



---

**Electronic Theses and Dissertations**

---

2025

# Effect of technology adoption on the sustainable competitive advantage of commercial banks in Kenya.

Muriuki, Clement Miano  
*Strathmore Business School*  
*Strathmore University*

**Recommended Citation**

Muriuki, C. M. (2025). *Effect of technology adoption on the sustainable competitive advantage of commercial banks in Kenya* [Strathmore University]. <http://hdl.handle.net/11071/15960>

Follow this and additional works at: <http://hdl.handle.net/11071/15960>

**EFFECT OF TECHNOLOGY ADOPTION ON THE SUSTAINABLE COMPETITIVE  
ADVANTAGE OF COMMERCIAL BANKS IN KENYA**

**CLEMENT MIANO MURIUKI**

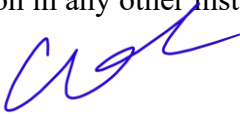
**REG NO. 12702**

**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS  
ADMINISTRATION (MBA), STRATHMORE BUSINESS SCHOOL, STRATHMORE  
UNIVERSITY, NAIROBI, KENYA**

**MAY,2025**

## **DECLARATION**

I, the undersigned, declare that this dissertation is my original and has not been submitted for examination in any other institution.

Signature: 

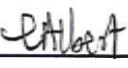
Date.....20<sup>th</sup> May 2025.....

**Clement Miano Muriuki**

Reg No. 12702

## **APPROVAL**

This research dissertation has been submitted for examination with my approval as the university supervisor.

Signature: 

Date.....20<sup>th</sup> May 2025.....

Dr. Albert Ochieng Abang'a

**Lecturer,**

**Strathmore University Business School**

## ABSTRACT

The banking industry had been grappling with a dynamic landscape characterized by rapid technological advancements, regulatory changes, and evolving customer preferences. The proliferation of fintech innovations and advancements in digital technologies had been transforming the banking landscape, compelling banks to adapt and incorporate digital solutions to remain relevant and competitive. The objective of the study was to determine the effect of technology adoption capabilities on the sustainable competitive advantage of commercial banks in Kenya. The specific objectives were to investigate the impact of automation on sustainable competitive advantage of commercial banks in Kenya, to establish the impact of alternative channels on sustainable competitive advantage of commercial banks in Kenya, to determine the impact of optimization of Human Capital on sustainable competitive advantage of commercial banks in Kenya and to determine the impact of customer relationship management on sustainable competitive advantage of commercial banks in Kenya. The study was anchored on four theories: resource dependency theory, technology adoption theory, expectation disconfirmation theory, and Porter's theory of competitive advantage. Furthermore, the study was framed within the pragmatist point of view, employing a descriptive research design to elucidate the correlation between the variables under investigation. The population under scrutiny encompassed the 39 commercial banks operational in Kenya as of December 2023. Data collection hinged upon a semi-structured questionnaire, which was administered to two respondents from each bank. The targeted participants consisted of managers within the Information and Communication Technology (ICT) and Business Development departments or individuals occupying analogous roles. The findings revealed that the automation of the bank processes enhances efficiency, reduces costs, and improves service delivery, while alternative banking channels such as mobile and internet banking increase accessibility and customer convenience. In relation to the role of adopting technology in the bank alternative channels, the findings reveal that it significantly enhances sustainable competitive advantage by increasing accessibility of the bank products, improves customer engagement, and facilitate personalized financial services. In relation to the technology adoption of the human capital function, the findings reveal that the bank operations are optimized because it improves the organization training and talent management, which in turn enhances productivity and innovation, fosters customer loyalty and brand reputation. Technology adoption in the CRM technologies was found to enhance the organizations data analytics capabilities, which in turn led to improved customer satisfaction, loyalty, and long-

term business growth. The study underscores the need for banks to integrate technology adoption with digital transformation and regulatory compliance to maximize competitiveness. In regard to the digitalization of customer It also highlights policy implications, emphasizing the role of regulators in fostering a supportive environment for financial innovation. By aligning with the resource-based view (RBV) theory, this research contributes to existing knowledge on technology-driven competitiveness in the banking sector, offering insights for scholars, industry practitioners, and policymakers.

**Key words: Sustainable competitive advantage; Alternative channels, automation, human capital**

## TABLE OF CONTENTS

<b>DECLARATION.....</b>	<b>ii</b>
<b>ABSTRACT.....</b>	<b>iii</b>
<b>LIST OF TABLES .....</b>	<b>ix</b>
<b>LIST OF FIGURES .....</b>	<b>x</b>
<b>ABBREVIATIONS AND ACRONYMS.....</b>	<b>xi</b>
<b>DEFINITION OF TERMS.....</b>	<b>xii</b>
<b>CHAPTER ONE .....</b>	<b>1</b>
<b>INTRODUCTION.....</b>	<b>1</b>
1.1 Background to the Study.....	1
1.2 Statement of the Problem.....	3
1.3 Objectives of the Study.....	5
1.4 Specific Objectives .....	5
1.5 Research Questions.....	5
1.6 Significance of the Study .....	6
1.7 Chapter Summary .....	7
<b>CHAPTER TWO .....</b>	<b>8</b>
<b>LITERATURE REVIEW .....</b>	<b>8</b>
2.1 Introduction.....	8
2.2 Theoretical Review .....	8
2.2.1 Resource Dependency Theory.....	8
2.2.2 Technology Adoption Theory .....	9
2.2.3 Expectation Disconfirmation Theory .....	10
2.2.4 Potters Theory of Competitive Advantage .....	12
2.3 Empirical literature review .....	13
2.3.1 Automation and sustainable competitive advantage .....	13
2.3.2 Alternative channels and sustainable competitive advantage.....	15

2.3.3 Optimization of human capital and sustainable competitive advantage.....	17
2.3.4 Customer Relationship Management and Sustainable Competitive Advantage .....	19
2.4 Conceptual Framework.....	20
2.4 Operationalization of Study Variable .....	22
2.5 Chapter Summary .....	24
<b>CHAPTER THREE.....</b>	<b>26</b>
<b>RESEARCH METHODOLOGY .....</b>	<b>26</b>
3.1 Introduction.....	26
3.2 Research Philosophy.....	26
3.2 Research Design.....	27
3.3 Population of the Study.....	27
3.4 Data Collection .....	27
3.5 Data Analysis .....	28
3.7 Research Quality.....	29
3.7.1 Validity .....	29
3.7.2 Reliability .....	29
3.7.3 Diagnostic Tests .....	30
3.7.4 Ethical Consideration .....	30
3.8 Chapter Summary .....	31
<b>CHAPTER FOUR.....</b>	<b>32</b>
<b>PRESENTATION OF RESULTS .....</b>	<b>32</b>
4.1 Introduction.....	32
4.2 Response rate .....	32
4.3 Demographic Information.....	32
4.3.1 Bank’s Operational History .....	32
4.3.2 Bank Size.....	34
4.3.3 Management Level .....	35

4.3.4 Work Experience .....	36
4.4 Descriptive Statistic .....	37
4.4.1 Automation and Sustainable Competitive Advantage of Commercial Banks in Kenya .....	37
4.4.2 Alternative Channels and Sustainable Competitive Advantage of Commercial Banks in Kenya.....	39
4.4.3 Optimization of Human Capital and Sustainable Competitive Advantage of Commercial Banks in Kenya.....	40
4.4.4 Customer Relationship Management and Sustainable Competitive Advantage of Commercial Banks in Kenya.....	41
4.4.5 Sustainable Competitive Advantage.....	43
4.5 Diagnostic Tests.....	45
4.5.1 Normality Test.....	45
4.5.2 Multicollinearity Test .....	46
4.5.3 Homoscedasticity Test.....	46
4.6 Correlation Analysis .....	47
4.7 Regression Analysis.....	49
4.7.1 Model Summary .....	49
4.7.2 Analysis of Variance (ANOVA) .....	49
4.7.3 Regression Coefficients.....	50
4.8 Chapter Summary .....	52
<b>CHAPTER FIVE .....</b>	<b>53</b>
<b>DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS .....</b>	<b>53</b>
5.1 Introduction.....	53
5.2 Summary of the Findings.....	53
5.3 Discussion.....	54
5.3.1 Effect of Automation on Sustainable Competitive Advantage .....	54
5.3.2 Effect of Alternative Channels on Sustainable Competitive Advantage.....	55

