

**EFFECT OF DIGITAL TECHNOLOGY ADOPTION ON THE  
PERFORMANCE OF COMMERCIAL BANKS IN KENYA**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE  
AWARD OF THE DEGREE OF MASTER OF BUSINESS  
ADMINISTRATION IN CORPORATE MANAGEMENT TO THE SCHOOL  
OF BUSINESS, KCA UNIVERSITY**

**SEPTEMBER 2023**

## DECLARATION

I declare that this dissertation is my original work that has not been published before nor has been submitted elsewhere for a degree award. I can also confirm that it contains no material written or published by other people with the exception of areas in which their work has been duly referenced and the authors acknowledged.

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Date

**16/02678**

I hereby certify that I have evaluated Lawrence Muthini Kimoni's master's dissertation.



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## ABSTRACT

The concept of performance holds a crucial position in the field of management. Exploring the reasons behind why two companies functioning in a similar setting have varying levels of success is a topic of interest, and numerous studies in the management discipline have focused on unraveling this enigma. In the last 10 years (2012-2021), we have witnessed increased adoption of digital technology among commercial banks in Kenya. Among the digital technologies comprise mobile banking, agency banking, internet banking, and blockchain technology among others. As the commercial banks adopt digital technology in their ways of doing business, such crucial issues m-banking services cost, system security, and speed of service and skills requirement need to be investigated with a view of establishing their overall effect on the performance. The aim of this study was to evaluate how the use of digital technology impacts the performance of commercial banks in Kenya. The study has identified specific objectives which include determining the influence of mobile banking, internet banking, agency banking, and blockchain technology on the performance of commercial banks in Kenya. The research focused on three theories - the technology acceptance model, financial intermediation theory, and diffusion of innovation theory. To conduct this study, a descriptive research design was used. The target population for the study was all the 42 banks, with the unit of analysis being head of strategy or operations manager. All 42 banks were encompassed in the research, and a census approach was used, with one respondent who was either the head of strategy or operations manager of each bank participating in the study. Questionnaire was used to collect primary data. A pilot study was conducted to evaluate the reliability and validity of the research questionnaire. Quantitative data was collected. The coded data was analysed using multiple linear regression method. The research discovered a substantial positive association between mobile banking, internet banking, agency banking, and blockchain technology with organizational performance of commercial banks in Kenya. Its regression analysis discovered collective adoption of digital technology accounted for 90.3 percent of the variations in performance of banks in Kenya. The Anova results revealed a p value of 0.000 which was less than the significance level of 0.05 implying that digital technology adoption is critical for organizations to adopt in their efforts to increase their performance levels, according to the result of this research. The study concludes that mobile banking, internet banking, and blockchain technology have positive effects on the organizational performance of commercial banks in Kenya. It is consequently, recommended that commercial banks in Kenya should invest in and promote these technologies to enhance their overall performance, attract and retain customers, streamline processes, and provide enhanced banking experiences.

**Key words:** Digital technology adoption, performance, mobile banking, internet banking, agency banking and blockchain technology

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You've all offered me incredible support.

## **DEDICATION**

I dedicate this dissertation to my beloved family and friends for their unwavering support throughout the duration of my studies. Their constant motivation, encouragement and understanding have been invaluable. Therefore, I thank you for being my pillars.

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## **ABBREVIATIONS AND ACRONYMS**

<b>ATM</b>	Automated Teller Machine
<b>CBK</b>	Central Bank of Kenya
<b>DOI</b>	Diffusion of Innovation
<b>KCB</b>	Kenya Commercial Bank
<b>NPM</b>	Net Profit Margin
<b>NSE</b>	Nairobi Securities Exchange
<b>RBV</b>	Resource Based View Theory
<b>ROA</b>	Return on assets
<b>ROI</b>	Return on Investments
<b>SMS</b>	Short Message Service
<b>VRIN</b>	Valuable, Rare, Inimitable, And Non-Substitutable

## DEFINITION OF TERMS

<b>Agency Banking</b>	Banks contracting third party retail networks as banking agent that offers selected products and services on behalf of the bank (Yang & Liu, 2016).
<b>Blockchain technology</b>	An advanced database mechanism that allows transparent information sharing within a business network (Freytag & Fricke, 2017).
<b>Digital technology adoption</b>	The process of creating new financial or investment products, services, or processes. In this study, digital technology adoption will entail mobile banking, agency banking, internet banking and blockchain technology (Sheleg & Kohali, 2015).
<b>Firm Performance</b>	Denotes ultimate objectives attainment of the bank as set out in the strategic plan (Fatihudin & Mochklas, 2018).
<b>Internet Banking</b>	A digital payment system that allows a bank's or other financial institution's customers to perform various financial transactions using the institution's website (Mohamed, 2018)

## **Mobile Banking**

The utilization of handheld electronic devices to access banking services, including but not limited to conducting account transactions like checking account balances and obtaining access to overdraft options (Rasheed, Law, Chin & Habibullah, 2016).

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the Study

Due to the ever-changing and unpredictable nature of the business environment, companies are consistently compelled to modify and improve their products in order to meet their desired performance standards (Ingow & Oluoch, 2020). The rapid changes in the organizational environment that is often hostile, uncertain, complex, dynamic and volatile threatens the very existence of firms in the industry, thereby requiring response strategies for business resilience. Economic shifts, political shifts, technical shifts, social shifts, and legal shifts are all expected to contribute to the business environment's dynamism (Kwaning, Churchill, & Opoku, 2019). These changes are driving business entities to be disturbed concerning their performance's stability and sustainability, necessitating the establishment of a plan in order to preserve competitive capability and operate in an evolving ecosystem (Dzingirai & Baporikar, 2022).

According to Koki (2018), The financial industry has also experienced changes, affecting different sectors within it, including banking. Banks are among the significant players in the financial sector, offering various products that influence their overall performance. Credit and loans are particularly noteworthy as they significantly contribute to the banking sector's performance. According to Wainaina (2017), the expansion of commercial banks' loan books has played a significant role in their overall performance over time. As more competitors enter the credit market, banks have had to come up with innovative and proactive approaches to attract and engage customers seeking credit facilities. This has resulted in the implementation of technological advancements aimed at simplifying and expediting the process of obtaining credit for customers. Digital credit has

emerged as one of the technological tools that commercial banks have adopted to facilitate the issuance of loans to their customers (Wainaina, 2017).

The global banking sector has undergone substantial change over the years (Nejad, 2016). For several years, the integration of digital technology has been a crucial aspect of economic operations. Centuries ago in central Italy, private investors created different aspects of limited liability firms such as publicly traded stocks, stock exchange, and corporations that possessed property and could create contracts separately from the individual shareholders (Zhang, 2017). The advancements facilitated mobilizations of capital for new ideas, allowing for the creation of investment banks, financial tools, and better record-keeping systems by big mining technologies and financial visionaries with specialized expertise. (Hsiao & Lin, 2017). A profound influence concerning how financial services are provided and delivered has been the advance in information technology and communication (Hussien & Aziz, 2017).

The integration of digital technology has owned a substantial effect on how financial companies function and has established a basis for these institutions to distinguish their products and services from those of their rivals. In Malaysia, Abdulkarim and Ali (2019) suggests that the adoption of digital technology is crucial in order to direct money towards efficient purposes and allocate risk to individuals who can make the most of it, ultimately improving performance. According to them, the implementation of digital technology in Japan is anticipated to increase financial inclusion, which would in turn improve intermediaries' performance (Rasheed, Law, Chin, & Habibullah, 2016). Neaime and Gaysset (2018) assert that implementing digital technology frequently has a major impact on increasing the earnings of financial organizations.

Sathye (2015) did study in South Africa to look at how the performance and risk management of commercial banks and credit unions are impacted by the use of digital technologies. The findings of this study demonstrated that the implementation of digital technology has a considerable favorable effect on the performance and risk management of commercial banks. This viewpoint is supported by evidence King'ang'ai et al. (2016) supplied showing that the implementation of digital technology has a favorable influence on the return on assets (ROA) of commercial banks in Rwanda. Jenevive and Anyanwaokoro (2017), who conducted research on the connection between financial innovations and Nigerian banking performance, disagree with the conclusions. It was discovered that mobile phone payments and blockchain technologies had little bearing on profitability.

In East Africa, Kenya has implemented information technology, resulting in improved utilization of human resources and organizational resources, increased revenue, and enhanced public access to financial services in the region. (Misati, 2014). Wanalo (2018) directed their research towards exploring the potential effects of digital technology on performance, specifically by evaluating the financial position of commercial banks. Their aim was determining whether there was a significant impact. The study discovered that, in spite of the widespread adaptation to ATMs and agency banking, there was a negligible impact to the entire financial health of a bank.

Kenya has adopted digital technology in a variety of ways, including through the mobile phone apps use, mobile money wallets, payroll lending, and service providers a variety, including banks, mobile network operators, and cooperatives for savings and credit (Waithanji, 2016). Many of these lenders operate outside of the confines of the law and are not regulated. Services provide short-term, (relatively) low-value loans. In attempts to

determine a credit score and loan amount, many of them use a customer's mobile phone-based data, like call and SMS records, mobile money transaction history, and social media data (Mohamed, 2018). The most well-known of them all may be M-Shwari, which uses the M-Pesa platform to provide loans from Commercial Bank of Africa as well as a savings account. Fuliza, a different piece of digital technology unveiled in January 2019, intends to offer overdrafts to users of mobile platforms (CBK, 2019).

Adoption of digital technology has shown to significantly improve the performance of Kenya's commercial banks (Kinyua, 2018). Chirah (2018) disputes this finding and claims that factors including ATMs, mobile banking, agency banking, internet banking, bank size, and capital structure have little to no impact on the performance of commercial banks in Kenya. Chemutai (2017) however agrees with Kinyua (2018) that adopting digital technology possesses positive effect on performance.

### **1.1.1 Digital Technology Adoption**

Digital technology refers to the use of electronic devices, systems, and software that utilize binary code and data processing to perform various tasks and operations (Sheleg & Kohali, 2015). Digital developments are providing various technological remedies that aim to attain ease, quicker processing times, and improved effectiveness in operations. (Klapper, 2016). The financial sector has witnessed the impact of digital technologies on different stakeholders. These technologies have facilitated the enhancement of asset management services by providing simplified systems for retail customers to access wealth management services, offering algorithms to aid decision-making, and enabling artificial intelligence management of portfolios through the use of robots. The banking industry has been affected by various changes, including the introduction of new technologies and techniques for monitoring financial activities such as savings, creditworthiness, spending habits, and tax

obligations. Additionally, the industry has expanded its offerings to include services beyond the traditional banking model, such as faster transaction processing using distributed ledger technology, mobile transfers, and the use of cryptocurrencies. The industry has also begun using data analytics to provide mobile lending services to persons as well as small businesses (Yang & Liu, 2016).

The continued embrace of digital technologies is transforming the banking sector in Kenya. Kenyan banks have been putting an increasing amount of weight on financial technology as a strategic tool in order to accomplish their objectives of lowering costs and raising income. As of 2019, KCB adopted Fuliza and promoted KCB MPESA, whereas Equity utilizes Equitel along with the Eazzy banking app. Mshwari and, more recently, Fuliza are offered by NCBA bank. Other banks have also added mobile lending capabilities to their online platforms (CBK, 2020). The key question at this point is whether the use of financial technology has resulted in any performance gains.

Demirguc-Kunt et al. (2018) suggests that digital technology has been widely adopted in financial transactions, and this is reflected in various operational methods. For example, mobile banking allows easy accessibility of bank accounts via mobile phones. Internet banking allows financial services to be provided through a bank's website. Peer-to-peer lending enables people to do borrowing and lending without involving a traditional bank. Blockchain technology is used to record transactions made in cryptocurrencies in a public and chronological digital ledger. Other digital technologies used in financial transactions include agency banking, credit cards, and ATM machines (Freytag & Fricke, 2017).

Abdulkarim and Ali (2019) defined mobile banking by measuring the total amount of money transferred through mobile banking during a specific timeframe. This

operationalization was also used by Neaime and Gaysset (2018). Internet banking was operationalized in terms of number of internet banking transactions by Kinyua (2018) while Chirah (2018) operationalized it in terms of value of transactions. Chemutai (2017) operationalized agency banking in terms of the value of agency banking transactions in a given year while Wanalo (2018) operationalized ATMs in terms of the value of transactions in a given year. The current study measured digital technology adoption via mobile banking, internet banking, agency banking and blockchain technology.

### **1.1.2 Firm Performance**

The term "firm performance" is the capability of any organization to create value, which can manifest as an improvement in the company's financial position through a better Return on Investment (ROI). This improvement in ROI is typically achieved through the efficient utilization of raw materials, labor, capital, and effective management of resources (Alchian & Demsetz, 2017). Venkatraman and Ramanujam (2018) have acknowledged the lack of agreement on the definition of organizational performance. In contrast, Eke and Adaku (2019) defined organizational performance as the level of efficiency in carrying out tasks. On the other hand, Armstrong (2019) has provided a definition of organizational performance that encompasses both behavior and results, which are the core concerns of business managers in any organization.

Various methods have been utilized to operationalize performance, with balanced scorecard being the most prevalent. This approach derives performance indicators based on an organization's mission, vision, and strategy, providing a comprehensive means of assessing organizational performance. It takes into account financial outcomes resulting from the organization's decisions, as well as customer satisfaction levels, which are crucial success metrics for these segments. Additionally, it identifies internal business processes

where the organization excels. Finally, balanced scorecard emphasizes learning and growth, which are essential for the organization's long-term growth (Kaplan & Norton, 1996). Given its widespread recognition as a performance measure, this study employed the balanced scorecard approach, focusing on customer satisfaction, business processes, and learning and growth as specific indicators.

