Service Automation, Data Analytics and Digital Payment Solutions: The Future of Competitive Advantage of Commercial Banks in Kenya

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ABSTRACT

In an era of rapidly evolving technologies, the banking industry in Kenya must adopt digital transformation to enhance competitiveness and improve customer experience. This study examined the effect of digital transformation strategies on the competitive advantage of commercial banks in Nairobi City County, Kenya, with a focus on three key dimensions: service automation, data analytics, and digital payment solutions. 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, the study employed a descriptive research design targeting 412 functional heads across 39 commercial banks stratified by size. A multi-stage sampling approach that combined proportionate stratified and simple random sampling techniques was used to select a sample of 203 participants determined by Yamane's formula. Primary data were collected through structured surveys, with the research instrument validated by subject matter experts among 15 respondents to ensure reliability. Cronbach's Alpha Coefficient confirmed internal consistency (threshold ≥ 0.7). Data analysis utilised descriptive and inferential statistics, with findings presented visually for clarity. Results demonstrated that service automation, data analytics and digital payment solutions strategies significantly influenced competitive advantage, although their individual effects varied. These findings highlight the need for a strategic customer-centric approach to digital transformation, advocating for selective automation that preserves human interaction in high-value services, improved feedback mechanisms, robust data governance and advanced analytics tools. In addition, banks should refine digital payments, promoting user experience, fraud prevention and service differentiation supported by regulatory frameworks that foster security and innovation.

Key Words: Competitive Advantage, Commercial Banks, Data Analytics, Digital Payments Solutions, Digital Transformation Strategy, Service Automation.

Introduction

Organisations currently operate in an increasingly complex and dynamic business environment where rapid technological advancements demand greater adaptability, strategic foresight and innovation to sustain competitiveness (Uphill, 2016). In this context, competitive advantage, defined as the acquisition of attributes that allow firms to outperform rivals, has become the cornerstone of strategic management (Wang, 2014; Ceglinski, 2017). Success in competitive markets hinges on strategic differentiation, requiring firms to develop unique value propositions that resonate with customers and strengthen market positioning (Hitt *et al*., 2021). However, the digital revolution has disrupted traditional competitive paradigms, compelling organisations to assess long-held strategic assumptions or risk obsolescence (Johnson *et al*., 2016; Lenox, 2023).

Digital transformation has emerged as a critical driver of competitive advantage, reshaping industry dynamics and redefining customer expectations (Bharadwaj *et al*., 2023). In the banking sector, particularly in emerging

economies, digital innovation is no longer optional but a strategic imperative for enhancing operational efficiency, customer experience and long-term viability (Kane *et al*., 2019; Berman, 2020; Hazikimana, Muraguri & Muathe, 2023). Despite historically leading financial technology adoption, banks have seen their competitive edge erode post the Global Financial Crisis (GFC), with larger institutions leveraging economies of scale to consolidate market power while smaller players struggle to keep pace (Liu, 2021). Kenya's banking sector exemplifies this trend, marked by intense competition and rapid digitisation (Arodi *et al*., 2023; Gaya *et al*., 2022). Industry reports reveal a widening gap between large banks, whose market shares grew from 75.1% to 76.6% between 2022 and 2023 and their smaller counterparts, whose shares declined from 16.3% to 15.0% (medium banks) and 8.6% to 8.4% (small banks) over the same period (CBK, 2023). These shifts indicate that smaller banks are losing their competitive edge, raising concerns about their long-term sustainability.

Competitive advantage in banking arises from delivering distinctive value through innovation, operational efficiency and customer centricity (Porter & Hepplemann, 2015; Rothaermel, 2021). Empirical studies highlight multiple metrics for assessing competitiveness, including profitability, market share, customer loyalty, technological leadership and corporate reputation (Ngugi & Mugo, 2018; Kariuki & Bichanga, 2018; Gurbaxani & Dunkle, 2019). In this study, competitive advantage is operationalised through four indicators: market share, technological leadership, corporate reputation and sustained profit growth, aligning with established strategic frameworks (Westerman *et al.,* 2014; Tanwar, 2017).

A robust digital transformation strategy integrates technology investments with organisational objectives, fostering enterprise-wide digital maturity (Westerman *et al.,* 2014). As Albukhitan (2020) emphasises, such strategies require holistic coordination across business functions, ensuring alignment with broader strategic goals. Globally, banks are accelerating digital transformation to meet evolving customer demands and maintain competitiveness. Leading institutions such as JPMorgan, Chase and HSBC banks have invested in AI-driven analytics and digital platforms, reflecting the broader industry trends towards mobile banking and open banking initiatives (PwC, 2021). In Kenya, the nation's financial hub, Nairobi exemplifies this trend with commercial banks increasingly adopting digital strategies to enhance efficiency, reduce costs and improve customer experiences (Mwangi & Weke, 2021). The success of mobile money platforms like M-*Pesa* highlights Kenya's pioneering role in digital finance, revolutionising financial inclusion and accessibility (Jack & Suri, 2011).

Service automation powered by robotics and artificial intelligence (AI) facilitates streamlining of routine tasks, including customer inquiries, transaction processing and fraud detection by banks. This has enhanced operational efficiency while also enabling banks to redeploy human resources to more strategic roles (Davenport & Ronanki, 2018). Concurrently, data analytics provides actionable insights into customer behaviour, preferences, and market trends and is a powerful tool for banks. By leveraging big data, banks can personalise services, optimise marketing strategies and make data-driven decisions that enhance their competitive positioning (McAfee & Brynjolfsson, 2012). Kenya's financial ecosystem continues to embrace digital payment solutions, with significant growth in virtual wallets, immediate payment networks and contactless payment adoption, a trend supported by the nation's extensive mobile coverage and transformative influence of mobile money solutions (Suri & Jack, 2016). These innovative technologies have expanded financial inclusion (Musau, Muathe & Mwangi, 2018) and provided banks with new revenue streams and opportunities to differentiate themselves in the market (CBK, 2021).

