

**DIGITAL TRANSFORMATION STRATEGY AND COMPETITIVE
ADVANTAGE AMONG COMMERCIAL BANKS IN NAIROBI CITY COUNTY,
KENYA**

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DECLARATION

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

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DEDICATION

This document is a heartfelt tribute to the late Samuel Wathome and Mrs Rachael Mwikali, my beloved parents, whose encouragement ignited within me a desire to seek knowledge and strive for excellence.

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OPERATIONAL DEFINITIONS OF TERMS

Competitive Advantage	Refers to the distinctive qualities and organisational strengths that enable a business to differentiate itself from competitors and attain exceptional marketplace results.
Corporate Reputation	A collection of views and perceptions of a company by its stakeholders based on its history, values and prospects.
Cybersecurity	Protection of computer systems, networks and organisational programs against attacks.
Data Analytics Strategy	A structured plan that outlines how an organisation will collect, manage, analyse and leverage data to drive business decisions, improve operations and gain a competitive advantage.
Digital Payment Solutions Strategy	A plan that outlines how an organisation will implement and expand electronic payment systems to facilitate fast, secure and convenient transactions.
Digital Transformation Strategy	In this study, it is a structured plan that organisations use to change how they operate by applying modern digital technologies to all areas of their business.
Employee Upskilling Strategy	A plan focused on enhancing employees' skills and competencies to meet evolving business needs.
Market Share	The fraction of overall industry earnings or transaction volume attributed to a specific enterprise.
Mobile Banking Applications Strategy	A plan that guides mobile application development, deployment and continuous improvement to provide banking services through smartphones and tablets.

Predictive Analytics

Data analytics that use historical data, statistics and modelling techniques to make predictions about future events, behaviours or outcomes.

Service Automation Strategy

A deliberate plan that an organisation adapts to use technology in managing service delivery processes.

Sustained Growth in Profits

The steady and sustained growth in a company's profitability over time.

Technological Leadership

An organisation's capacity to lead and influence the advancement, deployment, and integration of innovative technological solutions.

ABBREVIATIONS AND ACRONYMS

AI	Artificial Intelligence
API	Application Programming Interfaces
ATM	Automated Teller Machine
CBK	Central Bank of Kenya
DOI	Diffusion of Innovation
GFC	Global Financial Crisis
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
QR	Quick Response
RBV	Resource-Based View
ROE	Return on Equity
ROI	Return on Investment
RPA	Robotic Process Automation
SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
USSD	Unstructured Supplementary Service Data

ABSTRACT

In this era of rapidly evolving digital technologies, the banking industry in Kenya must adopt digital transformation to maintain competitiveness and improve the customer experience. However, while there is a growing emphasis on digitisation within the sector, the specific initiatives implemented by commercial banks and their subsequent effects on competitive advantage remain inadequately understood. This research examined how the digital transformation strategy affected the competitive positioning of commercial banks in Nairobi City County, Kenya. The research centred on five main objectives: service automation, data analytics, mobile banking applications, employee upskilling, and digital payment solutions strategies. The study relied on five theories: the Generic Competitive Strategies Framework, the Resource-Based View, the Dynamic Capabilities Theory, the Technology Acceptance Model, and the Diffusion of Innovation Theory. Using a descriptive research design, the study targeted 39 commercial banks grouped according to their sizes, comprising 412 functional heads. The study employed a multi-stage sampling method that combined proportionate stratified and simple random sampling techniques to recruit participants. Applying Yamane's formula, a sample of 203 participants was selected. Primary data collection was conducted using structured survey instruments. Preliminary testing was conducted on a small sample of 15 respondents before the main study. Experts in the subject matter pre-tested the research instrument to validate its appropriateness. Cronbach's Alpha Coefficient was used to assess reliability, with a threshold of 0.7 or above deemed satisfactory for internal consistency. The questionnaires were distributed to respondents using digital survey methods. The data analysis process employed descriptive and inferential statistics to summarise the findings. The results were presented in charts, graphs, and tables for easy interpretation and understanding. The study confirmed that service automation, data analytics, mobile banking applications, employee upskilling, and digital payment solutions strategies significantly influenced competitive advantage, although their individual effects varied. The findings suggest that commercial banks should go beyond merely implementing digital technologies and instead focus on strategic integration that enhances customer experience and value creation. Banks should adopt selective automation that retains human interaction for complex services and enhances feedback mechanisms. Further, data governance and investment in advanced, customer-focused analytical tools should be strengthened. Continued innovation in mobile banking is also recommended, including feature enhancements and improved interoperability, supported by strong cybersecurity standards. Employee upskilling should be prioritised through structured training, digital leadership development, and industry-wide certification. Lastly, banks need to re-evaluate their digital payment strategies to focus on user experience, fraud prevention, and differentiated services, with regulators promoting secure and innovation-friendly environments.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Organisations currently operate in a highly intricate and dynamic business environment. Rapid technological advancements have introduced new challenges for decision-makers and strategists within organisations, increasing the demand for adaptability, innovative thinking, strategic foresight, and resilience to deliver value to customers and stakeholders (Uphill, 2016).

A crucial concept that can help organisations achieve this goal is competitive advantage, which is obtained when organisations acquire attributes that enable them to surpass their competitors (Wang, 2014). Developing a competitive advantage is synonymous with achieving success within an organisation. This concept is widely accepted in management science and holds undeniable significance for the theory and practice of strategic management (Ceglinski, 2017).

Competitive excellence requires business leaders to make strategic choices about key tactics that differ from those made by the competition. For an organisation to resonate with customers, its strategy must include a distinguishing factor that differentiates it from rivals and enhances its market position (Hitt, Duhaime & Lyles, 2021). Leaders in competitive advantage recognise that the digital age and more dynamic markets have transformed customer mindsets (Gaya, Omone & Kinyua, 2021). Strategic thinking is, therefore, critical (Lenox, 2023). This implies thinking more effectively than the

competition to discover alternative and better ways of competing to provide customer value (Hague, 2023).

For many established organisations, the digital revolution has presented numerous challenges for strategists. Suddenly, market opportunities tend to deviate from historic capabilities, thus threatening an organisation's established competitive position (Lenox, 2023). Several companies face crises not due to poor execution, but because the foundational assumptions about their businesses no longer align with the evolving realities of the market. These assumptions shape an organisation's operations, and when they become outdated, companies risk misalignment with market needs, resulting in disruption and challenges in sustaining relevance (Ansari, Garud & Kumaraswamy, 2023).

The incorporation of digital technologies across many industries is a transformative force disrupting conventional paradigms and reshaping competitive dynamics (Bharadwaj, Bonnet, El Saway & Venkatraman, 2023; Musau & Muathe, 2025a, 2025b). Embracing digital innovation has therefore become a crucial strategy for banks in emerging and developing economies to enhance operational effectiveness, improve customer experience, and maintain competitiveness in a challenging and demanding business environment (Kane, Palmer, Phillips, Kiron & Buckley, 2019; Berman, 2020; Hazikimana, Muraguri & Muathe, 2023).

According to Liu (2021), although banks have historically led in the advancement of financial technologies, their competitive edge has diminished since the Global Financial Crisis (GFC). Liu asserts that while some global banks have prioritised digitisation as a key business focus, sustaining competitive advantage remains a challenge. The author

further argues that banks with substantial capital can leverage economies of scale, leading to a more concentrated banking system where smaller institutions struggle to compete.

In Kenya, the banking industry is characterised by fierce rivalry (Arodi, Nyamute, Okiro & Angima, 2023), with technological advancement identified as a significant determinant of financial institutions' success (Gaya, Omone, Kinyua, 2022). Digitisation has gained unprecedented importance, with most Kenyan banks actively investing in innovative technologies to enhance service delivery and secure competitive differentiation. However, the industry is experiencing a shift in market share, with larger banks expanding their dominance while small and medium-sized banks face a decline (CBK, 2023).

1.1.1 Competitive Advantage

A key principle in strategic management, competitive advantage is achieved when an organisation provides distinctive value for customers through unique products, services, or processes that competitors cannot easily replicate (Porter & Hepplemann, 2015). This is often driven by technological innovation and strategic positioning.

The concept originates from a company's ability to integrate its assets, competencies, and strategic initiatives to establish a unique market presence, ultimately resulting in long-term performance (Rothaermel, 2021). In emerging markets, competitive edge is largely dependent on how well a company responds to local market trends and its ability to meet customer-specific demands efficiently (Ngugi & Mugo, 2018).

Empirical literature has identified several ways for assessing competitive advantage. Ngugi and Mugo (2018) point out that strong financial performance, evident in profitability, revenue growth and rate of return, signals the superior ability of a firm to

generate value within its industry. A leading market share is another key benchmark directly reflecting success in attracting and keeping customers (Kariuki & Bichanga, 2018). This customer focus is critical as Gurbaxani and Dunke (2019) highlight satisfaction, loyalty and retention as fundamental proof that a company is delivering exceptional value.

Beyond current performance, a firm's prospects are shaped by its innovative capacity. Porter and Hepplemann (2015) contend that through technological leadership, companies carve out a unique market position, making flexibility and distinctive products vital signs of a lasting advantage. Furthermore, a powerful brand and solid reputation, as noted by Tanwar (2017) and Mwangi and Muathe (2020), are significant assets that boost the potential of an organisation to attract customers, command premium prices, and encourage loyalty.

Internally, operational efficiency is a widely recognised driver of competitive strength. Rothaermel (2021) explains that a company's proficiency in streamlining processes, cutting costs and boosting productivity has a favourable effect on market position and profitability, which is especially crucial for firms competing on cost. Based on the foregoing various viewpoints, market share, technological leadership, corporate reputation, and sustained profit growth were chosen to analyse the competitive advantage of commercial banks.

1.1.2 Digital Transformation Strategy

This concept, as viewed by Westerman, Bonnet, and McAfee (2014), involves reorganising a company's core activities and processes to utilise digital technology more effectively. As Albukhitan (2020) emphasises, a digital transformation strategy is characterised by its

broad scope, encompassing all business functions and requiring alignment with the overall strategy and integration across operations. Kane *et al.* (2017) and Vial (2019) contend that in the financial sector, among other metrics, digital transformation can be assessed through mobile banking platforms, staff upskilling, level of service automation, data analytics, cybersecurity measures and digital payments.

In accordance with Davenport and Ronanki (2018), service automation entails the deployment of technologies such as RPA, AI, chatbots, and workflow automation to reorganise customer interactions and operational efficiency. Automation enables banks to handle routine tasks like reconciliations, compliance checks, and data entry with minimal effort, improving accuracy and cutting costs.

This aligns with the view of Priyanto, Murwaningsari & Augustine (2023), who argue that RPA adoption in banking increases efficiency and strategic flexibility by enabling staff to focus on value-adding tasks rather than manual, repetitive functions. Research indicates that when combined with data analytics, automation facilitates faster credit scoring and improves fraud detection, collectively contributing to greater competitiveness in the banking sector.

Underpinning effective service automation and other digital initiatives is the strategic use of data analytics. The capability to harness big data is often described as the core of a data-driven organisation. Research by Mikalef, Krogstie, Pappas and Pavlou (2020) demonstrates that a firm's analytical capacity, its ability to process, analyse, and derive insights from vast datasets, is a direct determinant of its competitive performance and strategic agility. According to the researchers, capability enables personalised marketing, sophisticated risk management, and predictive insights, making the maturity of a

company's data analytics infrastructure a key variable in empirical studies measuring digital transformation success.

In the banking sector, a data analytics strategy transforms raw customer and operational data into a critical strategic asset for strategic decision-making, risk management, and customer engagement (McAfee & Brynjolfsson, 2012). Digital transformation delivers clear benefits in banking. Predictive tools support risk mitigation by reducing default rates (Kumar, Wiltz, & Kazan, 2021), while data-driven strategies optimise operations, cut costs, and enhance service quality for competitive advantage (Ghosh, Scott, & Purohit, 2022).

The most visible outcome of a bank's digital transformation is mobile banking applications, which have redefined service delivery and user experience. Their adoption, functionality, and acceptance reflect a bank's digital maturity, often measured by active users, available features, and transaction volumes (Alalwan, Dwivedi, & Rana, 2017). Mobile applications provide services such as transfers, inquiries, bill payments, credit applications, and wallets (Kumar, Raja, Venkatesan & Lecinski, 2020). This shift has transformed banking from branch-based to mobile-enabled transactions (Shaikh & Karjaluo, 2015), driving financial inclusion and expanding market reach in developing economies (Musau, Muathe, & Mwangi, 2018).

Mobile applications are viewed as a strategic tool for competitive advantage. They enable banks to provide efficient services, thereby enhancing customer convenience and satisfaction (Luo, Li, Zhang, & Shim, 2010). Beyond operational efficiency, mobile banking applications facilitate relationship building by enabling banks to gather and analyse customer data to tailor financial products and services. As Oliveira, Faria, Thomas

& Popovič (2014) observe, mobile banking is a technological innovation and strategic resource that fosters customer loyalty and strengthens banks' differentiation in competitive markets.

However, a successful digital transformation strategy is not a purely technological endeavour but equally a human one. Consequently, employee upskilling has emerged as a critical measure of the commitment of an organisation to its future in digitisation. As Kane *et al.* (2017) argue, technology and talent strategy must be inextricably linked. Investing in digital literacy, reskilling programs for AI and data analytics, and fostering a digitally fluent culture are essential for ensuring the workforce can effectively leverage new tools. Therefore, the scale of investment in training and the evolution of organisational roles are key indicators of a holistic digital transformation strategy (Li, Su, Zhang, and Mao, 2020).

Spanuth and Wald (2017) argue that organisational resilience in the banking industry depends not only on digital infrastructure but also on employees' competency to adapt to new systems and processes. In a country like Kenya, where the adoption of digital banking services is rapidly expanding, employee upskilling ensures that staff remain capable of delivering high-quality services and maintaining competitiveness in a challenging market environment (Shanmugam, Abalushi & Alufi, 2022).

Digital payment solutions signal a bank's transition from legacy systems, with adoption measured by market penetration and transaction volume (Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2014; Vial, 2019). Strategic fintech partnerships and diverse payment options further reflect digital maturity (Suri & Jack, 2016). These solutions, which range from mobile money, internet banking, and cardless transactions to QR codes and contactless payments, provide secure, seamless, and efficient services (CBK, 2021).

They lower costs, enhance efficiency, and improve transparency, strengthening competitiveness (Ozili, 2018). Mobile platforms, such as M-Pesa, have transformed banking by expanding financial access and increasing customer engagement (Kikulwe & Okello, 2019), while improving customer satisfaction through real-time, convenient transactions.

This study defined digital transformation strategy as a multi-faceted construct consistent with existing literature. The five measures chosen: service automation, data analytics, mobile banking applications, employee upskilling, and digital payment solutions, are not isolated tactics but are deeply interwoven. This interconnectedness suggests that their synergistic effect, rather than their individual implementation, is likely the true driver of competitive advantage and organisational performance.

1.1.3 Commercial Banks in Kenya

The banking Industry is integral to economic growth by facilitating credit access, enhancing financial inclusion and fostering capital formation. The CBK serves as the chief regulatory body charged with monitoring financial institutions in Kenya to guarantee adherence to statutory requirements and preserve overall economic stability (CBK, 2022).

Kenya boasts a vibrant banking sector comprising large, medium, and small-tier banks. As of December 2023, thirty-eight commercial banks and one mortgage finance company were operating in the country. Twenty were local private banks, seventeen were foreign institutions, and the Kenyan government owned two institutions (CBK, Cyntonn & NCBA Investments, 2023). Major players such as KCB, Equity and the Co-operative banks dominated the market, serving a diverse clientele ranging from individuals to corporate entities.

The CBK reported that in 2023, nine large banks collectively held a combined market share of 76.6%. Meanwhile, eight medium and twenty-two small banks accounted for 15.0% and 8.4% of the market, respectively. During this period, there were 1511 bank branches in Kenya, with Nairobi City County accounting for the highest number with 588 branches, approximately 39% of the total (CBK, 2023). As Kenya's capital and financial hub, Nairobi hosted the headquarters of most of the banking institutions, cementing its status as the nation's epicentre.

1.2 Statement of the Problem

Globally, banking institutions have made substantial technological investments to enhance competitiveness (Liu, 2021). However, while digital technologies are recognised as critical drivers of operational efficiency, better customer experiences, and market competitiveness (Akter, Gunasekaran, Dubey, & Childe, 2016; Brown & Parker, 2018; Shaikh & Karjaluo, 2015), commercial banks in Kenya encounter major challenges in translating these technological investments into sustainable competitive advantage (Musau & Muathe, 2025a, 2025b).

The fragile nature of the banks' competitive position is apparent. A report by the Central Bank of Kenya reveals worrying market share consolidation, with a widening gap between large banks, whose shares increased from 75.1% to 76.6% between 2022 and 2023, and smaller counterparts, whose shares declined from 16.3% to 15.0% (medium banks) and from 8.6% to 8.4% (small banks). Meanwhile, new entrants also gained market share by utilising more advanced technologies, streamlined processes, and personalised services that were attractive to tech-savvy consumers (CBK, 2023). This reflects the importance of technological leadership in shaping industry competitiveness.

Furthermore, despite the strategic significance of digital transformation for commercial banks, empirical studies reveal ongoing challenges in these institutions such as high costs (Mwangi & Otieno, 2023), resistance to change (Nkosi & Adeyemi, 2021), complex regulatory frameworks (Kumar & Gupta, 2019), data security concerns (Kusi, Mensah, & Yeboah 2022), and skill deficiencies (Muchiri, 2022). These challenges not only limited banks' capacity to lead in technological adoption but also affected their corporate reputation, as customers increasingly evaluated financial institutions based on trust, security, and service efficiency (Okonkwo & Obiora, 2020; Otieno & Kariuki, 2021).