### **1.1.3 Commercial Banks in Kenya**

According to the Kenyan Central Bank, a commercial bank is a company that does or wants to conduct banking operations in Kenya (CBK, 2021). Receiving deposits, making loans, disbursing funds, and other financial services make up the commercial banking sector. This section is an essential player in the financial industry since it focuses heavily on mobilization of savings and providing loans to the economy (Mwangi & Maina, 2021). The Central Bank is responsible for regulating the banking sector. Within this industry, there are 42 commercial banks, one mortgage finance firm, and 13 microfinance companies. Out of the 42 commercial banks, 11 are listed on the NSE (Bank supervision yearly Report, 2021)

The Kenyan banking industry is being transformed and influenced by the widespread adoption of digital technology. To achieve their objectives of reducing expenses and increasing profits, banks are adopting digital technology to be their strategic tool. In 2019, KCB launched fuliza while simultaneously advertising KCB MPESA, and Equity advertises Equitel and the Eazzy banking app. While other banks have also included mobile loans into their digital platforms, NCBA Bank offers Mshwari and, more recently, Fuliza (CBK, 2021). The main question is whether using digital technology has increased performance.

The performance of commercial banks has been variable, with some experiencing a rise in the number of customers and several others experiencing declines. During the last 5 years, certain banks, including Chase bank, have suffered from poor performance, which has led to a decrease in their client base. Meanwhile, National bank has been bought by KCB, and this is an example of another bank that has experienced changes in ownership. Over the same time span, other banks like Equity, Cooperative, KCB, and Standard Chartered bank have claimed improvements in both performance and client retention (CBK, 2021).

## **1.2 Statement of the Problem**

The financial industry is a great contributor to the economy of nations like Kenya, but it has undergone significant changes in performance. According to CBK (2021), over ten financial institutions in Kenya have failed, been liquidated, or are under receivership by the Deposit Protection Fund Board between 2009 and 2020, suggesting a concerning trend of one collapse per year on average over the eleven-year period. Moreover, the number of financially robust institutions decreased from 22 in 2014 to 11 in 2020. Kenya's investment rate has remained below 25% of GDP from 2005 to 2020. These findings suggest that the banking sector in the country is experiencing fluctuations in performance.

The banks have started to prioritize digital credit and increase their digitization efforts in order to enhance their network base, decrease expenses related to personnel, compete better with their peers, and enhance their overall performance. Despite this increased focus on digitization, National Bank, Sidian Bank, and Victoria Bank have experienced a decline in their performance. Not only are commercial banks in Kenya competing with each other to attract customers, but they are also facing competition from a growing number of Kenyan market digital lenders (Koki, 2018).

Previous studies conducted by Mutinda (2018), Kamande (2018), Sujud and Hashem (2017), and Kariu (2017) have yielded varying outcomes concerning the effect of digital technology adoption on bank performance. For instance, Mutinda (2018) found a negative correlation linking mobile banking to the performance of public commercial banks in the country. However, this research has a conceptual gap since it did not consider agency banking as part of digital technology adoption. On the other hand, Kariu (2017) found a positive relationship. Meanwhile, Kamande (2018) designated that only agency banking possessed statistically substantial positive correlation with bank performance, but it had a methodological gap as it utilized ordinary least square, which has limitations. A panel regression model would have been more appropriate. Finally, the study done by Sujud and Hashem (2017) on digital technology adoption and bank performance in Lebanon has a contextual gap as it was conducted in a diverse economic and social setting than Kenya.

While previous studies have been carried out in this field, there are still conceptual and methodological gaps. Conceptually, many of the research done at a local level have defined the adoption of digital technology in varying ways, often with narrow definitions. This has resulted in conceptual gaps that were addressed by the current study. Methodologically, previous studies have relied heavily on secondary data, which has led to methodological gaps. To overcome these gaps, the current study was based on primary data.

### **1.3 Objectives of the Study**

The main objective of this study was to establish the effect of digital technology adoption on the performance of commercial banks in Kenya.

The specific objectives was to:

- i. To establish the effect of mobile banking on the performance of commercial banks in Kenya

- ii. To establish the effect of internet banking on the performance of commercial banks in Kenya
- iii. To assess the effect of agency banking on the performance of commercial banks in Kenya
- iv. To determine the effect of blockchain technology on the performance of commercial banks in Kenya

#### **1.4 Research Hypotheses**

This research aimed to investigate the research hypotheses below:

- 1. **H<sub>01</sub>**: Mobile banking has no significant effect on the performance of commercial banks in Kenya
- 2. **H<sub>02</sub>**: Internet banking has no significant effect on the performance of commercial banks in Kenya
- 3. **H<sub>03</sub>**: Agency banking has no significant effect on the performance of commercial banks in Kenya
- 4. **H<sub>04</sub>**: Blockchain technology has no significant effect on the performance of commercial banks in Kenya

#### **1.5 Significance of the Study**

The research holds immense importance as it will produce valuable data for various stakeholders in the banking industry such as regulatory authorities, researchers and management. The report can be particularly beneficial for commercial bank management as it can help them identify ways to enhance their bank's performance through the adoption of digital technology.

This study will also assist the government and policy makers in creating strategies and measures that encourage commercial banks amongst other banks in the industry to

adopt digital technology. This will lead to improved performance for the banks and ultimately benefit the overall performance of the sector.

The research outcomes carry significant value for future researchers as they can serve as a benchmark. Moreover, scholars and researchers can utilize the findings to identify gaps in research on related topics and examine empirical literature to establish new areas for further research.

### **1.6 Scope of the Study**

This research project focuses solely on examining the digital technology adoption impact on the performance of commercial banks in Kenya. Specifically, it investigated four independent variables, namely mobile banking, internet banking, agency banking, and blockchain technology. The dependent variable was the overall performance of the banks, which was measured using the balanced scorecard approach. The study examined four dimensions of performance, including financial performance, customer satisfaction, business processes, and learning and growth. The study encompassed all 42 commercial banks in Kenya, with the strategy head or operations manager in every bank serving as the unit of observation. To analyze the data, a descriptive survey research design was employed, along with descriptive, correlation, and regression analysis. The research was done between April and July 2023.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The following chapter thoroughly examines the empirical literature of academic surveys that explore how adopting digital technology affects organizational performance. Additionally, the chapter explores three theories - resource-based view theory, diffusion of innovation theory, and agency theory - that guide this research.

#### **2.2 Theoretical Review**

In this section, the concepts that form the foundation for examining how digital technology adoption relates to organizational performance are discussed. The theories that were covered are the resource-based view theory, diffusion of innovation theory, and agency theory.

##### **2.2.1 Resource Based View Theory**

Barney (1991) is credited with originating this theory, which Mutinda (2018) argues proposes that a firm's unique resources and capabilities are the main drivers of maintaining a competitive advantage over time. The theory proposes that a firm's resources can be divided into two types: tangible and intangible (Hujud & Hashem, 2017). Tangible resources refer to those that are physical in nature and can be easily measured, such as financial resources, physical assets, and technological resources. In contrast, intangible resources are harder to measure and are rooted in a firm's culture, knowledge, and human capital, such as its reputation, brand equity, and the expertise of its employees..

The Resource-Based View (RBV) theory suggests that a company's resources can give it an edge over its competitors if they have certain characteristics, namely being valuable, rare, difficult to replicate, and irreplaceable (VRIN). These resources are called

strategic resources, as they can provide a lasting competitive advantage to the company (Abdulkarim & Ali, 2019). Furthermore, the RBV theory states that for these resources to be effective, they must be in sync with the company's strategy and the needs of the external environment, which allows them to create value and generate a long-term competitive advantage (Kamande, 2018).

Critics have argued that the RBV theory is difficult to test empirically, as it relies heavily on qualitative assessments of a firm's resources and capabilities ((Koki, 2018). This has led some scholars to question the validity of the VRIN criteria and the RBV theory's ability to explain sustained competitive edge. While the RBV theory provides a framework for identifying strategic resources, it may not provide sufficient guidance for how to develop and leverage those resources (Mutinda, 2018). This has led some scholars to argue that the RBV theory lacks prescriptive guidance for firms looking to build sustained competitive advantage.

In the context of a commercial bank, the RBV theory suggests that the strategic use of digital technologies can create a competitive advantage if the bank is able to leverage its unique resources and capabilities to generate value. For example, banks that have strong technological capabilities, data analytics, and a deep understanding of their customers' needs may be better able to design and implement effective digital technologies that enhance their customer experience and improve their performance. Digital technology adoption can help banks to rise efficiency, minimize costs, and enhance customer service offerings, which can lead to improvements in overall performance. For example, the adoption of digital technologies such as mobile banking, online banking, and electronic payments can enable banks to reduce their operating costs and improve customer convenience, thereby enhancing their competitiveness and profitability. The theory relates

mobile banking, internet banking, agency banking and blockchain technology with performance of banks.

### **2.2.2 Diffusion of Innovation Theory**

It was developed in 1962 by Rogers, which is one of the earliest concepts in the field of social sciences. The term "DOI" is used in communication to describe the process by which an idea or product gains acceptance and spreads throughout a community or social system (Rogers, 1976). As a result, people embrace a new concept, behaviour, or product as part of a social framework. Adoption is defined as someone doing something different than they did previously, such as buying or using a new product, learning and performing a new behaviour, and so on. Individuals' perceptions of the concept, behaviour, or product as innovative or creative impact adoption ((Sheleg & Kohali, 2015). The acceptance of a new idea, behavior, or technology, such as internet banking, in a social context is not immediate. Instead, it follows a pattern where some individuals are more inclined to embrace the innovation before others. Studies have found that people who are early adopters of an idea exhibit distinct traits compared to those who adopt it later (Hager, 2006).

According to proponents such as Infante, Rancer and Womack (1997) the diffusion of innovation hypothesis explains the rate at which customers will accept a new product or service. As a result, the theory aids marketers in understanding how trends arise and businesses in assessing the likelihood of a new product launch's success or failure. Firms can utilize the diffusion of innovation theory to predict which types of customers would buy their product or service, as well as build effective marketing strategies to encourage adoption in each category (Littlejohn, 1996).

Critics claim that the theory is too focused on the individual, ignoring the social environment and the media's influence in that setting (Rubin, 1985). According to

Littlejohn (1996), research focusing on uses and pleasure was excessively divided in particular cultures and demographic groups, obstructed synthesis and integrated research results, two key components in building theory.

In the context of a commercial bank, the diffusion of innovation theory can help to explain why certain digital technologies are adopted by banks, and why some banks may be more successful in their adoption efforts than others. For example, banks that are able to demonstrate the relative advantage of digital technologies, such as increased efficiency, reduced costs, and improved customer experience, may be more likely to adopt these technologies than those that do not. Furthermore, the diffusion of innovation theory suggests that the adoption of digital technologies may have different impacts on different types of banks, depending on their organizational characteristics and the external environment. For example, larger banks with more resources and a more established customer base may be better positioned to adopt and implement digital technologies than smaller banks, while banks operating in highly regulated markets may face more challenges in adopting digital technologies due to regulatory constraints. The theory relates mobile banking, internet banking, agency banking and blockchain technology with performance of banks.

### **2.2.3 Agency Theory**

Jensen and Meckling (1976) agency theory holds that when management and firm ownership is separated, the agent-principal relationship needs to be managed for better value creation (Moenga, 2015). Divergent views between agents and shareholders necessitates various strategies by the firm. This will incur the firm some agency costs for a healthy financial position in organizations like that. This theory postulates that the principal-agent relation is prone to conflicts of interest due to the differing goals and

incentives of the principal and the agent, and that contracts and monitoring mechanisms are necessary to align the interests of the two parties and make ensure that the representative performs actions that align with the principal's best interests. The theory states that any information asymmetry complicates the access, evaluation and interpretation all records and details pertaining to opportunistic managerial behavior by shareholders (Njau, 2016).

The agency theory has received support from prominent authors such as Mueller (2010); Gallagher (2004); and John Armstrong (2000) who argue that the theory plays a significant role in explaining the various relationships in an organization setting. However, despite its widespread use, agency theory has shortcomings. It overlooks several intricacies and obstacles that agents may encounter when executing their assigned duties and responsibilities on behalf of the principal. The agency theory proposes expensive and economically inefficient mechanisms of control. This is so because measures taken to safeguard shareholders' interests might impede the implementation of strategic decisions, constrain company operations, alter investment plans, and give little weight to the concerns of other stakeholders, according to (Segrestin & Hatchuel, 2011).

One of the main critiques of agency theory is that it presumes that people draw their sole motivations from self-interests, and that their actions are predictable based on incentives and contracts ((Alchian & Demsetz, 2017). Critics argue that this view is too simplistic and fails to account for the complex and multidimensional nature of human behavior. Another critique of agency theory is that it places too much emphasis on monitoring and control mechanisms, such as performance incentives and contracts, at the expense of other important factors that influence organizational behavior and performance, such as organizational culture, values, and social norms ((Yang & Liu, 2016).

Agency theory is relevant to the correlation linking digital technology adoption to organizational performance of a commercial bank, as it provides a framework for understanding the incentives and motivations of different stakeholders intricate in the adoption process and how they may impact organizational performance. In the context of a commercial bank, agency theory can help to explain how adopting digital technologies affects the principal-agent relationship between shareholders and managers, and how this relationship can impact organizational performance. For example, managers may be incentivized to adopt digital technologies that improve short-term financial performance (such as cost savings), even if these technologies do not align with the long-term goals of the shareholders (such as improving customer experience or investing in new products and services). The theory relates mobile banking, internet banking, agency banking and blockchain technology with performance of banks.

## **2.3 Empirical Literature**

This section reviewed previous literatures undertaken by other scholars and which is related to how digital technology adoption affects organizational performance of Kenyan commercial banks.

### **2.3.1 Mobile Banking and Organizational Performance**

Akinwumi, Adewole, Ademola, Adeleke, Olugbenga and Oyebisi (2020) carried out a research on mobile banking and performance of Nigerian banks. This research utilized panel data analysis to examine the connection linking mobile banking and the financial performance of Nigerian banks. The sample consisted of 14 banks that had mobile banking services during the period of 2012 to 2017. This research established a significant positive connection linking mobile banking adoption to bank performance, as measured by ROA, ROE, and NIM. This suggests that banks that adopt mobile banking services have higher

financial performance compared to those that do not adopt it. The research revealed that both their size and their level of capital adequacy positively and significantly influenced the performance of banks. Conversely, the loan-to-deposit ratio had an adverse effect on performance. The research offers a research gap as it only used financial performance indicators to measure bank performance, and did not consider non-financial indicators such as customer satisfaction or market share.