5.3.3 Effect of Optimization of Human Capital on Sustainable Competitive Advantage	57
5.3.4 Effect of Customer Relationship Management on Sustainable Competitive Advantage.....	58
5.4 Conclusion .....	60
5.5 Recommendations.....	61
5.5.1 Implications for Practice.....	61
5.5.2 Contribution to Management.....	61
5.5.3 Implications for Policy .....	61
5.5.4 Contribution to Knowledge .....	62
5.6 Limitations of the Study.....	62
5.7 Suggestions for Further Research .....	62
<b>REFERENCES.....</b>	<b>64</b>
<b>APPENDICES .....</b>	<b>75</b>
Appendix I : Literature Map .....	75
Appendix II: Cover Letter .....	86
Appendix III: Questionnaire .....	87
Appendix IV : List of Commercial Banks in Kenya .....	91

## LIST OF TABLES

Table 2. 1: Summary of Research Gap .....	<b>Error! Bookmark not defined.</b>
Table 4.1: Response Rate.....	32
Table 4.2: Descriptive Statistics for Automation.....	37
Table 4.3: Descriptive Statistics for Alternative Channels.....	39
Table 4.4: Descriptive Statistics for Optimization of Human Capital.....	40
Table 4.5: Descriptive Statistics for Customer Relationship Management.....	41
Table 4.6: Descriptive Statistics for Sustainable Competitive Advantage .....	43
Table 4.7: Normality Test.....	45
Table 4.8: Multicollinearity Test .....	46
Table 4.9: Homoscedasticity Test (Breusch-Pagan Test) Results .....	47
Table 4.10: Model Summary .....	49
Table 4.11: Analysis of Variance (ANOVA) .....	49
Table 4.12: Regression Coefficients .....	50

## LIST OF FIGURES

Figure 2. 1: Technology Acceptance Model.....	10
Figure 2. 2: Expectation-disconfirmation Theory (Adopted from Oliver, 1977) .....	11
Figure 2. 3: Conceptual Framework .....	21
Figure 4.1: Bank's Operational History .....	33
Figure 4.2: Bank Size.....	34
Figure 4.3: Management Level .....	35
Figure 4.4: Work Experience .....	36

## **ABBREVIATIONS AND ACRONYMS**

ATM	-	Automatic Teller Machine
CAK	-	Communication Authority of Kenya
CBK	-	Central Bank of Kenya
EDT	-	Expectation-Disconfirmation Theory
IT	-	Information Technology
NACOSTI	-	National Commission for Science, Technology, and Innovation
NSE	-	Nairobi Securities Exchange
RDT	-	Resource Dependence Theory
SEM	-	Structural Equation Modelling
SME	-	Small and Medium Enterprises
TAM	-	Technology Adoption Model

## **DEFINITION OF TERMS**

**Alternative Channels** These are non-traditional avenues through which customers can access banking services and perform transactions. These alternative channels offer flexibility and convenience, allowing individuals to conduct their banking activities outside of traditional brick-and-mortar branches (Bendoly et al. 2015)

### **Customer relationship Management**

This refers to the strategic use of technology to manage and enhance relationships with customers by leveraging digital tools, data analytics, and automated processes to understand, communicate with, and provide personalized services to customers (Alqershi, 2020)

### **Level of automation**

This refers to the extent to which technology and computer systems are used to perform various tasks and processes within the industry. It reflects the degree to which manual tasks are replaced or augmented by automated systems and technologies (Chen, et al., 2021).

### **Optimization of human resources**

This refers to maximizing the effectiveness and productivity of an organization workforce when implementing and integrating new technologies within the banking sector through alignment of human capabilities, skills, and roles with the requirements and opportunities presented by technological advancements (Hidaya, et al., 2020).

### **Technology Adoption**

This refers to the process through which individuals or organizations embrace and incorporate a new technology into their daily practices, operational procedures, or ways of life. This notion is frequently linked with the diffusion of innovations. (Riddell & Song, 2017).

## **ACKNOWLEDGEMENT**

I wish to express my sincere gratitude to God Almighty, whose grace, strength, and protection have kept me alive and healthy throughout this academic journey.

I am especially thankful to my supervisor, Dr. Albert Ochieng Abang'a, for his expert guidance, invaluable insights, and consistent support that greatly enriched the quality of this dissertation. I also extend my appreciation to Strathmore University for providing a rigorous and enriching learning environment that has shaped my academic and professional growth.

My heartfelt thanks go to my dear wife, Abigael Miano, for her unwavering encouragement, patience when I worked late into the night, and belief in me. Her love and support have been my anchor throughout this program.

Lastly, I am grateful to all the participants and respondents who generously shared their time and insights, making this research possible.

## **DEDICATION**

To my precious children — Harry Muriuki Miano, Harvey Maina Miano, Gianna Gathigia Miano, and Max Clement Githui Miano — may this be a reminder that with faith, determination, and hard work, all things are possible.

To my dear mother, Charity Gathigia Muriuki — your sacrifices and prayers have laid the foundation upon which I stand.

To the memory of my late father, Harry Muriuki Miano — your legacy of integrity, hard work and excellence continues to inspire me every day.

This achievement is as much yours as it is mine.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to Study

In the recent past, the strategic management discipline has recognized technological change and innovation as an important catalyst to an organization productivity and sustainable growth (Johnson, et al. 2017). In the last decade, businesses have witnessed notable progressions in communication, information, and connectivity technologies. These advancements encompass digital convergence, Web 2.0, service-oriented architectures and cloud computing. These technologies have effectively eliminated barriers of time and distance, leading to a transformation in the business environment. Technology adoption is an important form of strategic innovation that is different from the existing business and that if appropriate technology is employed by a firm, and then it has the potential to significantly its competitive advantage (Riddell & Song, 2017). The source of competitiveness from the adoption of appropriate technology in a business include bringing down operational costs and contributes to an increase of output by 6 to 81% (Arifin & Fontana, 2015), improves efficiency and effectiveness by making the organization more flexible and accountable. The sustainable competitive advantage that emanates from technology adoption depends on the extent of level of automation, application in alternative channels, capacity to optimize human capital and also help in making informed decision.

Different commercial banks, both at global and local level have embraced various forms of technology in their operations with such global commercial banks as Goldman Sachs and UniCredit accelerating digital transformation through AI and blockchain (Business Insider, 2024). Goldman Sachs has deployed AI tools to 10,000 employees, aiming for full integration by year-end while UniCredit has partnered with Google Cloud to enhance digital services across 13 markets. Over 90% of banks are expected to offer real-time payments by 2025 and through a partnership with fintech firms, banks have been able to expand their digital lending services. Through the adoption of advanced cybersecurity systems, such as biometric authentication and real-time fraud detection, banks are able to enhance consumer trust and regulatory compliance (African Business, 2024).

In a fiercely competitive business environment, it's vital for a company to possess the requisite resources and capabilities to effectively leverage its distinctive organizational structure, enabling it to surpass rivals in the industry. According to Porter (1985), the enduring success of a business hinges on its capacity to sustain competitiveness through the adoption of a distinct value-creation strategy not concurrently pursued by competitors. Organizations must formulate strategies aimed at enhancing performance relative to both current and future industry rivals. This involves strategically harnessing various controllable resources recognized by the company as potential sources of competitive advantage. Schweizer and Koscher (2021) propose that an organization's competitive edge stems from resources and competencies that drive the production of goods or services. Kharub, et al. (2018) argue that a firm's competitive advantage stems from its capacity to do activities in a manner that cannot be replicated by others using their own internal resources. Porter (1980) asserts that competitive advantage may be attained by either pursuing cost leadership or differentiation.