Existing global research has focused on particular technologies, such as big data analytics in decision-making (Kumar & Gupta, 2019) and mobile banking for customer engagement (Sharma & Patel, 2019). However, most studies concentrated on developed markets, raising concerns about how banks in developing countries, especially Kenya, implement digital transformation strategies to attain sustainable profitability and market growth.

While studies specific to Kenya, such as Kamau and Waweru (2020) and Njuguna (2022), have explored mobile banking adoption and electronic payments, their scope remains limited. They failed to thoroughly examine the integration of multiple digital strategies or their combined impact on competitive advantage. Additionally, key metrics for assessing digital transformation success, such as data processing volumes, predictive model accuracy, user penetration rates, employee adaptability, and fraud prevention, have been insufficiently examined.

The foregoing results reveal significant theoretical and methodological gaps in linking digital transformation strategies with long-term indicators of competitive advantage, such as market position, technological leadership, corporate reputation, and sustained profit

growth. The identified research gaps, therefore, demonstrate the need for undertaking an analysis of the effect of the strategies on the competitive advantage of commercial banks in Nairobi City County, Kenya.

1.3 Objectives

The following general and specific objectives were formulated to achieve the goals of the study:

1.3.1 General Objective

The main objective of the research was to investigate the effect of digital transformation strategy on the competitive advantage among commercial banks in Nairobi City County, Kenya.

1.3.2 Specific Objectives

The study aimed to achieve the following:

- i. To determine the effect of service automation strategy on the competitive advantage among commercial banks in Nairobi City County, Kenya
- ii. To determine the effect of data analytics strategy on the competitive advantage among commercial banks in Nairobi City County, Kenya
- iii. To determine the effect of mobile banking applications strategy on the competitive advantage among commercial banks in Nairobi City County, Kenya.
- iv. To determine the effect of employee upskilling strategy on the competitive advantage among commercial banks in Nairobi City County, Kenya.

- v. To determine the effect of digital payment solutions strategy on the competitive advantage among commercial banks in Nairobi City County, Kenya.

1.4 Research Questions

The research addressed the following questions:

- i. The extent to which the service automation strategy affected the competitive advantage of commercial banks in Nairobi City County, Kenya.
- ii. The extent to which the data analytics strategy affected the competitive advantage of commercial banks in Nairobi City County, Kenya.
- iii. The extent to which the mobile banking applications strategy affected the competitive advantage of commercial banks in Nairobi City County, Kenya.
- iv. The extent to which the employee upskilling strategy affected the competitive advantage of commercial banks in Nairobi City County, Kenya.
- v. The extent to which the digital payment solutions strategy affected the competitive advantage of commercial banks in Nairobi City County, Kenya.

1.5 Significance of the Study

This study was intended to benefit various stakeholders, including commercial banks, the government, the CBK, other policymakers, researchers, and academicians. The results provide commercial banks with an evidence-based illustration of the effectiveness of digital transformation strategies in enhancing competitive advantage. Banks can gain benchmarks to evaluate their progress in digital transformation relative to their peers, enabling informed decision-making and investment prioritisation.

The findings are also useful to the government as they highlight how digital transformation in the banking sector can stimulate economic growth by improving financial inclusion, facilitating cashless transactions and boosting access to credit for individuals and businesses. The government can utilise the findings to formulate effective policies and initiatives that encourage digital adoption in the banking sector, fostering innovation and enhancing Kenya's position as a regional financial hub. Furthermore, insights into the role of employee upskilling strategies can guide government initiatives to support workforce development and prepare the labour market for technology-driven roles.

The study provides data-driven recommendations to the CBK to refine its governance structure, ensuring it aligns with the evolving digital landscape and addresses risks such as cybersecurity and fraud. Understanding what connects technology integration to business performance is helpful to policymakers, including financial sector regulators and industry associations, to develop better industry standards. The outcome of this research establishes a foundational reference for scholars by providing a systematic examination of how technological adoption affects organisational competitiveness in banking.

1.6 The Scope of the Study

The research focused on commercial banks operating in Nairobi City County, Kenya. The city serves as Kenya's financial and commercial centre, with significantly more advanced digital capabilities than other parts of the country. The study examined digital transformation strategy as the predictor variable and competitive advantage as the outcome variable.

The research is theoretically grounded in the Generic Competitive Strategies Framework, the Resource-Based View, the Dynamic Capabilities theory, the Technology Acceptance

Model and the Diffusion of Innovation theory. Methodologically, the investigation employed a descriptive research approach. The research focused on key functional areas within the commercial banks where strategic decisions are made and implemented. As a cross-sectional study, data collection occurred at a single temporal point rather than longitudinally, specifically in one month.

1.7 Limitations of the Study

Numerous practical constraints became apparent during the research implementation. Managers in commercial banks were hesitant to share information, particularly challenges in implementing digital transformation strategies, due to concerns about confidentiality or reputational risks. The investigator ensured respondents' anonymity to promote truthful and precise responses. Collecting data on sensitive metrics such as revenue impact, fraud mitigation, and market share was also challenging due to banks' reluctance to disclose proprietary information. However, the participants were assured that their responses would only be presented in compiled non-identifiable formats.

Digital transformation strategies and technologies evolve rapidly, and the relevance of the study's recommendations might diminish over time as banks adopt more advanced technologies. The researcher addressed this challenge by including recommendations for future research to address technological advancements and long-term trends.

1.8 Organisation of the Study

This study report is structured into five chapters. The first chapter provides an overview of the research background, encompassing the problem statement, research aims, guiding questions, scholarly significance, scope of investigations and methodological constraints.

The second chapter reviews relevant theoretical perspectives, prior empirical findings, shortcomings in available literature and the study's conceptual framework. The third chapter details the methodological strategies adopted, including research approach, data collection and analytical procedures. The fourth chapter discusses and interprets the research findings derived from data analysis. Finally, the last chapter synthesises key findings, presents conclusions, and offers recommendations for policy, practice, and future research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter examined existing literature and theoretical frameworks, reviewing key concepts, models and previous studies to establish a foundation for the research. It also identified gaps in prior knowledge that this research aimed to address.

2.2 Theoretical Review

The fundamental concepts establish the scope and limits of a study (Grant & Osanloo, 2014). This research focused on five theories: the Generic Competitive Strategies Framework, the Resource-Based View Framework, the Dynamic Capabilities Theory, the Technology Acceptance Model, and the Diffusion of Innovation Theory.

2.2.1 Generic Competitive Strategies

Porter's (1980) Generic Competitive Strategies outline how businesses can secure a sustainable competitive position in their markets through three primary approaches: cost leadership, differentiation, and focus. Cost leadership emphasises efficiency and low operating costs, differentiation highlights unique offerings and premium value, while focus targets specialised niche markets. The framework, supported by the value chain concept, provides a structured way for firms to position themselves strategically and allocate resources effectively (Pretorius, 2008; Tanwar, 2017).

The model has been applied across industries, including banking, manufacturing, and technology, to demonstrate how digital technologies can enhance cost leadership (e.g., automation) and differentiation (e.g., personalised services) (Potter & Heppleman, 2015;

Ngugi & Mugo, 2018; Guxbaxani & Drunkle, 2019). However, critics argue that Porter's framework assumes stable industry structures, making it less effective in dynamic contexts such as fintech and digital banking, where disruption is constant (Rothaermel, 2021; Downes, 2017). Scholars also note that hybrid strategies and ecosystem-based collaborations are increasingly relevant in today's business environment (Tanwar, 2016; Jacobides, Cennamo & Gawer, 2018).

Porter's model supports the study variables, digital payment solutions, data analytics, service automation and mobile banking applications which align with cost leadership and differentiation strategies as tools to drive market share, technological leadership, corporate reputation, and profit growth. The model also indirectly supports employee upskilling, as skilled employees enhance differentiation through superior customer service. However, modern digital strategies may require additional flexibility beyond Porter's traditional categories.

2.2.2 Resource-Based View

The Resource-Based View (RBV) traces its origin to Penrose (1959), who proposed that an organisation's owned, allocated, and utilised resources held greater significance than the structure of the industry (Wang, 2014). Wernerfelt (1984) further formalised the concept by proposing that internal resources were as important as external market positioning in strategic planning.

RBV was developed in response to the shortcomings of externally oriented frameworks like Porter's Five Forces, redirecting strategic emphasis from market conditions to internal capabilities as the main source of competitiveness (Lynch, 2018). The framework has

evolved significantly through several key contributors. Wernerfelt (1984) introduced the concept by highlighting the importance of resources in strategy formulation.

Barney (1991) argued that only resources demonstrating four specific attributes- Value, Rarity, Inimitability and Non-Substitutability can generate sustained competitive advantage. Teece, Pisano and Shuen (1991) extended RBV to account for fast-changing environments, introducing the dynamic capabilities concept to address strategic realignment of resources. The concept has been critiqued by Priem and Butler (2001) for its lack of empirical validation and its inward-looking nature, leading to refinements that incorporate both internal and external perspectives.

RBV emphasises leveraging a firm's unique assets, often overlooked in market-based strategies (Barney, 1991). Businesses can sustain long-term advantage by protecting VRIN resources (Wernerfelt, 1984). By incorporating dynamic capabilities (Teece, Pisano and Shuen, 1997), the RBV gains explanatory power in turbulent business environments where static resources become quickly obsolete. However, RBV is criticised for insufficient consideration of external factors and industry dynamics (Priem & Butler, 2001). According to Peteraf (1993), traditional RBV frameworks do not fully account for resource evolution over time.

Within the Kenyan banking context, the RBV offers a pertinent theoretical foundation for analysing competitive advantage creation through digital transformation initiatives. The RBV framework aligns with the study by explaining how digital transformation resources (technology, data and human capital) contribute to competitive advantage.

The framework highlights internal capabilities as key drivers of differentiation, innovation and long-term success in the banking industry. RBV strongly supports employee upskilling, data analytics, service automation, mobile banking applications and digital payment solutions as Valuable, Rare, and Inimitable resources that drive technological leadership, corporate reputation and market share.

2.2.3 Dynamic Capabilities Theory

The Dynamic Capabilities theory was introduced by Teece, Pisano and Shuen (1997) in their foundational work expanding on earlier contributions from the RBV and broader strategy research (Lynch, 2018). While formally established in their 1997 publication, the theory's conceptual roots trace back to evolving discussions on how firms adapt resources to sustain competitive advantage in dynamic markets.

Teece *et al.* (1997) identified three dimensions: Sensing, Seizing and Transforming, which became the foundation of the theory. Eisenhardt and Martin (2000) connected Dynamic Capabilities to the RBV, defining them as the processes that allow firms to reconfigure resources to adapt and innovate. Their research showed that these capabilities were valuable in all industries, although their complexity depended on market stability.

Teece (2007) advanced the theory by identifying its micro-foundations, such as leadership and learning. Helfat *et al.* (2007) further enabled empirical study by creating a framework to measure these organisational routines. More recently, dynamic capabilities have been linked to digital transformation, where they are seen to drive competitiveness (Mutuku, Muathe, & James, 2019), strategic renewal (Warner & Wager, 2019), and sustainable innovation (Bocken & Geradts, 2020).

In essence, the theory outlines how firms adapt by sensing opportunities, seizing them, and reconfiguring assets. While essential in turbulent markets and for digital transformation, critics such as Winter (2003) questioned its universal applicability across all industries. He argued that the theory may be context-specific and limited to certain organisations or environments. Zahra, Sapienza and Davidson (2006) contended that the cost and effort involved in creating such capabilities outweighed the benefits for smaller and resource-constrained organisations. Barreto (2010) reviewed the literature and highlighted ambiguities in defining the scope and practical application of the theory.

In the current study, the Dynamic Capabilities theory is relevant as it showcases how commercial banks in Kenya can use their internal strengths and assets to manage digital disruption and sustain competitive advantage. The theory supports all digital transformation strategy variables because they represent capabilities commercial banks must develop, reconfigure and adapt over time. Specifically, data analytics, service automation, employee upskilling, digital payment systems and mobile banking applications are key dynamic capabilities that can help banks sustain a competitive advantage.

2.2.4 Technology Acceptance Model

Davis (1986) originally proposed the Technology Acceptance Model (TAM) as a theoretical framework for understanding and forecasting individuals' adoption and utilisation of new technologies. Davis (1989) enhanced the model to resolve multiple concerns. Organisations needed a framework that revealed why individuals embraced or dismissed new technologies, particularly since technological advancements were becoming crucial for organisations' efficiency.

Davis (1989) sought to create a simpler, more parsimonious model than existing frameworks like the Theory of Reasoned Action (TRA), which were more general and not technology specific. TAM explains technology adoption through two key beliefs: Perceived Usefulness (PU), or whether a system enhances job performance, and Perceived Ease of Use (PEOU), how effortless it is to operate. These factors influence a user's attitude, which then predicts their intention and actual use of the technology.

In order to reflect real-world workplace dynamics, Venkatesh and Davis (1996) later expanded the model. They added social influences, such as peer pressure and job relevance, strengthening its power to predict. These ideas were eventually consolidated into the broader Unified Theory of Acceptance and Use of Technology (UTAUT), which integrated TAM with other models. UTAUT provides a more comprehensive perspective of analysing technology acceptance across diverse environments (Venkatesh *et al.*, 2003).

A key strength of TAM lies in its simplicity; the concepts of usefulness and ease of use are intuitive and can be readily applied to almost any technological context (Davis, 1989). Furthermore, its core principles have been rigorously tested and validated in countless industries, solidifying its reputation as a reliable and robust framework. The theory can be adapted to study different technologies from simple systems to complex digital transformations (Venkatesh *et al.*, 2003). However, critics argue that the theory is limited in scope in that it oversimplifies the adoption process by excluding factors such as user emotions, cultural differences and organisational influences (Bagozzi, 2007).

TAM applies to the current study in that digital transformation in Kenyan commercial banks, which encompasses mobile financial services, online banking platforms, AI-driven solutions, blockchain technology, and other fintech solutions, requires customers to adopt

these new technologies. Understanding how customers perceive the effectiveness and user-friendliness of digital banking solutions is central to driving the adoption process and achieving a strategic edge in the market.

TAM strongly supports service automation, digital payment solutions, mobile banking applications, and employee upskilling strategies as key areas in which technology adoption influences customer and employee behaviour. The model indirectly supports data analytics as insights from analytics can be used to enhance technology acceptance strategies.

2.2.5 Diffusion of Innovations Theory

The Diffusion of Innovations (DOI) theory, developed by Everett M. Rogers in 1962, sought to explain how innovations circulate across societies over time. Rogers (1962) identified a need to study the rate of adoption and the function of information channels in influencing diffusion. The theory was founded to integrate insights from multiple disciplines, such as sociology, anthropology, and communication studies, into a unified framework for studying innovation adoption.

Rogers (1962) identified five key innovation attributes influencing adoption. The extent to which an innovation was regarded as superior to the current solution (Relative Advantage), along with its alignment with the values, experiences and requirements of prospective users (Compatibility), the level of simplicity or difficulty in understanding and utilising it (Complexity), the opportunity to try innovation before full implementation (Triability) and how easily its outcomes could be observed by others (Observability).

Rogers (1962) categorised adopters into five segments according to their willingness to embrace innovations: Innovators, Early Adopters, Early Majority, Late Majority and

Laggards. Rogers and Shoemaker (1971) emphasised the function of mass media and interpersonal communication channels in influencing the diffusion process. They highlighted the importance of opinion leaders in accelerating adoption. The theory was expanded to address innovation adoption within organisations, highlighting factors such as leadership, organisational structure and readiness for change (Rogers, 1995). DOI was later extended to analyse the adoption patterns of digital innovations and technologies such as mobile phones, the Internet, and social media (Rogers, 2003).

DOI's strength lies in its dual focus on individual adoption factors and the broader social system dynamics that facilitate innovation diffusion (Rogers, 1962). The theory has been successfully applied to study various innovations from agricultural practices to digital technologies (Rogers, 2003). The DOI framework identifies social networks, opinion leaders and peer influence as fundamental drivers of innovation diffusion processes (Valente, 1996).

Critics argued that DOI focused on the initial stages of adoption and less on post-adoption behaviour and sustained use (Lyytinen & Damsgaard, 2001). Additionally, while DOI explained patterns of adoption, it did not always predict the success or failure of specific innovations (Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004). The theory also assumed homogeneity in adopter groups, which oversimplifies the complexity of individual decision-making (Wejnert, 2002).

In this study, DOI is relevant as it aligns with the study by explaining how the adoption and spread of digital banking innovations influence market share, reputation and profitability. Banks that effectively introduce, promote and diffuse digital innovations gain a long-term competitive advantage. The theory strongly supports service automation,

digital payment solutions, mobile banking applications and employee upskilling as these require effective diffusion strategies for adoption. data analytics indirectly supports diffusion by identifying adoption patterns and optimising innovation strategies.

2.3 Empirical Review

The review of empirical evidence examined existing studies on digital transformation strategies and their effect on competitive advantage. The study focused on five key areas: service automation, data analytics, mobile banking applications, employee upskilling and digital payment solutions. The subsequent sections present a comprehensive analysis of scholarly literature on these variables.