Slimane and Yadi (2021) sought to investigate whether mobile banking impact financial inclusion and financial stability in developing countries. The research analyzed the connection between the adoption of mobile banking and both financial inclusion and financial stability, using information gathered from a group of developing nations. The authors used mobile banking adoption, population density, and economic development as independent variables, and financial inclusion and financial stability as dependent variables. In accordance to this research, using mobile banking had a favorable impact on financial inclusion, as indicated by the number of accounts per person, but an unfavorable effect on financial stability, as indicated by the proportion of non-performing loans. The research did not distinguish the impacts of different types of mobile banking services on performance, and did not account for potential endogeneity issues that may arise in the analysis.

Jaikumar and Selladurai (2021) pursued to establish the impact of mobile banking on financial performance of commercial banks in India. The research analyzed the correlation linking financial performance to the adoption of mobile banking, using information gathered from a selection of Indian banks. The authors used mobile banking adoption and bank size as independent variables, and financial performance indicators such as ROA, ROE, and NIM as dependent variables. This research found that mobile banking

adoption possessed a significant positive effect to financial performance, as measured by ROA, ROE, and NIM. The research also discovered that the magnitude of a bank had a significant and favorable influence on its financial performance. This research failed to differentiate between the effects of different types of mobile banking services on financial performance, and did not account for potential endogeneity issues that may arise in the analysis.

Cheong and Chang (2021) used survey data from Malaysian banks to examine the elements driving mobile banking adoption and its impact on customer satisfaction and loyalty. The authors used mobile banking adoption, customer satisfaction, and customer loyalty as dependent variables, and factors such as use perceived ease, perceived usefulness, and trust as independent variables. According to the research, when customers believed that mobile banking was helpful, easy to use, and trustworthy, they were more likely to use it. Moreover, this research showed that using mobile banking possessed a favorable impact on both customer satisfaction and loyalty. This research only placed its focus on the banking industry in Malaysia, and the findings may not be generalizable to other countries. The study also relied on self-reported data from customers, which may be subject to bias.

In Kenya, Gichuhi and Ombati (2022) did a research using a sample of Kenyan banks to investigate how adopting mobile banking relates to financial performance. The authors used mobile banking adoption, bank size, and loan portfolio quality as independent variables, and financial performance indicators such as ROA and ROE as dependent variables. This research found that mobile banking adoption possessed a significant positive effect on financial performance, according to ROA and ROE. The research also found that bank size possessed a positive impact on financial performance, while loan

portfolio quality had a negative impact. The study only used financial performance indicators to measure bank performance, and did not consider non-financial indicators such as customer satisfaction or market share.

In their study, Kamau and Masibo (2022) analyzed the correlation between financial performance and the adoption of mobile banking using information obtained from Equity Bank Limited, a commercial bank situated in Kenya. The authors used mobile banking adoption, bank size, and loan portfolio quality as independent variables, and financial performance indicators such as ROA, ROE, and NIM as dependent variables. The research found that mobile banking adoption possessed a significant positive effect on financial performance, as measured by ROA, ROE, and NIM. The study also found that bank size had a positive impact on financial performance, while loan portfolio quality had a negative impact. The study was a case study of only one bank in Kenya and therefore need for a study focusing on all banks in Kenya.

### **2.3.2 Internet Banking and Organization Performance**

Hossain (2021) examines the effects that the use of e-banking technology has had on the financial performance of Bangladesh's state-owned commercial banks. A pooled ordinary least squares (OLS) estimate was used to examine the panel data from the sample banks. According to studies, the practice of electronic banking has a significant negative impact on the institution's ROA, ROE, and net interest margin in the first year after it is implemented. However, research show that ROI considerably increases a year after adopting electronic banking. The study was conducted in Bangladesh, a country that possesses a unique cultural and economic setting that differs from that of Kenya.

Wang and Cao (2022) analyzed the impacts of online banking on the profitability of banks by utilizing information gathered from Taiwanese financial institutions. The

authors used a fixed-effects regression model to estimate the effect of internet banking on bank profitability, controlling for other factors such as bank size, capital adequacy, and loan quality. This research found that internet banking possessed a positive effect on bank profitability, but the effect was not significant for small banks. The study presents a research gap as it only used financial performance indicators to measure bank profitability, and did not consider non-financial indicators such as customer satisfaction or market share.

Afshan, Sharif, Waseem, and Frooghi (2018) used data from a Pakistani bank to examine the impact of internet banking on bank performance. The authors used financial ratios such as ROA, ROE, and NIM as measures of bank performance, and conducted a regression analysis to estimate the impact of internet banking on these ratios. The study established that internet banking possessed a significant positive effect on bank performance, according to ROA, ROE, and NIM. The study only focused on Pakistani banks, and the findings may not be generalizable to banks in other countries.

Kinyua (2018) pursued to scrutinize how the rise of internet banking has transformed bank efficiency in Kenya. The sample included data from 42 of Kenya's most prominent financial institutions. The predictor variable used in this research is the natural logarithm of the total amount of transactions that were conducted through online banking. One of the most important factors that was taken into consideration was whether or not customers used internet banking. To gauge a company's productivity, a technique involved calculating the ratio of its overall revenue to its total assets. This ratio was computed for each organization on an individual basis. Secondary data were obtained on an annual basis during the course of a span of five years. The study's findings showed that each of the criteria taken into account had statistically significant significance. This study found that Internet banking and liquidity both created positive values, whereas bank size produced

negative values. The study discovered no conclusive link between commercial banks' overall efficiency and the amount of capital they had available. This study focused on efficiency, a concept that is different from performance, which is the focus of current research.

This research by Chirah (2018) set out to find out how using alternative channels of banking affects the productivity of Kenya's commercial banks. The sample for this research comprised of all 42 commercial banks in Kenya that are presently in operation. The independent variable in this research was the sum of money involved in transactions conducted through non-conventional banking channels, such as the Internet, mobile phones, ATMs, and financial intermediaries. To evaluate operational efficiency, we utilized the ratio of operating costs to total revenue as the response variable. Each year from January 2017 through December 2017 secondary data was collected. The study results showed that liquidity is beneficial and has a high value. As per the research conclusions, the operational efficiency of commercial banks is not significantly impacted by factors such as the use of automated teller machines, the location of banking offices, the availability of mobile and online banking, the size of the bank, and its capital structure. The research presents a research gap as it only used financial performance indicators to measure bank profitability, and did not consider non-financial indicators such as customer satisfaction or market share.

Researchers from Arnaboldi and Claeys (2018) performed research in European banks to investigate how the internet affected productivity and performance. From the year 2006 to 2010 saw the use of a descriptive research methodology in the form of a survey that was administered to a total of 29 unique financial institutions. Utilization of online accounts, as well as debit and credit facilities, was one of the factors. In order to gather information for the research, online questionnaires were employed. The yearly financial

reports of the banks were combed through for any secondary data that might be extracted. The study reveals that internet banks generally have thicker profit margins compared to traditional local community banks. This is because internet banks have larger business volumes in terms of deposits and noninterest income, as well as lower staff expenses. In contrast, traditional local community banks have smaller business volumes and higher staff expenditures, resulting in thinner profit margins. Profits were down because of these variables. The author is keen to point out, however, that economies of scale quickly even out financial performance discrepancies. Right away, the author draws attention to this fact. The study was conducted in a number of European countries which have different social and economic setting from Kenya.

### **2.3.3 Agency Banking and Organization Performance**

Njoroge (2021) conducted research to examine how agency banking affected the growth of Kenya's financial sector and determined that it had a positive impact. A descriptive study was utilized to evaluate the aims. This study looked at the entire financial sector, including the 24 microfinance groups and the 43 commercial banks. The data gathered from the Central Bank of Kenya publications covering the years 2011 to 2020 were analyzed using the Statistical Package for the Social Scientists. It was crucial to concentrate on data from 2011 and after because there wasn't much information from earlier years. Both descriptive statistics and multiple linear regression were applied during the investigation. The research's conclusions show that three variables—the number of agents, agency banking transactions volume, and the monetary value of agency banking transactions—had a significant influence on the evolution of Kenya's financial system. This study separated the concepts of financial depth and performance, the latter of which would be the focus of this investigation.

Chude and Chude (2014) adopted a survey research design and collected data from a sample of 10 commercial banks in Nigeria offering agency banking services. Primary data was obtained through structured questionnaires administered to bank managers. Data was analyzed via descriptive and inferential statistics. The research discovered agency banking has a positive impact on the financial performance of commercial banks in Nigeria. Specifically, agency banking was found to have a significant impact on net interest margin, return on assets, and return on equity. However, the research too discovered that the cost of managing agency banking services was relatively high, which could affect the profitability of banks offering the services. The study only focused on Nigerian banks, and the findings may not be generalizable to banks in other countries.

Electronic banking's impact on Kenya's commercial banks' operational efficiency was studied by Nduta and Wanjira (2019). The research observed each of the 42 banks that are currently in operation in Kenya. The value of transactions completed via the usage of electronic banking methods such as agency banking, internet banking, mobile banking, and ATMs was used to pick electronic banking as the predictor variable. The level of effectiveness was chosen to be the response variable for this research. Beginning in January of 2017, and continuing through December of that same year, secondary data covering the previous 5 years were gathered. The conclusions of this research indicated a positive, statistically significant effect of parameters including ATM availability, bank size, capital adequacy, and liquidity on the performance of consumers' bank accounts. There was no conclusive evidence that the widespread use of either internet banking or banking intermediaries negatively impacted the efficiency of commercial banks. The research presents a research gap as it only used financial performance indicators to measure bank profitability, and did not consider non-financial indicators such as customer satisfaction or market share.

To ascertain agents impact on the financial performance of Rwandan banks as of December 31, 2015, King'ang'ai et al. (2016) looked at data from a subset of the country's four commercial banks. According to the study's findings, the nation's banks profit from agency banking's cheap transaction costs, consumer convenience, and industry growth. Agency banking improves client convenience, reduces transaction costs, and improves financial performance. A multiple linear regression study's conclusions indicate that agency banking has had a considerable and favorable influence on Rwanda's commercial banks. This research was done in Rwanda and its conclusions might not apply to other contexts due to different social and economic settings.

Khamis (2016) conducted research to establish how the use of agency banking methods influences the quality of customer service provided by commercial banks. The conclusion that proper agency banking and the improvement of customer service are strongly related comes from considering factors that influence the services that are provided to customers. These factors include a reduction in the amount of time spent waiting in bank hall queues, costs associated with providing services, and personalized banking services. Bank agents have been shown to have a significant impact on both customer service and commercial banks' productivity, according to the outcomes of the research. Because of this, the conclusion of the research was that financial institutions prerequisite to investigate various methods for ensuring that their customer service representatives are highly motivated. The authors of the study suggested that using bonuses that are tied to a person's level of performance could be one of these methods. Other measures of performance such as financial performance and internal processes were not taken into account.

### **2.3.4 Block Chain Technology and Organization Performance**

Jasim, Babu and Kathiravan (2022) analyzes the economics, technology, and governance of Bitcoin, which is one of the most widely known applications of blockchain technology. It examines the implications of Bitcoin for individuals, businesses, and governments, and discusses the potential of blockchain technology in the financial sector. The study highlights the potential benefits of blockchain technology for financial institutions, including increased efficiency, transparency, and security. It also identifies some of the challenges that need to be addressed for the widespread adoption of blockchain technology. The study presents a conceptual gap as it did not address the effect of blockchain on performance of commercial banks.

Kshetri (2022) examines the potential of blockchain technology in the supply chain management of goods and services. It reviews existing literature on the subject and analyzes case studies of blockchain applications in supply chain management. The study finds that blockchain technology can improve supply chain management by enhancing transparency, reducing costs, and improving coordination among stakeholders. The study has some limitations. Firstly, the study was a review of literature and therefore lacks empiricism. Secondly, the study was not context specific and therefore its findings cannot be generalized.

Swan (2021) provides an overview of blockchain technology and its potential applications in various sectors, including finance. It discusses the benefits and challenges of using blockchain technology in finance and identifies some of the key issues that need to be addressed for its successful adoption. The study suggests that blockchain technology can transform the financial sector by increasing efficiency, transparency, and security. It also highlights the need for collaboration among stakeholders and regulatory frameworks

to address the challenges associated with blockchain technology. The study has some limitations. Firstly, the study was a review of literature and therefore lacks empiricism. Secondly, the study was not context specific and therefore its findings cannot be generalized.

Kher, Terjesen and Liu (2021) analyzes the level of anonymity provided by Bitcoin, which is based on blockchain technology. It examines the potential implications of Bitcoin's anonymity for financial institutions and regulators. The study highlights the risks associated with the anonymity of Bitcoin transactions, including the potential for money laundering and other illegal activities. It suggests that regulators may need to impose more stringent requirements on financial institutions that deal with Bitcoin. This research has a conceptual gap as it failed to consider the effect of blockchain on performance of commercial banks.