Competitive advantage stems from either physical or intangible resources inside a firm. Tangible assets consist of technical, financial, and physical resources, while intangible assets include human capital, innovation, creativity, and the organization's reputation. Porter (1980) identifies three primary elements of competitive advantage for an organization: cost leadership, difference, and focus. Cost leadership is achieved by implementing a plan that maximizes efficiency and minimizes costs, surpassing rivals. An organization may achieve cost efficiency by implementing efficient scale development of facilities, reducing needless overhead budget, and minimizing expenses in each firm operation. The differentiation approach focuses on creating distinct items in comparison to other competitive products (Cho & Lee, 2018). Some of the indicators of differentiation in an organization include adoption of a different technology, prestige and brand, innovation and different product features. Further the ability of an organization to develop a different supply network and customer service are additional features of differentiation. Finally, the focus strategy is concerned with selecting a certain business segment and product to be its focus. The common indicators of the focus strategy include a focusing on superior products for a certain segment, excellent products and offering excellent service on the market being served. In the present study, the banks sustainable competitive advantage measures will include, cost containment, turnaround time, customer satisfaction, customer number growth, customer value growth and product innovation. One of the Kenyan market segments that have experienced adoption of technology in its quest to improve their competitiveness is banking industry.

Commercial banks in Kenya play a vital role in driving economic development by making substantial contributions to the country's financial stability, growth, and general prosperity. The Central Bank of Kenya (CBK) (2023) reports that there are now 39 commercial banks in operation in Kenya, with eight of them being listed on the Nairobi Securities Exchange (NSE). The banks act as intermediaries between savers and borrowers and thus mobilize funds from individuals and businesses with surplus funds and channel them to those in need of capital for various purposes. In addition, commercial banks offer credit facility to businesses, mobilize deposits, offer trade and commerce support, monetary policy transmission, facilitate financial inclusion as well as general stability of the financial system. CBK (2019) reports that several banks have undertaken diverse improvements in their operations during the last decade. Simultaneously, the local banking industry had eight distinct mergers and acquisitions throughout the same timeframe. These transactions, together with diverse product diversifications, led to a range of performance outcomes. In the past ten years, the banking sector has experienced several changes. These include the consolidation of smaller financial institutions by larger banks through mergers and acquisitions, the integration of new technologies, especially mobile technology, to enhance the efficiency of banking services, the implementation of new organizational frameworks, and the ongoing assessment of cultural aspects within the industry (Muhindi & Ngaba, 2018).

The primary banking sectors that have embraced the implementation of information technology include core banking services, ATM systems, point of sale systems, mobile banking, and internet banking. In addition, technology has been integrated into the cheque clearing system and the process of agency banking rollover. In a similar vein, the regulation of the banking industry has grown, necessitating ongoing adjustments by banks to conform to the prevailing banking framework (siligwa & Rennox, 2017). As a result of the uncertain nature of the banking industry in Kenya and the competitiveness being witnessed, it becomes imperative that the banks be managed by persons that have a strategic vision and can anticipate changes and be able to come up with appropriate strategies.

## **1.2 Statement of the Problem**

Over the preceding two decade, the banking sector has found itself contending with a multifaceted landscape characterized by swift technological progressions, regulatory change, and the evolving tendencies of clientele (Ooko & Muchelule, 2024). This paradigm shift has been underpinned by the proliferation of financial technology (fintech) innovations and the

advent of digital technologies, ushering in transformative changes within the Kenyan banking sphere (Kamuangu, 2024). To remain competitive, banks have undertaken strategic investments in user-centric mobile applications, online banking platforms, and other digital solutions aimed at augmenting customer experiences and securing a competitive advantage. A failure to adapt to these transformative dynamics could precipitate deleterious ramifications on the sustainability and competitive positioning of financial institutions (Schweizer & Koscher, 2021). The thoughtful adoption of pertinent technological advancements by Kenyan commercial banks is anticipated to exert an apparent impact on their competitive environment. Nonetheless, the precise magnitude and trajectory of the resultant organizational outcomes stemming from varied digital adoption capacities remain nebulous. By embracing digital banking solutions, mobile banking platforms, sophisticated data analytics, and technological integration, Kenyan banks can bolster their capacity to diversify their alternative channels, optimize human capital utilization, proactively manage customer relations, and ultimately, fortify their competitive position. Ndungu (2018) underscores that banks that efficaciously incorporate technology into their operational frameworks, products, and service provisions are better positioned to address evolving customer demands, navigate market fluctuations, and negotiate the competitive background.

Multiple scholarly inquiries have sought to delineate the influence of technology adoption on banking outcomes. For instance, Mang'ana (2022) examined the strategic integration of technological innovations and its impact on the competitive advantage of commercial banks in Kenya. Specifically, the study endeavoured to discern how the adoption of technology-driven capabilities, encompassing E-Money transfer systems, telephone banking facilities, internet banking platforms, and internal control mechanisms, influenced the competitive positioning of banks. The findings suggest a positive and statistically significant relationship between technology adoption metrics and the competitive advantage of commercial banks in the Kenyan context. Ahmed and Wamugo (2018) delved into the ramifications of financial innovation on the performance trajectories of commercial banks in Kenya, while Haseeb et al. (2019) endeavoured to ascertain the role of technological challenges in engendering a sustainable competitive edge for Small and Medium Enterprises (SMEs) in Malaysia. Although the latter investigation alluded to an indirect effect via strategic alignment on sustainable competitive advantage, it did not explicitly consider the competitive advantage accruing to banks from facets such as automation, alternative service channels, human capital optimization, and

customer relationship management. In addition, the context of the two studies differs due to their operating environments and regulatory conditions.

The speed at which disparate digital technologies are being introduced into the financial ecosystem, and their consequential impact on institutional operations, is inherently dynamic. What might have constituted a source of sustainable competitive advantage a few years ago is not necessarily tenable in the contemporary milieu or foreseeable future. Moreover, antecedent scholarly examinations scrutinizing the nexus between digital technology adoption and organizational outcomes have often relied upon disparate constructs or amalgamations thereof, diverging from the four-dimensional framework of digital adoption contemplated within the purview of the present inquiry. Compounded by contextual disparities across these studies, the current investigation sought to bridge extant conceptual, contextual, and methodological lacunae.

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

The general objective of the study was to assess the effect of technology adoption capabilities on the sustainable competitive advantage of commercial banks in Kenya

### **1.4 Specific Objectives**

- i. To investigate the effect of automation on the sustainable competitive advantage of commercial banks in Kenya
- ii. To establish the effect of alternative channels on the sustainable competitive advantage of commercial banks in Kenya
- iii. To determine the effect of optimization of Human Capital on the sustainable competitive advantage of commercial banks in Kenya
- iv. To determine the effect of customer relationship management on the sustainable competitive advantage of commercial banks in Kenya

### **1.5 Research Questions**

- i. What is the effect of level of automation on the sustainable competitive advantage of commercial banks in Kenya?
- ii. What is the relationship between levels of alternative channels on the sustainable competitive advantage of commercial banks in Kenya?
- iii. How does optimization of human capital affect the sustainable competitive advantage of commercial banks in Kenya?

- iv. How does customer relationship management impact on the sustainable competitive advantage of commercial banks in Kenya?

## **1.6 Significance of the Study**

This study will be of importance to commercial banks in Kenya, regulators, academicians as well as be of value to the development of the strategic practice.

### **1.6.1 Policy holders**

The study will be of value to the policyholders who will understand the significance and direction of effect of technology adoption. Policyholders like the CBK can benefit in refining and developing regulations. This research can inform regulatory frameworks that encourage responsible and secure technology adoption, ensuring that banks comply with industry standards and protect the interests of policyholders. Understanding how technology adoption influences the competitive advantage of banks helps regulators create an environment that encourages healthy competition. This can lead to better services, improved products, and ultimately benefit policyholders by providing them with a wider array of choice. In addition, the research findings can inform regulatory policies focused on protecting consumers, including policyholders. This is because that by understanding how technology adoption affects service delivery, data security, and overall customer experience, regulators can implement measures to ensure that policyholders are treated fairly and their interests are safeguarded.

