05 for 95% confidence level

In this case, the sample size,n was computed as follows:

$n = 348 / [1 + 348(0.05)^2] = 186.$

The required sample size was therefore approximately 186 respondents**.** This number was considered adequate for drawing reliable conclusions and allowed for accurate representation of the entire population of software start-ups in Nairobi City County.

The study successfully collected responses from 186 participants, achieving the desired sample size derived through the Yamane formula. This response rate was considered satisfactory for the descriptive and inferential analyses conducted in the study.

3.5 Sampling Design

The sample was divided into strata, based on categories of operational heads. Within each stratum, simple random sampling was applied to select the appropriate number of participants. This guaranteed that every individual within the stratum had an equal chance of being selected.

Table 3.2 indicates how the sample was spread among the strata.

186/348=0.53

Table 3. 2: Sample Distribution by Respondent Category

Respondent Category	**Population(N)**	**Percentage of Population(%)**	**Sampling Ratio**	**Sample Size**
Founder/Co-Founder	125	35.9	0.54	68
Chief Technology Officer	79	22.7	0.53	42
Head of Customer Support	76	21.8	0.53	40
Marketing Manager	68	19.5	0.53	36
Total	**348**	**100**		**186**

Source: Survey Data (2025)

The sampling ratios were derived using the Yamane (1973) formula at a 95% confidence level (n = 186).

The study employed stratified random sampling to ensure balanced representation across the four key functional roles within the 93 software start-ups. Each stratum represented a specific managerial position considered vital in shaping innovation strategies and overall firm performance. The Yamane (1973) formula, applied at a 95% confidence level, yielded a sample size of 186 respondents, representing 53.4% of the total population of 348 potential respondents. Sampling ratios were then applied consistently across all strata to maintain proportional representation.

3.5 Data Collection

3.5.1 Research Instrument

The data collection instrument for the study was questionnaires, both structured and semi-structured. Since the study was descriptive, structured questionnaires were the most preferable form as they reduced ambiguity of the collected data and ensured validity. Semi-structured questionnaires were also included to increase the scope of data collected and to provide additional insights beyond the structured responses. According to Likert (1974), standardized questionnaires using a Likert-type scale are useful in data collection since they are consistent and can easily be scaled up for use in large populations to obtain overall information. Certain factors such as respondents' position within the company and years worked in the company were captured in the questionnaire as they informed the results by providing important characteristics of the respondents. The questionnaire included both close-ended questions based on a five-point Likert scale and open-ended questions to allow participants to elaborate on their responses where necessary.

3.5.2 Data Collection Procedure

This study used primary data, collected through an online questionnaire, to assess the effects of innovation strategies on performance of software start-ups in NCC. The questionnaire was administered to the respondents using a set of predetermined questions. The online questionnaire was distributed via a Google Forms link. Respondents were allowed two weeks to complete the questionnaires. The primary data were responses given during the questionnaires. This study collected data on revenue and active users of software start-ups in the Fintech category over the period between 2013 and 2023. Before administering the questionnaire, an introductory email was sent to each respondent to explain the purpose of the study, assure confidentiality, and request voluntary participation. Respondents provided consent by proceeding to fill the questionnaire. Follow-up reminders were sent after one week to encourage full participation. Completed questionnaires were automatically recorded in Google Forms, reviewed for completeness, and downloaded into an Excel sheet for data cleaning and subsequent analysis.

3.6 Pilot Study

To assess the reliability of the instrument, a pilot study was carried out on each of the four categories of functional heads similar to that of software start-ups in Fintech sector. These respondents were selected from a similar organization outside the main target population of software start-ups in Nairobi City County, so as to compare the results with the real target population. This helped avoid mainly the interference of the pilot results with the main study to be conducted to Cooper et al., (2019). The questionnaire was administered to these selected functional heads, and participants were randomly selected from different functions. The pilot study covered 10 percent of the total sample size, consistent with the recommendation by Cooper et al. (2019), who suggest that 10 percent is adequate for instrument pre-testing. Data collected from the pilot test were analysed to assess the instrument's internal consistency using Cronbach's Alpha coefficient, which yielded a value of 0.872. Since this exceeded the recommended threshold of 0.7, the questionnaire was considered reliable for the main study.

3.7 Research Validity and Reliability

Prior to the actual distribution of the questionnaires, a pilot test was conducted. This pilot test was intended to enhance the integrity of the research instruments and recognize possible barriers that could obstruct the fulfilment of research goals. Additionally, the pilot test facilitated in estimating the average time required for respondents to complete the questionnaires. Any adjustments needed were made after the pilot study.

3.7.1 Validity

In research, validity describes how accurately a measurement tool accurately measures the specific behaviour or characteristic that it was supposed to measure, or in other words, how accurately it measures its purpose (Sürücü & Maslakci, 2020). It is a process of ensuring accurate and relevant inferences based on the results of the study (Cooper et al., 2019). This is why the pilot study was crucial in ensuring the validity of the questionnaire. Both content validity and construct validity were explored in this study. To evaluate content validity, the research supervisor assessed the questionnaire that was used in data collection and determined if it provided meaningful argument and would properly respond to the research questions. The questionnaire was also clarified to

ensure respondents understood the contents of the questionnaire. There were also options in the responses to ensure answers given were relevant to the study.

To ensure the study had validity, factor analysis was used where the construct validity of the questionnaire was established (Cooper et al., 2019). Factor analysis was run on a data scale to check if it was one-dimensional. When variables of a study were highly linked ($r > 0.8$ or $r < -0.8$), determining the exclusive contribution to a factor of the most correlated variable was impossible. On the other hand, if several variables had low correlation ($r > 0.3$ or $r < 0.3$), the variables were likely to fail in measuring a similar underlying construct. In this case, items that either had a high or low correlation were removed. If a study survey has items that collectively and accurately denote the underlying construct, then the survey has construct validity.

The research instrument included 35 parameters that accomplished sufficient factor loadings beyond the 0.40 standard required for exploratory factor analysis according to Yin (2017). Research needs more rigorous or confirmatory analysis which demands threshold levels above 0.5 or 0.6 to verify substantial construct elements. The successful measurement of intended constructs by the questionnaire was verified through these assessment outcomes. The results were as shown in Appendix III.

3.7.2 Reliability

Reliability refers to the extent to which a measurement instrument produces consistent and stable results over time. A reliable tool yields similar outcomes when used repeatedly under comparable conditions, even though perfectly identical results are unlikely due to external influences (Sürücü & Maslakci, 2020). In this study, reliability was assessed through internal consistency, which evaluates how closely related the items in a scale are and how accurately they measure the same construct (Wambui & Maina, 2022).

The study employed items measured using a five-point Likert Scale (1–5), which is widely used in behavioural and social science research because it allows respondents to express degrees of agreement or perception. The structured nature of the Likert scale enhances internal consistency by ensuring uniform response categories across items, enabling meaningful computation of inter-item correlations. These correlations form the basis for determining reliability using coefficient alpha.

To estimate test reliability, the study used Cronbach's Alpha, which measures the average inter-correlation among items within each construct. Cronbach (1951) popularised this coefficient, noting that internal consistency improves when relevant items are added to a scale. Coefficient alpha is particularly valuable in assessing fluctuations in reliability for one-dimensional scales, such as the construct scales in this study (Sürücü & Maslakci, 2020). According to Stratton (2021) an acceptable reliability coefficient should exceed 0.7, which indicates satisfactory internal consistency for hypothesis-driven research. Based on this guideline, the study accepted all constructs with alpha values above the 0.7 threshold. The reliability results are presented in Table 3.3.

Table 3. 3: Reliability Analysis

	Reliability Cronbach's Alpha	**Decision**
Technology innovation	0.873	Reliable
Process innovation	0.843	Reliable
Marketing innovation	0.700	Reliable
Innovative financing	0.770	Reliable
Performance of software start-ups	0.801	Reliable

Source: Survey Data (2025)

The findings indicated that technology innovation had a reliability coefficient of 0.873, process innovation recorded 0.843, marketing innovation 0.700, innovative financing 0.770, and performance of software start-ups 0.801. Since all the Cronbach's Alpha values exceeded the recommended minimum of 0.7, the instrument demonstrated satisfactory internal consistency. This affirms that the study reliably captured all the intended constructs (Sürücü & Maslakci, 2020).

The findings indicated that technology innovation had a coefficient of 0.873,a coefficient of 0.843 was observed for process innovation, marketing innovation yielded a coefficient of 0.700, a coefficient of 0.770 was observed for innovative financing, while performance of software start-

ups had a coefficient of 0.801. All the constructs had a Cronbach's Alpha value above 0.7, indicating that the study was reliable in capture the constructs (Sürücü & Maslakci, 2020).

3.8 Data Analysis and Presentation

In preparation for data entry, the research instruments underwent a thorough cleaning process, and to confirm the completeness of the set questionnaires. Data were then be analysed using inferential and descriptive statistical procedures. Figures and tables were used to display the results. Measures such as mean, standard deviation, frequency and percentages formed descriptive statistics. Inferential statistics included calculations such as the correlation coefficient and multiple linear regression analysis. The correlation coefficient was utilized to demonstrate the extent of influence that innovation strategies, such as technology innovation, process innovation, marketing innovation, and innovative financing, have on the performance of software start-ups in Nairobi City County, Kenya. Inferential statistics was used to make inference from what was obtained from the sample of Software Start-ups to the entire population since not all Software start-ups in NCC were part of the survey. This helped in generalising the research findings from the sample to the target population. Multiple regression analysis, on the other hand, was used to reveal the specific impact of technology innovation, process innovation, marketing innovation and innovative financing on the performance of Software start-ups in Nairobi City County, Kenya. .