As a cornerstone of economic growth, Kenya's banking sector facilitates credit access, capital formation and financial inclusion. The Central Bank of Kenya (CBK) regulates the industry, ensuring compliance and stability (CBK, 2022). The sector comprises 38 commercial banks and one mortgage financial institution categorised into large (9), medium (8) and small (22) tiers based on asset size and market share (CBK, 2023). As Kenya's capital and financial hub, Nairobi hosts the headquarters of most of the banking institutions, cementing its status as the nation's epicentre.

Statement of the Problem

Globally, financial institutions are increasingly investing in digital transformation to improve efficiency, customer experience and market competitiveness (Akter *et al*., 2016; Liu, 2021). However, commercial banks in Kenya face significant challenges in sustaining a competitive advantage through digital transformation. According to the Central Bank of Kenya (CBK), banks are steadily losing market share to peers, agile fintech firms and digital-only banks that offer more personalised, technology-driven services. New entrants in the banking industry are also capturing market share by leveraging more advanced automation, big data analytics

and innovative digital payment platforms to deliver faster, more secure, and more customer-centric services, areas where many commercial banks in Kenya still lag (CBK, 2023).

Empirical studies reveal a persistent gap in the implementation of effective digital transformation strategies among Kenyan banks. While research by Kamau and Waweru (2020) and Mwangi and Otieno (2023) highlights improvements in transaction efficiency and market share due to digitalisation, these studies focus on isolated technologies or specific bank tiers, neglecting a holistic analysis of digital transformation and its contribution to competitive advantage. Other studies, such as those by Davenport and Harris (2017) and Kumar and Gupta (2019), offer valuable insights into service automation and analytics but are largely based on developed economies and fail to capture the contextual realities, infrastructure limitations, and customer behaviour nuances in developing markets like Kenya.

Moreover, although regional research by Okonkwo and Obiora (2020), Kariuki and Mwiti (2021) and Kusi *et al*. (2022) has examined components of automation and fintech innovations, critical dimensions such as customer adoption rates, employee adaptability, predictive model accuracy, fraud detection, integration capacity, and innovation in digital payment systems are inadequately investigated or absent. These limitations highlight both theoretical and methodological shortcomings in the literature, particularly regarding how multiple digital transformation strategies collectively affect the competitive advantage within Kenya's banking sector. The situation is further complicated by challenges such as regulatory uncertainty (Kumar & Gupta, 2019), high implementation costs (Kamau & Wambugu, 2021), limited internal capacity (Adebayo & Ajayi, 2021), and cybersecurity concerns (Kusi *et al*., 2022). Despite these constraints, research specific to Kenya that analyses how banks are navigating these barriers while deploying service automation, data analytics, and digital payment strategies remains scarce.

This study, therefore, addresses this critical knowledge gap by examining how digital transformation strategies, specifically service automation, data analytics, and digital payment solutions, affect the competitive advantage of commercial banks in Kenya.

Objectives of the Study

i.   To determine the effect of service automation strategy on the competitive advantage of commercial banks in Nairobi City County, Kenya

ii. To determine the effect of data analytics strategy on the competitive advantage of commercial banks in Nairobi City County, Kenya

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

Review of Literature

Theoretical Review

Generic Competitive Strategies

The Generic Competitive Strategies proposed by Porter (1980) outline how businesses can establish and retain a competitive position in their markets. The model arose from the need for businesses to understand strategic positioning in competitive markets. Porter argued that firms could sustain competitive advantage by intentionally selecting a distinct strategic position instead of trying to compete on all fronts. The strategic options for gaining a competitive edge with this paradigm consist of cost leadership, differentiation and targeted focus approaches (Porter, 1980). The Generic Competitive Strategies were designed to help firms outperform competitors by creating a unique and defensible market position. Cost Leadership strategy enables firms to compete on efficiency and low operating costs. The strategy allows firms to offer lower prices or achieve higher profit margins. Differentiation strategy helps firms to offer unique, high-value products or services. Firms can charge premium prices and build customer loyalty.

Through the Focus strategy, firms target niche markets with specialised offerings (Porter, 1980). Since its introduction, Porter's Generic Competitive Strategies framework has undergone various refinements. Porter (1985) expanded on his initial model, explaining how these strategies lead to sustainable competitive advantage. He also introduced the value chain concept, which helps firms identify sources of cost efficiency or differentiation. Porter's strategies offer a structured way for firms to analyse their competitive position and make strategic decisions (Pretorius, 2008). The simplicity of the framework allows firms to quickly identify their strategic options and align their resources accordingly (Tanwar, 2017). The framework is highly adaptable and can be implemented across industries and settings, including emerging markets and digital transformation.

Studies have shown that the framework is effective in industries as diverse as banking, manufacturing and technology (Ngugi & Mugo, 2018; Guxbaxani & Drunkle, 2019). The framework provides clear guidance on how firms can position themselves in the market. The studies identify how digital technologies can enhance cost leadership (e.g. through automation) or differentiation (e.g. through personalised services) (Porter & Heppleman, 2015). While Porter's Generic Competitive Strategies have been widely adopted as a framework for achieving competitive advantage, they have also faced significant criticisms. Porter (1985) argued that firms that failed to choose a clear competitive strategy lacked a strong competitive advantage and struggled to compete effectively. However, critics argue that this rigid categorisation is outdated in today's dynamic business environment.