### **1.6.2 To the Management**

The study results may provide valuable insights to the management of commercial banks, aiding them in making strategic choices. The insights may be used by bank management to make well-informed strategic choices on technology investments, ensuring that their resources are aligned with the objective of attaining and maintaining a competitive advantage in the market. Likewise, the bank administration may effectively deploy the resources that are now accessible. To be competitive in a quickly changing technology environment, the bank would need to make investments in technical infrastructure, acquire talented individuals, and implement ongoing training programs. Typically, adopting technology improves how efficiently a bank operates. As a result, bank management can use research findings to pinpoint

areas where technology can be used to make processes more efficient, cut costs, and improve overall efficiency. This ultimately helps the bank gain a long-lasting competitive advantage.

### **1.6.3 To scholars**

The project will enhance the scholarly understanding of the convergence of technology adoption, sustainable competitive advantage, and the banking sector in the Kenyan environment. This research will contribute to the existing information on the influence of technology improvements on corporate strategy and competitiveness. Scholars may use the study results to enhance or create theoretical frameworks pertaining to the adoption of technology and the establishment of a sustainable competitive advantage in the banking industry. The acquired insights may result in the development of novel theoretical frameworks or the improvement of current ones. Furthermore, the study will provide valuable insights that may guide future research agendas by establishing a foundation for proposing and conducting further studies in relevant domains. This will contribute to the advancement of the subject and the resolution of existing knowledge gaps regarding the use of technology in the banking sector. Moreover, this study will enable scholars to provide counsel to policymakers and regulatory entities. By disseminating evidence-based perspectives, academics may shape the formulation of policies that promote responsible and efficient integration of technology in the banking industry.

### **1.7 Chapter Summary**

The first chapter lays the groundwork for the entirety of the research paper. It delves into the background of the study, elucidating the variables that inform it, while also providing context to the issue by highlighting its significance within the landscape of commercial banks in Kenya. Furthermore, it expounds upon the rationale, scope, and significance of the study to various pertinent stakeholders, thereby establishing a comprehensive framework for the research.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter presents a comprehensive overview of previous research undertaken by scholars about technology adoption and its impact on gaining a competitive advantage. These studies provide more understanding of the relevant literature and theoretical underpinnings that form the basis of this investigation. This section covers the theoretical basis, extensive empirical research on the adoption of technology, and its impact on achieving a sustainable competitive advantage. Finally, the chapter concludes by presenting a conceptual framework and providing a concise overview of the existing literature, while also highlighting areas where more study is needed.

#### 2.2 Theoretical Review

To research was anchored on four theories, namely, Resource dependency theory, Technology Adoption Theory, Expectation Disconfirmation Theory and Porters theory of competitive advantage. Discussion of these theories and their relevance in the current study is discussed in this section.

##### 2.2.1 Resource Dependency Theory

The Resource Dependence Theory (RDT) traces its roots back to the pioneering work of Pfeffer and Salancik (1978). This theoretical framework asserts that organizations are not self-contained entities; rather, they rely on their external environment to procure the essential resources required for their operations. Davis and Cobb (2015) further emphasize that RDT suggests organizations lack sufficient strategic resources, compelling them to seek external sources to fulfil their resource needs. Effectively managing this dependence is crucial for organizations, and they can achieve this by strategically structuring their relationships with other entities through formal and semi-formal mechanisms. This approach ensures a consistent and reliable supply of the required resources. Moreover, the theory posits that businesses' decision makers form partnerships with other entities to develop their company and get access to new resources, driven by the potential danger posed by existing and future competitors (Klein & Pereira, 2016). The idea acknowledges that in order to have a successful collaborative approach among partners; it is necessary to identify and respect the responsibilities and values of each organization involved.

Thiong'o et al. (2021) cited a previous study by Husted and Kock (2015) that recognizes the view of Resource Dependence Theory (RDT) that relying on external resources leads to the creation of a relational rent. This rent, in turn, facilitates the pooling of resources, technologies, markets, and information, resulting in benefits from economies of scale and scope. It also enables firms to share risks and outsource various stages of the value chain. According to Chimucheka and Mandipaka (2015), resource dependence has strategic implications for business organizations. It enables firms to focus on their core activities in the value chain, enhances their network flexibility by avoiding unnecessary commitments, and reduces transaction costs through mutual awareness and trust among network members. In addition, Frynas and Yamahaki (2016) assert that the use of RDT collaboration tactics enables enterprises to effectively acquire essential resources from their surrounding environment. In summary, the Resource Dependence Theory (RDT) suggests that an organisation must use external resources' advantages in addition to its own internal resources to increase its competitiveness.

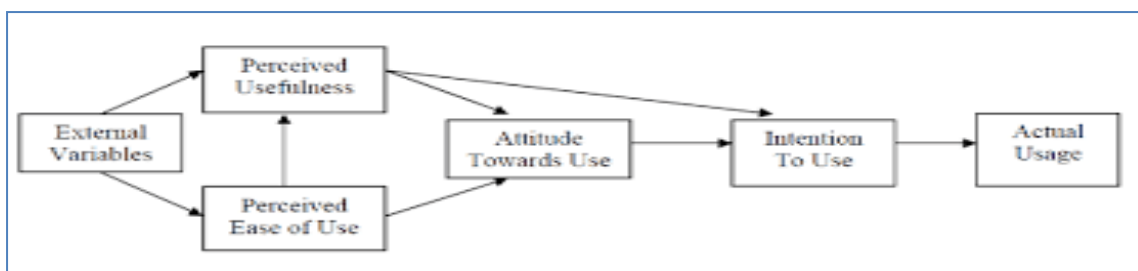
The resource dependency hypothesis recognizes the importance of collaboration, as it leads to enhanced achievement of individual goals and the emergence of fresh prospects. Moreover, the unequal reliance on resources contributes to the mitigation of environmental unpredictability for specific companies. As cooperating partners persist in their joint efforts, they develop a mutual dependency that strengthens the current economic connection. Hence, when an organization encounters a performance obstacle, assistance from external collaborators aids in readjusting the company's strategic trajectory. Therefore, proponents of Resource Dependence Theory (RDT) argue that it is crucial for a corporation to carefully consider the individuals and entities that have control over essential resources.

### **2.2.2 Technology Adoption Theory**

The Technology Adoption Model (TAM) was proposed by Davis (1989) as a tool for forecasting consumers' acceptance and application of new technology. According to Venkatesh (2000), the concept posits that the adoption of a new technology by users or an organization is determined by their assessment of its ease of use, perceived utility, and attitude toward its usage. According to their own evaluation, the actions might have either positive or negative effects on a system. Users anticipate real advantages from the usage of the technology while completing their duties. This stance elucidates the critique aimed at the Technology Acceptance Model (TAM), asserting that although TAM effectively describes individual

behavior, it falls short in elucidating user behaviors related to the acceptance or rejection of new technologies (Hu et al., 2019).

As per Davis (1989), consumers' inclination to embrace a new technology is mostly determined by their perception of its utility in doing their tasks, rather than its level of difficulty. However, the model still identifies the simplicity of use as having an essential influence on the adoption of the new technology as it would ultimately decide the perceived utility. Consequently, the more user-friendly a particular technology is, the higher the probability that consumers would see it as valuable (Fraj, Matute & Melero, 2015). Figure 2.1 illustrates the chronological order in which an organization or person adopts technology.