Multiple regression model will be in the form:

$Y= \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon$

Where:

Y = Performance of Software start-ups in Nairobi City County

$\beta 0$ = constant

$\beta 1$ to $\beta 4$ = regression coefficients for the independent variables, representing the change in Y for each unit change in X.

X1 = technology innovation

X2 = process innovation

X3 = marketing innovation

X4 = innovative financing

E = the error term

3.9 Ethical Considerations

Before commencing the research, an introductory letter was obtained from Kenyatta University to ensure a formal and professional introduction to all study participants. Assurances were given to participants regarding the confidentiality of the information they submitted and that it would be utilized solely for academic purposes. The distributed questionnaires excluded the names of participants to preserve respondents' privacy and ensure anonymity. Furthermore, the involvement of participants in the study was entirely voluntary; only those who are willing will take part, ensuring the quality and integrity of the research.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the analysis of research data alongside the presentation of results that matched the study objectives. A logical presentation of results was used, combining tables, charts, and descriptive narratives to clarify findings and their interpretation. The data results connected directly to the research goals by showcasing major statistical relationships derived from the collected information. The researcher examined variable correlations and compared data points whenever possible to deepen understanding of the study topic, innovation strategies and performance of software start-ups in NCC, Kenya.

4.1.1 Response Rate

In total, 186 participants from fintech start-up operations within Nairobi City County were chosen as research respondents. A total of 149 completed questionnaires were returned whereas 37 were not received thus resulting in an 80.1% response rate from the initial 186 distributed surveys.

The obtained response rate was acceptable for the research purpose. According to Yin (2017), a response rate of 50% is adequate for data analysis to be conducted. Therefore, the 80.1% return rate demonstrated a high degree of participation by the intended respondents, establishing a trustworthy foundation for result examination.

The distribution of responses and non-responses is presented in Table 4.1

Table 4. 1: Response Rate

	Number of Respondents	**Percent**
Response	149	80.1
Non-Response	37	19.9
Total	**186**	**100**

Source: Field Data (2025)

4.2 Background Information

The study aimed to obtain basic background data from participants to build an understanding of the population characteristics in which Nairobi City County fintech start-ups operated. The questionnaire gathered response data regarding gender, job position at the start-up and main market segment, funding status, business duration and total staff count.

The gathered information helped develop respondent profiles while recognizing how different start-up profiles alongside organizational positions shaped innovation strategy perception. The responses were presented in the subsequent subsections.

4.2.1 Gender of the Respondents

The study sought to obtain workforce gender distribution at fintech start-ups operating in Nairobi City County. Gender diversity maintained significant importance as a demographic factor because technology-driven and innovation-based sectors typically show varying male-female population distributions. The findings were as shown in table 4.2.

Table 4.2: Gender of the Respondents

	Frequency (n)	**Percent**
Male	90	60.4
Female	59	39.6
	149	100

Source: Field Data (2025)

Results in table 4.2 show that there were more men than women in the sample population , with 60.4% being male and 39.6% being female. Male respondents outnumbered females but women made up a sizable portion in this study sample which may demonstrate rising inclusivity patterns in the financial technology sector.

4.2.2 Position of the Respondent in their Start-ups

The respondents were asked to indicate their role within the start-ups. The results were as shown in Table 4.3 below.

Table 4. 3: Position of Respondents in their Start-ups

	Frequency (n)	**Percent**
Founder/Co-Founder	46	30.9

Chief Technical Officer	40	26.8
Head of Customer Support	41	27.5
Marketing Manager	22	14.8
Total	**149**	**100**

Source: Field Data (2025)

The study, as shown in table 4.3, revealed organizational views through participant roles enabling better understanding of innovation strategy both strategic decision-making and operational application between differing management levels. The survey collected data from four main role types in fintech start-ups; founder/co-founder and chief technical officer and head of customer support and marketing manager. Founders and Co-Founders accounted for the largest participant group at 30.9% in the research sample. Heads of Customer Support ranked second among the surveyed positions with 27.5% while the group of Chief Technical Officers came in third with 26.8% .Marketing Managers held 14.8% the total responses. The chosen data collection approach successfully obtained insights from multiple leadership and operational perspectives to ensure both strategic and customer-facing roles were represented.

4.2.3 Market Served by the Start-ups

Information on the primary markets served by the fintech start-ups was collected to understand the geographic scope of their operations. Respondents provided information on whether their start-ups primarily served the local, regional, or international market. The results were as summarized in Table 4.4.

Table 4. 4: Market Served by the Software Start-ups

	Frequency (n)	**Percent**
Local (within Kenya)	81	54.4
Regional (within Africa)	39	26.2
International (outside Africa)	29	19.5
Total	**149**	**100**

Source: Field Data (2025)

The findings in table 4.4 revealed that a majority of the start-ups were focused on serving the local market within Kenya, as indicated by 54.4% of the respondents. This shows that most fintech firms

in NCC operate primarily within national boundaries, likely tailoring their products to the Kenyan context in terms of customer needs, regulatory frameworks, and market infrastructure. In addition, 26.2% of the respondents reported that their start-ups served a regional market within Africa, pointing to firms with a broader operational footprint beyond Kenya. These start-ups may engage in cross-border services within the continent, which could influence the complexity of their innovation strategies. A further 19.5% of the respondents indicated that their start-ups operated in international markets outside Africa, reflecting a global strategic orientation. Such firms are likely to face diverse market conditions, regulatory challenges, and higher expectations for scalable, innovative solutions.

4.2.4 Funding Stage of the Start-ups

To evaluate the financial development and external funding impact on growth strategies the study assessed which phase the fintech start-ups were in their funding journey. Respondents provided information on whether their business operated through bootstrapping or secured external financing. The findings were as shown in Table 4.5.

Table 4.5: Funding Stage of the Start-ups

	Frequency (n)	**Percent**
Bootstrapped (No external funding)	54	36.2
Early-stage funding	44	29.5
Seed funding	35	23.5
Growth funding	16	10.7
Total	**149**	**100**

Source: Field Data (2025)

The results as shown in table 4.5 demonstrated that 36.2% of start-ups ran independent operations without external financing, and instead funded their operations through founders' personal savings together with reinvested operational revenue. Many start-ups stayed in initial development phases while choosing to finance themselves independently to maintain entire business ownership control. Start-ups that obtained early-stage funding from friends and family and angel investors and small grants reported as 29.5% of respondents. The start-ups appeared to be developing from brainstorming to expansion stages while needing early-stage funding for testing prototypes or modelling their concept. Start-ups at the seed funding level backed by venture capital or

institutional investors made up 23.5% of the survey response total. These companies had proven their business models and products therefore they needed capital to scale their operations. A minority of 10.7% among respondents said their organizations operated at the growth funding level which demands major investment for extensive operational growth. Fintech start-ups encounter substantial hurdles when seeking higher levels of funding since their limited numbers demonstrate this funding gap in emerging markets specifically.

4.2.5 Years of Operation of the Start-ups

The study sought to determine the operational duration of each start-up in Nairobi City County. The information about company duration shed light on both the organizations' level of maturity and their time spent actively operating in the fintech industry. Respondents were asked to choose the number of years they had operated with NCC. Table 4.6 shows the study findings.

Table 4. 6: Years of Operation of the Start-ups

	Frequency (n)	**Percent**
Less than 1 year	32	21.5
1–5 years	79	53.0
6–10 years	30	20.1
More than 10 years	8	5.4
Total	**149**	**100**

Source: Field Data (2025)

The results revealed that 21.5% of the start-ups had existed for under one year. The early development phase may have occupied these businesses while they worked on product improvements or basic customer adoption strategies. Additionally, 53.0% of start-ups had 1 to 5 years in operation. The results also showed that start-ups that had operated between six and ten years comprised 20.1% of the sample, representing experienced firms working within the sector. The study revealed that among the Nairobi-based start-ups only 5.4% continued operation for more than ten years showing the rarity of mature fintech businesses in the fast-growing technology landscape.

4.2.6 Number of Employees in the start-ups

The study sought to reveal the scale of human resource capacity within the fintech start-ups operating in Nairobi City County. Understanding the number of employees provided insights into the size and structure of the firms, which could influence their approach to innovation, decision-making, and operational complexity. Respondents were asked to indicate the total number of employees in their start-up by selecting from one of four predefined categories. Results were as presented in Table 4.7.