2.3.1 Service Automation Strategy and Competitive Advantage

Kumar and Gupta (2019) examined AI-driven automation in the banking and insurance sectors, analysing data from 50 multinational corporations focusing on big economies Germany, Japan, the United Kingdom and the United States of America (USA), and emerging markets like India and China. Their results highlighted a 20% improvement in productivity and decision-making accuracy. Despite this, metrics such as customer adoption rates or service turnaround time were not investigated, and the study leaned heavily on data from technologically advanced nations. The current study bridged this gap by examining automation's actionable effects on Kenyan commercial banks.

Martin and Taylor (2020) investigated the impact of AI-driven personalisation on services and competitive advantage, analysing data from 100 companies in the retail and hospitality sectors. The research focused on developed markets, specifically in North America (the United States and Canada) and Western Europe, due to their advanced technological

infrastructure, high levels of AI adoption, and mature markets for personalised customer experiences.

The study showed that AI-based personalisation strategies increased market share by 15% through improved customer loyalty and differentiation. However, it did not take into account developing economies where technology adoption is slower. This research addressed that gap by examining commercial banks in Nairobi, Kenya, a developing market with unique characteristics.

Rodriguez and Martinez (2022) studied RPA in Europe and North Africa and found that it reduced operational errors by 35% and streamlined repetitive tasks, allowing organisations to focus on strategic priorities. Similarly, Okonkwo and Obiora (2020) found that fintech innovations in Nigerian banks reduced transaction errors by 25% and built customer trust through digital payment systems. While these studies highlighted operational benefits, they gave limited attention to customer experience and service quality in banking. The present study, therefore, focused on service automation in Kenyan banks and its effect on customer service and competitiveness.

Kusi *et al.* (2022) examined service automation in 20 banks in Ghana and Nigeria, including ATMs, mobile banking, and digital onboarding. Their findings showed improvements in customer satisfaction and service accessibility, especially in underserved areas. In Ethiopia, Tadesse and Gebremedhin (2021) reported that automation improved efficiency by 40%, cut costs, and raised profitability. Despite these outcomes, both studies paid little attention to adoption rates and competitive advantage. This study extended the discussion by evaluating how automation in Nairobi's banks influences turnaround times, service delivery, and competitiveness.

Evidence from Kenyan research also highlights the growing importance of automation. Nyaga and Ndung'u (2020) found that mobile banking and automation in tier-two banks reduced complaints by 30% and improved customer retention. Kariuki and Mwiti's (2021) study showed that AI chatbots enhanced query resolution by 45%, while Mwangi and Otieno (2023) demonstrated that mobile and paperless banking reduced transaction times by 50% and expanded market share in larger banks, although smaller banks were excluded. The current study addressed this limitation by including banks of different sizes, providing a broader perspective on the challenges and opportunities presented by automation in the sector.

2.3.2 Data Analytics Strategy and Competitive Advantage

Akter *et al.* (2016) examined big data analytics in supply chains through a survey of 205 professionals in North America and Europe. Their study showed that analytics improved supply chain agility, cost efficiency, and customer satisfaction, contributing to competitive advantage. They also highlighted the importance of data quality, advanced tools, and a data-driven culture. While their focus was on supply chain performance, the present study applied these principles to banking in Kenya, assessing outcomes such as data processing capacity, predictive model accuracy, and revenue impact.

Davenport and Harris (2017) investigated data analytics across manufacturing, retail, and finance. They found that predictive analytics and machine learning supported operational efficiency, innovation, and customer satisfaction, with firms using advanced tools performing better in profitability, productivity, and retention. Their research, however, concentrated on developed markets such as the United States. This left limited evidence on

how data strategies function in developing economies, a gap this study addressed by examining the unique challenges facing Kenyan banks.

Regional research also points to the impact of analytics. Dlamini and Ngwenya (2020), in a study of South African retail chains, reported that analytics enhanced customer behaviour prediction, inventory management, and marketing efficiency, though smaller firms struggled with integration and limited access to data. In Nigeria, Adebayo and Ajayi (2021) surveyed 150 telecom professionals and found that analytics improved retention, cut costs, and enabled targeted marketing, though high costs and skill shortages remained barriers. While these studies were outside banking, they reinforced the link between analytics and competitiveness, insights that informed this research.

Kenyan studies have reported similar trends. Kamau and Wambugu (2021) found that analytics adoption in retail banking strengthened customer retention, fraud detection, and credit risk management, though smaller banks faced challenges related to cost and expertise. Njoroge and Muturi (2022), studying 120 manufacturing firms, showed that analytics improved efficiency and profitability but was limited by weak infrastructure and inadequate training. Building on this evidence, the current study investigated how commercial banks in Kenya used data analytics across different sizes of institutions and how these practices contributed to competitive advantage in the financial sector.

2.3.3 Mobile Banking Applications Strategy and Competitive Advantage

Shaikh and Karjaluoto (2015) studied mobile banking adoption in Europe through a survey of 300 users across several countries. They found that mobile applications improved convenience, lowered operational costs, and strengthened customer retention, though concerns over security and integration limited broader uptake. In Latin America,

Laukkanen and Cruz (2014) surveyed 20 banks in Brazil, Mexico, and Chile and reported that mobile banking increased market penetration and loyalty, particularly among younger customers. However, low digital literacy and limited smartphone access remained key barriers.

While these studies reflect regions with varied adoption levels, they do not capture the realities of Kenya's mobile-first banking ecosystem. This study addressed that gap by focusing on commercial banks in Kenya, where high mobile penetration is accompanied by regulatory challenges and gaps in digital literacy.

Regional evidence also highlights mobile banking's role in competitiveness. Doe and Smith (2024), studying banks in West Africa, found that perceived usefulness, ease of use, and trust influenced adoption, though infrastructure limitations and low financial literacy were obstacles. Similarly, El Khatib (2023) examined the MENA region and noted that mobile money uptake lagged behind Sub-Saharan Africa due to weaker literacy levels and fewer service options.

Pankomera and Van (2018), in a review of South Africa, observed that mobile banking improved accessibility for disadvantaged groups, but growth was hindered by unreliable networks and limited awareness. These findings underline mobile banking's potential in emerging markets while showing that challenges differ from those in Kenya, where mobile adoption is more advanced.

In Kenya, studies have explored electronic banking more broadly. Kiboori (2017), in a study at KCB Bank, found that mobile, internet, and ATM banking improved customer satisfaction, removed geographical barriers, and enhanced cash management. Odhiambo and Mang'ana (2022) reported that innovations such as electronic transfers, telephone, and

internet banking strengthened competitiveness and recommended greater integration with fintech solutions. While useful, these studies considered multiple digital channels rather than focusing specifically on mobile banking applications.

This study, therefore, narrowed the scope by examining mobile banking application strategies exclusively. It measured their influence on competitiveness through indicators such as penetration rates, transaction volumes, and customer satisfaction, providing a more focused view of mobile banking's role in Kenya's commercial banking sector.

2.3.4 Employee Upskilling Strategy and Competitive Advantage

Spirgi and Meier (2022) conducted a case study on Volkswagen Passenger Cars, examining how the company upskilled its workforce to support AI-driven transformation. Their research outlined the process of identifying required skills, introducing targeted training, and aligning these efforts with broader competitive goals. They found that building AI literacy and technical competencies was central to Volkswagen's digital transformation, strengthening both technological capacity and competitiveness in the automation sector.

Chatterjee (2016) analysed 347 software development projects involving over 5,500 employees in an Indian IT firm and showed that training in technological and business skills improved project outcomes and profitability. These studies provide useful insights from the automotive and IT sectors, while this study focused on a different setting, Kenya's commercial banks, where regulatory conditions and skill shortages create a distinct context for upskilling.

Evidence from Africa also supports the link between training and competitiveness. Wendewosen (2017), in a study of the Commercial Bank of Ethiopia, found that a blended approach to training improved employee skills, motivation, and performance, which contributed to the bank's competitive advantage. Thoronka and Combey (2024) also reported that initiatives such as job rotation, delegation, and mentoring at the United Bank for Africa in Sierra Leone enhanced employee performance, satisfaction, and organisational commitment.

In South Africa, Njoroge and Kwasira (2023) found that investment in training raised productivity in the manufacturing sector, while Kamoche and Siebers (2015) confirmed that incorporating indigenous HR practices into modern systems improved engagement and performance, creating competitiveness through a cohesive workforce. Although these studies confirm the value of upskilling, they did not address the banking industry directly. The present study, therefore, examined Kenyan commercial banks, linking upskilling strategies to competitiveness in the context of digital transformation and rising demand for customer-focused innovation.

Kenyan research has also stressed the role of training. Muchiri (2022) found that while 67.8% of local enterprises had training programs, many were not aligned with future skill needs, with larger firms more likely to invest in staff development. Onyango (2019) established a strong relationship between training, improved competence, and job performance in Kenyan banks, though the study did not measure broader outcomes such as market share.

Kariuki and Murimi (2022) further found that employee development in Kenyan banks positively influenced financial performance, though their study overlooked aspects such as

innovation and employee satisfaction. The current research addressed these gaps by analysing how upskilling strategies in Kenyan banks contribute to competitive advantage, with a focus on measurable outcomes, including market share growth and technological innovation.

2.3.5 Digital Payment Solutions Strategy and Competitive Advantage

Research in different contexts underscores the strategic role of digital payment solutions in enhancing competitiveness. In the United States, Brown and Parker (2018) found that transaction security, e-commerce integration, and customer satisfaction improved profitability and loyalty. However, their study overlooked innovation, which is important to long-term advantage.

Zhang and Zhou (2019), examining China's retail sector through expert interviews and transaction data, demonstrated that QR codes and AI-driven fraud detection increased user engagement while reducing risk. They also noted that limited integration with international systems restricted global scalability. While their work focused on retail, the present study focused on banking in Kenya, where mobile payments are widely adopted.

In Nigeria, Adebayo and Ogunleye (2020) reported that secure and reliable payment systems improved retention and market share. However, weak regulation and poor interoperability remained barriers. Their study did not investigate innovation, which is a defining feature of Kenya's mobile banking industry. Mbatha and Kamau (2020) in South Africa also found that speed, security, and ease of use increased customers' trust and retention, though they failed to consider innovation and technological leadership.

Osei and Boateng's (2020) study on the Ghana banking sector found that mobile and digital payments enhanced efficiency and retention but struggled with integration into legacy systems. By contrast, Kenya's higher mobile penetration provides a different environment, where innovation is more critical. In India, Gupta and Arora (2021) confirmed that fintech firms gained competitiveness through fraud prevention, third-party integration, and customer satisfaction. However, the exclusion of traditional banks limited their analysis, and again, innovation was not addressed.

Studies from Zimbabwe and Ghana highlight similar trends. Nyasha and Chikova (2021) found that mobile payments supported market share growth and customer convenience during economic instability, but low innovation and weak adaptability hindered competitiveness. Boakye and Amponsah (2022) confirmed that Ghanaian banks benefited from digital payments but noted gaps in fraud detection and innovation, as well as an absence of technological leadership.

Kenyan research has also addressed digital payments. Wanjiru and Njoroge (2022) demonstrated that mobile platforms improved retention and efficiency in tier-one banks but excluded smaller banks and innovation measures. Otieno and Kariuki (2021) found that digital wallets enhanced efficiency and convenience but did not link outcomes to competitiveness. Kamau and Waweru (2020) reported that EFT systems improved speed and satisfaction but overlooked fraud detection and innovation. Mwangi and Chege (2022) showed that mobile money integration improved efficiency and reach, though weak fraud detection and limited innovation restricted competitiveness.

The studies confirm that digital payment solutions support efficiency, trust, satisfaction, and retention. However, many overlooked innovation, fraud detection, and leadership,

which are essential for sustainable competitiveness. The current study addressed these gaps by examining digital payment solutions in Kenyan commercial banks with a specific focus on innovation, integration, security, and technological leadership as drivers of competitive advantage.

2.4 Summary of Reviewed Literature and Research Gaps

Although studies on digital transformation strategy and competitive advantage in the banking sector were on the rise, existing research revealed several gaps and limitations that required investigation. The summary below highlights key areas where existing literature fell short, providing a foundation for the current study to address the deficiencies.

Table 2.1 Summary of Research Gaps

Researcher	Study Scope	Findings	Research Gaps	Current Investigation
Shaikh & Karjaluoto (2015)	Mobile banking adoption in European banks.	Mobile banking improved customer satisfaction, reduced costs, and enhanced retention.	Knowledge Gap: Europe-focused with less relevance to Kenya's mobile-first banking ecosystem.	Addressed Kenya's unique context, including high mobile penetration.
Davenport & Harris (2017)	Data analytics in enhancing performance across industries in the USA.	Advanced analytics tools improved productivity, profitability, and customer loyalty.	Empirical & Theoretical Gaps: Generalised across industries and focused on advanced economies.	Focused on Kenyan banks, addressing their distinct challenges and metrics.
Martin & Taylor (2020)	AI-driven personalisation in retail and hospitality in developed markets (North America and Europe).	Personalisation increased market share by 15% through customer loyalty and differentiation.	Empirical: Limited to developed markets with advanced technology infrastructure; lacked insights into developing economies.	Targeted Kenya's banking sector in Nairobi, examining the distinct dynamics in an emerging market.
Okonkwo & Obiora (2020)	Fintech adoption in Nigerian	Automation reduced	Empirical Gap: General focus on	Focused specifically on

	banks, including automated services.	transaction errors by 25% and increased customer trust.	fintech without sector-specific insights into service automation.	service automation in Kenyan commercial banks.
Osei & Boateng (2020)	Digital payment adoption in Ghana's banking sector.	Improved customer satisfaction and operational efficiency.	Conceptual Gap: The study did not address innovation or security metrics.	Included these metrics for a detailed analysis.
Adebayo & Ajayi (2021)	Big data analytics in Nigeria's telecom sector.	Analytics enhanced customer retention, reduced costs, and enabled faster decisions.	Empirical Gap: Telecom-specific, with no insights into banking processes.	Investigated the role of analytics in Kenyan commercial banks.
Gupta & Arora (2021)	Digital payment solutions in Indian fintech firms.	Improved transaction security and user satisfaction boosted competitive advantage.	Empirical & Conceptual Gaps: Limited to fintech, excluding traditional banking, and lacked innovation metrics.	Targeted Kenyan banks and included innovation and feature development metrics.
Kamau & Wambugu (2021)	Data analytics in Kenya's retail banking sector.	Improved customer retention, fraud detection, and credit risk management.	Empirical Gap: Excluded smaller banks, limiting the scope.	Included all tiers of Kenyan commercial banks.
Otieno & Kariuki (2021)	Digital wallets in Kenyan banks.	Enhanced transaction efficiency but lacked fraud detection and innovation.	Conceptual & Methodological Gaps: No integration capability or innovation metrics.	Incorporated these metrics comprehensively.
Tadesse & Gebremedhin (2021)	Impact of digital transformation strategies on Ethiopian banks' performance.	Automation enhanced efficiency by 40%, reducing operational costs and boosting profitability.	Conceptual & Methodological Gaps: Did not include customer adoption rates or the number of automated processes as metrics.	Incorporated these metrics to provide a comprehensive evaluation.
Kusi, Mensha & Yeboah (2022)	Service automation in Sub-Saharan African banks (Ghana and	Automation improved customer satisfaction and service	Conceptual Gap: Limited analysis of specific metrics like service turnaround time	Incorporated detailed metrics for automation in Kenyan banks.

	Nigeria).	accessibility in underserved areas.	and customer adoption rates.	
Muchiri (2022)	Skill development programs across Kenyan enterprises.	67.8% of organisations offered training, with larger firms doing more.	Empirical & Conceptual Gaps: Broad focus without explicit links to banking or competitiveness.	Focused exclusively on Kenyan banks and competitive outcomes.
Odhiambo & Mang'ana (2022)	Technological innovations (e-money transfers, telephone banking) and competitive advantage in Kenyan banks.	Innovations positively influenced competitive advantage, with mobile solutions enhancing service reach.	Methodological Gap: Broad focus without specific metrics for mobile banking or competitive outcomes.	Focused specifically on mobile banking strategies and competitive advantage metrics.
Rodriguez & Martinez (2022)	Robotic Process Automation (RPA) in service delivery across industries in Europe and North America.	RPA reduced errors by 35% and streamlined repetitive tasks, enabling strategic focus.	Methodological: Generalised findings across industries without banking-specific metrics or customer-focused insights.	Evaluated automation in commercial banks, incorporating customer adoption and service delivery metrics.
Spirgi & Meier (2022)	Upskilling employees for AI transformation in Volkswagen (Germany).	Targeted training enhanced technological leadership and competitiveness.	Empirical & Contextual Gap: Focused on the automotive industry, not banking.	Focused on Kenyan banks with banking-specific metrics for upskilling.

Source: (Researcher, 2025)

2.5 Conceptual Framework

Extending the foundation laid by prior theoretical and analytical research, Figure 2.1 visually maps the causal pathways connecting the study's predictor and outcome variables.