**Figure 2. 1: Technology Acceptance Model**

*Source: Bagozzi et Warshaw*

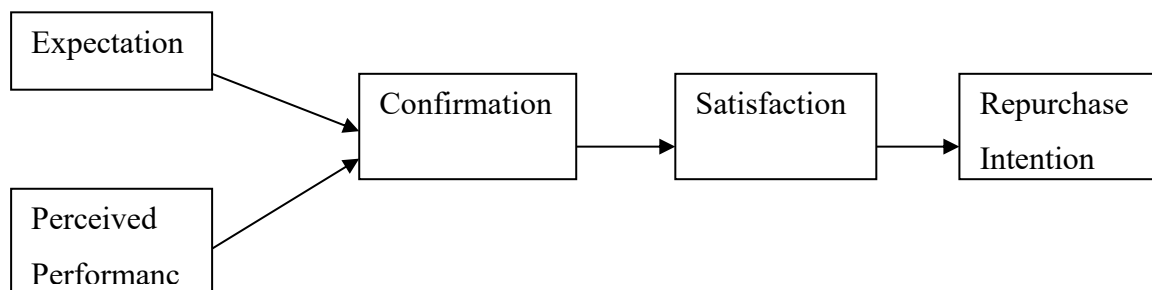
According to Figure 2.1, the TAM model acknowledges that the utility of technology and its simplicity of use may forecast one's attitude and desire to use it, which in turn leads to the acceptance and utilization of that technology. In the context of a business organization, perceived usefulness pertains to an individual's perception of the extent to which using a specific technology would enhance the competitiveness of the firm. Conversely, perceived ease of use refers to the extent to which an individual believes that using the technology would require minimal effort (Davis, 1989). It is important to note that the Technology Acceptance Model (TAM) does not consider the user's subjective viewpoint on the technology. Instead, TAM concentrates on the user's subjective assessment of the technology's perceived usefulness and ease of use as benchmarks for acceptance.

### **2.2.3 Expectation Disconfirmation Theory**

The Expectation-Disconfirmation Theory (EDT) was advanced by Oliver (1977) and further refined in 1980) with the intention of explaining why users of a technology change their reaction over time of implementing the project. The underlying focus of EDT is that the

satisfaction of a technology by users is a function of their expected expectation and disconfirmation and the same will influence their repurchase intention (Oliver et al. 2014). The expectation of a user is taken as a prior position that they hold on to the product before acquiring them. On the other hand, disconfirmation describes any discrepancy that might come about between the expectations and actual experiences of the used (Susarla et al. 2018). Positive disconfirmation occurs when an event proves to be better than anticipated, according to Kopalle and Lehmann (2001). Conversely, if the result falls short of expectations, there is a negative disconfirmation.

Oliver (1980) proposed a model that predicts customer satisfaction with technology based on a five-step process. This process begins with the user's original expectations before purchasing or adopting the system, followed by the acceptance of the product or service. Following the adoption of the product, the next phase involves the user forming a perspective of the product based on its main qualities (Chiu et al., 2005). The third phase in the confirmation disconfirmation process involves comparing the assessment of the product with the original perspective, depending on the degree of disconfirmation. Confirmation and positive disconfirmation help sustain a reasonable degree of contentment, whereas negative disconfirmation reduces dissatisfaction (Oliver, 2009). Figure 2.2 illustrates this approach.



**Figure 2. 2: Expectation-disconfirmation Theory (Adopted from Oliver, 1977)**

In the information technology field, the effect of unrealistic expectation by users on a technology was assessed by Ginzberg (1981) and found that organizations and individuals that held a more realistic position on a system were found to be more satisfied than those that held high expectations about a technology adopted. Szajna and Scamell (1993) subsequently elucidated this discovery by using the cognitive dissonance theory to demonstrate that users

would adjust their level of satisfaction with a system to match with their expectations. Contentment that having too lofty expectations would lead to a diminished perception of the benefits, in contrast to having reasonable expectations. The degree of contentment elucidates the fundamental inclination to persist and how these incentives impact the inclination to persist. Building on earlier studies, Bhattacharjee and Premkumar (2004) explained the processes and justifications for how users' attitudes and views about using IT change as they get more expertise with the particular system. The findings show that the most important element influencing the likelihood of continuing to use information systems is one's degree of pleasure with their use.

#### **2.2.4 Porter's Theory of Competitive Advantage**

Porter (1985) is credited with formulating the theory of competitive advantage, which asserts that an organization can attain a competitive edge by either offering the same benefits as its competitors at a lower cost (cost advantage) or by delivering a product with superior benefits compared to competing products (differentiation advantage). The theories of competitive advantage advocate for corporate organizations, much like countries, to adopt strategies that lead to the production of superior commodities capable of being sold at premium prices in the market (Wang, Lin & Chu, 2019). The theory posits that for a business to achieve satisfied customers; it is necessary to provide products of greater value than what is expected by management. This can be accomplished through efficient production organization, increased utilization, and minimizing production costs (Nderituet al., 2020). Resources that are precious and scarce might provide an edge over competitors. They can sustain their advantage over time if these resources are likewise difficult to duplicate, replace, and disperse (Barney, 2010). When a business acquires or develops a quality, or set of qualities, that enables it to perform better than its rivals, it has a competitive advantage. These characteristics might include having easy access to natural resources, such large quantities of excellent ores or affordable power sources, having a highly educated and competent labour force, and having cutting-edge technology.

Additionally, as per Porter's analysis, once the factors influencing a business's competitive position are discerned, the framework delineates strategies aimed at elevating the organization's performance. These strategies encompass focus, distinctiveness, and cost leadership. Cost leadership, specifically, is a strategic tactic geared towards surpassing competitors by prioritizing efficiency over the quality of the service or product (Al Shobaki & Abu-Naser,

2017). This approach revolves around delivering services or products to clients at a competitively lower cost while upholding service standards and quality. This strategy is shown by the management process of reducing costs and expenses inside a company or organization. A firm's distinguished approach refers to the deliberate action taken to establish a noticeable and tangible distinction in their product or service. The goal is to attract a broad client base within the industry who recognize and appreciate the high quality and alignment with their unique requirements (Porter, 1998). The focus strategy entails a corporation narrowing down its marketing approach by targeting certain geographic regions, segments of the product line, or customer groups. Indeed, this approach enables organizations to focus their efforts on specific geographic regions, product line segments, or customer groups (Brenes et al., 2014). By directing resources and strategies towards areas or market niches, companies employing a focused approach can tailor their offerings more precisely to meet the unique needs and preferences of those specific segments, potentially gaining a competitive advantage in those targeted markets. Absolutely, this strategic focus empowers organizations to streamline their operations and allocate resources efficiently, thereby maximizing effectiveness within their chosen domains.

## **2.3 Empirical literature review**

### **2.3.1 Automation and sustainable competitive advantage**

The integration of cutting-edge technologies for business process automation enables organizations to enhance the digitization of internal operations and processes. This, in turn, leads to heightened efficiency and effectiveness, ultimately securing the sustainability of the business (Laudon and Laudon, 2019; Ivanov & Mayorova, 2015). The utilization of various IT platforms is associated with a multitude of advantages that contribute to an overall improvement in corporate competitiveness. Big data analytics, for instance, facilitates the extraction of value from vast amounts of data, allowing for swift collection, discovery, and analysis (Chen, et al., 2014). Online social network data, being a conventional and significant source of big data, can be analyzed to drive innovative and customer-centric post-sale services, as well as to enable prompt actions based on consumer feedback. As per the principles of dynamic capabilities, business organizations integrate, build, and reconfigure technological resources to adapt to changing environments. Through adoption of an appropriate technology adoption enables learning, innovation, and strategic renewal, thereby sustaining competitive

advantage in dynamic financial markets through continuous responsiveness and capability enhancement (Dewasiri, et al. 2023).

In a study conducted by Chen et al. (2021), they explored how the adoption of fintech skills could enhance the performance and future survival of commercial banks in China. This highlights the growing recognition of the role of technology in reshaping and optimizing business practices within the financial sector. The research used a qualitative methodology to gather data, using five questionnaires and analysing the data using the technique of structural equation modelling. Consistent with the research conducted by Laudon and Laudon (2019), it is evident that the adoption of fintech products by Chinese commercial banks had a favourable impact on employee productivity, customer contentment, and the overall quality of banking services. Consequently, this led to an enhancement in the competitiveness of these banks. In contrast to Bendoly et al.'s (2015) findings, which indicated that customers did not encounter challenges when using alternative banking channels, Chen, et al. (2021) study revealed a noteworthy adverse effect of users experiencing difficulties with FinTech products (FTP). This difficulty ultimately led to a decrease in customer satisfaction.