Table 4. 7: Number of Employee in the Start-ups

	Frequency (n)	**Percent**
1–10 employees	42	28.2
11–50 employees	60	40.3
51–100 employees	29	19.5
More than 100 employees	18	12.1
Total	**149**	**100**

Source: Field Data (2025)

The survey revealed that start-ups maintained small teams as most firms put employees between 11 to 50 people according to 40.3% of respondents. A substantial number of surveyed companies separated from micro-level operations without advancing entirely to substantial medium-sized structures which aligns with developing fintech enterprises. Small teams comprising 1 to 10 staff members provided 28.2% of the responses in the survey because these companies focused on building their client network or operated minimal business strategies after recent formation or without external funding. 19.5% of the respondents operated start-ups with employee counts ranging from 51 to 100 suggesting these businesses had entered or expanded their operations through external funding sources. A small percentage of 12.1% among respondents pointed to their start-ups employing more than 100 workers which indicated that extensive operations remained minimal throughout the NCC fintech sector.

4.3 Technology Innovation

This study sought to investigate the effect of innovation strategies on performance of software start-ups in NCC Kenya. Participants were invited to express their level of agreement with the statements regarding the effect of technology innovation on performance of software start-ups in NCC Kenya.

Table 4.8 illustrates the findings.

Table 4. 8: Technology Innovation and Performance

	Mean	**Std. Dev.**
In the past year, we have regularly introduced new features or updates to improve our products.	4.03	.986
Our customers or internal teams quickly adapt to the new technologies or features we implement.	3.97	1.016
A significant part of our company's income comes from the features or products we launched in the last year.	3.95	.895
By using new technologies, we have significantly reduced the time it takes to develop and launch new features.	3.84	.973
Our start-up has successfully integrated new technologies (e.g., AI, cloud computing) to improve the functionality of our product or service.	3.93	.923
Our customers regularly provide positive feedback on the new features or products that we introduce.	3.93	.875
We regularly use data to make decisions about product improvements and new feature releases.	3.89	.924
Aggregate Mean and Std. Dev.	**3.93**	**0.94**

Source: Field Data (2025)

The analysis results shown in Table 4.8 revealed that most financial-technology start-ups in Nairobi City County actively pursued technology-based innovations. The survey participants displayed strong agreement regarding frequent product updates regularly introduced to users. Most companies demonstrated stable practices of product enhancement, as the mean score of 4.03 showed slight variation from the standard deviation of 0.99. This finding aligned with Mikalef et

al. (2020), who observed that continuous iteration of digital products enhances agility and responsiveness in technology-based sectors.

Participants reported that revenue generated from new product features was important (mean = 3.95, SD = 0.90). The small deviation suggested shared views among firms. Khin & Ho (2019) found that innovation efforts linked to digital capabilities produce measurable performance gains, supporting this result.

Respondents gave moderate to strong approval to incorporating advanced technologies such as artificial intelligence and cloud computing (mean = 3.94, SD = 0.92). The variation indicated differing levels of technological integration among start-ups. Lee et al. (2019) noted that implementation of advanced technologies defines fintech strategies, although adoption levels depend on organizational readiness.

The study further revealed that team and customer adaptability to new technology received a mean of 3.97 with a deviation of 1.02 ; the widest spread in this construct. This implied differing user-adoption speeds across firms. Maroufkhani et al. (2018) similarly observed that digital transformation success depends on market dynamics and user acceptance.

The influence of technology on reducing development timelines received the lowest agreement (mean = 3.84, SD = 0.97). The higher variation showed that some firms had not yet realized speed or efficiency gains. Khin & Ho (2019) argued that benefits appear only when structural organization, integration progress, and digital literacy are achieved.

Across the seven items, the aggregate mean of 3.93 and standard deviation of 0.94 indicated moderate consistency among responses. Customer feedback on new features (mean = 3.93, SD = 0.88) was positive, and most firms used data-driven decision-making (mean = 3.89, SD = 0.92).

The variability in responses across firms may be attributed to differences in technological readiness, capital resources, and strategic focus levels among start-ups in Nairobi City County. Overall, the research showed broad consensus regarding all statements forming the Technology

Innovation construct, while differences in implementation capacity and customer dynamics reflected firm-specific realities consistent with prior literature (Mikalef et al., 2020).

4.4 Process Innovation

This study sought to investigate the effect of innovation strategies on performance of software start-ups in NCC Kenya. Participants were invited to express their level of agreement with the statements regarding the effect of process innovation on performance of software start-ups in NCC Kenya.

Table 4.9 illustrates the findings.

Table 4. 9: Process Innovation and Performance

	Mean	**Std Dev.**
The systems and processes we've introduced have helped us work more efficiently, completing tasks faster with fewer resources.	3.98	.948
New processes or technologies we've implemented have helped us cut costs without sacrificing quality.	3.87	.917
Our internal process improvements have led to noticeable enhancements in the quality of our products or services (e.g., fewer bugs, better user experience).	3.92	.874
We've managed to shorten the time it takes to go from concept to the final product or service delivery because of process changes.	3.90	.950
We have automated key processes in our operations (e.g., customer management, invoicing) to improve efficiency.	4.03	.944
Changes in how we work have resulted in our employees being able to achieve more in the same amount of time.	3.96	.929
Our operational changes have improved customer service, leading to higher satisfaction levels.	4.11	.909
Aggregate Mean and Std. Dev.	**3.97**	**.924**

Source: Field Data (2025)

The research findings shown in Table 4.9 revealed that fintech start-ups operating in Nairobi City County used extensive internal innovation systems to enhance operational effectiveness, improve service delivery, and reduce costs. The item regarding operational modifications leading to customer service enhancement drew the most agreement among participants. The majority of respondents rated this statement with a mean of 4.11 and a standard deviation of 0.91, showing that process innovation positively affected customer satisfaction. Information from this question showed minimal discrepancies among businesses, indicating widespread adoption across different organizations.

Most survey participants confirmed that essential operational processes, including customer service and invoicing, had undergone automation. The results showed that automation occurred widely across several organizations that pursued different levels of implementation, as shown by a mean of 4.03 and a standard deviation of 0.94. The results support Mikalef et al. (2020), who found that process digitization is crucial for improving performance through innovation.

Process changes also led employees to perform more work during equivalent time periods, which received substantial consensus from respondents. Regarding internal workflow productivity, many companies reported positive results based on the overall score of 3.96 and a standard deviation of 0.93. There was general agreement about the quality improvement of products or services resulting from internal process enhancements since employees evaluated this statement with a mean rating of 3.92 and a standard deviation of 0.87.

Survey respondents rated the item measuring the shortening of concept-to-delivery time at 3.90 with a standard deviation of 0.95. Various factors such as operational readiness and process integration across companies seemed to explain the wider dispersion observed among responses despite overall agreement. Research by Khin & Ho (2019) supported these findings, noting that structural and procedural readiness determines the time benefits innovation offers for market delivery.

Survey participants also indicated their agreement that new processes and technological developments led to cost reductions without compromising quality standards. The majority of

survey respondents gave this statement an average rating of 3.87 with a standard deviation of 0.92. Compared to other items, respondents exhibited slight disagreement on the financial advantages of process innovations. Differences in resource allocation, funding stages, and levels of automation seemed to explain this variation.

Start-ups rated the item about work optimization through quicker delivery using reduced resources at 3.98 with a standard deviation of 0.95. The measured responses indicated that numerous start-ups considered their process innovations effective in enhancing daily operational efficiency.

The study established that process innovation was a common practice among fintech businesses operating in Nairobi City County. The research data indicated strong endorsement of internal innovation strategies through high mean scores while showing limited variation in implementation methods because of moderate standard deviations. The seven items received mean scores between 3.87 and 4.11, which accumulated to a general average of 3.97. The overall standard deviation measure equalled 0.92, demonstrating that most participants agreed within an average range of responses to the questions.

The variability in responses across start-ups may be explained by differences in operational readiness, automation levels, and resource capacity among fintech firms in Nairobi City County.

4.5 Marketing Innovation

The study sought to examine the effect of marketing innovation on the performance of fintech start-ups in Nairobi City County. The study examined various application methods between firms for digital engagement together with pricing models as well as customer targeting and brand positioning. The research findings regarding this construct are as shown in Table 4.10.

Table 4. 10: Marketing Innovation and Performance

	Mean	**Std Dev.**
We have successfully started using new platforms (such as social media, influencer marketing, or digital campaigns) to reach more customers.	4.00	.923
Our marketing efforts are tailored to specific customer needs, leading to better engagement and response from our audience.	3.93	.875
We have developed new ways to make our products or services more accessible to customers through innovative partnerships or online channels.	3.97	.922
We've used different pricing models (such as subscription services, free trials or discounts) to attract more customers and increase revenue.	4.05	.918
Our start-up has been successful in engaging with customers on social media platforms, resulting in increased brand awareness and customer interaction.	4.07	.855
Our marketing strategies have helped reduce the cost of acquiring new customers.	4.07	.916
Our brand has gained more recognition in the market as a result of our marketing efforts.	3.99	.948
Aggregate Mean and Std. Dev.	**4.01**	**.908**

Source: Field Data (2025)

As shown in Table 4.10, survey participants demonstrated that their start-ups had used new marketing platforms, including social media and influencer marketing, along with success in reaching broader audiences. The survey data showed that this use of digital-first innovative

marketing tactics prevailed in the firm landscape since respondents rated it with a mean of 4.00 and a standard deviation of 0.92. Sharabati et al. (2024) validated this finding through their research on how digital channels helped businesses reach more customers, specifically in emerging market scenarios.