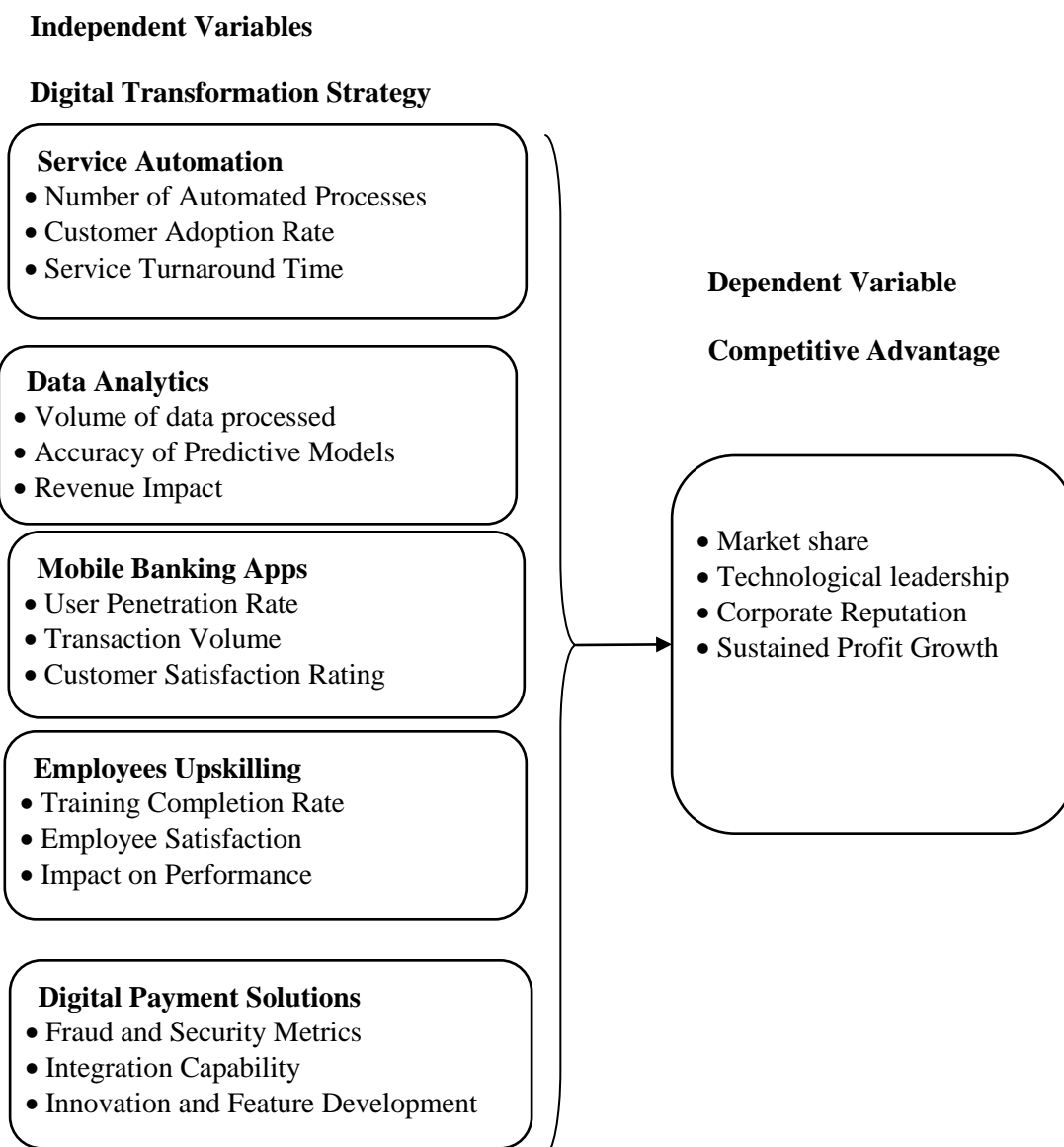


Figure 2.1: The Conceptual Model
Source: (Researcher, 2025)

The above diagram is grounded in a comprehensive review of established theories and empirical research relevant to this study. The selected variables align with the study objectives. The components of the digital transformation strategy representing the independent variable are illustrated on the left section of the diagram, while the elements of competitive advantage as the dependent variable are shown on the right.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the approach, methods, and techniques employed in the study. It includes research design, target population, sampling design, data collection methods, pilot testing, validity, reliability, data analysis approaches, and factors of research integrity.

3.2 Research Design

This study adopted a descriptive research approach. According to Taherdoost (2023), descriptive research is appropriate for collecting data from a large population sample using surveys or interviews, which is practical for studying multiple commercial banks. The research design was relevant, as the study aimed to describe and analyse the existing digital transformation strategies, their implementation, and their effect on competitive advantage (Creswell, 2014). Given the study's non-interventional nature, centred on examining pre-existing phenomena rather than manipulating variables, a descriptive analytical approach proved optimally aligned.

3.3 Target Population

The investigation targeted 39 commercial banks headquartered in Nairobi City County, Kenya (CBK, 2023). Respondents were drawn from key decision-making areas such as Audit, Corporate Banking, Credit, Customer Experience, Digital Financial Services, Finance, Human Resources, Information Technology, Legal Services, Marketing, Operations, Retail Banking, Risk, and Strategy. These functional areas vary across bank tiers due to differences in size, as shown in the table below.

Table 3.1: Target Population

Banks Peer Group	No. of Banks	No. of Functional Areas	No. of Functional Heads	Percentage
Small Banks	22	9	198	48%
Medium Banks	8	11	88	21%
Large Banks	9	14	126	31%
Total	39	34	412	100%

Source: Central Bank of Kenya, Commercial Banks (2023)

3.4 Sampling Design and Procedure

A well-selected sample reflects the characteristics of a population, ensuring representativeness and validity of research findings (Casteel & Bridier, 2021). This study used a two-stage sampling approach, combining proportionate stratified and simple random sampling to ensure balance and fairness. First, commercial banks in Nairobi City County were grouped by size: small, medium, and large, to guarantee proportional representation.

From the 412 eligible respondents, 198 (48%) were from small banks, 88 (21%) from medium banks, and 126 (31%) from large banks. A proportionate sample was then done, producing 98 respondents from small banks, 43 from medium, and 62 from large, which helped minimise bias (Etikan, Musa, & Alkassim, 2016; Kumar, 2019).

In the second stage, participants within each group were selected randomly using a computer-generated process (RAND function in Excel), giving every respondent an equal chance of selection and reducing researcher bias (Taherdoost, 2016; Creswell & Creswell, 2018). This two-step strategy enhanced representativeness, fairness, and the generalisability of the results (Fraenkel, Wallen & Hyun, 2022). The final sample size of

203 respondents was determined using Yamane’s (1967) mathematical model at a 95% confidence level and 5% margin of error.

Yamane Formula:

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

$$n = 412 / (1 + 412 (e^2))$$

$$n = 203$$

Where;

n = Sample size
N = population size
e = margin of error.

Table 3.2: Distribution of the Selected Sample Size

Banks Peer Group	No. of Banks	Proportion	Sample Size	Percentage
Small banks	22	198	98	48%
Medium banks	8	88	43	21%
Large banks	9	14	126	31%
Total	39	412	203	100%

Source: Researcher, 2025

3.5 Data Collection Instruments

Primary data was gathered through structured questionnaires with closed-ended questions to ensure consistency and facilitate quantitative analysis (Saunders, Lewis, & Thornhill, 2019). The tool had three sections: the first captured demographic and organisational details (e.g., gender, age, education, bank category, position, department, and work experience); the second assessed digital transformation strategies across five areas using Likert scale items; and the third measured perceived competitive advantage outcomes, also on a Likert scale.

This design minimised bias, enhanced comparability, and strengthened validity and reliability (Dillman, Smyth, & Christina, 2014; Creswell & Creswell, 2018). Questionnaires were administered via online platforms to streamline distribution, speed up data collection, and reduce entry errors (Evans & Mathur, 2018). Secondary data was obtained from financial reports, CBK publications, and industry studies (Smith & Johnson, 2023).

3.5.1 Pilot Study

A preliminary study was conducted with 15 respondents from key functional areas of commercial banks in Nairobi City County. The purpose was to test the feasibility and clarity of the questionnaire (Cooper & Schindler, 2019). The participants were selected since they shared similar traits and experience with the target group. They were excluded from the main survey to avoid bias. The feedback provided was used to improve the instrument.

3.5.2 Validity

Validity refers to the extent to which the study measures what it intends to (Casteel & Bridier, 2021). Content validity was determined by consulting banking and digital transformation experts, as well as a group of lecturers. They confirmed that the questionnaire accurately measured the study's intended concepts, which led to final improvements that aligned it with the study objectives.

3.5.3 Reliability

Reliability was assessed using Cronbach's Alpha to ensure consistent results (Taherdoost, 2023). All key constructs recorded scores above 0.87, exceeding the 0.7 benchmark and indicating internal consistency.

3.6 Data Collection Procedure

The researcher obtained a license from the National Commission for Science, Technology and Innovation (NACOSTI) after securing authorisation from Kenyatta University. The license permitted formal engagement with the targeted commercial banks, where knowledgeable functional and departmental heads were identified and provided formal consent.

Data collection was conducted using a structured online questionnaire administered via *Google Forms*. The survey link was shared through email and mobile phones, enabling respondents to participate conveniently while minimising physical contact and costs. Follow-up reminders were issued electronically and by phone to boost participation. Responses were securely stored in the survey platform's database, ensuring integrity and real-time monitoring.

3.7 Data Analysis and Presentation

Quantitative data were analysed using SPSS. The dataset was cleaned and coded to ensure accuracy and consistency (Saunders, Lewis & Thornhill, 2019). This process included checking for missing or inconsistent responses, addressing incomplete data through imputation, and removing outliers that fell outside the study's framework (Smith, 2023).

3.7.1 Descriptive Analysis

Descriptive statistics were used in the initial analysis. Frequencies and percentages summarised demographic data and response patterns, while means and standard deviations highlighted central tendencies and variability for each variable, following standard practice (Cooper & Schindler, 2014; Field, 2018).

3.7.2 Inferential Analysis

Correlation and regression techniques were used to examine the relationships between the variables (Hair, Black, Babin, & Anderson, 2019). Multiple regression determined the extent to which the five digital transformation strategies predicted competitive advantage, while controlling for other factors. ANOVA was then used to test the overall significance of the model and the contribution of individual predictors at standard significance levels (Tabachnick & Fidell, 2019).

3.7.3 Model Specification

The general multiple regression equation used was:

$$Y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3X_3 + \beta_4x_4 + \beta_5X_5 + \epsilon \dots \dots \dots \text{Equation 1}$$

Where:

Y =Competitive advantage

β_0 = Constant

$\beta_1, \beta_2, \beta_3, \beta_4,$ and β_5 = Regression coefficients of the independent variables, respectively

X1 =Service automation strategy

X2 =Data analytics strategy

X3 =Mobile banking applications strategy

X4 =Employee upskilling strategy

X5 =Digital payments solution strategy

ϵ =Error term.

3.7.4 Interpretation and Reporting

The study's results were presented in charts, graphs, and tables for clarity. The findings were interpreted according to the research objectives and literature. The research highlighted key information, trends, and implications for the independent variables.

3.8 Research Ethics

Participants were informed of the study's purpose, objectives, and significance, and assured of confidentiality and anonymity (Saunders, Lewis & Thornhill, 2019). Unique identifiers were used in place of personal or institutional details to protect privacy. Participation was voluntary, with respondents free to withdraw at any time without consequence.

The study followed ethical standards to avoid physical, psychological, or professional harm. All sources were cited, and data were reported honestly without fabrication. Ethical clearance was obtained from Kenyatta University, and relevant guidelines were observed. Data access was restricted to the researcher and authorised personnel, with all records anonymised or destroyed after completion (Creswell & Creswell, 2018).

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter is inclined towards presenting the results of the data analysis, their interpretation, and related discussions. A comparison has also been made between the findings and the literature reviewed in the second chapter, forming the basis for the study's conclusions and implications.

4.2.1 Response Rate

The researcher administered 203 questionnaires to the sampled respondents. At the end of the data collection period, 149 duly completed questionnaires were received, representing a response rate of 73% as shown in Figure 4.1.

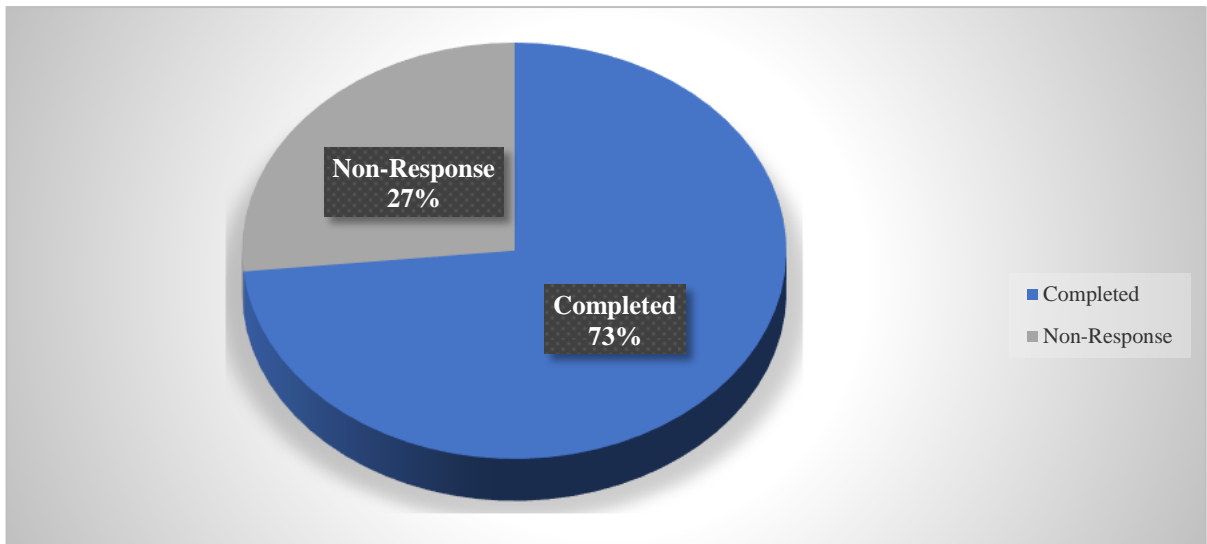


Figure 4.1. Questionnaire Completion Rate
Source: Survey Data (2025)

A response rate above 70% is considered good as it strengthens validity and minimises sampling error (Fowler, 2018; Hair *et al.*, 2021). The high participation was facilitated by digital tools, structured follow-ups, and increased interest in digital transformation in banking (Dillman *et al.*, 2016; Kapoor *et al.*, 2022). Non-responses (27%) were likely due to time constraints, disinterest, or organisational restrictions (Bell *et al.*, 2022).

4.2.2 Reliability Analysis

A pilot study was conducted to assess the reliability of the research instrument used for data collection. Cronbach’s Alpha was computed for each objective, representing the internal consistency of the scales measuring the key variables. All coefficients met the recommended threshold, confirming that the items were reliable for the main study. The findings are presented in the table below:

Table 4.1: Analysis of Reliability Tests

Variable	Scale Items	Cronbach Alpha	Remarks
Service Automation Strategy	7	0.959	Reliable
Data Analytics Strategy	6	0.927	Reliable
Mobile Banking Applications Strategy	7	0.872	Reliable
Employee Upskilling Strategy	7	0.964	Reliable
Digital Payment Solutions Strategy	7	0.959	Reliable
Competitive Advantage	4	0.941	Reliable
Overall Questionnaire Reliability	38	0.967	Reliable

Source: Pilot Test Data (2025)

Service automation, data analytics, employee upskilling, and digital payment solutions each recorded Cronbach’s Alpha values exceeding 0.92. Competitive advantage followed

this trend with a score of 0.941, while Mobile Banking Applications was also strong at 0.872. With an overall Alpha of 0.967 for the entire questionnaire, the instrument proved to be highly cohesive and reliable. Consequently, the construct was approved for the main survey as it was judged capable of generating credible and reproducible data (Field, 2018).

4.3 Demographic Data Analysis

Data on key demographic characteristics, including gender, age, education, job role, and department, were collected. According to Sekaran and Bougie (2016), these factors provide an important contextual background because they can influence how employees respond to organisational strategies such as digital transformation. As Saunders, Lewis, and Thornhill (2019) contend, a thorough grasp of participant demographics is also necessary to accurately interpret research results and establish the study's validity. Therefore, the following summary outlines respondent characteristics which aid in interpreting the findings within the banking sector.

4.3.1 Gender of the Respondents

Participants' gender was among the demographic variables collected and analysed. The results are presented in the subsequent findings.

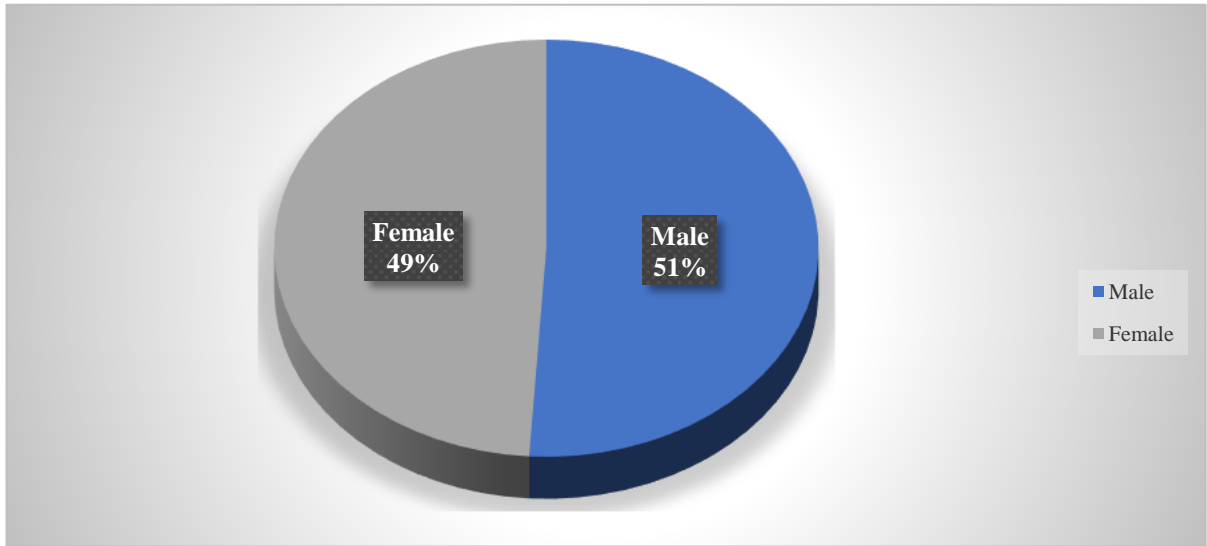


Figure 4.2: Gender
Source: Survey Data (2025)

Of the 149 respondents, 76 (51%) were male, while 73 (49%) were female. This equitable gender distribution enhanced the study's validity by ensuring its results were representative of both men and women.