Tanwar (2017) argues that hybrid strategies, which combine cost leadership and differentiation, are increasingly viable due to advancements in technology and operational efficiency. Porter's framework assumes relatively stable industry structures, making it less suitable for dynamic, fast-changing industries such as technology, fintech and e-commerce. Rothaermel (2021) observes that the framework fails to consider the accelerated rate of innovation and market disruption characteristic of sectors like digital banking, where competitive advantages can be short-lived. Downes (2017) argues that the Five Forces and Generic Competitive Strategies frameworks struggle to address the impact of digital disruption, where new entrants (e.g. fintech startups) can rapidly alter industry dynamics. Porter's framework focuses heavily on outperforming competitors but overlooks the importance of collaboration, partnerships and ecosystem-based strategies. Jacobides *et al*. (2018) emphasise that modern industries such as digital platforms and ecosystems require firms to collaborate with other firms (e.g. application developers and fintech firms) rather than solely competing with rivals.

In the current study, Porter's Generic Competitive Strategies framework is highly relevant as it helps in understanding how digital strategies align with low-cost, unique value or niche market strategies to enhance the competitiveness of commercial banks. The ability of banks to integrate digital transformation into one or more of Porter's strategies determines their long-term competitive advantage (Porter, 1998). Porter's model supports the study variables, Service Automation, Data Analytics, and Digital Payment Solutions, which align with cost leadership and differentiation strategies as tools to drive market share, technological leadership, corporate reputation and profit growth. However, modern digital strategies may require additional flexibility beyond Porter's traditional categories.

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 hold 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 primary source of competitive advantage (Lynch, 2018). The idea originated from the understanding that firms had distinct resources and capabilities that, when effectively utilised, enhanced their competitive positioning (Barney, 1991).

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 could generate sustained competitive advantage. Teece, Pisano and Shuen (1991) extended RBV to account for rapidly changing environments, introducing the dynamic capabilities concept to address resource configuration and adaptation. 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). Firms can maintain a competitive advantage over time by protecting VRIN resources (Wernerfelt, 1984). By incorporating dynamic capabilities (Teece *et al*., 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 Data Analytics, Service Automation, and Digital Payment Solutions as Valuable, Rare, and Inimitable resources that drive technological leadership, corporate reputation and market share.

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 Resource-Based View (RBV) and broader strategic management literature (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, Pisano and Shuen (1997) identified three dimensions: Sensing, Seizing and Transforming, which became the foundation of the theory. Eisenhardt and Martin (2000) linked Dynamic Capabilities to RBV, emphasising their role as processes and routines to enable firms to reconfigure resources for innovation and adaptation. They provided empirical evidence showing that dynamic capabilities were valuable across industries but varied in complexity depending on market conditions. Teece (2007) expanded the theory by introducing micro foundations, which focused on the managerial and organisational processes that underpinned dynamic capabilities. These include leadership capabilities, decision-making processes and learning mechanisms.

Helfat *et al*. (2007) developed a systematic framework to measure dynamic capabilities focusing on specific organisational routines, processes, and learning mechanisms. Their work facilitated empirical studies by providing clearer definitions and operational indicators. Recent studies have incorporated digital transformation as a critical application of dynamic capabilities. Mutuku, Muathe and James (2019) present digital capability development (e.g. mobile applications) as a dynamic process for sustaining competitiveness, while Warner and Wager (2019) demonstrated that dynamic capabilities supported organisations in adapting to digital technologies through ongoing strategic renewal. Research by Bocken and Geradts (2020) positioned dynamic capabilities as essential organisational faculties for achieving the dual objectives of market competitiveness and sustainability through innovative green initiatives. Dynamic capabilities serve as a mechanism through which organisations continuously evolve and innovate in response to environmental changes. Teece (2007) emphasised how superior managerial capabilities enabled firms to detect emerging opportunities, capitalise on them decisively and transform organisational assets to maintain market leadership.

Eisenhardt and Martin (2000) posited that dynamic capabilities were necessary for firms to achieve long-term success in environments characterised by rapid change and uncertainty. They showed that these capabilities enable firms to reconfigure resources to maintain relevance in competitive markets. The work of Warner and Wager (2019) established dynamic capabilities as essential organisational processes for successfully implementing digital transformation and responding to evolving market challenges. This strength demonstrates the theory's applicability in adapting to technological advancements in globalisation. A few weaknesses have been identified with the Dynamic Capabilities theory. Winter (2003) questioned the general applicability of dynamic capabilities across industries. He argued that the theory may be context-specific and limited to certain organisations or environments. Zahra, Sapienza and Davidson (2006) argued 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, 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 the three digital transformation strategy variables because they represent capabilities commercial banks must develop, reconfigure and adapt over time. Specifically, Service Automation, Data Analytics and Digital Payment Solutions are key dynamic capabilities that can help banks sustain a competitive advantage.

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 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 was also designed to help businesses develop strategies to increase user adoption of new systems by identifying key determinants of acceptance.

Davis (1989) established two fundamental constructs in technology acceptance: Perceived Usefulness (PU), defined as the user's belief that a system will enhance job performance, and Perceived Ease of Use (PEOU), representing anticipated freedom from effort required to operate technology. Davis posited that these cognitive variables shape users' attitudes toward technology, which in turn determines their adoption intention and ultimately predicts actual system usage behaviour. Venkatesh and Davis (1996) extended their original TAM framework by incorporating social influence factors (e.g. subjective norms) and cognitive instrumental variables (e.g. job relevance) to enhance its predictive power in organisational technology adoption scenarios. TAM evolved into the Unified Theory of Acceptance and Use of Technology (UTAUT), integrating constructs from multiple models, including TAM, TRA and the Diffusion of Innovation Theory. UTAUT offered a holistic model for analysing technology acceptance across various settings (Venkatesh *et al.*, 2003).