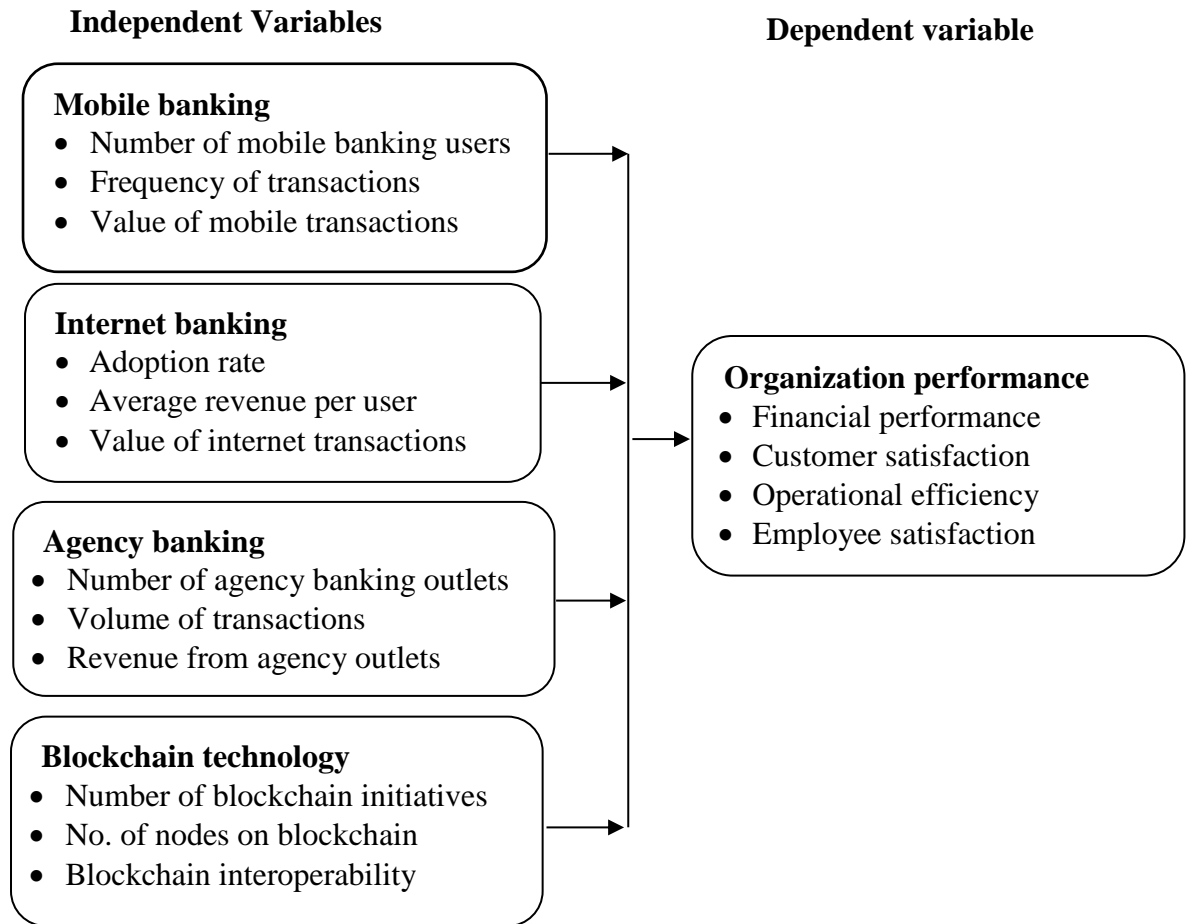
Sheth and Dattani (2019) provides an overview of blockchain technology and its potential applications in various sectors, including finance. It examines the benefits and challenges of using blockchain technology in finance and discusses the potential of blockchain technology to transform the financial sector. The study suggests that blockchain technology can increase efficiency, reduce costs, and improve security in the financial sector. It also highlights the need for regulatory frameworks to address the challenges associated with blockchain technology. This research took place in a developed context and thus the findings might not hold in a developing context like Kenya due to different social and cultural settings.

Zhang, Zhong, Wang, Chao, and Wang (2020) surveys the existing literature on the security of blockchain systems and examines the potential security risks associated with the technology. It also discusses some of the potential solutions to address these risks.

Findings: The research emphasizes on the need for stronger security measures to address the risks associated with blockchain technology, including the potential for 51% attacks and smart contract vulnerabilities. It suggests that further research is needed to develop more secure blockchain systems. The study has some limitations. Firstly, the study was a review of literature and therefore lacks empiricism. Secondly, the study was not context specific and therefore its findings cannot be generalized.

#### **2.4 Conceptual Framework**

It is a diagram demonstrating the correlation linking independent and dependent variables in this research. Organization performance is the dependent variable, whereas mobile banking, internet banking, agency banking, and blockchain technology are the independent factors. It was theoretically hypothesized that a rise in mobile banking, internet banking, agency banking or blockchain technology leads to a rise in performance of banks in Kenya and that is the hypothesis the current study intended to investigate.



**FIGURE 1**

**Conceptual Framework**

## 2.5 Operationalization of Variables

**TABLE 1**

**Operationalization of Variables**

Variable type	Variable	Indicators	Measurement scales
Dependent	Organization performance	<ul style="list-style-type: none"> <li>• Financial performance</li> <li>• Customer satisfaction</li> <li>• Operational efficiency</li> <li>• Employee satisfaction</li> </ul>	Likert/ordinal
Independent	Mobile banking	<ul style="list-style-type: none"> <li>• Number of mobile banking users</li> <li>• Frequency of transactions</li> <li>• Value of mobile transactions</li> </ul>	Likert/ordinal
Independent	Internet banking	<ul style="list-style-type: none"> <li>• Adoption rate</li> <li>• Average revenue per user</li> <li>• Value of internet transactions</li> </ul>	Likert/ordinal
Independent	Agency banking	<ul style="list-style-type: none"> <li>• Number of agency banking outlets</li> <li>• Volume of transactions</li> <li>• Revenue from agency outlets</li> </ul>	Likert/ordinal
Independent	Blockchain technology	<ul style="list-style-type: none"> <li>• Number of blockchain initiatives</li> <li>• No. of nodes on blockchain</li> <li>• Blockchain interoperability</li> </ul>	Likert/ordinal

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

In this section, the focus is on the research design that was employed as a guideline for this research. Other sections discussed included the target population for the research, the method of sampling, the instruments and procedures for collecting data, and finally, the collection and analysis of data, and how the findings were presented.

#### **3.2 Research Design**

The conceptual context surrounding the carrying out of the survey refers to research design. To address the study's research problem, a descriptive cross-sectional research strategy was used. Descriptive research aims to identify the occurrence of a phenomenon and its characteristics, such as what, when, or how it takes place (Cooper & Schindler, 2018). This methodology was appropriate because it allowed the researcher make use of quantitative data to assess how adoption of digital technology has affected the performance of Kenya's commercial banks.

#### **3.3 Target Population**

The phrase "target population" means a group of people or objects that possess the same characteristics or traits, according to Kothari (2014). This feature is generally shared by all members of the population. For this particular research project, the participants encompassed of all 42 commercial banks that are operational in Kenya as of December 31, 2022 (CBK, 2022).

### **3.4 Sample Size and Sampling Procedure**

Sampling refers to the entire procedure of picking out individuals or objects from a larger population. The technique used to choose the sample is called the sampling technique. The study used a census sampling approach to investigate 42 commercial banks located in Kenya due to the small size of the target population. The head of strategy or operations manager within each of these commercial banks were the unit of observation, resulting in a total of 42 respondents. Owing to the small target population, the study adopted a census sampling method concerning the element of investigation, which was the 42 commercial banks in Kenya. The unit of observation was the strategy head or operations manager from each commercial bank, resulting in a total of 42 participants.

### **3.5 Data Collection Instruments**

Data collection is the organized procedure of gathering and analyzing data related to particular variables of interest, with the goal of answering research questions, testing hypotheses, and evaluating outcomes (Burns & Burns, 2018). The nature of information to be obtained determines the research instruments to be used. The respondents were asked to fill out a questionnaire in order to obtain primary data. The primary data crucial in describing the real situation of the dependent and independent variables' relation. Questionnaire utilization is reasonable since it is a low-cost, reliable, and productive method of collecting data in a short period. Questions were designed to have closed ended questions. Closed-ended questions allowed the researcher to derive specific answers. The questionnaires were given to either the head of strategy or operations manager of all 42 commercial banks located in Kenya.

### **3.6 Data Collection Procedures**

Data collection refers to the procedure of collecting empirical data in order to obtain unique insights into a circumstance and to address the questions that prompted the study (Khan, 2018). Permission to obtain data was sought from the University and from the individual banks. The respondents were deemed to be knowledgeable enough, and therefore designed questionnaire deemed useful in data collection. The researcher distributed 42 sets of the questionnaire among the participants. The researcher administered the questionnaire to the head of strategy or operations manager in each commercial bank or their representatives who were assumed to be well conversant with digital technology adoption. The questionnaire was administered through Google forms. To ensure a high response rate, follow-ups were made.

### **3.7 Pilot Test**

Accuracy and relevance of the research instrument is critical. In this regard this study conducted a pilot study. In order to assess the viability of performing a comprehensive investigation, a pilot study was carried out. To establish the reliability and validity of the questionnaire, a pilot study was conducted on a sample of 10% of the 42 target respondents, which involved 4 participants. The researcher distributed the questionnaire to 4 commercial banks in order to obtain their feedback on the questions as well as any areas where the respondents believe changes are required, to make it more consistent and reliable in answering the research objectives. The 4 respondents were not involved in the final study.

#### **3.7.1 Validity of Data Collection Instrument**

The validity of an instrument is its ability to measure a particular concept accurately (Cooper & Schindler, 2018). Construct validity, was used to determine if the operational

definition of variables aligns with the intended theoretical meaning of a concept. To achieve this in the present study, the researcher modified the questionnaire based on previous studies to align with the research objectives. On the other hand, the guidance of expert opinion confirmed content validity. This entailed having study supervisors and defense panelists, who scrutinized the questionnaire and offer competent opinions to ensure that all study variables were captured. They also double-checked the proposal and ensure that the theoretical dimensions are presented in the same way they were envisioned.

### **3.7.2 Reliability of Data Collection Instrument**

According to Cooper and Schindler (2018), reliability is a term used to define an instrument's general consistency. When a measurement regularly yields comparable outcomes when used in same situations, it is said to have high dependability. By demonstrating the accuracy of the internal data collection tool, Cronbach alpha analysis was used to evaluate the dependability of the research instruments. A reliable dependability statistic that shows a genuine "base" score is Cronbach's Alpha. Cronbach's Alpha is crucial to a researcher in verifying the validity and reliability of the questionnaire, even if comparable items are substituted for some of the original ones (Khan, 2018). A reliability rating between 0.7 and 0.8 is often regarded as adequate, and over 0.8 as exceptional. This standard was used in the investigation.

### **3.8 Data Analysis and Presentation**

The procedure of refining and organizing that raw data into a clear systematic and scientific form in which it can easily be interpreted hence understood is referred to as data analysis (Burns & Burns, 2018). According to Kothari (2014), it entails a series of closely linked operations aimed at summarizing as well as arranging gathered data in such a way that it addresses the research query. The researcher reviewed the questionnaires, tallied how many

there were, and made sure they were adequate and completed. Based on appropriateness, the surveys were arranged. Each question's score was given a unique code. After entering the data, a computer reviewed and summarized it to determine the strength of any emergent themes. The mean, as a central tendency measure, as well as standard deviation, as a measure of dispersion was used to analyze the descriptive elements of the data while correlation and regression was utilized to conduct analysis on existence of relationships between and among variables. SPSS version 27 was utilized.

### 3.8.1 Model Summary

The regression model below was used:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where: Y = Organizational performance

$\alpha$  = y regression intercept.

$\beta_1, \beta_2, \beta_3, \beta_4$  = Model coefficients

$X_1$  = Mobile banking

$X_2$  = Internet banking

$X_3$  = Agency banking

$X_4$  = Blockchain technology

$\varepsilon$  = error term

### 3.9 Pretesting of Multiple Regression Assumptions

Before continuing to the calculation of the equations, diagnostic tests are run to guarantee that no violations of the classical linear regression model principles have occurred. When the conventions of a classical regression model are violated, skewed as well as inefficient model parameters result. As a result, diagnostic checks were carried out to guarantee that the regression analysis conventions were not violated.

### **3.8.1 Normality Test**

The assumption of normality is important in many statistical analyses, as it allows for the application of certain parametric tests and ensures the validity of statistical inferences made from the data. Violation of normality can lead to biased coefficient estimates and inaccurate prediction intervals. Conducting a normality test helps ensure that the normality assumption is met and strengthens the validity of the regression analysis. In attempt of determining if the residuals of the response variables were distributed normally near the mean, normality tests like the Shapiro-Wilk test or the Kolmogorov-Smirnov test were carried out. A P-value above 0.05 implied that data had normal distribution.

### **3.8.2 Multicollinearity Test**

Multicollinearity refers to a high correlation or linear relationship among predictor variables in a regression analysis. When multicollinearity exists, it can have a significant impact on the estimated regression coefficients (Kothari, 2014). The presence of multicollinearity makes it challenging to determine the unique contribution of every predictor variable, as their effects become difficult to distinguish. By conducting a multicollinearity test, researchers can assess the extent of multicollinearity and evaluate whether it is affecting the accuracy and reliability of the parameter estimates (Burns & Burns, 2018).

Multicollinearity was determined in the analysis via a correlation matrix, with an optimal 0.8 multicollinearity threshold (Cooper & Schindler, 2018). When multicollinearity is not taken into account, infinite standard errors and undetermined regression coefficients arise, resulting in high standard errors. This impacts the precision with which the null hypothesis is rejected or not rejected. The magnitude of the multicollinearity has an effect on the estimation process. As a result, a correlation coefficient of greater than 0.8 indicates extreme multicollinearity.

### **3.8.3 Heteroscedasticity**

Heteroscedasticity refers to the unequal variance of errors or residuals across diverse levels of the predictor variables in a regression analysis. It violates the assumption of homoscedasticity, which assumes that the variance of errors is constant across all levels of the predictors. Detecting and addressing heteroscedasticity is crucial because it might result in biased and inefficient parameter estimates, incorrect standard errors, and invalid hypothesis tests (Cooper & Schindler, 2018).