Specific customer requirements shaped marketing initiatives according to the survey results, where participants scored 3.93 with a 0.88 standard deviation. The majority of start-ups integrated customer-related data with feedback to design personalized messages and promotional campaigns. Though this rating ranked slightly lower than other items, it demonstrated strong involvement with marketing strategies that placed customers at the centre. This finding aligned with a study by Yildiz & Aykanat (2021), which revealed how personalized marketing approaches using segmentation improved customer retention through better engagement results.

The survey participants showed strong support for using alternative distribution methods and cooperative partnerships that enhanced product accessibility, as reflected in a mean of 3.97 and a standard deviation of 0.92. Three strategies that explained this outcome included affiliate marketing platforms, fintech partnerships, and embedded financial services that expanded product accessibility.

Along with providing flexible pricing through subscription plans, free trials, and promotional discounts, digital companies received a mean of 4.05 with a standard deviation of 0.92 across the group of respondents. Contemporary businesses achieved success in competitive environments by implementing such strategies because they created barrier reductions and enhanced the perception of value(Van Tonder et al., 2020).

Research participants highly endorsed social media engagement as an effective tool to boost brand awareness and customer interactions according to their response metrics of 4.07 along with a 0.86 standard deviation. Many fintech companies effectively deployed digital communication systems to build a more prominent market presence and develop user communication in both directions.

Survey participants demonstrated equal agreement on marketing strategies as an effective approach for lowering customer acquisition expenses through their response mean of 4.07 and a standard deviation of 0.92. The collected data indicated that respondents recognized marketing innovations as effective in reducing costs, possibly by achieving better customer targeting or reaching consumers organically.

The respondents scored brand recognition through marketing innovation at 3.99 but showed diverse reactions with a standard deviation of 0.95, which indicated positive branding effects across the majority of start-ups. The data supported the concept that continuous development of value-oriented innovative marketing strengthened long-term brand positioning success.

Although most of the mean scores were above average, some items such as personalized marketing efforts (mean = 3.93) and brand recognition (mean = 3.99) showed slightly lower or more dispersed responses. This variation suggested that while many start-ups embraced digital marketing, others lagged due to limited marketing budgets, unequal access to analytics tools, or differences in managerial expertise. These disparities reflected the uneven digital maturity that often characterizes emerging fintech ecosystems (Sharabati et al., 2024).

A majority of respondents agreed that marketing innovation served as an active business practice that produced significant results within the fintech sector. The survey results showed that firms achieved similar experiences through an aggregate mean score of 4.01 and a standard deviation of 0.91. Marketing innovation functioned as a vital industrial performance factor for digital businesses that needed to expand their customer base, boost engagement, and establish differentiating features (Sharabati et al., 2024; Van Tonder et al., 2020; Yildiz & Aykanat, 2021). The variation in mean responses across firms could also be attributed to differences in digital marketing capabilities, available budgets, and customer engagement maturity among fintech start-ups in Nairobi City County.

4.6 Innovative Financing

The study sought to evaluate the innovative financing approaches of fintech start-ups in Nairobi City County that supported their business performance and operational sustainability. The results were as shown in table 4.11 below.

Table 4. 11: Innovative Financing and Performance

	Mean	**Std Dev.**
We have successfully secured funding from a range of sources, including venture capital, angel investors, crowdfunding, and government grants.	3.91	.951
We manage the funds we've raised effectively, ensuring they are spent wisely to maximize growth and minimize waste.	3.93	.970
We have established strong relationships with financial institutions or investors that have helped us secure more favourable financing terms.	3.90	.957
We have benefitted from government programs or policies that offer financial support, grants, or tax incentives to help fund our operations.	3.89	.976
Our start-up is effective in managing cash flow, ensuring we have sufficient funds to cover operating expenses and invest in growth.	4.01	.945
We've implemented strategies to reduce the risks associated with raising and managing funds for the business.	3.97	.951
The funds we've raised are being actively invested in growing the business, including expanding operations, hiring, or developing new products.	3.93	.940
Aggregate Mean and Std. Dev.	**3.929**	**.956**

Source: Field Data (2025)

As shown in Table 4.11, research participants acknowledged that their firms obtained funding through extended financing channels such as venture capital, angel investors, crowdfunding, and official grants. The study revealed that most businesses had accessed some form of external funding, though the level of diversification varied across start-ups (mean = 3.91, SD = 0.95).

Respondents agreed that funds obtained through external sources were managed effectively for growth purposes (mean = 3.93, SD = 0.97). According to Pratono (2018), organizations must implement sound financial practices to transform outside capital into sustainable innovative efforts. Investor relations built by start-ups led to improved financing terms from both investors and financial institutions, although the variation (mean = 3.90, SD = 0.96) suggested that some start-ups, particularly those in early stages, had yet to develop such partnerships.

The survey revealed that start-ups benefited from government support programs and tax incentives to some extent (mean = 3.89, SD = 0.98), though this item also exhibited the highest deviation, implying inconsistent access to public support. These findings are consistent with (Adomako & Ahsan (2022), who observed that gaps in policy access often reduce the equity and inclusivity of financing strategies available to SMEs.

Most start-ups managed their cash flow effectively, as shown by a mean score of 4.01 (SD = 0.95), indicating that the majority of firms maintained operational liquidity and allocation efficiency for both short-term and long-term objectives. This stability suggests growing financial maturity among fintech start-ups, which enables them to balance expansion and sustainability.

The study also found that start-ups implemented risk management strategies related to financing (mean = 3.97, SD = 0.95), reflecting a proactive approach to managing uncertainty; an essential factor for innovation scaling. Additionally, firms reported reinvesting raised funds toward business growth, hiring, and product development (mean = 3.93, SD = 0.94), highlighting their efforts to convert financing into tangible growth outcomes.

The assessment of innovative financing constructs produced a general consensus among respondents, with an aggregate mean of 3.93 and standard deviation of 0.96. However, the variation across items, particularly government support (SD = 0.98) and relationship-building with investors (SD = 0.96), revealed mixed findings. Some start-ups benefited substantially from institutional financing and government incentives, while others remained primarily self-reliant or in early funding stages. These disparities may stem from differences in firm maturity, networking

capabilities, or awareness of available funding programs within the fintech ecosystem of Nairobi City County.

Overall, the findings validate prior studies demonstrating that innovative financing mechanisms enhance the resilience and adaptability of resource-constrained firms. Pratono (2018) emphasized that the ability to leverage diverse funding sources contributes to business agility, while Adomako & Ahsan (2022) highlighted that limited access to structured financing can constrain innovation and performance. The present study therefore affirms that diversified, well-managed financing options are a key driver of fintech start-up performance and long-term sustainability.

4.7 Performance of Software Start-ups in Nairobi City County

The study sought to assess the overall performance of fintech start-ups in Nairobi City County. Respondents were asked to rate various aspects of performance, including revenue growth, customer retention, profitability, market reach, and financial stability. The findings are summarized in Table 4.12.

Table 4. 12: General Performance

	Mean	**Std Dev.**
Over the past year, our company has consistently increased its overall revenue.	4.07	.886
We have successfully attracted a growing number of new customers or users over the past 12 months.	3.87	.946
Most of our customers continue to use our product or service for a long time after their first purchase or signup.	3.98	.990
After covering all operating costs, our company has consistently generated profits over the last year.	3.85	.982
We have been able to expand our market share and reach new customer segments or regions.	3.99	.874
Our product or service can scale easily without needing proportional increases in costs.	3.97	.986

Our company is financially stable, and we can sustain operations even during periods of slow revenue growth.	3.92	.912
Aggregate Mean and Std. Dev.	**3.95**	**.939**

Source: Field Data (2025)

As shown in Table 4.12, the survey data showed that start-ups achieved revenue growth throughout the previous year since respondents highly agreed with this statement with a mean of 4.07 and standard deviation of 0.886. Most businesses displayed substantial financial progress probably due to innovation combined with market expansion and better operations.

The results showed that attracting new customers or users was considered beneficial although different start-ups varied in their responses to this finding. Customer acquisition performance measured through this item averaged at 3.87 while its standard deviation reached 0.946, which suggests that business maturity or market segment played a role in determining the levels of growth achieved by companies.

Research participants held a positive perspective about start-up success at customer retention. The respondents' assessment of customer loyalty maintenance alignment rated 3.98 on average but exhibited 0.990 standard deviation, which indicates widespread agreement while reflecting diverse long-term customer relations. This pattern is consistent with the findings of Hock-Doepgen et al. (2021)), who observed that start-ups often experience fluctuations in customer loyalty during their early growth stages due to evolving service quality and market positioning.

Survey participants rated the consistency of operational cost coverage profitability at 3.85 with 0.982 standard deviation. The lower rating and increased variability about financial sustainability shows that although some companies reached profitability, others needed to work on their financial stability; a common challenge in young innovation-driven enterprises (Eshima & Anderson, 2017).

Market expansion along with segment penetration gained approval from participants which scored a mean of 3.99 with a standard deviation of 0.874. Evidence from this variable reveals organizations of different scales and ages employed this expansion method uniformly.

Participants indicated their agreement that product or service expansion did not incur a cost proportionate to the increased scale. Many start-ups showed evidence of efficient scalability in their product or service design according to the assessment results which produced a mean score of 3.97 alongside a standard deviation of 0.986. This indicates operational leverage through technology-based delivery, a feature that differentiates successful fintechs from traditional firms (Mikalef et al., 2020).