TAM's strengths include its core constructs (PU & PEOU) are intuitive and easy to apply in various technological contexts (Davis, 1989). The model has been extensively tested and validated across industries, making it a reliable framework (Kind & He, 2006). TAM can be adapted to study different technologies from simple systems to complex digital transformations (Venkatesh *et al.,* 2003). However, critics argue that TAM 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 and Digital Payment Solutions 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.

Diffusion of Innovation Theory

The Diffusion of Innovations (DOI) theory, developed by Everett M. Rogers in 1962, seeks 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 is 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 (Trialability) and how easily its outcomes can 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 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 argue that DOI focuses on the initial stages of adoption and less on post-adoption behaviour and sustained use (Lyytinen & Damsgaard, 2001). Additionally, while DOI explains patterns of adoption, it does not always predict the success or failure of specific innovations (Greenhalgh et al., 2004). The theory also assumes 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 and Digital Payment Solutions as these require effective diffusion strategies for adoption. Data Analytics indirectly supports diffusion by identifying adoption patterns and optimising innovation strategies.

Empirical Review

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 (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 revealed that AI-based personalisation strategies led to a 15% market share increase by enhancing customer loyalty and differentiation. However, the study failed to consider developing economies where technology adoption lags. This research addresses the gap through an empirical investigation of commercial banks in Nairobi, Kenya, a developing market with distinct characteristics.

Robotic process automation (RPA) has been shown to reduce operational errors by 35% and streamline repetitive tasks, enabling strategic focus, according to research conducted by Rodriguez and Martinez (2022) across industries in Europe and North America. However, the study lacked specific emphasis on customer adoption or banking metrics. The present study narrowed this focus by evaluating RPA in the Kenyan banking sector from a customer service perspective. Okonkwo and Obiora (2020) evaluated the adoption of fintech innovations including automated services in Nigerian commercial banks. The study utilised qualitative and quantitative data from 15 banks. The study revealed that automated services such as digital payment systems and loan approvals reduced transaction errors by 25% and increased customer trust. The research primarily focused on fintech innovations and transaction error reduction without a detailed exploration of service automation in the banking sectors. The study generalised findings across industries missing sector-specific nuances. The current study focused specifically on service automation in commercial banks examining how it drives competitive advantage in the Kenyan Banking Industry.

Kusi *et al*. (2022) studied service automation in sub-Saharan African banks focusing on ATMs, mobile banking and digital customer onboarding. Data was collected from 20 banks across Ghana and Nigeria. The study found that service automation increased customer satisfaction and improved service accessibility, particularly in underserved regions. The study primarily relied on sources which may not fully capture the complexities of service automation implementation. It lacked an industry-specific framework for analysing competitive advantage in a regional context. This study contributes by providing empirical data from the banking sector in Nairobi a fast-evolving financial hub in East Africa. Tadesse and Gebremedhin (2021) investigated the influence of digital transformation strategies including service automation on the performance of Ethiopian Banks. The research found that automation enhanced operational efficiency by 40% and reduced operational costs leading to increased profitability. The study emphasised the operational efficiency and profitability of Ethiopian Banks but did not address specific metrics like customer adoption rates or the number of automated processes. The current

study incorporated customer adoption rates and evaluated automation's effect on service delivery outcomes like turnaround times.

Mobile banking and service automation adoption significantly increased customer retention and reduced complaints by 30% in tier 2 Kenyan banks, according to Nyaga and Ndung'u (2020). However, their study did not explore broader service automation dimensions or organisational outcomes. The current research offers a more comprehensive perspective by assessing multiple facets of automation. Kariuki and Mwiti (2021) investigated how chatbots and AI-driven customer service aid in the improvement of customer satisfaction in Kenyan commercial banks. The study found that AI-driven customer query resolution time increased by 45% leading to higher customer satisfaction level. The study focused narrowly on chatbots and their impact on service automation aspects like service automation turnaround or adoption rates. The current study extended beyond chatbots to include the overall level of automation and its measurable outcomes across various bank processes.

Digital transformation, including mobile and paperless banking, reduced transaction times by 50% and increased market share in Kenyan commercial banks, as shown by Mwangi and Otieno (2023). The study, however, focused only on major banks, excluding smaller financial institutions. The current study addressed this limitation by examining automation challenges and opportunities across banks of all sizes.

Data Analytics Strategy and Competitive Advantage

Big data analytics positively influence supply chain agility, cost efficiency, and customer satisfaction, contributing to competitive advantage. Akter *et al*. (2016) reached this conclusion after surveying 205 supply chain professionals from North America and Europe. Their research emphasised the significance of data quality, analytics tools, and data-driven culture in driving a firm's performance. While these findings were based on supply chain metrics like agility and cost efficiency, the current study applied similar principles to the banking sector in Kenya, focusing on metrics such as data processing volume, predictive model accuracy, and revenue impact. Data analytics' role in achieving competitive advantage in various industries, including manufacturing, retail, and finance, was highlighted in research by Davenport and Harris (2017). Their findings revealed the importance of predictive analytics and data-driven approaches in improving operational efficiency, innovation, and customer satisfaction. Companies that utilised advanced analytics tools like machine learning consistently outperformed their peers in profitability, productivity, and customer retention. Although the investigation emphasised the importance of organisational culture in fostering a data-driven mindset, its focus on developed markets such as the United States does not account for the unique data challenges faced in Kenya. This study addressed the limitation by analysing data analytics strategies in Kenyan banks and their specific effect on competitive outcomes.