If heteroskedasticity occurs, it must be checked and completely accounted for in the CLRM. The error term has a constant variance, according to the CLRM. If the error variance is not constant, the data is said to be homoscedastic. If a regression analysis is run before checking for heteroskedasticity, the estimated coefficients will be unbiased and the standard errors will be incorrect. In this study, panel level heteroskedasticity was assessed using the Likelihood Ratio (LR) test invented by Khan (2018). The null hypothesis for this test was presence of homoscedastic error variance.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1 Introduction

In this chapter, the survey's results are presented. The sections in this chapter are general information sections, which include demographic data and the response rate. The chapter also emphasizes the descriptive and inference statistics in relation to the objectives of the research.

#### 4.2 Response Rate

In a research study, the response rate is calculated as the number of received replies divided by the number of target participants. The response rate, which is frequently expressed as a percentage, is also known as the completion rate or return rate. Details on the response rate for this research are provided in Table 2.

**TABLE 2**  
**Response Rate**

<b>Response Rate</b>	<b>Frequency</b>	<b>Percent</b>
Returned	36	85.7
Unreturned	11	14.3
<b>Total</b>	<b>42</b>	<b>100</b>

Table 4.1 shows that 42 questionnaires were distributed to the operations manager at each of Kenya's 42 commercial banks. Out of the 42 questionnaires distributed to the target respondents only 36 obtained good replies and were returned, yielding an 85.7 percent study response rate, according to the study's conclusions. This supports Kothari's (2014) assertion that analysis and conclusion-drawing are appropriate for studies with a response rate of 70% or above.

### 4.3 Demographic Characteristics

Demographic information provides a snapshot of the characteristics of the respondents. This information helps to describe the sample or population under study and provides a basis for analyzing and interpreting the data in relation to these demographic variables. It allows researchers to understand the demographic composition of the sample and identify any potential biases or limitations in the data. The first questionnaire segment intended to get data of the general information concerning the profile of the respondents. The segment covered age, gender, highest levels of education and number of years in the current position.

#### 4.3.1 Gender of the Respondents

The target respondents were implored to state their gender. Table 3 displays the conclusions.

**TABLE 3**

**Gender Distribution**

<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
Male	19	52.8
Female	17	47.2
<b>Total</b>	<b>36</b>	<b>100</b>

The findings revealed that Male respondents encompassed of 52.8 percent of the total, according to Table 4.2 data, while female respondents made up 47.2 percent. This illustrates the dedication of Kenyan commercial banks to gender diversity, since there was no difference in the proportion of male and female operational managers among participants. These findings concur with Nduta and Wanjira (2019) who also discovered that the commercial banks observe gender diversity.

#### 4.3.2 Age of the Respondents

The research sought to determine the age of the study's participants. Age is closely tied to the respondent's stage in the lifecycle and their corresponding developmental milestones,

responsibilities, and priorities. Different age groups may have different needs, aspirations, and challenges based on their life stage (young adulthood, middle age, or older adulthood). Knowing the respondents' ages is crucial since a person's age might affect how they respond to the survey. Table 4 presents the results.

**TABLE 4**

**Respondents' Age Composition**

<b>Age</b>	<b>Frequency</b>	<b>Percentage</b>
31-40 years	5	13.9
41-50 years	18	50
Above 50 years	13	36.1
<b>Total</b>	<b>36</b>	<b>100</b>

Table 4.3 outlines that the highest participant number (50%) was 41-50 years, 36.1 percent were aged above 50 years, those among the ages of 31-40 years were 13.9% while no one was aged between 21 and 30 years. According to the findings, commercial banks in Kenya operational managers are relatively aged. Age is often associated with experience. They are also mature to respond to the research questions raised. These conclusions are in agreement with Gichuhi and Ombati (2022) which found that majority of employees at management level among Kenyan commercial banks are aged 40 years and above.

**4.3.3 Highest Level of Education**

The participants were expected to input their highest education level. The finds are illustrated in Table 5.

**TABLE 5**

**Highest Level of Education**

<b>Education</b>	<b>Frequency</b>	<b>Percentage</b>
Degree	18	50%
Masters	17	47.2%
PhD	1	2.8%
<b>Total</b>	<b>36</b>	<b>100%</b>

The largest proportion (50%) had a bachelor’s degree as shown by the results while 47.2% had a master’s degree. 2.8% had a PhD as their highest level of qualification while none of the respondents had a diploma as their highest education level. The conclusions suggest that commercial banks are eager to attract well-educated operational managers. A high level of education is typically associated with competence and mastery of the skills required to carry out one's work duties. The conclusions coincide with Kamau and Masibo (2022) who found that employees of Kenyan commercial banks are relatively well educated.

**4.3.4 Years of Experience with the Bank**

The participants were asked to indicate the duration of their employment with their current company. The time spent with an organization can be used to gauge their understanding of internal organizational processes, capabilities, as well as success.

**TABLE 6**

**Years of Experience with Current Employer**

<b>Number of years</b>	<b>Frequency</b>	<b>Percentage</b>
Less than 1 year	1	2.8%
1-3 years	3	8.3%
4-7 years	21	58.3%
8 years and above	11	30.6%
<b>Total</b>	<b>36</b>	<b>100%</b>

The replies in Table 6 display that the respondents had served in their present workplace for a variety of lengths of time. According to the findings, 58.3% of respondents had worked for their present job for between four and seven years, 30.6% for eight years or more, 8.3% for between one and three years, and 2.8% for less than a year. The conclusions display that most respondents had worked for their commercial bank for more than a year, indicating that they had sufficient knowledge of the business based on their prior employment.

#### **4.4 Descriptive Statistics**

The researcher was able to synthesize and define the key traits, patterns, and distributions of the gathered data using descriptive statistics. Statistical summaries that transmitted crucial information about central tendency, variability, and the shape of the data distribution were supplied by measures like mean and standard deviation. Each variable under study's descriptive data are reported in the subheading as percentages, means, and standard deviations.

##### **4.4.1 Mobile Banking**

Table 7 gives the mean and standard deviation for the precise mobile banking qualities. The findings demonstrate that commercial banks have adopted mobile banking to a large extent. This is reinforced by the mere fact that, on a five-point Likert scale, the qualities connected to mobile banking had mean values more than 3, with a 3.95 mean score and a 0.61 standard deviation.

**TABLE 7****Descriptive Statistics for Mobile Banking**

<b>Statements</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>
This commercial bank has introduced mobile banking services to customers	36	3.86	0.79
The bank frequently promotes its mobile banking services to customers	36	4.06	0.78
The bank has invested in mobile banking infrastructure	36	3.89	0.94
The bank's mobile banking services are user-friendly	36	4.08	0.55
This bank has integrated mobile banking with other banking channels such as internet banking and agency banking	36	3.81	0.94
This commercial bank trains customers on the use of mobile banking services	36	4.00	0.78
<b>Overall mean Score</b>	<b>36</b>	<b>3.95</b>	<b>0.61</b>

The respondents' perception of the bank's introduction of mobile banking services is relatively positive, with 3.86 mean score and a 0.79 standard deviation. The standard deviation suggests that the opinions of the respondents varied to some extent, indicating that some customers may have had a more favorable view of the bank's mobile banking services than others. The bank's frequent promotion of mobile banking services received a relatively high mean score of 4.06, with a standard deviation of 0.78. The small standard deviation suggests that the respondents' opinions were relatively consistent, indicating that the bank's active promotion efforts were generally well-received by customers.

Regarding the bank's investment in mobile banking infrastructure, the mean score is 3.89, and the standard deviation is 0.94. The larger standard deviation implies more variability in the responses, indicating that some respondents may have had differing views on the extent of the bank's investment in mobile banking infrastructure. The user-friendliness of the bank's mobile banking services received a high mean score of 4.08, with

a relatively low standard deviation of 0.55. The small standard deviation suggests that respondents' opinions were clustered closely around the mean, signifying a high agreement level regarding the user-friendly nature of the services.

In terms of integration with other banking channels, the bank received 3.81 mean score, with a relatively large 0.94 standard deviation. The higher standard deviation suggests that there was more variability in the responses regarding the bank's integration efforts, with some customers perceiving the integration as more effective than others. The bank's training of customers on the use of mobile banking services received a mean score of 4.00, with a 0.78 standard deviation. The small standard deviation indicates that there was relatively little variability in the responses, suggesting a general consensus among respondents concerning the adequacy of the bank's training initiatives.

Considering all the statements together, the overall mean score for the bank's mobile banking services is 3.95, with a 0.61 standard deviation. The relatively small standard deviation suggests that respondents' opinions were fairly consistent, indicating a general positive perception of the bank's mobile banking services. The research conclusions suggest that the bank's introduction of mobile banking services, frequent promotion, user-friendly interface, integration with other channels, and customer training efforts have generally been well-received by customers. These findings are in line with Slimane and Yadi (2021) who sought to investigate whether mobile banking impact financial inclusion and financial stability in developing countries and revealed that mobile banking has been adopted to a great extent.

#### **4.4.2 Internet Banking**

For the specific characteristics of internet banking, Table 8 displays the mean and standard deviation. The results demonstrate that commercial banks have implemented internet

banking to a great extent. This is reinforced by the finding that on a five-point Likert scale, the mean scores for characteristics related to social elements were 3.88, with a 0.58 standard deviation.

The respondents' perception of the bank's introduction of internet banking services is highly positive, with a mean score of 4.14 and a small standard deviation of 0.63. The small standard deviation designates a relatively low level of variability in the responses, suggesting a general consensus among respondents that the bank's introduction of internet banking services has been successful and well-received. The bank's frequent promotion of internet banking services received a mean score of 3.94, with a small standard deviation of 0.62. The small standard deviation proposes a moderate agreement level among respondents, indicating that the bank's promotional efforts have been perceived positively, although with some variability in the responses.

**TABLE 8**

**Descriptive Statistics for Internet Banking**

<b>Statements</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>
This commercial bank has introduced internet banking services to customers	36	4.14	0.63
The bank frequently promotes its internet banking services to customers	36	3.94	0.62
The bank has invested in internet banking infrastructure	36	3.67	1.13
The bank's internet banking services are user-friendly	36	3.53	0.90
This bank has integrated internet banking with other banking channels such as mobile banking and agency banking.	36	4.03	0.73
This commercial bank trains customers on the use of internet banking services	36	3.94	0.85
<b>Overall Mean Score</b>	<b>36</b>	<b>3.88</b>	<b>0.58</b>

Regarding the bank's investment in internet banking infrastructure, the mean score is 3.67, with a relatively large standard deviation of 1.13. The larger standard deviation implies a substantial amount of variability in the responses, indicating that respondents' opinions varied significantly regarding the extent of the bank's investment in the necessary technological resources to support internet banking. The bank's internet banking services achieved a mean rating of 3.53 out of 5, with a relatively low standard deviation of 0.90. The moderate standard deviation suggests that respondents' opinions were somewhat dispersed, indicating that there were differing views on the user-friendliness of the services.

In terms of integration with other banking channels, the bank received a mean score of 4.03, with a moderate 0.73 standard deviation. The moderate standard deviation suggests that respondents' opinions were somewhat dispersed, with some perceiving the integration efforts more positively than others. The bank's training of customers on the use of internet banking services received a 3.94 mean score, with a moderate standard deviation of 0.85. The moderate standard deviation advocates some variability in the responses, indicating that customers had differing opinions regarding the effectiveness of the bank's training initiatives.

Considering all the statements together, the overall mean score for the bank's internet banking services is 3.88, with a small 0.58 standard deviation. The small standard deviation suggests that respondents' opinions were relatively consistent, indicating a generally positive perception of the bank's internet banking services. The research conclusions suggest that the bank's introduction of internet banking services and its promotional efforts have been positively received by customers. However, there may be room for improvement in terms of the bank's investment in internet banking infrastructure, user-friendliness of the services, and customer training initiatives, as indicated by the

variability in the responses. The findings support Hossain's (2021) investigation of how the use of e-banking technology has affected the financial performance of Bangladesh's state-owned commercial banks, which found that the country's banks have heavily embraced online banking.

#### 4.4.3 Agency Banking

The mean and standard deviation for the precise attributes of agency banking are as presented in Table 9. The results show that commercial banks promote agency banking to a large extent. Looking at the results, it is evident that the respondents' perception of the bank's introduction of agency banking services is moderately positive, with a mean score of 3.67 and a standard deviation of 0.88. The standard deviation suggests that there is a fair amount of variability in the responses, indicating that some customers may have had a more favorable view of the bank's agency banking services than others.

**TABLE 9**

**Descriptive Statistics for Agency Banking**

<b>Statements</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>
This commercial bank has introduced agency banking services to customers	36	3.67	0.88
The bank frequently promotes its agency banking services to customers	36	3.64	0.65
The bank has invested in agency banking infrastructure	36	3.92	0.49
The bank's agency banking services are user-friendly	36	3.89	0.46
This bank has integrated agency banking with other banking channels such as mobile banking and internet banking.	36	3.11	0.87
This commercial bank trains customers on the use of agency banking services	36	3.92	0.55
<b>Overall Mean Score</b>	<b>36</b>	<b>3.69</b>	<b>0.61</b>

The bank's frequent promotion of agency banking services received a mean score of 3.64, with a relatively small standard deviation of 0.65. The small standard deviation suggests that there was a moderate level of agreement among the respondents regarding the bank's promotional efforts for agency banking services. Regarding the bank's investment in agency banking infrastructure, the mean score is 3.92, with a small standard deviation of 0.49. The small standard deviation suggests that respondents' opinions were relatively consistent, indicating that the bank's investment in the necessary infrastructure for agency banking was generally well-perceived.

The mean score for the bank's agency banking services' user-friendliness is 3.89, with a small standard deviation of 0.46. The small standard deviation suggests a relatively high level of agreement among respondents, indicating that customers find the agency banking services to be user-friendly and easy to use. In terms of integration with other banking channels, the bank received a mean score of 3.11, with a relatively large standard deviation of 0.87. The larger standard deviation implies a significant amount of variability in the responses, indicating that customers' opinions varied widely regarding the bank's integration efforts of agency banking with other channels such as mobile banking and internet banking.