Beck et al. (2017) emphasize the use of cloud computing in business to enhance the efficient use of resources, enabling the implementation of economies of scale and cost management in financial institutions. In addition to cost reductions, cloud computing was also discovered to enable effortless deployment and streamlining of corporate processes. In their 2022 study, Boute et al., examine the implementation of digital lean operations in Belgian financial institutions. They argue that automating business operations facilitates collaboration and data sharing within business networks, enabling the identification of market shifts and the implementation of strategic actions such as relocating facilities, changing suppliers, and outsourcing non-core services. The research determined that the use of artificial intelligence improves the integration of digital lean operation inside financial institutions. According to Ngai et al. (2011), the automation of business processes enhances the flexibility of supply chains by enabling them to promptly detect and react to market fluctuations, exchange information and knowledge across different functions, adapt to unexpected events and market changes, and establish a virtual supply chain. This reduces the reliance on internal resources necessary for providing effective services. This statement outlines the fundamental concept of the Resource Dependence Theory (RDT), which suggests that to increase an organization's reach in terms of products and services, it is necessary to seek more external resources to supplement the existing internal resources.

Akpan et al. (2020) argue that the automation of enterprises provides firms with the chance to generate value by creating novel goods for clients. Optimal results are attained when the business entity efficiently collects consumer data during their association with the company, while also enhancing focused marketing strategies via product differentiation and market segmentation. Kemunto and Kagiri (2018) aimed to assess the influence of applying fintech methods on the competitiveness of Kenya commercial bank via the use of a descriptive study approach. The researcher considered the factors of online banking, mobile banking, process automation, and agency banking. The discovery demonstrates a clear and meaningful connection between process automation and competitiveness in commercial banks. This study corroborates the results of Mwangi (2013), which shown that automating operations improved customer service, decreased cost inefficiencies, facilitated bank development, and helped maintain a competitive edge in commercial banks. Nevertheless, the use of automation in a firm does not inherently provide a competitive advantage. Instead, this advantage is only achieved when combined with effective organizational strategies and utilization of human resources (Coltman & Devinney, 2013). In addition, organizations will be required to adopt a higher quantity and frequency of modifications in the IT system to sustain its support for a business process post-implementation. Likewise, firms may need to expand their IT systems by including new modules or using new methods of executing procedures to achieve commercial growth (Gyimah et al., 2023)

### **2.3.2 Alternative channels and sustainable competitive advantage**

The use of alternative channels is the process through which a business uses physical stores as well as online platforms to sell its products or offer services. Bendoly et al. (2015) underscore that there are two approaches to integrating business channels: a hybrid model amalgamating online and offline businesses, and a strategy facilitating access to and information about physical stores on the internet platform. Wang and Cheng (2016) observe that retail giants like Walmart, Macy's, Best Buy, and Staples have acknowledged the significance of online business channels and are adopting a multi-channel retailing strategy. Implementing a multi-channel company strategy offers the advantage of enhancing service quality and mitigating risk exposure by effectively integrating online and offline channels, leveraging their respective strengths. For instance, the physical channel may complement the internet channel in terms of service quality and risk management.

In a study by Oteh, et al. (2017), the impact of e-banking channels on the operational effectiveness of commercial banks in Nigeria was evaluated. Conducted with a sample of 47 banks in Ibo state, the study employed a descriptive research approach for data collection and analysis. The findings indicated that the effectiveness of electronic banking channels, such as debit cards, video banking, and mobile transfers, was influenced by the source of technology. This aligns with the findings highlighted by Kaur et al. (2021), emphasizing the diverse channels utilized by banks. Consequently, the enhanced service quality and reduced risk associated with the online channel may contribute to a more favourable evaluation of the offline channel. Online channels offer enhanced intermediation by enabling commercial organizations to extend the distribution of specialized items across a wide geographical area, broadening their supply with specialty products from other small and medium-sized enterprises (SMEs). Nonetheless, it's crucial for individuals utilizing digital technology across various platforms provided by a firm to recognize the advantages and user-friendliness of the technology. The Technology Acceptability Model (TAM) suggests that the adoption and acceptability of a technology are influenced by its perceived utility and ease of use.

According to Jeanpert and Paché (2016), an alternative channel strategy in the banking industry yields various benefits, both from the bank's perspective and from the customer's point of view. Consequently, one of the challenges banks faces is ensuring consistent service delivery quality across both e-banking and traditional brick-and-mortar branches. It is incumbent upon the bank to provide the same level of service across all distribution channels consistently. Patel and Brown (2016) acknowledges that adoption of alternative channel of service delivery by a bank result in less administration work in form of reduced stationery, paper costs and that customers can be able to utilize these channels without intervention of the bank staff. However, this leads to less personal interaction with bank staff and thus no consultation option about their finances. Bendoly et al. (2015) contend that the implementation of online service delivery presents obstacles in the early stages due to the perceived complexity and difficulty experienced by clients. It will need a period for clients to get acquainted with the new system.

From the customers' point of view, online service delivery is associated with improved effectiveness because banks end up deploying advanced technology devices, management programs or alarms to help their customers administer all its assets efficiently. Moreover, the use of multi-channel services leads to enhanced competitive advantage since these channels are always accessible, operating continuously throughout the week (Johansson & Kask, 2017). Hence, it is advantageous since there is no time to waste standing in a line, as the bank is now

easily accessible with only a click. Similarly, the services are found everywhere since customers can access bank services everywhere, whether in town or out of town. The convenience to customers is equally enhanced due to their ability to manage all their accounts and transactions with a click of a button in dispersed geographical locations.

### **2.3.3 Optimization of human capital and sustainable competitive advantage**

The long-term viability of enterprises relies on efficiently managing the available resources, with internal resources playing a crucial role in enhancing the competitiveness of organizations (Hidaya, et al. 2020). Human capital, despite its intangibility, is a crucial internal resource that plays a vital role in knowledge management at the firm level. The sustainable competitive advantage of a business depends on its ability to establish relationships with external networks, both at the micro level (such as customers, competitors, suppliers, and partners) and at the macro level (including the technological, legislative, demographic, and cultural environments). Therefore, to achieve long-term success, it is crucial for the organization's human capital to effectively manage and reconcile the interests of many stakeholders (Prajogo & Oke, 2016).

Magana (2022) performed research investigating the impact of technology developments on the competitive advantage of commercial banks in Kenya. The study used a descriptive research approach, with a sample size of 215 respondents from 43 branches of various commercial banks located in the Nairobi Central Business District (CBD). The collection of primary data included the use of a semi-structured questionnaire. The questionnaire assessed the level of technical innovation using indicators such as money transfer equipment, telephone banking, internal workers' network, and internet banking technology. The research findings suggest that organization internal controls were enhanced by effective networks of staff with intense knowledge and that when employees are connected to one another via internal communication network, it increases positive relationship with customers resulting from prompt network. The findings support the conclusion that effective customer-centric communication leads to improved customer experience, loyalty and eventually organizational performance (Al-Shbiel & Al-Olimat, 2019). The findings imply that the adoption of internal communication technology improves the overall efficiency, accessibility of convenience of financial service, an outcome that differentiates bank services from one another and thus resulting in competitive advantage.

The influence of human resource management innovation on the relationship between learning capabilities and competitive advantage of service firms in Australia was undertaken by

Amarakoon, et al. (2018). The research employed a qualitative case study research design with an interview guide being the research tool. Further the study collected the firm's secondary data relating to the number of employees, business operations, and management team concerned. The targeted respondents were HR managers of the respective team with over 28 interviewees participating in the study. The findings suggest that both internally generated and externally acquired knowledge from the technologically enabled systems resulted in improved speed, cost management and agility of the service firms to the changing business environment. The study findings also indicate that for the requisite competitive advantage to be achieved, then it is important that the external knowledge is appropriately adapted to avoid inefficiencies, loss of credibility and wastages. This finding is in tandem with, De Luca and Atuahene-Gima (2007) which found that a lack of synergy between internally and externally sourced technology sources affected seamless working of staff in organizations.