A case study conducted on four major retail chains by Dlamini and Ngwenya (2020) on data analytics applications in the South African retail sector revealed that analytics improved customer behaviour prediction, inventory management, and marketing efficiency, leading to enhanced profitability and customer experience. However, smaller retailers faced challenges with data accessibility and the integration of analytics into business strategies. While their research focused on retail, this study shifted attention to Kenya's banking sector to evaluate data analytics in achieving competitive advantage. In Nigeria's telecommunications sector, big data analytics has been found to improve organisational efficiency and strengthen competitive positioning. Adebayo and Ajayi (2021) surveyed 150 professionals from leading telecom companies and identified customer retention, cost reduction, and targeted marketing as key benefits of analytics adoption. However, barriers such as high implementation costs and a shortage of skilled workers hindered broader application. Unlike the telecommunications focus of this study, the current research examined how Kenyan banks utilised big data analytics to gain a competitive edge.

Kamau and Wambugu (2021) analysed data analytics adoption in Kenya's retail banking sector, highlighting its role in enhancing customer retention, fraud detection accuracy, and credit risk management. While the study primarily concentrated on 10 major banks, it noted that smaller banks struggled with adoption due to high costs and limited expertise. This research aimed to provide a more inclusive perspective by examining data analytics adoption across banks of all sizes in Kenya, identifying challenges and strategies unique to different tiers of the institutions. Njoroge and Muturi (2022) investigated the influence of analytics on operational efficiency and profitability in Kenya's manufacturing sector. Using a survey of 120 firms, the study indicated that data analytics contributed to improved organisational performance. However, issues such as limited data infrastructure and insufficient staff training were significant barriers. The current study expanded on these findings by focusing on

commercial banks in Kenya and investigating how data analytics strategies affected competitive advantage within the banking context.

Digital Payment Solutions Strategy and Competitive Advantage

Brown and Parker (2018) analysed digital payment strategies in the banking industry in the USA, focusing on transaction security, integration with e-commerce platforms, and customer satisfaction. Data from 20 banks and 1,000 customers showed that advanced fraud detection systems and seamless integration with e-commerce platforms boosted profitability and customer satisfaction. However, the study's limited attention to innovation and feature development hindered its relevance to long-term differentiation. By contrast, the current study included innovation as a central component in investigating digital payment solutions in Kenyan banks. Innovation in payment features, transaction security, and system scalability were key themes in Zhang and Zhou's (2019) investigation of digital payment platforms in China's retail sector. Using interviews with 50 payment technology experts and transaction data analysts, the study found that features like quick response (QR) codes and AI-driven fraud detection significantly improved user engagement and reduced risks. However, the research did not explore integration with global payment systems, limiting scalability for international transactions. While the study investigated the retail sector, the current research was conducted in the banking industry, offering insights specific to Kenyan banks.

A study by Adebayo and Ogunleye (2020) on the adoption of digital payment solutions among Nigerian banks revealed that secure and reliable payment systems contributed to higher customer retention and market share. Despite these advantages, challenges such as weak regulatory frameworks and limited interoperability persisted. The study emphasised transaction security and integration but excluded innovation and feature development, metrics central to the current research in Kenya's banking context, where mobile money integration is a significant factor. In South Africa, Mbatha and Kamau (2020) assessed the effect of digital payment initiatives on organisational efficiency, focusing on transaction speed, fraud detection, and ease of use. Their findings highlighted improved customer trust and retention but did not address innovation or technological leadership, which are critical drivers of competitive advantage in the current research.

In Ghana's banking sector, Osei and Boateng (2020) assessed how mobile and digital payment solutions impacted competitive advantage. Their research, involving surveys of 150 bank employees and 300 customers, identified transaction speed, security, and integration as critical factors for customer retention and operational efficiency. The study concluded that secure and user-friendly payment platforms gave banks a competitive edge, although integrating new systems with legacy infrastructure remained a challenge. Unlike Kenya, where mobile money systems are more advanced, the study in Ghana lacked a focus on innovation and feature development, a core metric in the current study. A study by Gupta and Arora (2021) investigated the role of digital payment solutions in enhancing competitive advantage for Indian fintech firms. Their study highlighted how fraud prevention measures, ease of integration with third-party applications, and user satisfaction significantly contributed to competitive advantage.

Based on surveys with 200 fintech professionals and an analysis of performance metrics, the findings emphasised that firms with robust fraud detection systems and seamless integration capabilities achieved higher customer loyalty and market penetration. However, the study's focus on Fintech firms excluded traditional banking institutions and did not address innovation and feature development, key aspects covered in the current research on Kenyan banks. Mobile money and digital payment solutions have also been pivotal in the competitive strategies of Zimbabwean financial institutions, as highlighted by Nyasha and Chikova (2021). Interviews with bank executives and transaction data analysis revealed that these solutions enhanced market share and customer convenience, particularly during periods of economic instability. However, low innovation levels and difficulties in adapting to customer needs were notable challenges. The study did not investigate fraud and security metrics or integration capabilities, aspects addressed in the present research.

Boakye and Amponsah (2022) examined the integration of digital payment platforms in Ghana's banking industry, finding improvements in customer satisfaction and operational efficiency. However, inadequate fraud detection mechanisms and limited innovation in feature development were barriers to competitive advantage. Metrics such as technological leadership and corporate reputation, which the current study in Kenya considered, were also omitted. Within Kenya, Wanjiru and Njoroge (2022) analysed mobile payment platforms' influence on tier-one banks, noting significant contributions to customer retention and operational efficiency. However, the study excluded smaller banks and lacked a focus on innovation and feature development. Similarly, Otieno and

Kariuki (2021) investigated digital wallets in Kenyan banks, finding improvements in transaction efficiency and customer convenience. Nonetheless, their research overlooked broader competitive advantage metrics such as corporate reputation and technological leadership.