4.3.2 Age of the Respondents

The study examined the respondents' age distribution to assess the generational representation and experience levels within the sampled commercial banks. The findings are presented below.

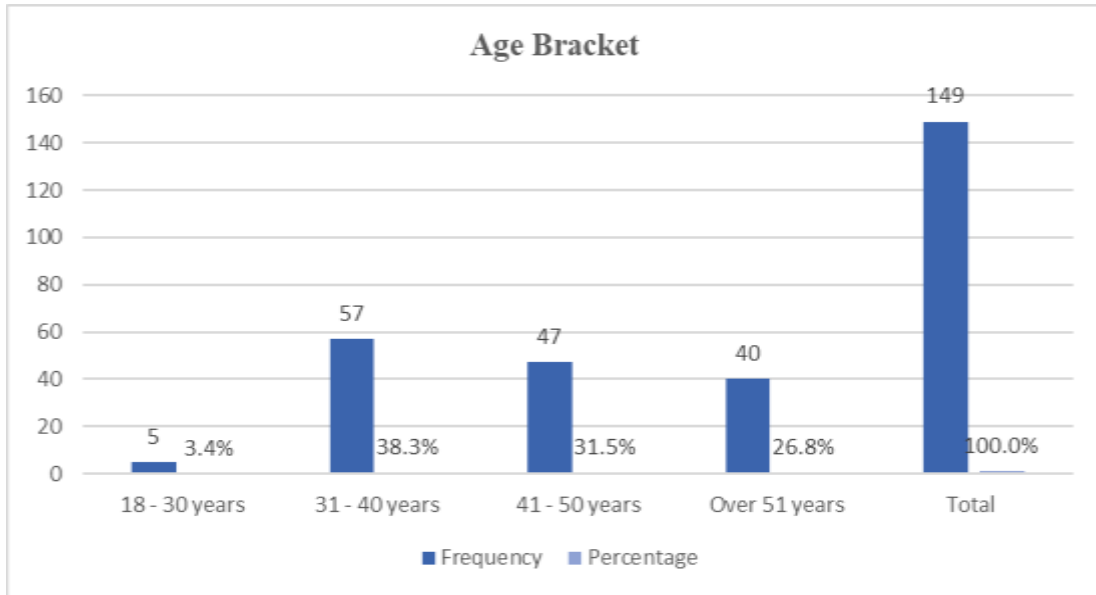


Figure 4.3. Age Bracket
Source: Survey Data (2025)

The largest age group among the respondents fell within the 31 to 40 age group, comprising 57 respondents (38.3%). This was followed by those aged 41 to 50 at 31.5% and individuals over 51 at 26.8%. Only 3.4% were between 18 and 30 years old. The age distribution pattern suggests a predominance of mid-career and senior-level professionals, indicating substantial accumulated industry expertise among respondents.

4.3.3 Education Levels

The investigation analysed respondents' academic qualifications to evaluate potential correlations between educational background and perceptual frameworks. The findings are presented in Figure 4.4 below.

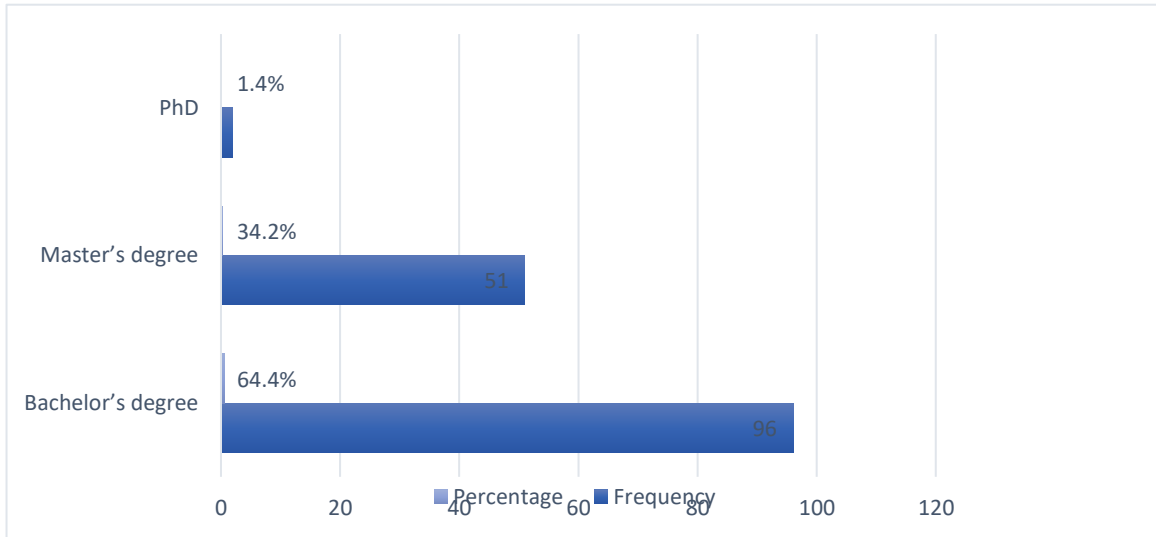


Figure 4.4. Level of Education

Source: Survey Data (2025)

Most respondents (64.4%) possessed a bachelor's degree, followed by 34.2% with a master's degree, and a small minority (1.4%) holding doctorates. This high level of educational attainment indicates that the respondents were well-educated professionals, which strengthened the validity of the collected data.

4.3.4 Banks Category

The study analysed the respondents' bank categories to ensure representation across small, medium and large commercial banks, thereby capturing diverse institutional perspectives as illustrated below.

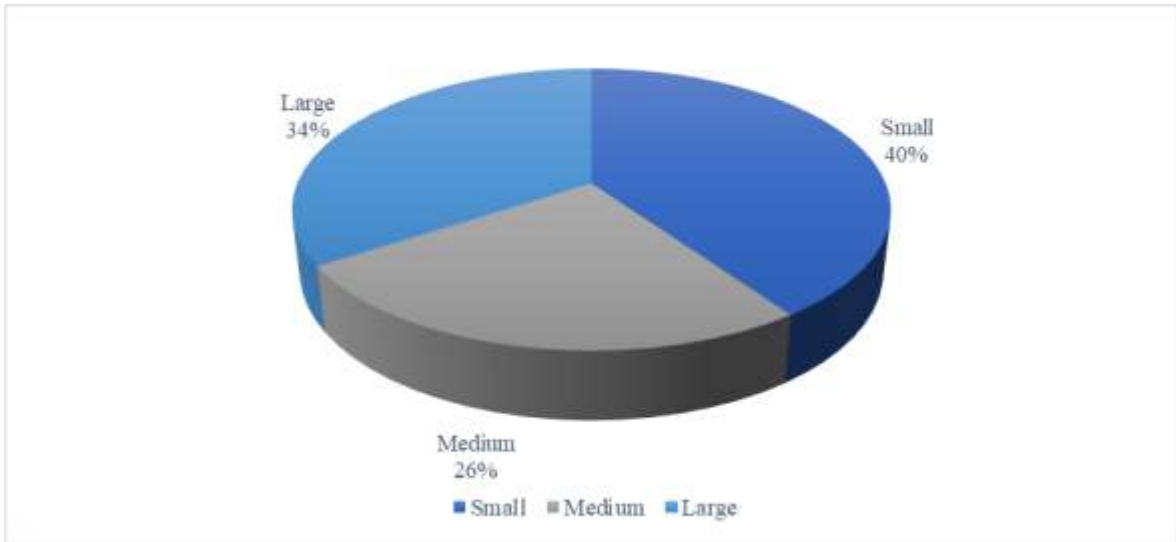


Figure 4.5. Bank Sizes
Source: Survey Data (2025)

Respondents were drawn from a mix of bank sizes, with 40% working in small banks, 34% in large banks, and 26% in medium-sized banks. This distribution ensured that the views and practices of commercial banks across various tiers in Nairobi City County were fairly represented.

4.3.5 Positions Held by Respondents

The study analysed the positions held by the respondents to understand the level of decision-making authority and strategic involvement among participants from various commercial banks, as illustrated in Figure 4.6 below.

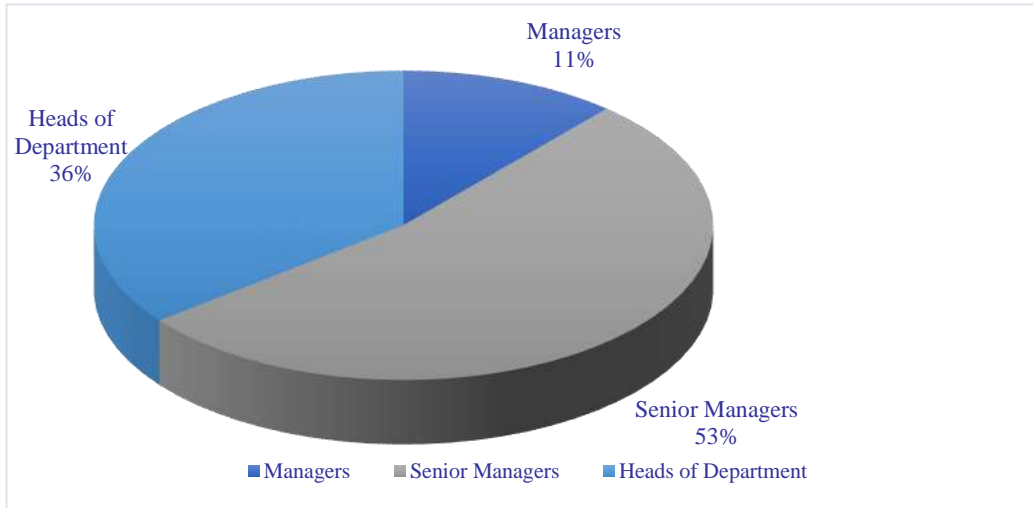


Figure 4.6. Positions Held
Source: Survey Data (2025)

Most respondents (53%) were senior managers, followed by heads of department at 36% and managers at 11%. This indicates that most participants held senior-level roles, suggesting they were well-positioned to provide informed views on strategic issues such as digital transformation and competitive advantage.

4.3.6 Departmental Affiliation

The research analysed participants’ departmental affiliations to incorporate varied functional viewpoints regarding the study’s key variables.

Table 4.2. Departments

Department	Frequency	Percentage
Audit	12	8.1
Corporate Banking	10	6.7
Credit	9	6.0
Customer Experience	9	6.0
Digital Financial Services	17	11.4
Finance	9	6.0
Human Resources	7	4.7

Information Technology	16	10.7
Marketing	9	6.0
Operations	11	7.4
Retail Banking	13	8.7
Risk	14	9.4
Strategy	13	8.7
Total	149	100.0

Source: Survey Data (2025)

Respondents represented a broad spectrum of organisational functions with notable participation from Digital Financial Services (11.4%), Information Technology (10.7%), Risk (9.4%), and Retail Banking and Strategy (each 8.7%). Other departments, such as Audit, Corporate Banking, Customer Experience, Finance, Credit, Operations, Marketing, and Human Resources, were also represented, though in smaller proportions. The diversity in departmental representation enhanced the comprehensiveness of the study by incorporating varied perspectives from across the operational and strategic functions of the commercial banks.

4.3.7 Duration in Positions

Data on years worked in current roles were collected to establish the participants' experience levels.

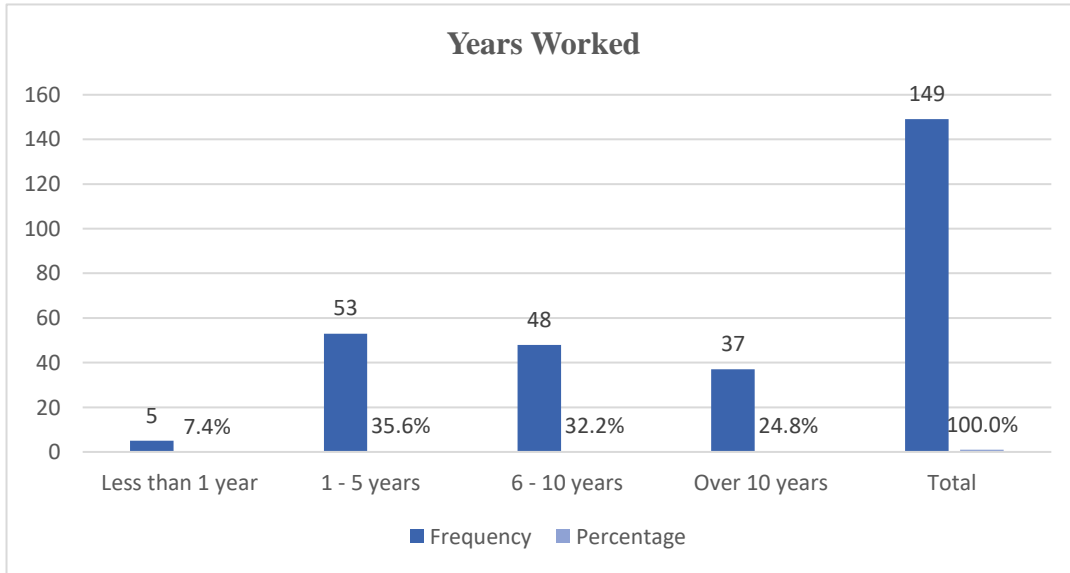


Figure 4.7. Years Worked
Source: Survey Data (2025)

Respondents' experience levels were distributed as follows: 1-5 years (35.6%), 6-10 years (32.2%), over 10 years (24.8%), and less than one year (7.4%). The findings show that most respondents were experienced professionals, supporting the validity of their views on digital transformation initiatives in their institutions.

4.4 Descriptive Statistics

Descriptive statistics were used to summarise key data characteristics, including distributions, means, and standard deviations (Cooper and Schindler, 2014). Respondents' perceptions were measured on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree), converting attitudes into quantifiable data and enabling comparisons across variables. The next section presents these findings.

4.4.1 Service Automation Strategy

The descriptive analysis of the Service Automation Strategy focused on three main aspects: the extent of automated processes, the rate of customer adoption, and the speed of service delivery. Responses were collected on a 5-point agreement scale (1-5) with score magnitude corresponding to assertion strength. The aggregate scores are displayed in the table below.

Table 4.3. Descriptive Statistics for Service Automation Strategy

	N	Min	Max	Mean (M)	Std. Dev (SD)
Number of Automated Processes					
The bank has implemented a high number of automated processes.	149	1.0	5.0	4.10	1.10
Most routine services at the bank are now handled through automation.	149	2.0	5.0	3.76	1.25
The bank continuously automates manual processes to improve efficiency.	149	1.0	5.0	4.03	1.08
Total Score for Number of Automated Processes				3.96	1.15
Customer Adoption Rate					
The majority of customers have adopted automated services.	149	1.0	5.0	3.52	1.31
The bank provides adequate support to encourage customers to use automated services.	149	1.0	5.0	3.44	1.45
Total Score for Customer Adoption Rate				3.48	1.38
Service Turnaround Time					
Automation has led to reduced service turnaround time.	149	1.0	5.0	3.13	1.59
Automated services at the bank have improved the overall efficiency of service delivery.	149	1.0	5.0	2.98	1.39
Total Score for Service Turnaround Time				3.06	1.49
Aggregate Score for Service Automation Strategy				3.57	1.31

Source: Survey Data (2025)

The statement regarding banks' extensive implementation of automated processes recorded a high mean score (M=4.10, SD=1.10), indicating strong consensus among respondents

with limited dispersion. Consistent with these findings, respondents reported substantial automation adoption, with routine service automation (M=3.76) and continuous process improvement through automation (M=4.03) both receiving strong endorsement.

The dimension's aggregate score (M=3.96, SD=1.15) demonstrates favourable respondents' assessments of banks' automation levels, though with some divergence in perspectives. The results are consistent with Kiragu and Waithaka (2020), who found that Kenyan banks had heavily invested in automation to reduce manual processes. The customer adoption dimension demonstrated more moderate acceptance levels with a mean score of 3.48 (SD=1.38), reflecting greater variability in user adaptation rates. Mean scores revealed stronger agreement for customer automation adoption (3.52) than for bank support provision (3.44), indicating a potential gap between service availability and user facilitation.

These patterns imply that while there was a moderate agreement that customers were embracing automation, there was room for improvement in promoting and supporting customer adoption of these services. The observation is supported by Mugambi and Karanja (2021), who found that while Kenyan banks had automated services, many customers still preferred human interaction due to trust issues and a lack of digital literacy.

The dimension related to service turnaround time recorded (M=3.06, SD=1.49), indicating greater variability and less overall agreement among respondents. While automation showed a modest perceived reduction in processing times (3.13), its overall efficiency gains scored below neutral (2.98), indicating customers or staff were not experiencing tangible workflow improvements.