The bank's training of customers on the use of agency banking services received a mean score of 3.92, with a small standard deviation of 0.55. The small standard deviation indicates a relatively low level of variability in the responses, suggesting that customers generally perceived the bank's training initiatives for agency banking services to be effective. Considering all the statements together, the overall mean score for the bank's agency banking services is 3.69, with a standard deviation of 0.61. The standard deviation

suggests a moderate level of variability in the responses, indicating that customers' opinions varied to some extent regarding the bank's agency banking services.

The findings of the study suggest that the bank's introduction of agency banking services and its promotional efforts have been moderately well-received by customers. While the bank's investment in infrastructure and user-friendliness of agency banking services have generally received positive feedback, there is room for improvement in terms of integrating agency banking with other channels. These findings are in line with Njoroge (2021) who conducted research to examine how agency banking affected the growth of Kenya's financial sector and determined that agency banking has been implemented to a large extent.

#### **4.4.4 Block Chain Technology**

The mean as well as standard deviation for the precise traits of block chain technology are as obtainable in Table 10. The results show that commercial banks promote agency banking to a large extent. The results reveal that the respondents' perception of the bank's adoption of blockchain technology is moderately positive, as designated by a mean score of 3.81 and a 0.70 standard deviation. The moderate standard deviation suggests that there is some variability in the responses, implying that while some respondents may have viewed the bank's adoption of blockchain technology favorably, others may have had a more reserved or critical opinion.

**TABLE**

**10 Descriptive Statistics for Block Chain Technology**

<b>Statements</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>
This bank has adopted blockchain technology in its operations	36	3.81	0.70
The bank frequently uses blockchain technology to process transactions	36	3.69	0.62
The bank has invested in blockchain technology infrastructure	36	3.64	0.67
The bank's blockchain-based services are user-friendly	36	3.28	0.93
This commercial bank has integrated blockchain technology with other banking channels such as mobile banking and internet banking.	36	4.00	0.58
This commercial bank trains customers on the use of blockchain-based services.	36	3.67	0.78
<b>Overall Mean Score</b>	<b>36</b>	<b>3.68</b>	<b>0.53</b>

The bank's frequent use of blockchain technology to process transactions received a 3.69 mean score, with a relatively small standard deviation of 0.62. The small standard deviation designates a moderate level of agreement among the respondents, suggesting that the bank's utilization of blockchain technology in transaction processing has been generally well-perceived. Regarding the bank's investment in blockchain technology infrastructure, the mean score is 3.64, with a standard deviation of 0.67. The standard deviation suggests some variability in the responses, indicating that respondents' opinions differed to some extent regarding the bank's investment in the necessary technological resources to support blockchain technology.

The mean score for the user-friendliness of the bank's blockchain-based services is 3.28, with a relatively large standard deviation of 0.93. The larger standard deviation suggests that respondents' opinions were more widely dispersed, indicating differing views

on the user-friendliness of the services provided by the bank using blockchain technology. In terms of integration with other banking channels, the bank received a mean score of 4.00, indicating a positive perception of the bank's efforts to integrate blockchain technology with other channels like mobile banking and internet banking. The relatively small standard deviation of 0.58 suggests a relatively high level of agreement among respondents, indicating that the integration of blockchain technology with other banking channels has been well-received.

The bank's training of customers on the use of blockchain-based services received a mean score of 3.67, with a standard deviation of 0.78. The standard deviation recommends a moderate variability level in the responses, signifying that customers' opinions differed to some extent regarding the effectiveness of the bank's training initiatives for blockchain-based services. Considering all the statements together, the overall mean score for the bank's blockchain technology adoption and utilization is 3.68, with a small standard deviation of 0.53. The small standard deviation suggests that respondents' opinions were relatively consistent, indicating a generally positive perception of the bank's use of blockchain technology in its operations.

The findings of the research suggest that the bank's adoption of blockchain technology and its integration efforts with other banking channels have been generally positively received by customers. While the bank's utilization of blockchain technology in transaction processing has been perceived favorably, there may be a possibility of improvement in terms of the user-friendliness of the blockchain-based services. These findings are in line with Swan (2021) who provides an overview of blockchain technology and its potential applications in various sectors, including finance. The study suggests that blockchain technology adoption has been on the rise.

#### **4.4.5 Organizational Performance**

Table 11 displays the mean and standard deviation for the specific performance features of commercial banks. The respondents' perception of the increase in new customers over the years is moderately positive, as indicated by a mean score of 3.17 and a standard deviation of 0.99. The standard deviation suggest that there is a fair amount of variability in the responses, indicating that some respondents may have perceived a greater increase in new customers compared to others. In terms of customer retention, the mean score is 2.89, with a standard deviation of 1.02. The lower mean score suggests that respondents perceived customer retention in the bank to be relatively lower, and the larger standard deviation indicates a higher degree of variability in the responses. This implies that respondents' opinions differed significantly regarding the level of customer retention in the bank.

The mean score for the increase in bank profits over the years is 2.81, with a standard deviation of 1.02. The relatively lower mean score indicates a perception of slower growth in profits, and the standard deviation suggests a high level of variability in the responses, signifying differing views on the profitability of the bank. Regarding the number of branches, the mean score is 2.94, with a standard deviation of 0.85. The mean score suggests a moderate perception of an increase in the number of branches, and the standard deviation shows a moderate level of variability in the responses, suggesting differing opinions regarding the expansion of the bank's branch network.

**TABLE 11****Descriptive Statistics for Organization Performance**

<b>Statement</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>
There has been an increase in new customers over the years	36	3.17	0.99
There is improved customer retention in the bank	36	2.89	1.02
The bank profits have been increasing over the years	36	2.81	1.02
The number of branches have been increasing over the years	36	2.94	0.85
There is reduced customer complaints in the bank	36	3.25	0.92
There is increased number of referrals in the bank	36	2.72	0.93
There is personal and career growth and development of employees in the bank	36	3.42	1.11
The employees have a positive attitude and deliver excellent customer service.	36	4.00	0.62
<b>Average</b>	<b>36</b>	<b>3.15</b>	<b>0.60</b>

The mean score for reduced customer complaints is 3.25, with a standard deviation of 0.92. A higher mean score suggests a relatively positive perception of reduced customer complaints, and the standard deviation indicates a restrained level of variability in the responses, showing some differences in opinions regarding the effectiveness of complaint management. The mean score for the increased number of referrals is 2.72, with a standard deviation of 0.93. A lower mean score suggests a perception of fewer referrals, and the standard deviation indicates a moderate level of variability in the responses, suggesting that respondents' opinions differed regarding the level of referral activity.

In terms of personal and career growth and development of employees, the mean score is 3.42, with a standard deviation of 1.11. The higher mean score suggests a relatively positive perception of personal and career growth opportunities in the bank, while the larger standard deviation indicates a higher degree of variability in the responses. The statement

regarding an employees' positive attitude and excellent customer service delivery received the highest mean score of 4.00, with a small standard deviation of 0.62. The high mean score suggests a positive perception of the employees' attitudes and customer service, and the small standard deviation indicates a relatively low level of variability in the responses, suggesting a general agreement among respondents.

The overall mean score for the organizational performance of commercial banks in Kenya is 3.15, with a small standard deviation of 0.60. The small standard deviation suggests that respondents' opinions were relatively consistent, indicating a generally positive perception of the organizational performance of the banks. The findings of the research recommend that while there are areas for improvement, such as customer retention, bank profits, and referral numbers, the banks generally demonstrate positive performance in terms of new customer acquisition, reduced customer complaints, and employees' positive attitude and excellent customer service delivery. These findings are in line with Gichuhi and Ombati (2022) who did a research using a sample of Kenyan banks to investigate how adopting mobile banking relates to performance and revealed that performance of commercial banks in Kenya has been improving overtime.

#### **4.5 Correlation Analysis**

Correlation analysis allows the researcher to examine the strength and direction of the association between variables and provides valuable insights into how changes in organizational performance may be related to changes in mobile banking, internet banking, agency banking and block chain technology. Pearson correlation was employed to find a link between the predictor factors and the performance of commercial banks. As seen in Table 12, this is the case.

**TABLE 12****Correlation Results**

		Organizational performance	Mobile banking	Internet banking	Agency banking	Blockchain technology
Organizational performance	Pearson Correlation Sig. (2-tailed)	1				
Mobile banking	Pearson Correlation Sig. (2-tailed)	.778** .000	1			
Internet banking	Pearson Correlation Sig. (2-tailed)	.825** .000	.693** .000	1		
Agency banking	Pearson Correlation Sig. (2-tailed)	.736** .000	.637** .000	.735** .000	1	
Blockchain technology	Pearson Correlation Sig. (2-tailed)	.911** .000	.680** .000	.737** .000	.664** .000	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
b. Listwise N=36

Table 4.11's results exposed that there is a strong and significant correlation between organizational performance and mobile banking ( $r = 0.778$ ,  $p = 0.000$ ). This suggests a robust positive relationship between organizational performance and the adoption of mobile banking services. The significance level of 0.000 indicates that this relationship is statistically significant at the 0.01 level. Similarly, there is a strong and significant correlation between organizational performance and internet banking ( $r = 0.825$ ,  $p = 0.000$ ). This shows a strong positive relationship between organizational performance

and the execution of internet banking services. The significance level of 0.000 suggests that this relationship is statistically significant at the 0.01 level.

Furthermore, there is a strong and significant correlation between organizational performance and agency banking ( $r = 0.736$ ,  $p = 0.000$ ). This suggests a robust positive relationship between organizational performance and the utilization of agency banking services. The significance level of 0.000 indicates that this relationship is statistically significant at the 0.01 level. Additionally, there is a strong and significant correlation between organizational performance and blockchain technology ( $r = 0.911$ ,  $p = 0.000$ ). This indicates a strong positive relationship between organizational performance and the adoption of blockchain technology. The significance level of 0.000 suggests that this relationship is statistically significant at the 0.01 level.

#### **4.6 Diagnostic Tests**

It is assumed that the data follows all the assumptions of ordinary least square when performing statistical modulus operandi such as correlations, regression, t-tests, and variance analysis. These analyses need to be verified since they include statistical flaws. To check for these statistical mistakes, this study checked for normalcy, multicollinearity, and heteroskedasticity. This was done to see whether the data set could be effectively modelled. Shapiro-Wilk's test was used to gauge normality. Variance inflation factors and tolerance are employed to examine multicollinearity. Levene's test was used to examine heteroskedasticity. The outcomes of various statistical tests are shown in this subsection.

##### **4.6.1 Tests of Normality**

The Shapiro-Wilk test was used to look for normalcy. This test looks for skewness, kurtosis, or both to evaluate how normal the data are. The Shapiro-Wilk statistic has a range of 0 to 1, and values higher than 0.05 are indicative of normal data. The data significantly deviates

from the normal distribution when it is less than 0.05. Data normality was verified using the Shapiro-Wilk test, and the results indicated that all variables had a p-value larger than 0.05 ( $p > 0.05$ ). The notion that the sample distribution of the mean is normal is referred to as "normality". The results of the normalcy test are shown in Table 13.

**TABLE 13**

**Test of Normality**

Study variables	Statistic	Shapiro-Wilk	
		Df	Sig.
Mobile banking	.880	36	.722
Internet banking	.891	36	.783
Agency banking	.900	36	.814
Block chain technology	.906	36	.819
Organizational performance	.873	36	.811

Table 4.12's findings show that all of the p values are higher than the threshold value of 0.05, supporting the theory that the data came from a population with a regularly distributed distribution.

**4.6.2 Tests of Multicollinearity**

Multicollinearity is the term for when there is a considerable amount of correlation between independent variables. To examine multicollinearity, one uses the variance inflation factor (VIF). The VIF counts the amount that the estimated coefficient's variance is exaggerated in the absence of any connection between the independent variables. If there is no correlation between two independent variables, all VIFs will be 1. A VIF of 5 indicates some multicollinearity, whereas a VIF of 10 indicates severe multicollinearity. The variance inflation factor (VIF), used to this study's multicollinearity test, is displayed in the results. The opposite of VIF, tolerance evaluates the effect of one independent variable on all other independent variables. Table 14 displays the test outcomes.

**TABLE 14**

**Test of Multicollinearity**

<b>Variable</b>	<b>VIF</b>	<b>Tolerance</b>
Mobile banking	1.30	0.771
Internet banking	1.27	0.785
Agency banking	1.36	0.735
Block chain technology	1.38	0.725
Mean VIF	1.33	

All of the variables had a VIF between 1.27 and 1.38, according to the results in Table 4.12, and tolerance values ranged from 0.725 to 0.785. This demonstrated the absence of multicollinearity in the independent variables.

**4.6.3 Tests of Heteroscedasticity**

When the variance of the errors in the dependent variable is not constant over the whole set of data, heteroscedasticity takes place. It happens when the values of the independent variables change the variance of errors. Heteroscedasticity in regression analysis is a systematic change in the dispersion of the residuals over the spectrum of measured values. Ordinary least squares regression makes the assumption that residuals come from a population with constant variance. High levels of heteroscedasticity in this regression can significantly skew the results, undermine the analysis, and increase the likelihood of a type 1 error. In this study, homogeneity was assessed using heteroscedasticity Breusch-Pagan/Cook-Weisberg test. The variances between groups are unequal if the Breusch-Pagan/Cook-Weisberg test for heteroscedasticity is statistically significant = 0.05. It is a test to examine if the scores in the variables have about the same dispersion. The outcomes are displayed in Table 15.

**TABLE 15**

**Test of Heteroscedasticity**

<b>Breusch-Pagan / Cook-Weisberg test for heteroscedasticity</b>			
chi2(1)	=		0.3633
Prob > chi2	=		0.1681

Table 4.14 demonstrates that the null hypothesis of homoskedastic error terms is not rejected with a p-value of 0.1681.

**4.7 Regression Analysis**

The use of regression analysis enabled the researcher to evaluate the influence of mobile banking, internet banking, agency banking, and blockchain technology on organizational performance as well as the relationship between changes in the independent variables and changes in organizational performance. Model fitness, Analysis of Variance (ANOVA), and regression coefficients are all included in the regression analysis. This is shown in the tables below, Tables 26, 17 and 18.