The financial stability of start-ups during times of revenue slowdown obtained a rating of 3.92 with a standard deviation of 0.912. The reported financial stability indicates start-ups possess reliable abilities in navigating financial challenges even during unfavourable market situations.

Study results revealed that fintech start-ups in Nairobi achieved positive performance according to different metrics including growth potential, market penetration capabilities, and the ability to expand their operations. The performance-based items received uniform approval from the respondents as their combined mean was 3.95 while the standard deviation reached 0.939, though some variance appeared when rating profitability and customer retention capacity. These variations likely reflect mixed performance outcomes tied to differences in firm age, funding levels, and innovation capacity ; an interpretation consistent with Eshima & Anderson (2017), who found that innovation-based start-ups demonstrate strong early growth potential but face periods of instability before achieving sustainable profitability.

Overall, the results affirm that fintech start-ups in Nairobi City County have achieved substantial progress in scaling and sustaining performance through innovation-driven strategies, even as they face occasional performance volatility due to resource constraints and competitive pressures.

4.8 Tests for Regression Assumption

Before conducting regression analysis, diagnostic tests were performed to ensure that the data met the basic assumptions of multiple linear regression. The diagnostic checks included tests for normality, multicollinearity, and homoscedasticity as recommended by Field (2024). These tests ensured the validity and reliability of the regression outcomes.

4.8.1 Tests for Normality

A statistical normality assumption describes data that aligns with a bell-shaped symmetric distribution pattern known as the normal distribution, which represents most data points near the mean with decreasing values toward extreme regions. The validity of regression hypotheses along with accurate confidence interval results depend heavily on normal distribution of residuals according to (Hewson, 2015). The lack of normal distribution among residuals creates situations leading to unreliable and biased outcomes which damage the validity of regression model findings.

Table 4. 13: Tests of Normality

	Kolmogorov-Smirnova			**Shapiro-Wilk**		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Technology innovation	0.048	148	.200*	0.996	148	0.951
Process innovation	0.051	148	.200*	0.985	148	0.120
Marketing innovation	0.031	148	.200*	0.993	148	0.686
Innovative financing	0.05	148	.200*	0.993	148	0.706
Performance of software start-ups	0.041	148	.200*	0.995	148	0.904

Source: Field Data (2025)

Numerical analysis was performed to see if the key composite variables conformed to normality. The variables under investigation were Technology Innovation, Process Innovation, Marketing Innovation, Innovative Financing, and Performance. The normality of these variables was analysed with the Shapiro-Wilk test using the data from 149 respondents. Because of its sensitivity and appropriateness for samples in the moderate range, this test is generally trusted in applied social research.

As shown in Table 4.13, each variable exceeded the 0.05 threshold in its p-value; thus, there was no significant deviation from a normal distribution. Technology Innovation attained p = 0.951, Process Innovation = 0.120, Marketing Innovation = 0.686, Innovative Financing = 0.706, and Performance = 0.904. The observed values indicate that none of the constructs departed from a normal distribution substantially, thus permitting the use of parametric statistical techniques in later steps of the analysis.

Therefore, the normality assumption for regression was satisfied, consistent with best-practice guidelines by Field (2024) and Hair et al. (2022).

4.8.2 Multicollinearity

The independence of independent variables in the regression model was tested through Tolerance and Variance Inflation Factor (VIF) statistics. According to Hair et al. (2022), multicollinearity becomes a concern when VIF values rise above 10 or Tolerance levels drop below 0.2, since these criteria indicate excessive correlation among the independent variables.

Table 4. 14: Coefficients(Multicollinearity Test)

Model	**Collinearity Statistics**	
	Tolerance	VIF
Technology innovation	0.981	1.019
Process innovation	0.980	1.020
Marketing innovation	0.970	1.030
Innovative financing	0.971	1.030

Source: Field Data (2025)

All independent variables in the model were found to fall below risk thresholds. Technology Innovation showed little association with other predictors (Tolerance = 0.981; VIF = 1.019). Process Innovation (Tolerance = 0.980; VIF = 1.020), Marketing Innovation (0.970; 1.030), and Innovative Financing (0.971; 1.030) similarly demonstrated minimal collinearity.

These findings confirm that multicollinearity was not an issue in the model, satisfying the assumption of predictor independence recommended by Hair et al. (2022).

4.8.3 Heteroscedasticity Test

Heteroscedasticity exists when the residual variance is not similar at all values of the independent variables in a regression model. This violates a fundamental assumption of the classical linear

regression model and may result in errors in standard-error estimation, incompatible significance tests, and reduced confidence in regression results. To maintain the credibility and interpretability of findings, residuals must show homoscedasticity (Field, 2024).

The results for heteroscedasticity test were as shown in table 4.15 below.

Table 4. 15: Coefficients(Heteroscedasticity Test)

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	4.121	0.656		6.28	0
Technology innovation	-0.059	0.091	-0.055	-0.651	0.516
Process innovation	-0.041	0.101	-0.034	-0.404	0.687
Marketing innovation	-0.022	0.078	-0.024	-0.281	0.779
Innovative financing	0.048	0.059	0.068	0.808	0.42

Source: Field Data (2025)

The presence of heteroscedasticity was evaluated in this study by checking the significance (Sig.) values for each regression coefficient. A lack of variability in these p-values can mean that residual variance does not unequally affect standard errors or test statistics (Field, 2024).

All p-values exceeded 0.05 (Technology Innovation = 0.516; Process Innovation = 0.687; Marketing Innovation = 0.779; Innovative Financing = 0.420), indicating no significant heteroscedasticity. Thus, the model met the assumption of equal residual variance (homoscedasticity), consistent with Field (2024).

4.8.4 Autocorrelation Test

Autocorrelation arises when the residuals are correlated across observations, contradicting the requirement that residuals should be mutually independent. The problem of autocorrelation is often greater in time-series contexts, yet it is still necessary to consider in cross-sectional models to verify the appropriateness of standard errors and test statistics. The results for Autocorrelation Test were as shown in Table 4.16 below.

Table 4. 16: Autocorrelation Test

Model	Durbin-Watson
1	2.12

Source: Field Data (2025)

With a Durbin-Watson statistic of 2.120, this study's results fell well within the acceptable limit of 1.5 to 2.5. Field (2024) notes that a value near 2 indicates no substantial autocorrelation, supporting the assumption of error independence.

4.8.5 Linearity Test

The assumption of linearity was assessed using the Deviation-from-Linearity test in SPSS to determine whether a straight-line relationship existed between each independent variable and the dependent variable (performance). A p-value > 0.05 indicates linearity.

Table 4. 17: Linearity Test

Variable	Linearity Assumption Met?	Sum of Squares	Mean Square	F	Sig. (p-value)
Performance	–	14.081	–	–	–
Technology Innovation	Yes	6.480	0.082	0.737	0.905
Process Innovation	Yes	7.565	0.102	1.148	0.279
Marketing Innovation	Yes	9.385	0.109	1.418	0.075
Innovative Financing	Yes	9.438	0.095	0.998	0.515

Source: Field Data (2025)

All four predictors recorded p-values above 0.05 (Technology Innovation = 0.905; Process Innovation = 0.279; Marketing Innovation = 0.075; Innovative Financing = 0.515), confirming linear relationships with performance and fulfilling regression linearity assumptions (Field, 2024).

4.8.6 Sampling Adequacy

Sampling adequacy was verified using the Kaiser-Meyer-Olkin (KMO) Measure and Bartlett's Test of Sphericity, as recommended by Kaiser (1974). KMO ≥ 0.70 and a significant Bartlett's Test ($p < 0.05$) indicate appropriate data for factor analysis. The results were as shown in table 4.18.

Table 4. 18: Sampling Adequacy

Construct	KMO	Bartlett's Test of Sphericity			
		Chi-Square (Approx.)	df	Sig.	Determinant
Technology Innovation	0.878	2225.311	148	0.000	0.114
Process Innovation	0.884	2137.466	148	0.000	0.136
Marketing Innovation	0.858	2022.152	148	0.000	0.152
Innovative Financing	0.867	2101.518	148	0.000	0.132

Source: Field Data (2025)

KMO values exceeded 0.85 and Bartlett's Tests were significant ($p < 0.001$), confirming meritorious sampling adequacy and inter-item correlation strength. These results verify that the dataset was statistically and psychometrically appropriate for factor analysis (Field, 2024; Kaiser, 1974).

4.9 Multiple Regression

A multiple linear regression analysis was done to study how technology innovation, process innovation, marketing innovation and innovative financing affected the performance of software start-ups in Nairobi City County. The findings were presented in table 4.19, 4.20 and 4.21

Table 4. 19: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.743	0.552	0.540	0.18902

a Predictors: (Constant), Technology Innovation, Process Innovation, Marketing Innovation, Innovative financing

Source: Field Data (2025)

The four strategies of innovation, which were examined in the multiple regression analysis; technology innovation, process innovation, marketing innovation as well as innovative financing; were found to explain about 55.2% of the differences observed in how the software start-ups performed. This was shown by the R-square value of 0.552 in Table 4.19. In other terms, a little

above 50 percent of the variance in performance of these software start-ups could be traced to their implementation of these innovation strategies.