Kamau and Waweru (2020) focused on electronic funds transfer (EFT) systems in Kenyan banks, identifying improvements in transaction speed and customer satisfaction. The study, however, did not investigate innovation or fraud detection mechanisms as part of digital payment strategies. Mwangi and Chege (2022) examined mobile money integration in Kenyan banks, finding that it enhanced operational efficiency and customer reach. However, limited innovation and inadequate fraud detection mechanisms hindered competitive advantage. The study's competitive metrics were restricted to market share and customer retention, omitting broader dimensions like corporate reputation and technological leadership. These studies highlighted diverse regional and industry-specific contexts but omitted critical aspects such as innovation, fraud detection, and integration capabilities. The current research analysed digital payment solutions across all commercial banks in Kenya, capturing sector-specific challenges and opportunities.

Research Methodology

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.

Target Population, Sampling and Sample Size

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. A two-stage sampling strategy was adopted, combining proportionate stratified sampling and simple random sampling to obtain a balanced and unbiased sample. In the first stage, the target population of commercial banks in Nairobi City County, Kenya, was stratified according to the bank sizes (small, medium and large). This stratification ensured that all bank categories were proportionally represented in the sample. Out of the total 412 respondents, 198 (48%) were from small banks, 88 (21%) from medium-sized banks and 126 (31%) from large banks.

A proportionate allocation was made for each stratum: 98 respondents were drawn from small banks, 43 from medium-sized banks and 62 from large banks, maintaining the relative proportions of each category in the population and minimising category bias (Etikan, Musa & Alkassim, 2016; Kumar, 2019). In the second stage, simple random sampling was conducted within each stratum to select individual participants. This involved listing eligible respondents and then selecting participants using computer-based randomisation tools, specifically the RAND in Microsoft Excel. This method ensured that every individual in each stratum had an equal chance of selection, thereby reducing researcher bias and enhancing the fairness of the sampling process (Taherdoost, 2016; Creswell & Creswell, 2018). The combined use of these techniques increased the external validity and generalisability of the study findings, ensuring both representativeness and randomness (Fraenkel, Wallen & Hyun, 2022). The Yamane (1967) mathematical model was applied to determine the sample size, with sampling parameters (95% confidence, 5% error tolerance) resulting in an optimal sample size of 203 respondents.

Data Collection and Analysis

Primary data was collected using structured questionnaires that featured closed-ended questions to ensure uniformity in responses and ease of quantitative analysis (Saunders, Lewis & Thornhill, 2019). The research instrument was divided into three main sections. The first section captured respondents' demographic and organisational information, such as gender, age, education level, bank category, job position, department and

work experience through multiple choice questions with predefined response options. This facilitated the classification and comparison of respondents across relevant subgroups.

The second section consisted of five parts, which focused on various components of the digital transformation strategy. Each part featured a series of Likert statements allowing respondents to express the extent of their agreement with strategic initiatives implemented in their banks. The format is widely recognised for generating reliable, scalable and statistically analysable data in organisational research (Bryman, 2016; Taherdoost, 2016). The last section focused on perceived competitive advantage outcomes resulting from digital transformation, also using Likert scale items. The use of structured questions throughout the tool ensured that all participants interpreted and responded to the same questions in the same way, minimising researcher bias, facilitating comparability across responses and enhancing the instrument's validity and reliability (Dillman, Smyth & Christina, 2014; Creswell & Creswell, 2018). The questionnaire was distributed through online survey platforms, which enhanced respondent accessibility and reduced logistical challenges, allowing for faster data collection and lower error rates through automated entry and storage (Evans & Mathur, 2018). The secondary data collection process involved gathering information from various records. This data was obtained from reference materials, including financial reports, publications from the CBK and industry reports (Smith & Johnson, 2023).

A pilot study was conducted before the main research. According to Cooper and Schindler (2018), a pilot study provides an opportunity to assess the feasibility, clarity, and effectiveness of the research instruments, particularly the questionnaires. A small subset of 15 respondents was selected from key functional areas of several commercial banks in Nairobi City County. These respondents were excluded from the main survey. This decision was justified by the need to obtain a pilot sample with characteristics similar to those of the study group in terms of traits, organisational affiliations, and experience. Feedback from the respondents was instrumental in refining and improving the final research instrument.

Validity ensures that the research evaluates its intended subject (Casteel & Bridier, 2021). Experts, including banking and digital transformation professionals, were consulted to establish the content validity of the research tools. The experts reviewed the questionnaire to determine if it measured the intended concepts. A small group of respondents, primarily drawn from lecturers, evaluated whether the questions were relevant and meaningful to the study constructs. Feedback from the experts informed refinements to ensure the instrument aligned with the study objectives. According to Taherdoost (2023), reliability ensures that the research instrument produces consistent and stable results. To assess the internal consistency of the research instrument, a reliability analysis was conducted using Cronbach's Alpha for each key variable.