**TABLE 16**

**Model Fitness**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.950 <sup>a</sup>	.903	.891	.160301

a. Predictors: (Constant), Blockchain technology, Agency banking , Mobile banking, Internet banking

As shown in Table 16, Block chain technology, Mobile banking, Agency banking, and Internet banking) explain approximately 90.3% of the variance in the dependent variable. This suggests that these predictors have a significant impact on the outcome variable., with other factors beyond the scope of the study explaining the remaining variance. The model that links the variables is also predicated to be sufficient. The R value represents the correlation coefficient between the predictors and the dependent variable. In

this case, the value of R is 0.950, indicating a strong positive correlation between the predictors and the dependent variable. This suggests that the predictors collectively explain a substantial portion of the variance in the dependent variable.

**TABLE 17**

**Analysis of Variance**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.442	4	1.860	72.400	.000 <sup>b</sup>
	Residual	.797	31	.026		
	Total	8.238	35			

a. Dependent Variable: Organizational performance

b. Predictors: (Constant), Blockchain technology, Agency banking , Mobile banking, Internet banking

The F value of 72.400 and the sig. value of 0.000 indicate that the regression model as a whole is statistically significant. This suggests that the predictors (Block chain technology, Mobile banking, Agency banking, and Internet banking) have a significant impact on the dependent variable (Organizational performance), and the model provides a better fit than just relying on chance alone.

The regression coefficient table revealed that the p-value for the coefficient of mobile banking is 0.030. Since this value is less than the conventional significance level of 0.05, it is concluded that the coefficient for mobile banking is statistically significant. This suggests that there is a significant relationship between mobile banking and organizational performance. The p-value for the coefficient of internet banking is 0.037. Similar to mobile banking, this p-value is less than 0.05, indicating that the coefficient for internet banking is statistically significant. Thus, there is a significant relationship between internet banking and organizational performance.

**TABLE 18****Regression Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.192	.237		.812	.423
	Mobile banking	.158	.070	.191	2.271	.030
	Internet banking	.209	.096	.214	2.181	.037
	Agency banking	.079	.089	.077	.883	.384
	Blockchain technology	.506	.079	.572	6.368	.000

a. Dependent Variable: Organizational performance

The p-value for the coefficient of agency banking is 0.384. This p-value is more than 0.05, indicating lack of statistical implication. Therefore, there is no significant relationship between agency banking and organizational performance. The p-value for the coefficient of block chain technology is 0.000. Similar to the other predictors, this p-value is less than 0.05, indicating statistical significance. Hence, there is a significant connection between block chain technology and Organizational performance.

The following is the regression model that was estimated from the study results:

$$Y = 0.192 + 0.158X_1 + 0.209X_2 + 0.079X_3 + 0.506X_4$$

Where

Y = Organization performance,

X<sub>1</sub> – Mobile banking,

X<sub>2</sub> – Internet banking,

X<sub>3</sub> – Agency banking,

X<sub>4</sub> – Block chain technology

#### **4.8 Hypothesis Testing**

With the use of multiple linear regressions, the hypotheses were evaluated. Results of multiple regression is shown in Table 4.16. According to the acceptance/rejection criterion, the H<sub>0</sub> is accepted if the p value is more than 0.05 but rejected if it is less than 0.05.

##### **4.8.1 Mobile Banking and Organization Performance**

The null hypothesis, H<sub>01</sub>, stated that: mobile banking has no substantial impact on performance of Kenyan commercial banks. The results of Table 4.17 indicate that the p-value was 0.030 which is less than 0.05 hence, rejecting the null hypothesis proving that mobile banking significantly affect the performance of commercial banks in Kenya. Mobile banking has a positive and substantial relationship with the performance of Kenyan commercial banks ( $\beta = 0.158$ ,  $p = 0.030$ ). This suggests that there is a significant relationship between Mobile banking and Organizational performance.

The findings of the study agree with research by Akinwumi et al. (2020) who carried out a research on mobile banking and performance of Nigerian banks. This research utilized panel data analysis to observe the connection linking mobile banking and the financial performance of Nigerian banks. This research established a significant positive connection linking mobile banking adoption to bank performance, as measured by ROA, ROE, and NIM. The results are also consistent with those of Jaikumar and Selladurai (2021) who sought to determine the impact of mobile banking on financial performance of commercial banks in India. The research analyzed the correlation linking financial performance to the adoption of mobile banking, using information gathered from a selection of Indian banks. This research found that mobile banking adoption possessed a significant positive effect to financial performance, as measured by ROA, ROE, and NIM.

The results of the research are similarly consistent with those of Gichuhi and Ombati (2022) who did a research using a sample of Kenyan banks to investigate how adopting mobile banking relates to financial performance. The authors used mobile banking adoption, bank size, and loan portfolio quality as independent variables, and financial performance indicators such as ROA and ROE as dependent variables. This research found that mobile banking adoption possessed a significant positive effect on financial performance, according to ROA and ROE. The findings are also in agreement with Kamau and Masibo (2022) who analyzed the correlation between financial performance and the adoption of mobile banking using information obtained from Equity Bank Limited, a commercial bank situated in Kenya. The research found that mobile banking adoption possessed a significant positive effect on financial performance, as measured by ROA, ROE, and NIM.

#### **4.8.2 Internet Banking and Organization Performance**

The second null hypothesis,  $H_{02}$ , stated that: internet banking has no significant impact on performance of commercial banks in Kenya. Table 4.17 outcomes display that the p-value was  $0.037 < 0.05$ . This designates that the null hypothesis is rejected hence there is a significant effect of internet banking on performance of commercial banks in Kenya. Internet banking were positively as well as significantly correlated with performance of commercial banks in Kenya ( $\beta = 0.209$ ,  $p = 0.037$ ). The research results show that internet banking is a significant determinant of performance.

The findings of this study are consistent with those of Hossain (2021), who examines how the use of e-banking technology by Bangladesh's state-owned commercial banks has affected these businesses' capacity to remain profitable. According to the study, electronic banking has a significant negative impact on an institution's ROA, ROE, and net

interest margin in the first year after it is implemented. However, research show that ROI considerably increases a year after adopting electronic banking. The research findings are also in line with Wang and Cao (2022) who analyzed the impacts of online banking on the profitability of banks by utilizing information gathered from Taiwanese financial institutions. This research found that internet banking possessed a positive effect on bank profitability, but the effect was not significant for small banks.

The research conclusions are also in line with Afshan et al. (2018) who used data from a Pakistani bank to study the impact of internet banking on bank performance. The authors used financial ratios such as ROA, ROE, and NIM as measures of bank performance, and conducted a regression analysis to estimate the impact of internet banking on these ratios. The study established that internet banking possessed a significant positive effect on bank performance, according to ROA, ROE, and NIM. The study's conclusions concur with those of Kinyua (2018), who wanted to determine how the emergence of online banking has affected Kenyan banks' operational efficiency. The study's findings showed that each of the criteria taken into account had statistically significant significance. This study found that both liquidity and Internet banking created favorable results.

#### **4.8.3 Agency Banking and Organization Performance**

The third null hypothesis,  $H_{03}$ , stated that: agency banking has no significant effect on performance of commercial banks in Kenya. Results in Table 4.17 show that the p-value was  $0.384 > 0.05$ . This shows that the null hypothesis is not rejected hence, there is no significant effect of agency banking on performance of commercial banks in Kenya. Agency banking was positively but not significantly related with performance of commercial banks in Kenya ( $\beta = 0.079$ ,  $p = 0.384$ ). The research results show that agency banking is not a significant determiner of performance.

In the current research discoveries concur with Njoroge (2021) who conducted research to examine how agency banking affected the growth of Kenya's financial sector and determined that it had a positive relationship. The research's conclusions show that three variables—the number of agents, the volume of agency banking transactions, and the monetary value of agency banking transactions—had a significant influence on the evolution of Kenya's financial system. The study concurs with King'ang'ai et al. (2016), who determined the impact of agents on the financial performance of Rwandan banks by analyzing data from a subset of the country's four commercial banks. The results of a study using multiple linear regression show that agency banking has a favorable impact on Rwanda's commercial banks' performance.

The study findings differ with those of Nduta and Wanjira (2019) who investigated electronic banking's impact on Kenya's commercial banks' operational efficiency. Their findings indicated a positive, statistically significant effect of parameters including ATM availability, bank size, capital adequacy, and liquidity on the performance of consumers' bank accounts. There was no conclusive evidence that the widespread use of either internet banking or banking intermediaries negatively impacted the efficiency of commercial banks. The study is however in agreement with Khamis (2016) who conducted research to show how the use of agency banking methods influences the quality of customer service provided by commercial banks. The conclusion that proper agency banking and the improvement of customer service are strongly related comes from considering factors that influence the services that are provided to customers.

#### **4.8.4 Block Chain Technology and Organization Performance**

The fourth null hypothesis,  $H_{03}$ , stated that: block chain technology has no significant effect on performance of commercial banks in Kenya. Results in Table 4.17 show that the p-value

was  $0.000 < 0.05$ . This indicates that the null hypothesis is rejected hence there is a significant effect of block chain technology on performance of commercial banks in Kenya. Block chain technology was positively and significantly related with performance of commercial banks in Kenya ( $\beta = 0.506$ ,  $p = 0.000$ ). The study results show that block chain technology is a significant determiner of performance.

The current research discoveries agree with Jasim et al. (2022) who analyzes the economics, technology, and governance of Bitcoin, which is one of the most widely known applications of blockchain technology. It examines the implications of Bitcoin for individuals, businesses, and governments, and discusses the potential of blockchain technology in the financial sector. The study highlights the potential benefits of blockchain technology for financial institutions, including increased efficiency, transparency, and security. The study also agrees with Kshetri (2022) who examines the potential of blockchain technology in the supply chain management of goods and services. The study finds that blockchain technology can improve supply chain management by enhancing transparency, reducing costs, and improving coordination among stakeholders.

The study findings also agree with those of Swan (2021) who provides an overview of blockchain technology and its potential applications in various sectors, including finance. The study suggests that blockchain technology can transform the financial sector by increasing efficiency, transparency, and security. The study is also in agreement with Sheth and Dattani (2019) who provides an overview of blockchain technology and its potential applications in various sectors, including finance. The study suggests that blockchain technology can increase efficiency, reduce costs, and improve security in the financial sector.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

A summary, a conclusion, and recommendations to policy and practice are presented in this chapter. With the goals of the study research, the summary, conclusion, and suggestions for research improvement are offered. There are also suggestions for further studies in this chapter.

#### **5.2 Summary**

The primary goal of this research was to determine how digital technology adoption influences the performance of commercial banks in Kenya. The resource-based view theory, diffusion of innovation theory, and agency theory served as the study's foundations. Performance of the organization was the dependent variable. Mobile banking, internet banking, agency banking, and block chain technology served as independent variables. The study's research design used a descriptive survey approach. The target population consisted of each of Kenya's 42 commercial banks. The population was rather small; hence a census method was employed. 42 operational managers from Kenyan commercial banks were issued a structured questionnaire using Google forms in order to collect primary data. In response to the researcher's follow-up, 36 questionnaires were obtained, yielding an 85.7 percent response rate. Descriptive statistics, correlations, and regression analysis were employed in analyzing the data. With the use of a multivariate linear regression model and the t-statistic, it was possible to assess the perceived reputation of every independent variable in relation to its influence on performance. The research findings are described in this section.

### **5.2.1 Mobile Banking and Organization Performance**

The study's first objective was to assess mobile banking influence on performance of Kenyan commercial banks. The descriptive results indicate that customers perceive mobile banking services positively, with a mean score of 3.86 out of 5. The standard deviation of 0.79 suggests relatively low variability in the responses, indicating a general consensus among customers. The bank's frequent promotion of mobile banking services and investment in mobile banking infrastructure also received positive mean scores of 4.06 and 3.89, respectively. These results suggest that customers are aware of and engaged with the bank's mobile banking offerings. Furthermore, the bank's emphasis on user-friendly mobile banking services is reflected in the mean score of 4.08, indicating customers' positive experience with the usability of the services. According to the regression results, a unit change in mobile banking resulted in a 0.158 variation in organization performance. This also confirmed that mobile banking approach had a significant positive influence on the performance of Kenyan commercial banks.

### **5.2.2 Internet Banking and Organization Performance**

The research's second objective was to evaluate the impact of internet banking on the commercial banks' performance. The descriptive results reveal a mean score of 4.14 for the bank's introduction of internet banking services, indicating customers' positive perception of this offering. The bank's frequent promotion of internet banking services and investment in internet banking infrastructure also received relatively high mean scores of 3.94 and 3.67, respectively. These results suggest that customers are receptive to the bank's internet banking initiatives and value the technological investments made by the bank. Additionally, the user-friendliness of the bank's internet banking services received a mean score of 3.53, indicating customers' generally positive experience with the ease of use. The results also suggested that improving internet banking will improve organization performance. The

findings also revealed that a unit change in internet banking might result in a 0.209 unit change in insurance firm performance in Kenya. This supported the notion that internet banking has a major impact on organization performance. The null hypothesis was rejected, and it was determined that internet banking had a significant effect on bank performance.

### **5.2.3 Agency Banking and Organization Performance**

The research's third objective was to establish influence of agency banking on commercial banks' performance. The descriptive outcomes indicate that it has a positive effect on the organizational performance of commercial banks in Kenya. The mean score of 3.67 for the bank's introduction of agency banking services reflects customers' positive perception of this offering. The bank's frequent promotion of agency banking services and investment in agency banking infrastructure received mean scores of 3.64 and 3.92, respectively, suggesting that customers are aware of and engaged with these services. Moreover, the bank's integration of agency banking with other channels, such as mobile banking and internet banking, received a mean score of 4.00, indicating customers' positive experience with the convenience and accessibility provided by the integration. The regression outcomes exposed that agency banking and organization performance have a positive but not significant link. The findings suggested that a shift in agency banking approach will boost commercial banks' performance in Kenya. The null hypothesis was not rejected, and conclusion made that agency banking has no significant influence on performance of commercial banks.