According to Raffiee and Coff (2016) for an organization human capital to have desired effect on the sustainability potential of the firm, employees need to have necessary competence, creativity, knowledge and social capital. The degree of expertise and experience that individuals have gained from both their present and past occupations is referred to as their competence. The essential skills that workers should possess are implementation, coordination, assistance, inquiry, renewal, assessment, concentration, and termination abilities (Al-Tarawna & Al-Salihy, 2004). Moorhead and Griffin (2000) assert that employee creativity refers to the capacity to successfully transform novel ideas into practical applications for the creation of commodities, provision of services, or any other activity. workers' knowledge refers to the process of equipping workers with professional, technical, and specialized information related to the industry, operations, and the ability to comprehend and adapt to the evolving business environment. In addition, another essential attribute of human capital is social competence, which pertains to the ability of employees to effectively interact and collaborate with one another. The cooperation among individuals within the organization is crucial for attaining the desired level of performance (Delery & Roumpi, 2017).

To find out how employee views of human capital practices affect employee productivity and business success, Thuda, Sari, and Maharani (2019) undertook a research. The study used a correlation research technique with an emphasis on Indonesian service firms. The two independent variables at the focus of the study were worker productivity and human capital practices. Corporate performance, however, was the dependent variable. The results showed that the productivity and efficiency of each employee as well as the collective knowledge,

skills, and capacities of the company's staff had a substantial and beneficial influence on the business's overall success. These outcomes are consistent with research conducted by Abomeh and Peace (2015), which found that employee development and training initiatives directly affect a company's human capital and, in turn, its competitive stance.

#### **2.3.4 Customer Relationship Management and Sustainable Competitive Advantage**

In qualitative research undertaken by Alqershi (2020), the focus was on examining how customer relationship management (CRM) may serve as a competitive advantage for small and medium companies in Yemen. The study included analysing data from 247 organizations. The study focused on analyzing organizations at the unit level, with the various owners of the firms being observed. The study focused on a specific group of 1,441 businesses. To choose a representative sample, the research used the Krejcie & Morgan (1970) size table, which helped calculate the appropriate sample size. The study used technology-based CRM, knowledge management, and a main customer focus as proxies for customer relationship management. The findings suggest that technology-based CR and the firm competitive advantage was significant ( $p=0.04$ ) with the study concluding that the direct positive effect is registered in the organizations marketing, product, process and service innovation capabilities. Application of technology in CR was also found to result in improved data integration and analysis of customer information. In line with the findings by Alipour and hallaj Mohammadi (2011), the study concluded that with the adoption of technology in the management of customers, organizations can assess potential customers' needs and be able to proactively respond to them. The study concludes that the ability to respond effectively to customer changes has a net effect of improving the firm level of competitiveness.

Anabila and Awunyo-Vitor (2013) conducted a study to explore the influence of customer relationship management (CRM) on the sustainable competitive advantage and survival of commercial banks in Ghana. Utilizing a cross-sectional research design, the study focused on 25 banks and 54 customers. Data collection was executed through a questionnaire. The findings indicated that customer feedback capabilities, particularly those enabled by technology, were identified as a critical CRM practice significantly affecting the sustainable competitive advantage of banks. This underscores the importance of technology-driven customer feedback mechanisms in contributing to the competitive edge and long-term viability of commercial banks in Ghana. The ability of banks to provide timely feedback, facilitated by technology adoption, resulted in customer loyalty. These findings support those of Roh et al. (2005), who

found that technology-based CRM fosters customer loyalty, resulting in increased revenue and reduced costs.

Kebede and Tegegne (2018) conducted research to determine how CRM affects the performance of banks in Ethiopia's Amhara Region, substituting knowledge management, organizational CRM, and technology-based CRM for individual bank CRM. Convenience sampling and a cross-sectional research strategy were employed to determine the study's participant population. A statistically significant p-value of 0.037 suggests that the application of technology-based CRM has a noteworthy and positive effect on performance. Commercial banks reportedly made substantial investments in information technology assets to enhance customer relationships throughout the entire purchase process, resulting in improved performance.

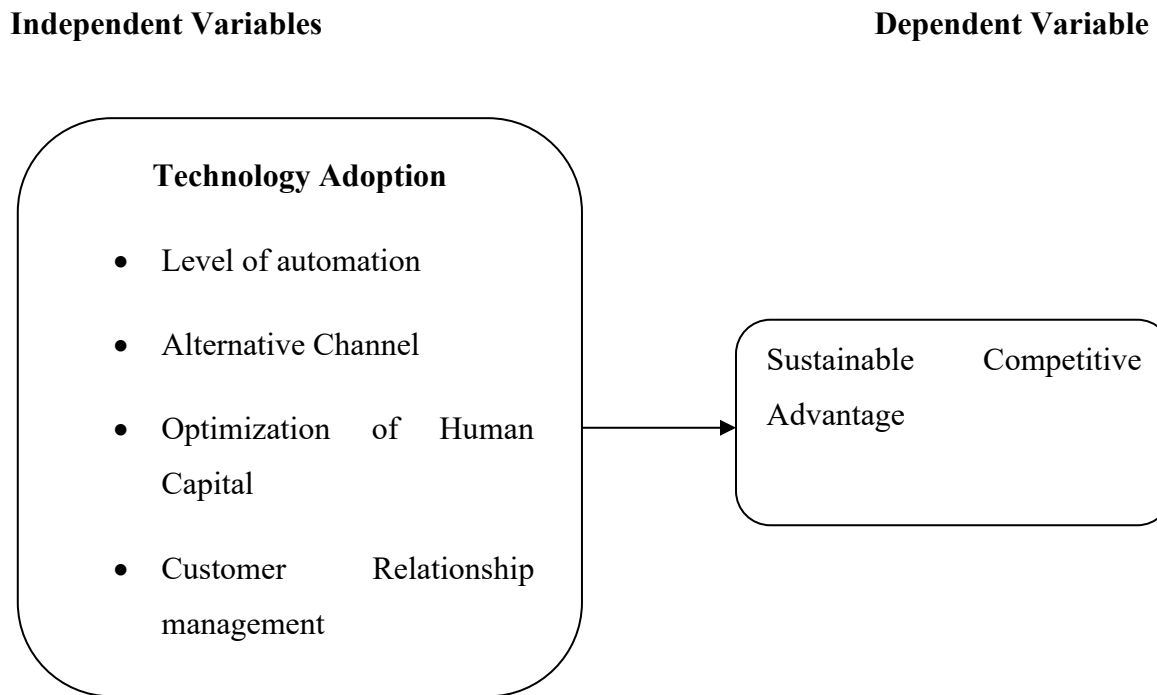
Zaky (2017) aimed to evaluate the impact of information technology adoption on the sustainable competitive advantage of the Egyptian banking sector through the lens of CRM. The study included a sample of forty active banks in Egypt, investigating how institutions in the Egyptian banking environment could establish a long-term competitive advantage by integrating IT into CRM processes. The findings indicated that the use of information technology in CRM substantially and positively influences the performance of banks ( $p=0.000$ ). IT applications in CRM enable the consolidation of client data in a centralized database, facilitating prompt responses to customer requests by the bank. Stefanou, Sarmaniotis, and Stafyla (2003) similarly concluded that utilizing IT in CRM improves a company's adaptability to changes in the business environment.

## **2.4 Conceptual Framework**

Camp (2001) defined a conceptual framework as a well-defined structure that a researcher deems most suitable for describing the development of a natural event under investigation. The statistical conceptual framework organizes the key concepts of a research in a logical structure to graphically represent the relationships between ideas. The conceptual framework accentuates the worthiness of a research topic to be studied, as well as researcher's assumptions and asserted remedies to a defined problem (Adom & Hussein, 2018). The framework shows a relationship between the independent (predictor) and dependent (outcome) variables. An independent variable affects the value of another variable and is not affected by the change of another variable's value while a dependent variable changes in value following the change of

another variable like independent variable. Figure 2.3 shows a conceptual framework, which describes the relationship of the study variables.

**Figure 2. 3: Conceptual Framework**



The above conceptual framework sought to review the interaction between the technology adoption in an organization and sustainable competitive advantage. The dimensions of technology adoption in an organization investigated were level of automation, alternative channel, and optimization of HR and informed decision making. The dependent variable is represented by sustainable competitive advantage that is measured by cost management, differentiation and innovation.