Table 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
Digital Payment Solutions Strategy	7	0.959	Reliable
Competitive Advantage	4	0.941	Reliable
Overall Questionnaire Reliability	**24**	**0.946**	**Reliable**

All constructs recorded Cronbach's Alpha coefficients above the recommended threshold of 0.7, indicating that the items used to measure each variable were reliable and internally consistent (Taber, 2018). Service Automation Strategy, Data Analytics Strategy, and Digital Payment Solutions Strategy all recorded Cronbach's Alpha values above 0.92, reflecting excellent reliability. Similarly, competitive advantage had a high Alpha of 0.941, indicating excellent internal consistency despite having only four items. The overall reliability score for the full 24-item questionnaire was 0.946, demonstrating the robustness of the instrument. The high Alpha value supports the conclusion that the questionnaire was cohesive and that respondents interpreted the questions consistently. As a result, the construct was deemed fit for full deployment in the main survey and capable of generating credible and reproducible data (Field, 2018).

The quantitative data collected was analysed using the Statistical Package for the Social Sciences (SPSS). Before the analysis, the data were cleaned and coded to address any inconsistencies and ensure completeness, a process essential for enhancing the accuracy and reliability of results (Saunders, Lewis & Thornhill, 2019). The completed questionnaires were reviewed for any missing or inconsistent responses. Incomplete data was

addressed through appropriate imputation techniques to maintain the integrity of the dataset. Any outliers or anomalies that did not align with the study parameters were removed (Smith, 2023).

Descriptive statistics formed the foundation of the initial data examination. Frequencies and percentages were calculated to summarise respondents' demographics and the distribution of responses across various digital transformation indicators (Cooper & Schindler, 2014). Measures of central tendency, including the mean and standard deviation, were computed to understand the typical responses and variability in the data set for each variable under investigation (Field, 2018). The study utilised correlation and regression techniques to investigate the relationship between the variables (Hair *et al.*, 2018). Multiple regression analysis was then conducted to assess the combined predictive power of the three digital transformation strategies and competitive advantage while controlling for the potential confounding factors. The Analysis of Variance (ANOVA) was used to determine the overall significance of the regression model (Tabachnick & Fidell, 2019).

Research Findings and Discussion

Table 2: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.706(a)	.498	.488	.910

A Predictors: (Constant), Service Automation Strategy, Data Analytics Strategy, Digital Payment Solutions Strategy

Source: Survey Data (2025)

The model summary reveals that the digital transformation strategies examined; service automation, data analytics and digital payment solutions are strong predictors of competitive advantage among commercial banks. The model yielded a multiple correlation coefficient (R=0.706), indicating a strong positive relationship between the combined independent variables and competitive advantage. This suggests that improvements in the application of these digital strategies are generally associated with increased levels of competitive advantage within the banking sector. The coefficient of determination (R^2 =0.498) shows that approximately 49.8% of the variance in the competitive advantage can be explained by the three digital strategies included in the model. The adjusted R^2=0.488, which accounts for the number of predictors, indicates that the model remains robust and not overfitted.

These results highlight the importance of digital transformation as a strategic tool in banking, aligning with the Resource-Based View, which posits that firms gain and sustain competitive advantage by effectively deploying valuable, rare and inimitable resources (Barney, 1991). The model provides significant empirical support for the assertion that digital transformation strategies have a strong effect on competitive advantage. However, while the model explains nearly half of the variation in competitive advantage, the remaining 50.2% remains unexplained. This indicates that other variables not included in the study such as organisational culture, innovation capability, regulatory environment, leadership commitment, and customer satisfaction may also play critical roles. According to the Dynamic Capabilities Theory (Teece, Pisano & Shuen, 1997), organisations must not only possess resources but also the agility to reconfigure and adapt them in response to environmental changes an aspect not captured fully by the current model.

ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	119.381	3	39.794	48.019	.000(a)
	Residual	120.163	145	.829		
	Total	239.544	148			

a. **Dependent Variable**: Competitive Advantage.
b. **Predictors (Constant)**: Service Automation Strategy, Data Analytics Strategy, Digital Payments Solutions Strategy.

Source: Survey Data (2025)

The Analysis of Variance (ANOVA) results presented in the table assess the overall significance of the regression model that examines the relationship between digital transformation strategies, service automation, data analytics and digital payments solutions and competitive advantage. The total variation in the dependent variable

(competitive advantage) is partitioned into two aspects: variation explained by the regression model (regression sum of squares=119.381) and unexplained variation or residual error (residual sum of squares=120.163). The total (sum of squares=239,544) represents the combined data set in the variation.

The F-statistic obtained (48.019), calculated by dividing the regression mean square (39.794) by the residual mean square (0.829), is a measure of how well the regression model fits the data relative to a model with no predictors. The F-value indicates that the variance explained by the model is greater than the variance left unexplained, suggesting a good fit. Moreover, the p-value (Sig.=0.000) is far below the standard significance threshold of 0.05. The result implies that the regression model is statistically significant and the likelihood of the results occurring by chance is extremely low (Field, 2018). In summary, the ANOVA analysis confirms that the combination of the three digital transformation strategies significantly improves the model's ability to predict competitive advantage. The strong F-value and statistically significant p-value affirm that the regression model adds explanatory power, that the examined strategies are collectively influential in shaping competitive outcomes in commercial banks in Kenya.

Table 3: 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
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 is:

$Y = 4.695 - 0.333X_1 - 0.581X_2 - 0.505X_5$

Where:
Y=Competitive Advantage
X_1=Service Automation, X_2=Data Analytics, X_3=Digital Payment Solutions

The regression coefficients indicate how much each independent variable contributes to explaining variance in competitive advantage when all other factors are 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 (β=-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 Resource-Based View (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). Dynamic Capabilities theory posits that commercial banks could be failing to reconfigure and adapt automation tools that create sustained advantage. TAM demands that suboptimal system usability (low perceived ease of use) or inadequate functionality (low perceived usefulness) frequently results in adoption resistance among both consumers and staff, ultimately diminishing potential organisational benefits (Davis, 1989; Venkatesh *et al*, 2003). Similarly, the Diffusion of Innovation Theory suggests that

banking automation in Kenya could still be in initial or problematic stages of adoption, with barriers such as low awareness or confidence.