### **5.2.4 Block Chain Technology and Organization Performance**

The research's fourth objective was to establish influence of block chain technology on commercial banks' performance. The descriptive results show that the bank's adoption of blockchain technology received a mean score of 3.81, indicating customers' positive

perception of this technological innovation. The bank's emphasis on user-friendly blockchain-based services also received a high mean score of 3.89, suggesting that customers find these services easy to use and navigate. The integration of blockchain technology with other banking channels, such as mobile banking and internet banking, received a mean score of 4.00, indicating customers' positive experience with the seamless integration of services. These findings indicate that customers value the security, transparency, and efficiency provided by blockchain technology. The regression results revealed that block chain technology and organization performance have a positive and significant link. The findings suggested that a shift in block chain technology will boost commercial banks' performance in Kenya. The null hypothesis was rejected, and concluded that block chain technology influences performance of commercial banks.

### **5.3 Conclusions**

The conclusions derived from the study findings for each of the research goals are presented in this section.

#### **5.3.1 Mobile Banking and Organization Performance**

According to findings of this study, it can be concluded that mobile banking has a positive impact on the organizational performance of commercial banks in Kenya. The outcomes show that customers perceive mobile banking services positively, with high satisfaction and engagement levels. The mean score for the introduction of mobile banking services indicates that customers are receptive to this offering, and the relatively low standard deviation suggests a general consensus among customers. Furthermore, the frequent promotion of mobile banking services and investment in mobile banking infrastructure have a significant impact on the overall organizational performance. These efforts

contribute to customer awareness, engagement, and increased usage of mobile banking services, ultimately leading to improved customer satisfaction and loyalty.

The user-friendliness of mobile banking services is another key aspect highlighted by the study. The high mean score for user-friendliness indicates that customers find mobile banking services easy to use and navigate. This aspect plays a crucial role in enhancing customer experience and satisfaction. By providing a convenient and user-friendly platform for banking transactions, commercial banks can attract and retain customers, ultimately leading to improved organizational performance. Thus, it can be concluded that mobile banking impact positively the organizational performance of commercial banks in Kenya by increasing customer satisfaction, engagement, and convenience.

### **5.3.2 Internet Banking and Organization Performance**

The study findings provide evidence to support the positive effect of internet banking on the organizational performance of commercial banks in Kenya. Customers' perception of internet banking services is highly favorable, as indicated by the high mean scores and relatively low standard deviations. The positive response to the introduction of internet banking services suggests that customers in Kenya are receptive to this mode of banking and see it as a valuable addition to the range of services offered by commercial banks. The positive perception of internet banking is further reinforced by the high mean score for user-friendliness, indicating that customers find the online banking experience convenient and easy to navigate.

The research also highlights the importance of promotion and investment in internet banking infrastructure for improving organizational performance. The frequent promotion of internet banking services helps raise customer awareness and encourages their adoption and usage. Moreover, the investment in internet banking infrastructure is crucial for

providing a reliable and efficient online banking platform. By ensuring the availability and accessibility of internet banking services, commercial banks can cater to the evolving needs and preferences of customers, leading to enhanced customer satisfaction and loyalty.

### **5.3.3 Agency Banking and Organization Performance**

Customers' perception of agency banking services is highly positive, as reflected by the high mean scores and relatively low standard deviations. The introduction of agency banking services has been well-received, indicating that customers value the convenience and accessibility provided by these services. The frequent promotion of agency banking services and investment in agency banking infrastructure further contribute to the overall organizational performance. These efforts enhance customer awareness and engagement with agency banking, leading to increased customer satisfaction and loyalty.

The integration of agency banking with other banking channels, such as mobile banking and internet banking, is a key aspect highlighted by the study. The high mean score for integration suggests that customers find the seamless connection between different banking channels convenient and beneficial. By providing a comprehensive and interconnected banking experience, commercial banks can cater to the diverse needs and preferences of customers, thereby enhancing their overall satisfaction and contributing to the organizational performance.

### **5.3.4 Block Chain Technology and Organization Performance**

The findings of this study provide strong evidence to support the positive effect of blockchain technology on the organizational performance of commercial banks in Kenya. Customers' perception of blockchain-based services is highly positive, as indicated by the high mean scores and relatively low standard deviations. The adoption of blockchain technology has been well-received, highlighting customers' recognition of its value in

enhancing security, transparency, and efficiency in banking operations. The investment in blockchain infrastructure further contributes to the overall organizational performance by supporting the seamless implementation of blockchain-based services.

The integration of agency banking with other banking channels, such as mobile banking and internet banking, is a key aspect highlighted by the study. The high mean score for integration suggests that customers find the seamless connection between different banking channels convenient and beneficial. By providing a comprehensive and interconnected banking experience, commercial banks can cater to the diverse needs and preferences of customers, thereby enhancing their overall satisfaction and contributing to the organizational performance.

The user-friendliness of blockchain-based services is another significant aspect highlighted by the study. The high mean score for user-friendliness suggests that customers find these services easy to use and navigate, enhancing their overall experience. By providing a user-friendly platform for blockchain-based transactions, commercial banks can improve customer satisfaction and engagement, leading to enhanced organizational performance. Moreover, the integration of blockchain technology with other banking channels, such as mobile banking and internet banking, is a crucial factor emphasized by the study. The high mean score for integration indicates that customers value the seamless connectivity and convenience offered by the integration of different banking channels.

#### **5.4 Recommendations of the Study**

Commercial banks in Kenya should actively embrace and invest in technological innovations such as mobile banking, internet banking, and blockchain technology. These technologies have shown a positive impact on organizational performance by enhancing customer satisfaction, engagement, convenience, and operational efficiency. Banks should

allocate resources to improve the infrastructure and user-friendliness of these services, ensuring seamless integration across different channels. By embracing and investing in these technologies, banks can stay competitive, attract more customers, and meet the evolving demands of the digital era.

To fully harness the potential benefits of technological innovations, commercial banks should focus on customer education and training. Banks should design comprehensive programs to educate customers on the features, benefits, and usage of mobile banking, internet banking, agency banking, and blockchain-based services. By providing clear instructions, tutorials, and demonstrations, banks can enhance customers' understanding and confidence in utilizing these technologies. Regular training sessions and workshops can also be organized to update customers on new features and functionalities. This investment in customer education will promote wider adoption, increase customer engagement, and maximize the benefits derived from these technologies.

Collaboration and partnerships with technology companies, fintech startups, and other industry players can accelerate the development and implementation of technological innovations in the banking sector. Commercial banks in Kenya should actively seek collaborations to leverage external expertise, access cutting-edge technologies, and stay at the forefront of digital banking. Collaboration can also facilitate the integration of different technologies and enhance interoperability across banking channels. By fostering partnerships, banks can harness synergies, pool resources, and jointly innovate to enhance organizational performance and customer satisfaction.

The technological landscape is continuously evolving, and commercial banks need to adapt to emerging trends and customer preferences. Banks should establish a process of continuous monitoring and evaluation of their technological offerings. Regular feedback

from customers should be sought to identify areas for improvement and innovation. Banks should also monitor industry developments and emerging technologies to stay informed about new opportunities and potential threats. Regular system upgrades and feature enhancements should be undertaken to address customer needs, improve functionality, and maintain a competitive edge in the market.

### **5.5 Research Areas for Further Studies**

As per the research conclusions, mobile banking, internet banking, agency banking, and blockchain technology together make up to 90.3% of the variation in the performance of banks in Kenya. According to the study, further investigation should concentrate on identifying additional factors that contribute to the remaining 9.7 percent. In order to clearly demonstrate the performance disparities, further study might concentrate on comparing the performance of firms that have adopted digital technology aspects with those that have not. Additional investigation is also required on how top management affects the adoption of digital technology.

Longitudinal studies to evaluate the long-term impact of digital technology adoption on the performance of commercial banks should also be conducted. By tracking the performance of commercial banks over an extended period, researchers can gain insights into the digital technology adoption -performance relationship and observe any potential changes or trends over time. Further, researchers should investigate the mediating and moderating factors that may influence the association between digital technology adoption and performance. For example, factors such as firm size, industry dynamics, or regulatory environment could impact the strength or direction of the relationship.

Future research can also complement the quantitative findings with qualitative research methods like interviews or focus groups to gain a deeper understanding of the

mechanisms and processes through which digital technology adoption impact performance. Qualitative research can provide rich insights into the experiences, perspectives, and practices of commercial banks in Kenya and help identify the best practices for digital technology adoption into their operations.

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## **APPENDICES**

### **Appendix I: Introduction Letter**

March 2023

Lawrence Muthini Kimoni

Masters Student

KCA University

### **RE: REQUEST FOR RESEARCH DATA**

I am a student at KCA University where I am undertaking a degree in Master of Business Administration. As part of my course work, I am expected to submit a research paper on **“Effect of Digital Technology Adoption on the Performance of Commercial Banks in Kenya”**.

To accomplish this, your company has been chosen to collect the data needed for this report. Your name will not be included in the study, and this information will be used solely for academic reasons. The study's findings will be made available to you on demand.

Kind regards.

**Lawrence Muthini Kimoni**

**Masters Student – Researcher**

**KCA University**

## Appendix II: Questionnaire

The data received from this survey will be utilized in part fulfillment of a master's research thesis to examine the impact of digital technology adoption on the performance of commercial banks in Kenya. The information was collected strictly for academic purposes. Please take the time to carefully read the questions and provide the best insight you can. Only scholarly goals will be served by the information acquired.

### Instructions

Do not specify your name on the questionnaire.

Tick only one answer (box) for each question.

### PART A: BACKGROUND INFORMATION

- 1 Gender: Male  Female
  
- 2 Under which age brackets are you?  
21 – 30 Years  31 - 40 Years   
41 - 50 years  Over 50 years
  
- 3 Which is the highest education level that you have attained?  
Diploma  Masters   
Degree  PhD   
  
Others Specify.....
  
- 4 How many years have you worked in your bank?  
Less than one year  1-3 years   
4-7 years  8 years and above

## **PART B: DIGITAL TECHNOLOGY ADOPTION**

To what extent do you agree with the following statements? Rate in a scale of 1 to 5 (1 Strongly disagree, 2 Disagree, 3 Neutral, 4 Agree, 5 Strongly Agree)

### **i) Mobile Banking**

<b>STATEMENT</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
This commercial bank has introduced mobile banking services to customers					
The bank frequently promotes its mobile banking services to customers					
The bank has invested in mobile banking infrastructure					
The bank's mobile banking services are user-friendly					
This bank has integrated mobile banking with other banking channels such as internet banking and agency banking					
This commercial bank trains customers on the use of mobile banking services					

### **ii) Internet Banking**

<b>STATEMENT</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
This commercial bank has introduced internet banking services to customers					
The bank frequently promotes its internet banking services to customers					
The bank has invested in internet banking infrastructure					
The bank's internet banking services are user-friendly					

This bank has integrated internet banking with other banking channels such as mobile banking and agency banking.					
This commercial bank trains customers on the use of internet banking services					

**iii) Agency Banking**

<b>STATEMENT</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
This commercial bank has introduced agency banking services to customers					
The bank frequently promotes its agency banking services to customers					
The bank has invested in agency banking infrastructure					
The bank's agency banking services are user-friendly					
This bank has integrated agency banking with other banking channels such as mobile banking and internet banking.					
This commercial bank trains customers on the use of agency banking services					

**iv) Blockchain Technology**

<b>STATEMENT</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
This bank has adopted blockchain technology in its operations					
The bank frequently uses blockchain technology to process transactions					
The bank has invested in blockchain technology infrastructure					
The bank's blockchain-based services are user-friendly					

This commercial bank has integrated blockchain technology with other banking channels such as mobile banking and internet banking.					
This commercial bank trains customers on the use of blockchain-based services.					

**PART C: ORGANIZATIONAL PERFORMANCE**

To what extent do you agree with the following statements? Rate in a scale of 1 to 5 (1 Strongly disagree, 2 Disagree, 3 Neutral, 4 Agree, 5 Strongly Agree)

<b>Statements</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
There has been an increase in new customers over the years					
There is increased customer retention in the bank					
The bank profits have been increasing over the years					
The number of branches have been increasing over the years					
There is reduced customer complaints in the bank					
There is increased number of referrals in the bank					
There is personal and career growth and development of employees in the bank					
The employees have a positive attitude and deliver excellent customer service.					

**THANK YOU**

### **Appendix III: Commercial Banks in Kenya**

1. Absa Bank Limited
2. African Banking Corporation Ltd
3. Bank Of Africa Ltd
4. Bank of India
5. Bank of Baroda (Kenya) Ltd
6. CFC Stanbic Bank Limited
7. SBM Bank
8. Citibank N A
9. Commercial Bank of Africa
10. Consolidated Bank
11. Co-operative Bank
12. Credit Bank
13. Dubai Islamic Bank
14. Development Bank of Kenya Ltd
15. Diamond TRUST Bank (K) Ltd
16. Spire Bank Ltd
17. Equatorial Commercial Bank Limited
18. Equatorial Investment Bank
19. Equity Bank
20. Gulf African Bank Ltd
21. Guardian Bank Ltd
22. Habib Bank A.G. Zurich
23. First Community Bank Ltd
24. Fidelity Bank Ltd
25. Family Bank Ltd
26. Giro Commercial Bank Ltd
27. Guardian Bank Ltd.
28. Housing Finance Corporation Ltd
29. Imperial Bank Limited
30. Investments & Mortgages Bank Limited – I&M Bank
31. KCB Bank
32. Kenya Post Office Savings Bank
33. Sidian Bank Ltd
34. National Bank
35. NCBA Bank Ltd
36. Oriental Commercial Bank Ltd.
37. Paramount Bank Ltd

38. Prime Bank
39. Standard Chartered
40. Standard Investment Bank
41. UBA Kenya Bank Ltd
42. Transnational Bank Ltd

**Source: CBK (2022)**