These divergent findings imply that while some respondents observed improvements, others may not have experienced significant changes, possibly due to disparities in automation effectiveness across banks and service areas. The observation is confirmed by the study by Ochieng and Were (2019), which found that automation reduced processing times in some banks, but others saw no significant improvement due to system failures and poor integration.

The Service Automation Strategy index ($M=3.57$, $SD=1.31$) indicates that respondents generally agreed that service automation had been implemented within their institutions. However, the varying scores across the three dimensions point to stronger internal automation but less consistent outcomes in customer adoption and service delivery efficiency. The findings are supported by the CBK, which reported that Kenyan banks were leading in Africa in automation, but gaps existed in customer education and systems reliability (CBK, 2022).

4.4.2 Data Analytics Strategy

The descriptive analysis of the Data Analysis Strategy focused on three main dimensions: the volume of data processed, the accuracy of predictive models and revenue impact. Each indicator was measured on a 5-point Likert scale, where higher scores reflected stronger agreement. The results are presented below.

Table 4.4. Descriptive Statistics for Data Analytics Strategy

	N	Min	Max	Mean (M)	Std. Dev (SD)
Volume of Data Processed					
The bank processes a large volume of data to support decision-making.	149	1.0	5.0	3.04	1.45
The data analytics infrastructure at the bank can handle large-scale data inputs from multiple sources in real time.	149	1.0	5.0	3.01	1.41
Total Score for Volume of Data Processed				3.03	1.43
Accuracy of Predictive Models					
The predictive models used by our bank consistently provide accurate insights for decision-making.	149	1.0	5.0	3.48	1.43
We regularly update our predictive models to ensure high levels of accuracy.	149	1.0	5.0	2.91	1.46
Total Score for Accuracy of Predictive Models				3.20	1.45
Revenue Impact					
Data analytics initiatives at our bank have led to measurable increases in revenue.	149	1.0	5.0	3.27	1.39
We rely on data-driven insights to capitalise on new revenue opportunities.	149	1.0	5.0	2.73	1.32
Total Score of Revenue Impact				3.00	1.36
Aggregate Score for Data Analytics Strategy				3.07	1.41

Source: Survey Data (2025)

On the volume of data processed dimension, the statement that the banks processed a large volume of data to support decision-making had a mean score of 3.04, while the statement that the data analytics infrastructure at the banks could handle large-scale data inputs from multiple sources in real time had a mean score of 3.01. These results suggest that the respondents were generally neutral to slightly agreeable regarding the banks' ability to process and manage large volumes of data.

The composite score for this dimension was (M=3.03, SD=1.43), indicating moderate perspectives and a relatively high variability in responses, possibly reflecting differences in data capabilities across institutions. These outcomes align with the findings of Mutua and Karanja (2021) that Kenyan banks collected vast data, such as mobile transactions and

customer records, but real-time processing was a challenge due to infrastructure limitations.

On the accuracy of predictive models, survey respondents rated the statement “bank forecasting models reliably generate accurate decision-making insights’ with a mean score of 3.48, while the statement that predictive models were regularly updated to ensure high levels of accuracy was rated lower at 2.91. This dimension yielded ($M=3.20$, $SD=1.45$), pointing to mixed levels of agreement.

While some banks appeared to have confidence in the accuracy of their models, there may have been concerns regarding the regular updating and refinement of these models, which were critical for sustaining predictive performance. This is confirmed by Ngugi and Omwenga (2020), who found that while Kenyan banks used predictive models (e.g. credit scoring, fraud detection), only 38% regularly updated them, leading to accuracy decay. The dimension measuring the revenue impact of data analytics had the lowest average score among the three ($M=3.00$, $SD=1.36$).

The item stating that data analytics initiatives at the banks led to measurable increases in revenue had a moderate mean of 3.27, but the statement that the banks relied on data-driven insights to capitalise on new revenue opportunities was lower at 2.73. These findings indicate neutral responses overall, suggesting that while some institutions gained financial benefits from data analytics, others were not leveraging data fully for strategic revenue generation. This is echoed by Kamau and Aduda (2019), who noted that only 25% of Kenyan banks linked data analytics directly to revenue growth, and that most of the banks used it for cost reduction rather than strategic monetisation.

The overall score for the Data Analytics Strategy was (M=3.07, SD=1.41), reflecting a neutral to moderately positive perception of data analytics capabilities within the surveyed banks. The relatively high standard deviation suggests that experiences and implementations varied significantly across institutions.

These findings implied that while data analytics was present, its strategic use, especially for revenue impact and model accuracy, required further development and investment. The observations are supported by the CBK, which noted that Kenyan banks were in the “early maturity” phase of data analytics with high variability in adoption. Larger institutions were more advanced, while the smaller ones lagged (CBK, 2023).

4.4.3 Mobile Banking Applications Strategy

The Mobile Banking Applications Strategy was assessed using three key dimensions: user penetration rate, transaction volume, and customer satisfaction rating. Each indicator was measured on a 5-point Likert scale, where higher scores indicated stronger agreement with the respective statement. The findings are presented below.

Table 4.5. Descriptive Statistics for Mobile Banking Applications Strategy

	N	Min	Max	Mean (M)	Std. Dev. (SD)
User Penetration Rate					
A high percentage of our customers actively use our mobile banking application.	149	1.0	5.0	3.27	1.39
The bank has experienced a steady increase in mobile banking users over the past year.	149	1.0	5.0	2.95	1.26
Total Score for User Penetration Rate				3.11	1.33
Transaction Volume					
The volume of transactions via mobile banking has grown substantially.	149	1.0	5.0	2.90	1.30
Mobile banking contributes a significant share of the bank’s overall transaction activity.	149	1.0	5.0	3.14	1.34

Total Score for Transaction Volume				3.02	1.32
Customer Satisfaction Rating					
Customers express high satisfaction with our mobile banking application.	149	1.0	5.0	2.88	1.19
Our mobile banking application enhances the overall customer experience.	149	1.0	5.0	2.66	1.26
Feedback from customers has led to continuous improvements in the mobile banking application.	149	1.0	5.0	3.06	1.42
Total Score for Customer Satisfaction Rating				2.87	1.29
Aggregate Score for Mobile Banking Applications Strategy				2.97	1.29

Source: Survey Data (2025)

On the user penetration rate, the statement that a high percentage of customers actively used the banks' mobile banking applications recorded a mean score of 3.27, suggesting a moderately positive view of customer uptake. However, the statement that the banks had experienced a steady increase in mobile banking users over the past year was rated lower, with a mean of 2.95. These results empirically validate Mbiti and Weil's (2016) earlier conclusions that while *M-Pesa* drove initial mobile banking adoption, its growth had slowed down in recent years due to market saturation and competition from fintech.

Ndungu (2018) also found that 72% of Kenyans used mobile banking, but the growth rates plateaued post-2018, with only a 5% annual increase in new users. The aggregate mean for this dimension was 3.11 with a standard deviation of 1.33, indicating a moderate user adoption of mobile banking, though not uniformly across the sampled banks.

For transaction volume, the statement that the volume of transactions via mobile banking had grown substantially had a mean of 2.90, while the statement that mobile banking contributed a significant share of the banks' overall transaction activity was rated at 3.14. The dimension had a mean of 3.02 and a standard deviation of 1.32. The results reflect a neutral to slightly positive perception, suggesting that while mobile banking contributed to

transaction volumes, its impact may not have been substantial or consistent across institutions.

The findings are confirmed by the CBK (*Annual Banking Sector Report 2023*), which found that mobile banking accounted for 45% of total transactions but contributed less than 20% of revenue, indicating high volume but low monetisation (CBK, 2023). Kariuki and Aduda (2020) also found that mobile transactions in Kenyan commercial banks grew by 22% annually but had minimal impact on profitability due to low fees and high operational costs.

The lowest scores were recorded in the customer satisfaction dimension. The statements that “customers expressed high satisfaction with the banks’ mobile banking applications”, “banks’ mobile banking applications enhanced the overall customer experience”, and “feedback from customers led to continuous improvements in the mobile banking applications”, scored a mean of (2.88, 2.66, 3.06), respectively.

This was confirmed by Opiyo and Omwenga (2021), who reported that 62% of users cited poor application designs, frequent downtimes and slow customer support as key pain points. The score for this category was (M=2.87, SD=1.29), indicating a generally low to neutral level of customer satisfaction and highlighting areas for improvement in usability and responsiveness of customer feedback.

The overall results for the Mobile Banking Applications Strategy were (M=2.97, SD=1.29). This suggests that respondents held a neutral perception of the strategy’s effectiveness. While there were some positive uptake and usage, customer satisfaction remained low, pointing to a need for banks to enhance functionality, user experience and responsiveness within their mobile banking platforms. The findings are echoed by the

World Bank (2021), which found that Kenya led Africa in mobile banking penetration but trailed in service quality and innovation beyond payments.

4.4.4 Employee Upskilling Strategy

The Employee Upskilling Strategy was assessed through three key dimensions: training completion rate, employee satisfaction and the impact on performance. All survey items employed a 5-point Likert-type scale anchored by 1(Strongly Disagree) to 5(Strongly Agree). The analysed results reflect respondents’ perceptions of how effectively banks equipped their employees with digital skills.

Table 4.6. Descriptive Statistics for Employee Upskilling Strategy

	N	Min	Max	Mean (M)	Std. Dev. (SD)
Training Completion Rate					
A high percentage of employees have completed digital upskilling programs.	149	1.0	5.0	3.58	1.32
There is a high participation rate in digital skill enhancement training.	149	1.0	5.0	3.60	1.24
Training programs are structured with clear timelines to ensure timely completion by staff.	149	1.0	5.0	3.19	1.34
Total Score for Training Completion Rate				3.46	1.30
Employee Satisfaction					
Employees are satisfied with the quality of digital training offered by the bank.	149	1.0	5.0	3.28	1.16
Staff express positive feedback regarding the learning experience provided.	149	1.0	5.0	3.71	1.16
Total Score for Employee Satisfaction				3.49	1.16
Impact on Performance					
Training programs have led to improved employee performance.	149	1.0	5.0	3.69	1.18
Upskilling has increased employee productivity in delivering digital banking services.	149	1.0	5.0	3.73	1.27
Total Score for Impact on Performance				3.71	1.23
Aggregate Score for Employee Upskilling Strategy				3.54	1.24

Source: Survey Data (2025)

The dimension assessing training completion received a moderate to positive evaluation, with mean scores of (3.58, 3.60, 3.19) across the three items. The item with the lowest mean, “training programs were structured with clear timelines to ensure timely completion by staff”, suggested a potential gap in scheduling or planning.

This is consistent with Mwangi and Karanja (2021), who found that while 78% of bank employees participated in digital skill training, only 52% completed programs on time due to poor scheduling and workload conflicts. The total score for this dimension was (M=3.46, SD=1.30), indicating general agreement that training was widely accessed, but the delivery structure could be improved.

Employee satisfaction with training initiatives was relatively high. The survey data revealed moderate agreement (M=3.28) regarding employee satisfaction with the quality of digital training programs offered by banks. Respondents expressed even stronger consensus (M=3.71) on staff providing positive feedback about the overall learning experience.

This aligns with the study by Omondi and Mutua (2020), which reported that 82% of bank employees rated digital training as satisfactory or better, praising practical modules but criticising outdated content in 34% of programs. The total score for this dimension was (M=3.49, SD=1.16), suggesting positive sentiments and consistent feedback regarding the learning environment.

The dimension, impact on performance, recorded the highest scores with respondents agreeing that training programs led to improved employee performance, with a mean score of (3.69), and that upskilling had increased employee productivity in delivering digital banking services, with a mean of (3.73).

The results are corroborated by Ngugi and Were (2019), who noted that banks with structured upskilling programs saw 27% higher productivity in digital service delivery compared to their peers. The CBK also found that 89% of banks reported measurable performance gains post-training, though only 41% tracked long-term outcomes (CBK, 2023).

The dimension yielded (M=3.71, SD=1.23), highlighting that most commercial banks witnessed tangible benefits in employee performance due to upskilling programs. This reflects broader trends in Kenya. According to FSD Kenya (2021), Kenyan banks allocated 5-8% of payroll to upskilling, ranking second in Africa for investment but lagging in ROI measurement.

The overall score for the Employee Upskilling Strategy was (M=3.54, SD=1.24). These findings point to a generally positive perception of the employee upskilling efforts within the banks surveyed. Respondents acknowledged the value and impact of digital training, although some areas, particularly program structure and planning, could benefit from further enhancement to improve participation and timely completion.

4.4.5 Digital Payment Solutions Strategy

The Digital Payment Solutions Strategy was evaluated through three dimensions: fraud and security metrics, integration capability and innovation and feature development. Variables were scored on a 5-point agreement continuum (1=lowest, 5=highest) with higher values indicating more positive perceptions of strategy implementation and results.

Table 4.7. Descriptive Statistics for Digital Payment Solutions Strategy

	N	Min	Max	Mean (M)	Std. Dev (SD)
Fraud and Security Metrics					
The bank has implemented robust security measures to safeguard digital payment transactions.	149	1.0	5.0	3.89	1.44
There has been a noticeable reduction in fraud incidents related to digital payment solutions.	149	1.0	5.0	3.85	1.12
Our fraud detection systems are effective in mitigating risks in real time.	149	1.0	5.0	3.67	1.04
Total Score for Fraud and Security Metrics				3.80	1.20
Integration Capability					
Our digital payment systems are well-integrated with other internal banking platforms.	149	1.0	5.0	3.90	1.10
Our bank’s payment solutions integrate with external platforms.	149	1.0	5.0	3.93	0.98
Total Score for Integration Capability				3.92	1.04
Innovation and Feature Development					
The bank regularly produces new functionalities for digital payment platforms.	149	1.0	5.0	3.95	1.18
Customer feedback is actively used to drive innovation in our digital payment solutions.	149	1.0	5.0	4.01	1.10
Total Score for Innovation and Feature Development				3.98	1.14
Aggregate Score for Digital Payment Solutions				3.89	1.14

Source: Survey Data (2025)

Fraud and security metrics dimension yielded relatively high scores, indicating that banks had invested in and implemented strong protective measures. Respondents agreed that robust security measures were in place (mean score of 3.89) and that fraud incidents had reduced as a result (mean score of 3.85). They also viewed the fraud detection systems as effective (mean score of 3.67). This is corroborated by the Central Bank of Kenya (CBK) report that Kenyan banks reduced digital fraud by 42% (2020-2023) through biometric authentication and AI-driven fraud detection (CBK, 2023).

According to Mutua and Were (2022), banks that spend more than 5% of their IT budgets on security saw fraud rates drop 2.5 times faster than peers. The aggregate score for this

dimension was ($M=3.80$, $SD=1.20$), reflecting confidence in the reliability and security of digital payment systems. The integrated capability dimension received the highest aggregate mean score of all three at ($M=3.92$, $SD=1.04$). Respondents strongly agreed that the banks' payment systems were well integrated with internal platforms (mean score of 3.90) and effectively connected with external platforms (mean score of 3.93).

These results suggest that interoperability and system compatibility were key strengths in the banks' digital payment solutions. This aligns with the Kenya Bankers Association (KBA) report that 94% of banks achieved full integration between mobile money, core banking and third-party APIs (e.g. PayPal, Flutterwave) (KBA, 2023). Innovation in digital payments also scored highly, with banks appearing as responsive to market trends and customer feedback. The mean scores were 3.95 for regular feature updates and 4.01 for customer-driven innovation. The dimension scored ($M=3.98$, $SD=1.14$), highlighting a strong commitment to continuous improvement and user-centric development.

FSD Kenya (2022) reports that banks launched 12-15 new payment features annually, with 68% inspired by customer feedback (e.g. *M-Pesa* overdrafts, cardless ATM withdrawals). The study by Ndungu (2023) also supports the findings by reporting that Kenyan banks led Africa in real-time innovation cycles, averaging 3-6 months from feedback to deployment.

Digital Payment Solutions Strategy yielded an overall score of ($M=3.89$, $SD=1.14$). This suggests that digital payment solutions were well developed, secure and responsive to both internal operational needs and external customer expectations. The strategy was perceived as a strong area of digital transformation in the banking sector. This is confirmed by the World Bank (2023), which found that 82% of Kenyan adults used digital payments, with bank-led solutions dominating.

4.4.6 Competitive Advantage

The Competitive Advantage among commercial banks in Nairobi City County was assessed through four indicators: market share growth, technological leadership, corporate reputation, and sustained growth in profitability, all evaluated on a 5-point Likert scale (1=Strongly Disagree and 5=Strongly Agree).

Table 4.8. Descriptive Statistics for Competitive Advantage

	N	Min	Max	Mean (M)	Std. Dev (SD)
The bank has increased its market share in recent years.	149	1.0	5.0	3.54	1.32
The bank is recognised as a technological leader in the industry.	149	1.0	5.0	3.03	1.43
Our corporate reputation has improved due to digital initiatives.	149	1.0	5.0	3.12	1.47
The bank has recorded sustained profit growth due to digital transformation.	149	1.0	5.0	3.24	1.52
Aggregate Score for Competitive Advantage				3.23	1.43

Source: Survey Data (2025)

The statement that banks had increased their market shares in recent years received a relatively high score (M=3.54, SD=1.32), suggesting that most respondents moderately agreed that digital transformation had contributed to expanding the surveyed banks' market presence. This aligns with Kamau and Aduda's (2022) study, which reported that banks investing more than 10% of revenue in digital channels saw 5-8% annual market growth.