In contrast to previous research (Kumar & Gupta, 2019; Martin & Taylor, 2020), which dealt with technologically advanced markets and noted productivity as well as customer loyalty gains, this research gives a different perspective from a developing country, revealing that automation without proper contextual integration could fail to yield a competitive advantage. In comparison with earlier studies, which placed great concern on operational efficiency (Tadesse & Gebremedhin, 2021; Rodriguez & Martinez, 2022), the current research focused on effects facing customers and revealed a more complex relationship between automation and strategic outcomes. Thus, the implications are that Kenyan commercial banks need to go beyond automation implementation and focus on user-centred design, employee readiness, and strategic integration to convert technology into lasting competitiveness.

Data Analytics Strategy also showed a negative and statistically significant effect (β=-0.581, p=0.001), implying that increased emphasis on data analytics, as measured in this study, was associated with a decline in competitive advantage. 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 enhanced customer value or reduced 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 lack 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 Digital Payments Solutions Strategy had a negative and highly significant relationship (β=-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 highlights 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 fail to distinguish them from competitors. The Resource-Based view (RBV) clarifies that while digital payment solutions infrastructure is valuable, it is not rare or inimitable in Kenya's saturated market, where most banks offer similar digital payment options. The Dynamic Capability theory suggests that Kenyan banks lack 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 perceive 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 Central Bank of Kenya (CBK) confirms this view, noting that mobile money penetration has exceeded 80% of the adult population, with growth rates plateauing, suggesting market saturation (CBK, 2023). In such a scenario, digital payments become a basic expectation rather than a competitive edge, especially when competitors offer 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.

Conclusion

This study finds 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. First, the study found a statistically significant inverse association between service automation strategy and competitive advantage. While banks have extensively implemented automation in routine operations, the results suggest that automation alone, without complementary strategies such as enhancing customer experience, may not directly translate into a competitive edge. This aligns with concerns about the maturity of automation infrastructure and employee adaptation challenges within Kenyan banks.

Second, the data analytics strategy showed a significant inverse relationship with competitive advantage. This indicates that while banks may have invested in data analytics capabilities, challenges such as data utilisation and interpretation in decision-making processes could limit their positive impact. Third digital payment solutions had a negative and significant relationship with competitive advantage. Despite robust efforts in enhancing digital payment systems, possible factors such as operational challenges, customer trust issues, or intense market competition may have undermined their positive contribution.

The study, therefore, concludes that while Kenyan commercial banks have adopted various digital transformation strategies, these initiatives are not currently translating into sustainable competitive advantage. To address this gap, banks need to move beyond adoption and focus on strategic alignment, innovation and customer-centric implementation. Only through effective deployment and continuous capability development can digital strategies yield meaningful competitive gains.

Policy Recommendations

The digital transformation strategy of Kenya's banking sector presents significant opportunities and complex challenges for enhancing competitive advantage. Based on the empirical findings, policy recommendations are proposed to guide commercial banks, the Central Bank of Kenya (CBK), policymakers, researchers and academic institutions. These recommendations aim to strengthen the banking sector's competitiveness, address strategic gaps and foster an enabling ecosystem that maximises the competitive potential of technological innovation in Kenya's dynamic financial system.

The study's finding that excessive automation negatively affects competitive advantage requires commercial banks to implement selective automation that preserves human interaction for complex, high-value services while automating routing back-office operations. Customer feedback mechanisms should be strengthened to identify and address pain points in automated services. The CBK and other regulators should provide guidelines that encourage customer-centric automation practices, enhancing rather than replacing human interactions. Researchers can further explore customer experience frameworks that integrate automation without diminishing perceived service value.

Given the unexpected negative effect of data analytics on competitive advantage, commercial banks should review their data governance structures and invest in analytical capabilities focused on customer behaviour, risk management, and product innovation. Instead of concentrating on basic reporting, commercial banks should develop advanced applications such as AI-driven credit scoring and real-time fraud detection. The CBK can facilitate this transition by establishing secure data-sharing frameworks. Further, policymakers should set standards and initiate training programs to enhance data literacy within the industry. Academic institutions are encouraged to strengthen curricula that build practical data analytics skills tailored for the financial sector. For researchers, this presents an important opportunity to explore why analytics initiatives are failing in Kenyan banks, whether due to data quality issues, cultural resistance, or infrastructure limitations, and to identify best practices from comparable markets that could be adopted locally.

The negative effect of digital payment solutions on competitive advantage highlights market saturation, minimal service differentiation, poor user experience, and rising security concerns. Banks need to re-evaluate their digital payment strategies by prioritising customer experience, enhancing fraud prevention systems, and differentiating their offerings through value-added services. The CBK should reinforce standards for cybersecurity and user protection in digital payments, while policymakers should encourage innovation-friendly regulations.

Researchers should investigate the saturation point and innovation gaps in Kenya's digital payments ecosystem to guide future strategic direction.

Limitations and Future Research Directions

As noted by Marjan, G (2006) and Muathe (2010), the current study lacks a longitudinal aspect related to the survey data. The data was collected at only one point in time, which limits the possibility of drawing causal relationships. Additionally, the researchers sampled functional departments in the head offices of commercial banks located in Nairobi City County, which is a metropolitan and highly industrialised area. To enhance generalisability, 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. As digital disruption redefines banking, future research should aim to generate empirical evidence that captures the evolving relationship between emerging technologies and competitive advantage in the banking sector. There is a need for more granular studies that assess 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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