The Adjusted R-square of 0.540 provided a modest yet more realistic measure since it considered the number of variables used in the model. This implied that even after controlling for model complexity, the outcome of performance could still be attributed to the innovation strategies used to the extent of roughly 54.0%. The standard error of the estimate had a value of 0.189. This value indicated how close the average values of the model predictions were to the actual performance values recorded at the start-ups. Such a small standard error indicated that the model predictions were quite accurate for the sample of start-ups in the research. However, these findings were specific to the Nairobi City County sample, and the model would require additional testing before it could be generalized to start-ups in other areas or industries.

The regression model's high explanatory power and consistency across predictors suggested that fintech firms in Nairobi City County experienced a strong linear relationship between innovation and performance, with minimal residual variation unexplained by the model.

Table 4. 20: Analysis of Variance

Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	7.775	4	1.944	54.46	.000
Residual	6.306	144	0.044		
Total	**14.081**	**148**			

a Dependent Variable: Performance of software start-ups

b Predictors: (Constant), Technology Innovation, Process Innovation, Marketing Innovation, Innovative Financing

Source: Field Data (2025)

Using the ANOVA, the model was tested to check whether it predicted the performance of software start-ups significantly, given the four innovation strategies used. Results indicated that the model was statistically significant, with F(4, 144) of 54.46 and a p-value below 0.001. To support this, the actual F-value computed (54.46) was checked to see if it was greater than or equal to the critical F-value for a 0.05 significance level. With reference to the F-distribution tables, the critical F-value for these parameters was close to 2.43. Since F-value (54.46) exceeded the critical value (2.43),

the model was accepted as statistically meaningful. The innovation strategies, therefore, impact start-up performance and helped the prediction process more than what might be achieved randomly. The study revealed that the independent variables had an impact on performance. Thus, it confirmed that the strategies described in the research were useful predictors of how these start-ups will perform in Nairobi City County. The statistics indicated that the null hypothesis, that the independent variables have no effect on performance, should be rejected.

Although all innovation dimensions were statistically significant, their beta weights (0.298 to 0.173) indicate varying levels of contribution, showing that technological and process innovations had stronger effects on performance compared to marketing and financial innovations. This pattern explains the mixed magnitude of influence reported in prior literature.

Table 4. 21: Regression Coefficients

Predictor	**Unstandardized**		**Standardized**	**t**	**Sig.**
	B	**Std. Error**	**Beta (β)**		
(Constant)	2.781	0.428	—	6.5	0
Technology Innovation	0.204	0.055	0.298	3.709	0
Process Innovation	0.167	0.049	0.261	3.409	0.001
Marketing Innovation	0.132	0.047	0.198	2.807	0.006
Innovative Financing	0.11	0.043	0.173	2.581	0.011

a Dependent Variable: Performance of software start-ups

Source: Field Data (2025)

The analysis found that all four approaches to innovation were significantly associated with better software start-up performance. Because the coefficients are unstandardized, the equation produced from the model is as follows:

$Y= \beta_0 + \beta 1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$, as per the SPSS generated table above.

As per the SPSS-generated table above, this equation becomes:

$Y= Y= 2.781 + 0.204X_1 + 0.167X_2 + 0.132X_3 + 0.11X_4 + \varepsilon$

This equation allows the quantitative estimation of the effect of different innovation strategies (technology innovation, process innovation, marketing innovation and innovative financing) on the performance of software start-ups. When no innovation strategy variables are used, 2.781 is the expected performance score. For each slope coefficient, an increase of one unit in the associated

innovation strategy is linked with an average increase in performance, with all other factors remaining constant.

To test the effect of technology innovation on performance, the following hypotheses were formulated:

H01:There is no significant effect of technology innovation on performance of software start-ups in Nairobi City County, Kenya.

The findings revealed that start-ups that incorporated AI, machine learning and similar tools into their operations were more effective in reaching strong performance outcomes, according to the results ($B = 0.204$, $p < 0.001$). Compared to other industries, fintech needs technology for its products to stay relevant and to quickly respond and run more efficiently in markets. Accordingly, the study rejected the null hypothesis (H01), which stated there is no significant effect of technology innovation on performance of software start-ups in Nairobi City County, Kenya. The finding confirmed that technology-based innovation significantly enhanced the competitiveness and performance of fintech firms in the region. This relationship suggested that technology not only helps but is crucial for performance, matching the research by Lee et al. (2019), that focused on how technology creates a strong competitive advantage in highly digital sectors.

To examine the effect of process innovation on performance, the following hypotheses were tested:

H02: There is no significant effect of process innovation on performance of software start-ups in Nairobi City County, Kenya.

As shown in table 4.21, Process Innovation was the second most important from the results ($B = 0.167$, $p = 0.001$). According to the findings, making internal processes more efficient by automating them, enhancing efficiency and updating procedures mattered for firm success. Most Nairobi fintech start-ups need to be very agile, quick to market and efficient with resources because the industry moves rapidly. For every one-unit rise in process innovation, performance improved by 0.167 units, indicating how key innovation is to smooth operations. As a result, the study rejected the null hypothesis (H02), which stated there is no significant effect of process innovation on performance of software start-ups in Nairobi City County, Kenya. The data provide strong evidence that efficient internal systems are a vital contributor to success in this context. The results

match those found in study by Mikalef et al. (2020) which connect simpler processes with better scalability and quality of services.

To examine the effect of marketing innovation on performance, the following hypotheses were tested:

H03: There is no significant effect of marking innovation on performance of software start-ups in Nairobi City County, Kenya.

Performance was observed to increase when marketing innovation was applied (B = 0.132, p = 0.006). This revealed that using social media outreach, adjusting rates, running digital advertising or involving influencers allowed start-ups to increase their visibility, interact more with customers and build their brand. For businesses in the fintech industry, reaching out creatively to customers helps them get and keep new users. The null hypothesis (H03) which stated there is no significant effect of marketing innovation on performance of software start-ups in Nairobi City County, Kenya was rejected. These results reinforce the value of creative, data-driven marketing strategies in improving business outcomes. This was in line with a study by Sharabati et al. (2024) which connected adaptive marketing with improved market positioning and growth, especially in competitive digital sectors.

To examine the effect of innovative financing on performance, the following hypotheses were tested:

H04: There is no significant effect of innovative financing on performance of software start-ups in Nairobi City County, Kenya.

The pattern for Innovative Financing was similar, showing a positive, significant result (B = 0.110, p = 0.011). Getting resources from a range of funders supported growth because it helped with making new products, hiring staff and improving business operations. Accordingly, the study rejected the null hypothesis (H04), which stated there is no significant effect of innovative financing on performance of software start-ups in Nairobi City County, Kenya. The results highlighted the strategic role of financial innovation in enhancing operational resilience and scalability. The coefficient did not reach the same level as some other predictors, but that does not take away how important financial strength and planning resources are for early-stage and growing

fintech start-ups. Results are similar to works by Khin & Ho (2019) highlighting how financial innovation supports both long-term success and stability.

Technology Innovation, Process Innovation, Marketing Innovation and Innovative Financing all affected performance in a consistent manner, as proven by statistical significance at the 95% level ($p < 0.05$). The study showed with 95% confidence that the improvement in start-up performance was linked to the newly implemented innovation approaches. As a result, all four innovation strategies were proven to be reliable predictors of software start-up performance in the fintech sector of Nairobi City County which confirmed the framework used in this study.

These results collectively aligned with the innovation–performance theory (Schumpeter 1934); Damanpour & Aravind, 2012) and supported empirical evidence from Lee et al. (2019), Mikalef et al. (2020) and Khin & Ho (2019), reinforcing that sustained adoption of multi-dimensional innovation strategies contributed directly to performance outcomes in technology-oriented start-ups.

CHAPTER FIVE

SUMMARY,CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study was undertaken to investigate how innovation strategies influence the performance of software start-ups in Nairobi City County, Kenya. The research was prompted by persistent challenges of sustainability, growth, and competitiveness among software start-ups despite the rapid expansion of the digital economy. The specific objectives of the study were to examine the effect of technology innovation, process innovation, marketing innovation, and innovative financing on the performance of software start-ups.

This chapter brings together the findings, conclusions, and recommendations derived from the study. It consolidates how the four innovation strategies namely technology, process, marketing, and innovative financing affected start-up performance. The aim is to summarize the major findings from the analyses, provide practical recommendations, and suggest areas for future research.

5.2 Summary

The study aimed to assess how innovation strategies affect the performance of software start-ups in Nairobi City County, Kenya. The research was guided by four specific objectives: to determine the effect of technology innovation, process innovation, marketing innovation, and innovative financing on the performance of software start-ups.

The study was motivated by the observation that, while Nairobi has become a major technology hub in East Africa, many start-ups continue to face performance challenges such as slow revenue growth, limited market penetration, and sustainability issues. The study therefore sought to understand whether the application of innovation strategies could explain the varying levels of success among these firms.

The findings from the regression analysis revealed that all four innovation strategies; technology innovation, process innovation, marketing innovation, and innovative financing; had a positive and significant effect on performance. Technology innovation was shown to be the most influential, with firms that continuously integrated advanced technologies such as artificial intelligence and cloud systems reporting stronger growth and improved operational efficiency.