Respondents rated their agreement with the statement that their banks were recognised as technological leaders in the industry at (M=3.03, SD=1.43), indicating a neutral to slightly positive perception. The results suggest moderate confidence in the relevant banks' positioning as technology frontrunners. Muthoni and Karanja (2021) found that only 34%

of bank employees rated their institutions as “industry technology leaders”, with Equity Bank Kenya and KCB Bank Kenya dominating perceptions.

The statement that the surveyed banks’ corporate reputation had improved due to digital initiatives yielded ($M=3.12$, $SD=1.47$), reflecting a slightly positive perception of digital transformation’s role in enhancing the banks' public image. The results are supported by the Brand Finance Kenya (2023) report, which indicated that digital-first banks such as ABSA Bank Kenya saw 22% higher scores than peers linked to mobile application quality and customer service responsiveness.

The item that the banks had recorded sustained profit growth due to digital transformation achieved ($M=3.24$, $SD=1.52$), implying that respondents somewhat agreed with the assertion that digital strategies had positively influenced financial outcomes. This score aligns with the CBK report that digitally advanced banks achieved 12-15% ROE (2020-2023), but smaller banks lagged due to implementation costs (CBK, 2023).

The overall rating for Competitive Advantage was ($M=3.23$, $SD=1.43$), indicating that commercial banks in Nairobi City County, Kenya, generally perceived digital transformation as having a moderately positive effect on their competitive advantage. While there was some variability in responses, the overall perception aligns with a positive association between digital initiatives and competitive outcomes. The findings reflect the Kenyan digital banking landscape. According to FSD Kenya (2023), 71% of banks view digitisation as a key competitive lever, but only the top 5 banks fully monetise these investments.

4.5 The Inferential Analysis

The inferential analysis examined the prediction ability of the digital transformation strategies on competitive advantage to ascertain the links among the key study variables. Based on the sampled data, the analysis sought to draw generalisations about the population of commercial banks using regression and correlation approaches. The results are presented and discussed below.

4.5.1 Correlation Analysis

The correlation analysis was designed to determine the type and strength of the correlations between the key independent variables and the dependent variable. The findings are shown in Table 4.8.

Table 4.9. Correlation Analysis between Dependent and Independent Variables

		Service Automation Strategy	Data Analytics Strategy	Mobile Banking Apps Strategy	Employees Upskilling Strategy	Digital Payments Solutions Strategy	Competitive Advantage
Service Automation Strategy	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	149					
Data Analytics Strategy	Pearson Correlation	0.387	1				
	Sig. (2-tailed)	1.055					
	N	149	149				
Mobile Banking Apps Strategy	Pearson Correlation	0.541	0.679	1			
	Sig. (2-tailed)	1.002	1.678				
	N	149	149	149			
Employees Upskilling Strategy	Pearson Correlation	0.107	0.121	-0.065	1		
	Sig. (2-tailed)	0.194	0.141	0.43			
	N	149	149	149	149		
Digital Payments	Pearson Correlation	-0.027	0.072	0.177	-0.617	1	

Solutions Strategy	Sig. (2-tailed)	0.744	0.385	0.03	5.084		
	N	149	149	149	149	149	
Competitive Advantage	Pearson Correlation	-0.031	-0.072	-0.055	0.677	-0.704	1
	Sig. (2-tailed)	0.709	0.38	0.503	3.299	1.268	
	N	149	149	149	149	149	149
	Correlation is significant at the 0.01 level (2-tailed).						
**	Correlation is significant at the 0.05 level (2-tailed).						
*							

Source: Survey Data (2025)

The Employee Upskilling Strategy showed a positive correlation with Competitive Advantage ($r = 0.677$, $p < 0.01$). This suggests that improvements in employee digital competencies are linked to a greater competitive advantage among commercial banks. According to Sekaran and Bougie (2016), a strong positive correlation suggests that as one variable increases, the other also increases, highlighting the critical role of workforce development in driving strategic outcomes. By contrast, Digital Payment Solutions Strategy displayed a strong negative correlation with competitive advantage ($r=0.704$, $p=0.01$). This suggests that although digital payment solutions were advancing, they might not have immediately resulted in competitive gains, possibly due to market saturation or strong competition in digital offerings. According to Creswell and Creswell (2018), a negative correlation suggests that as one variable increases, the other tends to decrease.

Service Automation Strategy, Data Analytics Strategy, and Mobile Banking Applications Strategy each showed a very weak negative correlation with Competitive Advantage ($r=-0.031$, -0.072 , and -0.055 , respectively), with no statistical significance ($p>0.05$). According to Field (2018), weak and negligible correlations indicate either little or no linear relationship between the investigated variables. The results reflect the need for strategic employee development to obtain a competitive edge in digital banking and for

commercial banks to evaluate the success of other digital transformation initiatives to produce concrete benefits.

4.5.2 Multiple Regression Analysis

Regression analysis was conducted to assess how well the independent variables predicted the dependent variable, both individually and collectively. Multiple regression was used as it is suitable for investigating relationships between several predictors and an outcome (Field, 2018). The findings from the model summary, ANOVA, and coefficient tables are presented and discussed below.

Table 4.10. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.801(a)	.641	.628	.775

A Predictors: (Constant), Digital Payment Solutions Strategy, Service Automation Strategy, Data Analytics Strategy, Employee Upskilling Strategy and Mobile Banking Applications Strategy.

Source: Survey Data (2025)

The model summary shows that the multiple correlation coefficient (R) was 0.801, indicating a strong positive relationship between the set of independent variables and the dependent variable. Further, the R Square value was 0.641, meaning that approximately 64.1% of the variance in competitive advantage was explained by the combined effect of the five digital transformation strategies. According to Sekaran and Bougie (2016), an R Square value above 0.60 indicates high explanatory power in business research.

In the study by Ngugi and Were (2023), a similar regression model ($R^2 = 0.59$) identified mobile banking and data analytics as the strongest predictors of market growth in Kenyan banks, confirming that digital strategies collectively drive competitiveness. The adjusted R

Square was 0.628, hence slightly lower than the unadjusted R Square. This adjustment incorporated the number of predictors in the model, ensuring a more accurate measure of explained variance. Despite this correction, the model remained capable of accounting for 62.8% of the variability in competitive advantage (Field, 2018).

The regression analysis yielded a standard error estimate (SEE) of 0.775, which means the model predictions differed from the actual competitive advantage values by approximately 0.775 units on average. A smaller standard error indicates a more accurate prediction model (Field, 2018). Generally, the model demonstrates good explanatory strength, implying that the selected digital transformation strategies were strong predictors of competitive advantage.

Table 4.11. ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	153.549	5	30.710	51.067	.000(a)
	Residual	85.995	143	.601		
	Total	239.544	148			

a. **Dependent Variable:** Competitive Advantage.

b. **Predictors (Constant):** Digital Payments Solutions Strategy, Service Automation Strategy, Data Analytics Strategy, Employees Upskilling Strategy, Mobile Banking Applications Strategy

Source: Survey Data (2025)

The Analysis of Variance (ANOVA) results confirmed the regression model's statistical significance, demonstrating that the combined digital transformation strategies (service automation strategy, data analytics strategy, mobile banking applications strategy, employee upskilling strategy and digital payment solutions strategy) reliably predicted competitive advantage. In particular, the F-statistic obtained was 51.067 with a p-value of 0.000, which is lower than the standard cut-off value of 0.05. The regression sum of

squares (153.549) was higher than the residual sum of 85.995, suggesting that the model explained a large proportion of the competitive advantage variation.

Table 4.12. Coefficients of Regression Analysis

	Unstandardised Coefficients		Standardised Coefficient		
	β	Std. Error	Beta	t	Sig.
(Constant)	4.695	.617		7.611	.000
Service Automation	-.333	.121	-.167	-2.761	.007
Data Analytics	-.581	.170	-.241	-3.423	.001
Mobile Banking Applications	.509	.127	.311	4.006	.000
Employee Upskilling	.497	.072	.456	6.913	.000
Digital Payment Solutions	-.505	.071	-.465	-7.149	.000

a. **Dependent Variable:** Competitive Advantage

b. **Predictors (Constant):** Service Automation, Data Analytics, Mobile Banking applications, Employee Upskilling and Digital Payment Solutions.

Source: Survey Data (2025)

Derived from the coefficient estimates, the predictive equation took the form:

$$Y=4.695 - 0.333X_1 -0.581X_2 + 0.509X_3 + 0.497X_4 - 0.505X_5$$

Where:

Y=Competitive Advantage

X₁=Service Automation, X₂=Data Analytics, X₃=Mobile Banking Applications, X₄=Employee Upskilling and

X₅=Digital Payment Solutions

The regression coefficients indicate how much each independent variable contributed to explaining variance in competitive advantage when all other factors were statistically held constant. Based on the findings, the constant (intercept) was fixed at 4.695 and was found to be statistically significant (p=.000), suggesting that when all independent variables were held at constant zero, the competitive advantage score would be 4.695.

The analysis showed Service Automation exerted a significant detrimental effect on Competitive Advantage ($\beta=-0.333$, $p<0.01$), where a one-unit escalation in automation implementation was associated with an approximate one-third standard deviation decline in competitive advantage, holding other factors constant. The findings are contrary to earlier studies, which primarily registered positive operational outcomes from automation (Kumar & Gupta, 2019; Nyaga & Ndungu, 2020; Tadesse & Gebremedhin, 2021; Okonkwo & Obiora, 2020; Rodriguez & Martinez, 2022).

The negative effect can be interpreted through several theoretical frameworks. According to Porter's Generic Competitive Strategies, despite automation being expected to drive cost leadership or differentiation, the adverse effect suggests that it may be undermining customer experience, thus eroding competitive advantage. The RBV suggests that service automation only becomes competitively valuable and rare when combined with supporting organisational capabilities, including workforce expertise and strategic integration (Barney, 1991; Teece, 2007). The Dynamic Capabilities theory posits that commercial banks could be failing to reconfigure and adapt automation tools that create sustained advantage.

According to TAM, users often resist adopting new systems if they find them difficult to use (low perceived ease of use) or not fit for purpose (low perceived usefulness). This resistance, evident among both customers and employees, can significantly undermine an organisation's expected return on investment (Davis, 1989; Venkatesh *et al.*, 2003). According to the findings, banking automation in Kenya may still be in its early stages, facing the adoption barriers such as limited public awareness or a lack of user confidence typical of an innovation's initial diffusion.

Unlike previous research (Kumar & Gupta, 2019; Martin & Taylor, 2020), which dealt with technologically advanced markets and noted productivity as well as customer loyalty gains, this study provides a different view from a developing country, showing that simply implementing automation does not guarantee a competitive advantage if it is not properly integrated.

While prior studies focused on operational efficiency (Tadesse & Gebremedhin, 2021; Rodriguez & Martinez, 2022), this study found a stronger link between automation and strategic success by emphasising customer experience. For Kenyan commercial banks, this means moving beyond simply adopting automation to focusing on user-centred design, employee readiness, and strategic alignment to achieve lasting competitiveness.

Data Analytics Strategy also had a negative and statistically significant effect ($\beta=-0.581$, $p=0.001$), suggesting that the banks' increased investment in analytics, as implemented, may have inadvertently harmed their market position. The result contrasts with prior research (e.g. Akter *et al.*, 2016; Davenport & Harris, 2017), which underlines data analytics' positive role in cost efficiency, customer insights and agility. Based on Porter's Generic Competitive Strategies, this unexpected finding confirms that while Kenyan banks may be collecting data, they were not converting it into meaningful information that enhances customer value or reduces costs.

The RBV posits that analytics capabilities can only be competitive if they create value, are scarce in the market, are difficult to replicate and are well organised. In the Kenyan banking sector, a lack of skilled personnel, data quality issues or poor integration can prevent data analytics from being a strategic asset. From a Dynamic Capabilities theory view, the findings imply that banks lacked the internal agility to continuously integrate

analytics into decision-making on an ongoing basis, thus missing out on potential responsiveness or innovation.

The TAM further indicates that when employees or decision-makers perceive analytics tools as complex or not relevant, their usage and adoption could weaken the overall strategic impact. The Diffusion of Innovation theory suggests that data analytics remains at the innovator/early adoption stages within some Kenyan banks, particularly smaller institutions that may be facing challenges in terms of infrastructure, skills and cost factors, as indicated in prior research (Kamau & Wambugu, 2021; Njoroge & Muturi, 2022).

Compared to global studies (Akter *et al.*, 2016; Davenport & Harris, 2017), which found that data analytics enhanced operational agility, customer experience and financial performance in developed markets, the current study shows that such benefits are not necessarily realised in developing economies. Similarly, while other studies (Dlamini & Ngwenya, 2020; Adebayo & Ajayi, 2021) determined that analytics enhanced prediction and market effectiveness in retail and telecommunication sectors, they also noted that smaller firms faced challenges like those in Kenyan Banks.

The study found that Mobile Banking Applications Strategy had a positive and statistically significant relationship with Competitive Advantage ($\beta=0.509$, $p=.000$), suggesting that improvements in mobile banking applications enhanced Competitive Advantage. This aligns with prior research (Laukkanen & Cruz, 2014; Shaikh & Karjaluoto, 2015), which highlighted mobile banking applications' role in enhancing customer convenience, retention and cost efficiency.

According to Porter's generic competitive strategies, this finding suggests that mobile banking applications serve as a differentiator, enabling Kenyan banks to offer unique,

convenient services (e.g. *M-Pesa* integration) that rivals cannot easily replicate. The RBV further supports this view, as mobile banking applications leverage valuable, rare and organised digital infrastructure (e.g. Kenya's high mobile penetration) to sustain a competitive edge. The positive relationship observed implies that Kenyan banks have transformed mobile platforms into strategic assets to a significant extent, which enhances their market positions.

The Dynamic Capabilities theory further explains that banks which successfully sense market shifts (e.g. mobile-first customer preferences), seize technological opportunities (e.g. application innovations), and reconfigure their service models build a lasting competitive advantage. This aligns with findings from (Kiboori, 2017; Odhiambo & Mang'ana, 2022), who emphasised that technological innovations like mobile banking expand reach and improve customer satisfaction when well-integrated.

The Kenyan context validates TAM's core premises with empirical evidence (Doe & Smith, 2024), confirming that adoption rates correlate strongly with users' assessments of usefulness, ease of navigation and platform trustworthiness. The current research findings further establish that these positive perceptions are directly linked to higher customer satisfaction and gains in market share. This accelerated adoption can also be understood through the lens of Diffusion of Innovation theory. Kenya's unique ecosystem, defined by widespread mobile phone penetration and a vibrant fintech sector, has propelled mobile banking into the mainstream far more rapidly than in regions like MENA, a trend also noted by El Khatib (2023).

The early adoption of mobile banking grants Kenyan institutions significant first-mover advantages in both customer acquisition and operational cost reduction. This research

distinguished itself from previous studies, which addressed electronic banking more generally or were situated in other regions, by providing a targeted analysis of mobile banking applications in the Kenyan context.

The assessment was grounded in specific performance indicators, including transaction volume, user penetration, and profit growth. The findings affirm that when strategically deployed and tailored to the local context, mobile banking applications significantly strengthen banks' competitive positions by combining operational efficiency with superior customer experience.

From the findings, Employee Upskilling Strategy was positively and strongly significant ($\beta=0.497$, $p=.000$), indicating that employee upskilling efforts significantly boosted Competitive Advantage. This relationship is grounded in several strategic management and innovation theories. From the perspective of the RBV, employee competencies developed through targeted upskilling represent valuable, rare and inimitable resources that enhance a bank's ability to deliver superior service and innovate effectively.

As seen in (Charterjee, 2016; Spirgi & Meier, 2022), upskilling initiatives focusing on technological literacy and domain expertise enhanced firm performance and profitability. The current study extends this insight to Kenyan banks, where digital transformation demands skills in data analytics, cybersecurity and customer experience management, enabling differentiation and sustained competitive advantage.

These findings align with the Dynamic Capabilities theory, which views upskilling as vital for reconfiguring human capital in times of change. Similar to Wendewosen (2017) and Thoronka & Combey (2021), who linked structured training to improved motivation and

performance in Ethiopia and Sierra Leone, this study shows that in Kenya, skilled bank employees drive better customer service, innovation adoption, and operational agility.

Upskilling provides banks with dual advantages of differentiation and cost leadership, as Porter suggests. Skilled staff can both personalise services to stand out and streamline operations to reduce costs. Studies by Karoche and Siebers (2015) confirm productivity gains, while Njoroge and Kwasira (2023) add that integrating indigenous knowledge enhances efficiency and cultural relevance.

TAM further explains this relationship: training fosters positive attitudes that support the adoption and effective use of new technologies. Upskilling helps in building employees' confidence and perceived ease of use, which the current study found essential for the implementation of innovations such as automation, data analytics and mobile banking in Kenya. Muchiri (2022) found that although many Kenyan enterprises implemented training, there was a gap in alignment with future skill demands, which this study addressed by linking training with specific technological capabilities.

The Diffusion of Innovation theory suggests that employees serve as key change agents. The current study found that staff who were strategically upskilled in customer engagement, digital skills and risk management facilitated faster internal adoption of innovations during market responsiveness and customer satisfaction corroborating with (Onyango, 2019; Kariuki & Murimi, 2022), who linked employee training in Kenyan banks to improved financial and operational performance, though their studies did not extensively explore metrics like technological innovation and market reputation, which the current study incorporated.

The present study confirmed that employee upskilling is not only a fundamental driver of improved performance and innovation in Kenyan banks but also a strategic enabler of competitive advantage aligned with theoretical models and substantiated by both regional and global empirical evidence.