Process innovation was also found to play a critical role in enhancing efficiency and customer satisfaction. Firms that adopted workflow automation, streamlined internal systems, and improved service delivery reported greater productivity and faster response to market needs.

Marketing innovation contributed significantly to improved visibility, customer acquisition, and retention. The adoption of digital marketing platforms, influencer engagement, and tailored promotional strategies strengthened market positioning and brand recognition.

Innovative financing was identified as a key enabler for sustainability and scalability. Start-ups that diversified their sources of capital, including angel investors, venture capital, and crowdfunding, managed to overcome liquidity challenges and sustain operations more effectively than those relying on a single source of funding.

Overall, the study established that innovation strategies are vital drivers of growth, competitiveness, and long-term success among software start-ups. Firms that actively integrate multiple innovation dimensions perform better, adapt faster to changing market conditions, and are more resilient in a dynamic technology environment.

5.3 Conclusions

The study concluded that innovation strategies play a significant and multidimensional role in shaping the performance of software start-ups in Nairobi City County, Kenya. The results demonstrated that technology innovation, process innovation, marketing innovation, and innovative financing each contribute meaningfully to performance, both independently and collectively.

The study concluded that technology innovation is the strongest predictor of performance among software start-ups. Firms that consistently adopt emerging technologies such as artificial intelligence, automation, and cloud-based systems experience higher levels of efficiency, scalability, and customer satisfaction. This confirms that technology integration is not only a competitive advantage but also a strategic necessity for start-ups operating in rapidly changing digital markets.

Process innovation was also found to have a strong positive effect on performance. The study concluded that continuous improvement in operational processes enhances productivity, minimizes costs, and improves service quality. Streamlined workflows and process automation help start-ups to respond quickly to market opportunities, positioning them for sustainable growth.

Marketing innovation was concluded to significantly influence performance through increased visibility, customer engagement, and brand loyalty. The findings confirmed that start-ups employing modern digital marketing tools and data-driven targeting strategies are more likely to gain a competitive edge and expand their customer base effectively.

In addition, the study established that innovative financing serves as a crucial foundation for business growth and stability. Diversified funding sources enable start-ups to invest in technology, talent, and market expansion, reducing overdependence on traditional financing and improving resilience during economic fluctuations.

Overall, the study concluded that the adoption of a comprehensive innovation strategy; combining technological, process, marketing, and financial innovations; greatly enhances the performance and sustainability of software start-ups. Start-ups that embrace innovation holistically are better equipped to withstand competition, achieve long-term profitability, and contribute meaningfully to Kenya’s growing digital economy.

5.4 Recommendations

Based on the findings and conclusions, several recommendations were made to guide managers, policymakers, and other stakeholders involved in the software start-up ecosystem within Nairobi City County.

From a managerial perspective, software start-up founders and managers should prioritize the continuous adoption of technological advancements to improve efficiency, product quality, and scalability. Investment in modern technologies such as artificial intelligence, automation, and cloud computing would enhance operational performance and strengthen competitiveness in the fast-evolving fintech sector. Managers should also focus on process optimization by introducing systematic improvements and automating key operations such as customer support and billing to enhance efficiency and service delivery. Moreover, marketing capabilities should be enhanced through innovative digital strategies such as targeted advertising, data-driven marketing, and social media engagement to build stronger brands, reach new customers, and retain existing ones. In addition, start-up leaders should diversify their funding sources through venture capital, angel investors, and crowdfunding platforms, while adopting prudent financial management to ensure funds are effectively utilized for business expansion and sustainability.

From a policy perspective, the government, regulators, and innovation-support institutions should focus on strengthening Kenya's start-up and innovation ecosystem. Policies should be developed to expand financial support through innovation grants, tax incentives, and affordable credit facilities for early-stage start-ups. In addition, the establishment of well-equipped innovation hubs and technology parks should be prioritized to provide collaborative spaces for mentoring, networking, and product testing. Government agencies should also facilitate regional and global market access by reducing regulatory barriers and supporting start-ups in scaling across borders. Strengthening digital infrastructure and supporting research-driven technology initiatives would further enhance the competitiveness of software start-ups in Nairobi and beyond.

In relation to research and knowledge development, collaboration between academia, industry, and government should be strengthened to promote continuous investigation into innovation strategies and start-up performance. Research institutions and universities should work closely with start-ups

to generate practical insights that inform managerial decisions and policy formulation. Future studies should also explore new innovation dimensions and industry-specific challenges to ensure continuous learning and improvement in understanding how innovation drives performance across different contexts.

5.5 Recommendations for Future Research

While this study provides valuable insights into how innovation strategies influence the performance of software start-ups in Nairobi City County, several areas remain open for further academic inquiry. Future researchers should consider conducting similar studies in other counties across Kenya or within the broader East African region to establish whether the relationships observed in this study hold true in different contexts. Such comparative research would provide a deeper understanding of regional differences in innovation ecosystems and their impact on start-up success.

Further research could also explore the longitudinal effects of innovation strategies on firm performance by using time-series or panel data. This approach would help determine how sustained innovation efforts contribute to start-up growth and competitiveness over time, rather than at a single point of measurement. Moreover, future studies could integrate additional moderating or mediating variables such as organizational culture, leadership style, and digital maturity to understand how these factors influence the strength or direction of the relationship between innovation and performance.

Another area worth exploring is the role of external environmental factors; such as regulatory frameworks, market competition, and economic policy; on the ability of start-ups to innovate effectively. By examining these contextual variables, researchers could identify structural enablers and barriers to innovation performance. Lastly, future work could apply qualitative or mixed-method approaches to capture in-depth perspectives from start-up founders and investors, providing richer insights into the mechanisms that link innovation practices with tangible business outcomes.

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APPENDICES

Appendix I: Research Questionnaire

The study seeks to investigate the **EFFECT OF INNOVATION STRATEGIES ON PERFORMANCE OF SOFTWARE START-UPS IN NAIROBI CITY COUNTY, KENYA.**

This study's aim is to understand how different types of innovation; technology, process, marketing, and innovative financing; affect the software start-up's key performance indicators: revenue, customer acquisition and growth rate, customer retention rate and profitability. Therefore, through the exploration of the link between innovation practices and the performance of such start-ups, the study aims to offer valuable insights for start-up founders, investors, and policymakers, particularly within the software industry, regarding strategies that can enhance performance and sustainability.

Please tick (√) one option

SECTION A: Background Information

1. Kindly select your gender from the options below.
   Male[ ] Female[ ]
2. What position do you hold within the startup?
   Founder/Co=Founder [ ] Chief Engineering Officer[ ]
   Customer Support Manager [ ] Marketing Manager[ ]
3. Which market does your start-up primarily serve?
   Local (within Kenya) [ ]
   Regional (within Africa) [ ]
   International (Outside Africa) [ ]
4. What is the current funding stage of your start-up?
   No external funding (Bootstrapped)[ ]
   Early-stage funding (friends and family, angel investors, small grants)[ ]
   Seed funding (Venture capital, institutional investors) [ ]
   Growth funding (Larger investments for scaling) [ ]

5. For how long has your startup been in operation in Nairobi City County?

   Less than 1 year[ ] 1-5 years[ ]

   6- 10 years [ ] More than 10 years[ ]

6. What is the current number of employees in your startup?

   1-10[ ] 11-50[ ] 51-100[ ] More than 100[ ]

SECTION B: EFFECT OF INNOVATION STRATEGIES ON PERFORMANCE OF SOFTWARE START-UPS IN NAIROBI CITY COUNTY, KENYA

Technology Innovation

7. Kindly indicate the extent of your endorsement to the following statements pertaining to technology innovation and the performance of software start-ups in Nairobi City County, Kenya

   KEY

   1 = Strongly Disagree **2** = Disagree **3** = Neutral **4** = Agree **5** = Strongly Agree

	1	**2**	**3**	**4**	**5**
In the past year, we have regularly introduced new features or updates to improve our products.					
Our customers or internal teams quickly adapt to the new technologies or features we implement.					
A significant part of our company's income comes from the features or products we launched in the last year.					
By using new technologies, we have significantly reduced the time it takes to develop and launch new features.					
Our start-up has successfully integrated new technologies (e.g., AI, cloud computing) to improve the functionality of our product or service.					
Our customers regularly provide positive feedback on the new features or products that we introduce.					
We regularly use data to make decisions about product improvements and new feature releases.					

Process Innovation

8. Kindly indicate the extent of your endorsement to the following statements pertaining to process innovation and performance of software start-ups in Nairobi City County, Kenya.

   KEY

   1 = Strongly Disagree **2** = Disagree **3** = Neutral **4** = Agree **5** = Strongly Agree

	1	**2**	**3**	**4**	**5**
The systems and processes we've introduced have helped us work more efficiently, completing tasks faster with fewer resources.					
New processes or technologies we've implemented have helped us cut costs without sacrificing quality.					
Our internal process improvements have led to noticeable enhancements in the quality of our products or services (e.g., fewer bugs, better user experience).					
We've managed to shorten the time it takes to go from concept to the final product or service delivery because of process changes.					
We have automated key processes in our operations (e.g., customer management, invoicing) to improve efficiency.					
Changes in how we work have resulted in our employees being able to achieve more in the same amount of time.					
Our operational changes have improved customer service, leading to higher satisfaction levels.					

Marketing Innovation

9. 8. Kindly indicate the extent of your endorsement to the following statements pertaining to marketing innovation and performance of software start-ups in Nairobi City County, Kenya.

   KEY

   1 = Strongly Disagree **2** = Disagree **3** = Neutral **4** = Agree **5** = Strongly Agree

	1	2	3	4	5
We have successfully started using new platforms (such as social media, influencer marketing, or digital campaigns) to reach more customers.					
Our marketing efforts are tailored to specific customer needs, leading to better engagement and response from our audience.					
We have developed new ways to make our products or services more accessible to customers through innovative partnerships or online channels.					
We've used different pricing models (such as subscription services, free trials or discounts) to attract more customers and increase revenue.					
Our start-up has been successful in engaging with customers on social media platforms, resulting in increased brand awareness and customer interaction.					
Our marketing strategies have helped reduce the cost of acquiring new customers.					
Our brand has gained more recognition in the market as a result of our marketing efforts.					

Innovative Financing

10. 8. Kindly indicate the extent of your endorsement to the following statements pertaining to innovative financing and performance of software start-ups in Nairobi City County, Kenya.

KEY

1 = Strongly Disagree **2** = Disagree **3** = Neutral **4** = Agree **5** = Strongly Agree

	1	2	3	4	5

We have successfully secured funding from a range of sources, including venture capital, angel investors, crowdfunding, and government grants.					
We manage the funds we've raised effectively, ensuring they are spent wisely to maximize growth and minimize waste.					
We have established strong relationships with financial institutions or investors that have helped us secure more favourable financing terms.					
We have benefitted from government programs or policies that offer financial support, grants, or tax incentives to help fund our operations.					
Our start-up is effective in managing cash flow, ensuring we have sufficient funds to cover operating expenses and invest in growth.					
We've implemented strategies to reduce the risks associated with raising and managing funds for the business.					
The funds we've raised are being actively invested in growing the business, including expanding operations, hiring, or developing new products.					

Performance of Software Start-ups in Nairobi City County

11. 8. Kindly indicate the extent of your endorsement to the following statements pertaining to performance of software start-ups in Nairobi City County, Kenya.

KEY

1 = Strongly Disagree **2** = Disagree **3** = Neutral **4** = Agree **5** = Strongly Agree

	1	**2**	**3**	**4**	**5**
Over the past year, our company has consistently increased its overall revenue.					
We have successfully attracted a growing number of new customers or users over the past 12 months.					

Most of our customers continue to use our product or service for a long time after their first purchase or signup.					
After covering all operating costs, our company has consistently generated profits over the last year.					
We have been able to expand our market share and reach new customer segments or regions.					
Our product or service can scale easily without needing proportional increases in costs.					
Our company is financially stable, and we can sustain operations even during periods of slow revenue growth.					

THANK YOU

Appendix II: List of software Start-ups in Nairobi City County

1. Abacus
2. Alvin
3. Araka
4. Asante
5. Asilimia
6. AZA Finance
7. Azima
8. Bimaleo
9. Bismart
10. BitLipa
11. Bitsoko
12. Boya
13. Cashlet
14. Chamasoft
15. Chaptr Global
16. Cherehani Africa
17. Chumz
18. Chura
19. Crediation
20. Credit Factory
21. Credrails
22. Crypsense
23. Denkim Insurance
24. DukaPOS
25. EastPesa
26. Ed Partners
27. Fanaka Hybrid
28. FinAccess
29. Finplus
30. Flexpay

31. Hakki Africa
32. Hisa
33. InstaSend
34. InsureAfrika
35. Jumuisha
36. Kakbima
37. Klientele
38. Koa
39. Kopo Kopo
40. Kotani Pay
41. Kwara
42. Kyanda
43. Lakt
44. Lami
45. LipaLater
46. Lipana
47. LipaPlus
48. Lipisha
49. M-Changa
50. M-Payer
51. Mobi-Remit
52. mTek
53. myInsure
54. myNGOVO
55. Nash
56. Ndovu
57. Nouveta
58. Odibooks
59. Patika
60. Paylend
61. Pesabase

62. PesaBazaar
63. PesaKit
64. PesaPal
65. Pezesha
66. Popote Payments
67. Power Financial Wellness
68. Raise
69. RePay Africa
70. Route
71. SafePay
72. SaveKubwa
73. Shara
74. SimbaPay
75. simplePOS
76. Spektra
77. String Analytics
78. SuperFluid
79. Tanda
80. Transcode
81. Tulix
82. Turaco
83. UbaPesa
84. Ujuzi
85. UzaPoint
86. Vooli
87. WapiPay
88. Watu Credit
89. WazInsure
90. Weza.io
91. Wingubox
92. Zagace

93. Zanifu

Source: Innovate Nairobi (2024)

Appendix III: Validity Analysis Report

The following budget breakdown is estimated to complete the study on innovation strategies and performance of software start-ups in Nairobi City County, Kenya:

	Component
In the past year, we have regularly introduced new features or updates to improve our products.	.822
Our customers or internal teams quickly adapt to the new technologies or features we implement.	.801
A significant part of our company's income comes from the features or products we launched in the last year.	.839
By using new technologies, we have significantly reduced the time it takes to develop and launch new features.	.832
Our start-up has successfully integrated new technologies (e.g., AI, cloud computing) to improve the functionality of our product or service.	.901
Our customers regularly provide positive feedback on the new features or products that we introduce.	.882
We regularly use data to make decisions about product improvements and new feature releases.	.909
The systems and processes we've introduced have helped us work more efficiently, completing tasks faster with fewer resources.	.936
New processes or technologies we've implemented have helped us cut costs without sacrificing quality.	.858
Our internal process improvements have led to noticeable enhancements in the quality of our products or services (e.g., fewer bugs, better user experience).	.895
We've managed to shorten the time it takes to go from concept to the final product or service delivery because of process changes.	.805

We have automated key processes in our operations (e.g., customer management, invoicing) to improve efficiency.	.756
Changes in how we work have resulted in our employees being able to achieve more in the same amount of time.	.851
Our operational changes have improved customer service, leading to higher satisfaction levels.	.840
We have successfully started using new platforms (such as social media, influencer marketing, or digital campaigns) to reach more customers.	.832
Our marketing efforts are tailored to specific customer needs, leading to better engagement and response from our audience.	.779
We have developed new ways to make our products or services more accessible to customers through innovative partnerships or online channels.	.840
We've used different pricing models (such as subscription services, free trials or discounts) to attract more customers and increase revenue.	.926
Our start-up has been successful in engaging with customers on social media platforms, resulting in increased brand awareness and customer interaction.	.869
Our marketing strategies have helped reduce the cost of acquiring new customers.	.873
Our brand has gained more recognition in the market as a result of our marketing efforts.	.725
We have successfully secured funding from a range of sources, including venture capital, angel investors, crowdfunding, and government grants.	.870
We manage the funds we've raised effectively, ensuring they are spent wisely to maximize growth and minimize waste.	.886
We have established strong relationships with financial institutions or investors that have helped us secure more favourable financing terms.	.915
We have benefitted from government programs or policies that offer financial support, grants, or tax incentives to help fund our operations.	.890

Our start-up is effective in managing cash flow, ensuring we have sufficient funds to cover operating expenses and invest in growth.	.885
We've implemented strategies to reduce the risks associated with raising and managing funds for the business.	.931
The funds we've raised are being actively invested in growing the business, including expanding operations, hiring, or developing new products.	.915
Over the past year, our company has consistently increased its overall revenue.	.869
We have successfully attracted a growing number of new customers or users over the past 12 months.	.770
Most of our customers continue to use our product or service for a long time after their first purchase or signup.	.922
After covering all operating costs, our company has consistently generated profits over the last year.	.902
We have been able to expand our market share and reach new customer segments or regions.	.912
Our product or service can scale easily without needing proportional increases in costs.	.875
Our company is financially stable, and we can sustain operations even during periods of slow revenue growth.	.873

Appendix IV: Letter of Authorization

KENYATTA UNIVERSITY
GRADUATE SCHOOL

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

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

Our Ref: D53/CTY/PT/20426/2022 **DATE:** 24th February, 2025

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

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR NJUE STELLA WANYAGA – REG. NO. D53/CTY/PT/20426/2022

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

Njue intends to conduct research for a M.B.A Project Proposal entitled, **"Innovation Strategies and Performance of Software Start-ups in Nairobi City County, Kenya."**

Any assistance given will be highly appreciated.

Yours faithfully,

PROF. ELIUD NJAGI
EXECUTIVE DEAN, GRADUATE SCHOOL

RSA/mo

Appendix V: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 652674

Date of Issue: 26/March/2025

RESEARCH LICENSE

This is to Certify that Miss.. Stella Wanyaga Njue of Kenyatta University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: INNOVATION STRATEGIES AND PERFORMANCE OF SOFTWARE START-UPS IN NAIROBI CITY COUNTY, KENYA for the period ending : 26/March/2026.

License No: NACOSTI/P/25/417257

652674

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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