The study found that Digital Payments Solutions Strategy had a negative and highly significant relationship ($\beta=-0.505$, $p=.000$), suggesting that while digital payment solutions were important, in this context, they may have been associated with challenges that reduced Competitive Advantage. This contrasts with prior research (e.g. Brown & Parker, 2018; Zhang & Zhou, 2019), which generally highlighted digital payment solutions as a driver of efficiency, security and customer retention.

Anchored in Porter's generic competitive strategies, the findings suggest that Kenyan banks may be adopting digital payment solutions as cost-saving tools rather than a differentiation strategy, leading to homogenised services that failed to distinguish them from competitors. The RBV clarifies that while digital payment solutions infrastructure was valuable, it was not rare or inimitable in Kenya's saturated market, where most banks offered similar digital payment options.

The Dynamic Capability theory suggests that Kenyan banks lacked the agility to innovate beyond basic transactions (e.g. AI-driven fraud detection, global payment integration) compared to Chinese firms (Zhang & Zhou, 2019). The Technology Acceptance Model (TAM) also helps to explain the negative outcome. If users perceived digital payment platforms as unreliable, complex or insecure, adoption rates may decline or fail to translate into strategic benefits, pointing to a gap between implementation and end-user satisfaction, a theme underexplored by prior studies that assumed uniform acceptance.

From the lens of Diffusion of Innovation theory, it appears that digital payment solutions in Kenya may have moved beyond the early adopter phase and reached the majority or laggard adoption without meaningful innovation. The CBK confirms this view, noting that mobile money penetration had exceeded 80% of the adult population, with growth rates plateauing, suggesting market saturation (CBK, 2023).

In such a scenario, digital payments became a basic expectation rather than a competitive edge, especially when competitors offered similar services with minimal feature differentiation (e.g. near-identical peer-to-peer transfers across banks and mobile wallets). This study, therefore, concludes that the Kenyan banking sector appears to be facing diminishing returns from digital payment solutions, highlighting the need for renewed innovation, better user experience design and stronger cybersecurity investments to reclaim strategic value.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This concluding chapter consolidates the research outcomes, formulates interpretive conclusions and advances strategic proposals corresponding to the research objectives. It also examines the practical applications, policy considerations, and research directions. Through this synthesis, the chapter intends to deliver an actionable report to support banking institutions in enhancing their strategic initiatives and sustaining competitiveness in an increasingly digitised environment.

5.2 Summary

The study investigated the effects of service automation, data analytics, mobile banking applications, employee upskilling, and digital payment solutions on the competitive advantage among commercial banks. The statistical analysis demonstrated that the collective effect of these strategies was significant, indicating that digital transformation was crucial in shaping the competitive positions of banks. However, the individual contributions of each strategy varied, with some enhancing competitive advantage while others had a negative effect.

Regarding the first objective, the study found that the Service Automation Strategy showed a negative predictive relationship with Competitive Advantage. Although banks actively automated many services, the results suggest that automation alone cannot ensure improved competitiveness unless it is combined with customer expectations and service quality standards.

Concerning the second objective, analysis revealed that the Data Analytics implementation also negatively affected competitive advantage. This result suggests that while banks adopted data analytics initiatives, there were gaps in effectively translating data insights into actionable competitive benefits or challenges in organisational data maturity.

The results further demonstrate that the Mobile Banking Applications Strategy, the third objective, enhanced competitive advantage with statistical significance. Investment in mobile banking platforms enhanced accessibility, customer experience, and convenience, thereby improving the competitive positions of banks in the market.

On the fourth objective, the study established that the Employee Upskilling Strategy demonstrated the strongest positive correlation with competitive advantage. The research revealed that banks investing in enhancing employees' digital skills achieved greater innovative capabilities, enhanced service quality and improved market adaptability, ultimately boosting their competitive edge.

Analysis of the fifth objective revealed that Digital Payment Solutions exerted a statistically significant adverse effect on competitive advantage. This suggests that while digital payment solutions were critical for modernisation, challenges related to security, integration, and customer trust may have diminished their effectiveness in enhancing competitiveness.

The study, therefore, revealed that while some digital transformation strategies (mobile banking applications and employee upskilling) effectively enhanced competitive advantage, others (such as service automation, data analytics, and digital payment solutions), as currently implemented, posed challenges. These results indicate the necessity for commercial banks to adopt holistic digital transformation strategies that prioritise

customer experience, organisational alignment and strategic implementation to maximise competitive benefits.

5.3 Conclusion

This study found that digital transformation strategies significantly affect the competitive positioning of commercial banks across multiple dimensions, although the effect varies based on the specific strategic approach. The study found a statistically significant inverse association between service automation strategy and competitive advantage. While it was noted that banks had implemented automation in their routine operations, service automation, as it is currently implemented, may not translate into a competitive edge unless it is aligned with customer expectations and service quality.

The heavy investment in data analytics also indicated a negative link to competitiveness. This counterintuitive result suggests that banks were collecting vast amounts of data but struggling to translate it into actionable insights. The problem is not a lack of data, but a gap in the skills or processes needed to use it effectively for strategic decisions. The study confirmed that a robust mobile banking strategy was a clear winner. Enhancing mobile services directly strengthened a bank's competitive position by boosting customer satisfaction due to the convenience and accessibility they provided.

Employee upskilling emerged as the single most powerful driver of competitive advantage. Investing in the digital fluency of staff was the key to unlocking the value of other technological investments, underscoring that the human element remains critical for long-term success. Finally, the study found that, despite their popularity, digital payment solutions had a negative relationship with competitiveness. This could be due to intense

market saturation, operational inefficiencies, or customer trust issues that prevented these systems from becoming a true differentiator.

The study therefore concludes that, to ensure a successful digital transformation strategy, commercial banks should focus on a balanced approach that combines technological investment with strategic execution. This means integrating service automation and data analytics in ways that genuinely enhance efficiency and decision-making, while simultaneously upskilling employees and continuously improving essential customer services such as mobile banking and digital payment solutions.

5.4 Policy Recommendations

The digital transformation of Kenya's banking sector offers significant opportunities for competitiveness, but success depends on how well it is executed. This study recommends practical actions for commercial banks, the CBK, and other stakeholders to close critical gaps and ensure technology strengthens the sector's resilience.

To manage the risks of excessive automation, banks should strike a balance between automating routine processes and maintaining human interaction for complex services. Clear customer feedback mechanisms are useful to identify weaknesses in automated systems. The CBK can support this by issuing guidelines that promote automation designed to complement, not replace, human service.

For data analytics to drive competitiveness, banks must go beyond data collection to practical application. This means investing in advanced tools such as AI-powered credit scoring and fraud detection, supported by strong data governance. The CBK can create

secure data-sharing frameworks, while policymakers promote data literacy across the sector. Researchers should also help identify the causes of current gaps in implementation.

Mobile banking remains a major source of competitive advantage. Banks should continue to innovate by introducing features like biometric authentication while keeping USSD services for inclusivity. Stronger integration with payment and e-commerce platforms is vital. Policymakers and the CBK must push for interoperability and high cybersecurity standards to maintain trust and encourage adoption.

Upskilling staff is crucial for competitiveness. Banks should provide continuous digital training and develop leadership pipelines focused on technology. Sector-wide collaboration, through the CBK and the Kenya Bankers Association, can establish common training standards, while universities and colleges must align their curricula to future industry needs.

Finally, in the crowded digital payments space, banks need to differentiate themselves. This requires offering seamless customer experiences, strengthening fraud prevention, and creating value-added services. Regulators also have a critical part to play: the CBK should enforce robust cybersecurity standards, while policymakers must craft regulations that foster, rather than hinder, innovation. Researchers can guide this by investigating specific saturation points and innovation gaps within the ecosystem.

5.5 Recommendations for Future Research

As digital disruption redefines banking, future research should aim at generating empirical evidence that captures the evolving relationship between emerging technologies and competitive advantage in the banking sector. Researchers can adopt longitudinal and real-

time data collection approaches to track the effects of digital strategies over time, ensuring relevance in fast-changing environments. There is a need for more granular studies that assess the contextual factors, such as organisational culture, regulatory frameworks, customer behaviour and market maturity that influence the success or failure of digital initiatives.

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APPENDICES

Appendix I: Letter of Introduction

Dear Respondent,

RE: INVITATION TO PARTICIPATE IN A RESEARCH SURVEY

My name is Nelly Nthenya Musau, a postgraduate student at Kenyatta University. As part of my academic requirements, I am conducting a research study titled "Digital Transformation Strategy and Competitive Advantage of Commercial Banks in Nairobi City County, Kenya."

You have been selected to participate in the study due to your expertise in the banking industry and your bank's significant role in the sector. Your responses will help determine the main factors influencing competitive advantage in the context of digital transformation, which will ultimately benefit the banking sector and contribute to academic knowledge.

Please be assured that your involvement in this study is completely optional, and you may discontinue at any point without consequences. All responses will be kept strictly confidential and utilised exclusively for academic purposes. The data collected will be anonymised to ensure that no individual or organisation can be identified in the final report. For further clarification, you may contact me at musaunelly@yahoo.com or my supervisor, Prof. Stephen Muathe, at muathe.stephen@ku.ac.ke.

Your time and cooperation in supporting this academic endeavour are greatly appreciated. I look forward to your positive response.

Yours sincerely

NELLY NTHENYA MUSAU

Appendix II: Questionnaire

This questionnaire is a component of an academic investigation focused on understanding the effects of digital transformation strategy and the competitive advantage of commercial banks in Nairobi City County, Kenya. The survey will take approximately 10-15 minutes to complete.

Instructions

- a. Please respond to all questions as accurately as possible.
- b. Tick (✓) in the appropriate box.

Section A: General Information

1. Gender: Male Female

2. What is your age bracket?
18-30 years 31-40 years
41-50 years Over 51 years

3. What is your highest level of education?
Diploma Bachelor's Degree
Master's Degree PhD
Other (please specify) _____

4. What is the category of your bank?
Small Medium
Large

5. What is your position in the bank?
Manager Senior Manager
Head of Department Other (please specify) _____

6. Which department do you work in?
IT Digital Finance Services
Finance Strategy

Marketing	<input type="checkbox"/>	Operations	<input type="checkbox"/>
Customer Service	<input type="checkbox"/>	Credit	<input type="checkbox"/>
Human Resources	<input type="checkbox"/>	Other (please specify)	_____

7. How long have you worked in your current position?

Less than 1 year	<input type="checkbox"/>	1-5 years	<input type="checkbox"/>
6-10 years	<input type="checkbox"/>	Over 10 years	<input type="checkbox"/>

Section B: Digital Transformation Strategy

Part I: Service Automation Strategy

8. Please indicate the extent to which you agree with the following statements using the scale below:

1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-Strongly Agree

Statement		1	2	3	4	5
(i)	The bank has implemented a high number of automated processes.					
(ii)	Most routine services in our bank are now handled through automation.					
(iii)	The bank continuously automates manual processes to improve efficiency.					
(iv)	The majority of the bank's customers have adopted automated services.					
(v)	The bank provides adequate support to encourage customers to use automated services.					
(vi)	Automation has led to reduced service turnaround time.					
(vii)	Automated services at the bank have improved the overall efficiency of service delivery.					

Part II: Data Analytics Strategy

9. Please indicate the extent to which you agree with the following statements using the scale below:

1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-Strongly Agree

Statement		1	2	3	4	5
(i)	The bank processes a large volume of data to support decision-making.					
(ii)	The data analytics infrastructure at our bank can handle large-scale data inputs from multiple sources in real time.					
(iii)	The predictive models used by our bank consistently provide accurate insights for decision-making.					
(iv)	We regularly update our predictive models to ensure high levels of accuracy.					
(v)	Data analytics initiatives at our bank have led to measurable increases in revenue.					
(vi)	We rely on data-driven insights to capitalise on new revenue opportunities.					

Part III: Mobile Banking Applications Strategy

10. Please indicate the extent to which you agree with the following statements using the scale below:

1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-Strongly Agree

Statement		1	2	3	4	5
(i)	A high percentage of our customers actively use our mobile banking application.					
(ii)	The bank has experienced a steady increase in mobile banking users over the past year.					
(iii)	The volume of transactions via mobile banking has grown substantially.					
(iv)	Mobile banking contributes a significant share of the bank’s overall transaction activity.					
(v)	Customers express high satisfaction with the mobile banking application.					
(vi)	The mobile banking application enhances the overall					

	customer experience.					
(vii)	Feedback from mobile application users is regularly collected.					

Part IV: Employee Upskilling Strategy

11. Please indicate the extent to which you agree with the following statements using the scale below:

1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-Strongly Agree

Statement		1	2	3	4	5
(i)	A high percentage of employees have completed digital upskilling programs.					
(ii)	There is a high participation rate in digital skill enhancement training.					
(iii)	Training programs are structured with clear timelines to ensure timely completion by staff.					
(iv)	Employees are satisfied with the quality of digital training offered by the bank.					
(v)	Staff express positive feedback regarding the learning experience provided.					
(vi)	Training programs have led to improved employee performance.					
(vii)	Upskilling has increased employee productivity in delivering digital banking services.					

Part V: Digital Payments Solutions Strategy

12. Please indicate the extent to which you agree with the following statements using the scale below:

1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-Strongly Agree

Statement		1	2	3	4	5
(i)	The bank has implemented robust security measures to safeguard digital payment transactions.					
(ii)	There has been a noticeable reduction in fraud incidents related to digital payment platforms.					
(iii)	Our fraud detection systems are effective in mitigation risks real time.					
(iv)	Our digital payment systems are well-integrated with other internal banking platforms.					
(v)	Our bank’s payment solutions to integrate seamlessly with					

	external platforms.					
(vi)	The bank regularly produces new functionalities to digital payment platforms.					
(vii)	Customer feedback is actively used to drive innovation in our digital payment solutions.					

Section C: Competitive Advantage

13. Please indicate the extent to which you agree with the following statements using the scale below:

1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-Strongly Agree

	Statement	1	2	3	4	5
(i)	The bank has increased its market share in recent years.					
(ii)	The bank is recognised as a technological leader in the industry.					
(iii)	Our corporate reputation has improved due to digital initiatives.					
(iv)	The bank has recorded sustained profit growth due to digital transformation.					

END

Appendix III – Approval of Research Proposal



**KENYATTA UNIVERSITY
GRADUATE SCHOOL**

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

Website: www.ku.ac.ke

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

Internal Memo

FROM: Executive Dean, Graduate School

DATE: 26th March, 2025

TO: Musau Nthenya Nelly
C/o Business Administration Dept.

REF: D53/OL/CTY/20479/2022

SUBJECT: APPROVAL OF RESEARCH PROJECT PROPOSAL

This is to inform you that Graduate School Board at its meeting of 18th March, 2025 approved your Research Project Proposal for the M.B.A Degree Entitled, **“Digital Transformation Strategy and Competitive Advantage of Commercial Banks in Nairobi City County, Kenya.”**

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

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

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

Thank you.

JANE KAMONDE
FOR: EXECUTIVE DEAN, GRADUATE SCHOOL

c.c. Chairman, Business Administration.


Supervisors:


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

JNK/ms




Appendix IV – Research Permit


REPUBLIC OF KENYA


NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **566192** Date of Issue: **04/April/2025**

RESEARCH LICENSE




This is to Certify that Ms.. Nelly Nthenya Musau 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: Digital Transformation Strategy and Competitive Advantage of Commercial Banks in Nairobi City County, Kenya for the period ending : 04/April/2026.

License No: **NACOSTI/P/25/417825**

566192
Applicant Identification Number

W. Mutembo
Director General
NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY &
INNOVATION

Verification QR Code



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Scan the QR Code using QR scanner application.

See overleaf for conditions

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

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

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to.
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
 - i. Endanger national security
 - ii. Adversely affect the lives of Kenyans
 - iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
 - iv. Result in exploitation of intellectual property rights of communities in Kenya
 - v. Adversely affect the environment
 - vi. Adversely affect the rights of communities
 - vii. Endanger public safety and national cohesion
 - viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. Neither the license nor any rights thereunder are transferable.
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

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

Appendix V: List of Commercial Banks in Kenya

Tier I Banks

1. Absa Bank Kenya PLC
2. Co-operative Bank of Kenya
3. Diamond Trust Bank Kenya
4. Equity Bank Kenya
5. I & M Bank Kenya
6. KCB Bank Kenya
7. NCBA Bank Kenya
8. Stanbic Bank Kenya
9. Standard Chartered Kenya

Tier II Banks

1. Bank of Baroda (Kenya)
2. Bank of India
3. Citibank N.A. Kenya
4. Ecobank Kenya
5. Family Bank
6. National Bank of Kenya
7. Prime Bank
8. SBM Bank (Kenya)

Tier III Banks

1. Access Bank (Kenya) PLC
2. African Banking Corporation
3. Bank of Africa
4. Commercial International Bank (Kenya)
5. Consolidated Bank of Kenya
6. Credit Bank PLC
7. Development Bank of Kenya
8. DIB Bank Kenya
9. Guaranty Trust Bank (Kenya)
10. Guardian Bank
11. Gulf African Bank
12. Habib Bank AG Zurich
13. HFC Limited
14. Kingdom Bank Kenya
15. Middle East Bank (Kenya)
16. M-Oriental Bank Kenya
17. Paramount Bank
18. Premier Bank Kenya
19. Sidian Bank
20. Spire Bank
21. UBA Kenya Bank
22. Victoria Commercial Bank

Source: Central Bank of Kenya (2023)