Level of automation, through digital account opening, mobile banking, automated loan processing, and e-signature adoption, enhances banks' competitiveness by improving operational efficiency, reducing costs, and accelerating service delivery. It strengthens customer experience, enables scalability, and supports regulatory compliance. These capabilities allow banks to differentiate their offerings, respond quickly to market changes, and

expand access, ultimately sustaining long-term competitive advantage. Alternative channels dimension as measured by online presence, mobile app usage, customer feedback, and online surveys, has the potential of increasing bank's sustainable competitive advantage by deepening customer engagement, improving service responsiveness, and gathering real-time insights. These channels increase accessibility, strengthen brand loyalty, and enable continuous service innovation, allowing banks to adapt swiftly to evolving customer needs and stay ahead in a competitive market.

In relation to the optimization of human capital, the adoption of different technologies that facilitate employee self-service, workforce analytics, and well-being initiatives, has the potential to affect sustainable competitive advantage by improving productivity, engagement, and retention. Empowered employees deliver better customer service, adapt more effectively to change, and drive innovation. Data-driven HR practices also align talent with strategy, fostering a resilient, high-performing workforce that supports long-term organizational success. Finally, CRM as measured by CRM efficiency tracking, mobile accessibility, automation, and real-time interaction, strengthens sustainable competitive advantage by enhancing customer engagement, personalization, and service responsiveness. Effective CRM systems deepen customer insights and streamline support. Mobile and automated CRM capabilities ensure consistent, proactive communication, enabling banks to build lasting relationships and adapt quickly to customer needs.

#### **2.4 Operationalization of Study Variable**

Operationalization of study variables helps in transforming abstract concepts into tangible, measurable variables with a view to enhancing the rigor, reliability, and validity of research studies. This will allow for meaningful data collection, analysis, and interpretation.

**Table 2.1: Operationalization of Study Variables**

<b>Variable</b>	<b>Indicators</b>	<b>Data Collection Tool</b>	<b>Data Analysis</b>	<b>Supporting Literature</b>
<b>Independent Variables</b>				
<b>Level of automation</b>	<ul style="list-style-type: none"> <li>• Digital account opening</li> <li>• Mobile banking</li> <li>• ATM usage</li> <li>• E-signature</li> </ul>	Structured questionnaire ; 5-point Likert scale	Descriptive statistics; Standard deviation and mean, inferential statistics	Laudon and Laudon (2019).  Kemunto and Kagiri, 2018)
<b>Alternative Channel</b>	<ul style="list-style-type: none"> <li>• Online presence</li> <li>• Mobile app usage</li> <li>• Content marketing</li> <li>• Customer feedback</li> </ul>	Structured questionnaire ; 5-point Likert scale	Descriptive statistics; Standard deviation and mean, inferential statistics	Oteh, et al. (2017; Patel and Brown: 2016)
<b>Optimization of human capital</b>	<ul style="list-style-type: none"> <li>• Employee self-service</li> <li>• E-learning engagement</li> </ul>	Structured questionnaire ; 5-point Likert scale	Descriptive statistics; Standard deviation and mean,	Hidaya, et al. 2020; Thuda, et al. (2019)

	<ul style="list-style-type: none"> <li>• HR-technology learning</li> </ul>		inferential statistics	
<b>Customer Relationship Management</b>	<ul style="list-style-type: none"> <li>• Software usage</li> <li>• Linking CRM to mobile</li> <li>• Real time interaction with customers</li> </ul>	Structured questionnaire ; 5-point Likert scale	Descriptive statistics; Standard deviation and mean, inferential statistics	(Kebede & Tegegne (2018); Stefanou et al. (2003))
<b>Dependent Variable</b>				
<b>Bank performance</b>	<ul style="list-style-type: none"> <li>• Cost effectiveness</li> <li>• Productivity</li> <li>• Customer satisfaction</li> <li>• Employee satisfaction</li> </ul>	Structured questionnaire ; 5-point Likert scale	Descriptive statistics; Standard deviation and mean, inferential statistics	Kemunto & Kagiri, (2018)  Kebede and Tegegne; (2018)

**Source: Researcher (2024)**

## 2.5 Chapter Summary

This chapter covered the extant relevant literature relating to the research objectives by discussing the theoretical foundation anchoring each variable. Similarly, the section evaluated different empirical studies by scholars. The theories discussed with their relevance include Resource dependency theory, Technology Adoption Theory, Expectation Disconfirmation

Theory and Porters theory of competitive advantage. Relevant empirical literature covering the variables themes was also discussed, with the gaps that the current research would bridge discussed. Finally, the chapter conceptualized the variables relationship with the operationalization of the studies.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

This chapter outlines the research approach that guided the study. It encompassed the research philosophy, the selected research design, the targeted demographic for the study, and the intended sample size. Furthermore, it provided a comprehensive explanation of the data gathering approach and the methods employed to evaluate the acquired data. Subsequently, the strategies that were used to maintain the research's calibre and the ethical principles that were adhered to were elucidated.

#### 3.2 Research Philosophy

Every research philosophy starts with the premise that people have different perspectives on the world, and that it is important to provide these perspectives a forum to be articulated via information exchange. Research philosophy, according to Saunders, et al. (2015), is a set of ideas that clarify how experts in a certain subject use their knowledge in their work. According to Krishnaswami and Satyaprasad (2010), research philosophy encompasses fundamental beliefs that researchers have about their perspectives on the world and their approach to their job.

This study was grounded on the pragmatic viewpoint. Positivism, interpretivism, constructivism, and pragmatism are among the prevalent research philosophies. Pragmatism is used in this study, as opposed to other paradigms, with the aim of generating practical suggestions for enhancing management (Saunders, et al. 2015). Adopting a pragmatist philosophy for the study aligns with the overarching goal of understanding how technology adoption impacts a firm's sustainable competitive advantage. By using both quantitative and qualitative techniques and procedures, the pragmatic philosophy permits the creation of links between variables. The pragmatic nature of this strategy lies in its emphasis on finding the most effective solutions to address the research questions and accomplish the study's goals. A more thorough and nuanced knowledge of the intricate link between technology adoption and sustained competitive advantage in a corporate setting may be gained by the study by integrating quantitative and qualitative methodologies. This pragmatic approach acknowledges the flexibility needed to address the multifaceted nature of the research inquiry.

### **3.2 Research Design**

Research design, as defined by Sekaran and Bougie (2016), refers to a set of rules that are intended to achieve a certain target with little interference. This study used a descriptive research approach, which is appropriate for seeking to establish a link between variables. Descriptive research, also known as statistical research, provides a comprehensive account of the phenomena being studied. It is often used in natural and physical sciences to describe social events, structures, and circumstances. According to Gill and Johnson (2006), the aim of a descriptive survey design is to uncover the overarching characteristics of a specific group of subjects. It also helps in understanding an individual's genuine viewpoints and beliefs, thereby assessing how the situation aligns with the target group.

### **3.3 Population of the Study**

A population of a study is a group of individuals or group of objects from which a sample is taken (Kombo & Tromp, 2018). The same position is pursued by Lavrakas (2013) who submit that a study is a finite or infinite group of individual elements with some common characteristics to which the study generalizes the results.

The survey included all commercial banks that were operational in Kenya as of December 31, 2023. As to the report of the Central Bank of Kenya on June 30th, 2023, there were a total of 39 commercial banks that were officially registered and actively functioning in Kenya. This constituted the study's population (Appendix II) ([www.centralbank.go.ke](http://www.centralbank.go.ke))

### **3.4 Data Collection**

The primary data was gathered using a questionnaire as the primary instrument for data collection. A questionnaire, as defined by Schwab (2005), is a measuring tool that prompts participants to reply to a series of questions or statements. Kothari (2015) defines a questionnaire as a written document containing a series of questions arranged in a certain sequence on one or more forms. The questionnaire contained close ended questions with boxes to be ticked and contain boxes weighted from a Likert scale of 5 (to a great extent) and 1 (low effect) on the variable under consideration. The researcher targeted two respondents per bank. The target respondents were managers' in-charge of the Information and Communication Technology (ICT) and the Business Development departments or equivalent positions in the respective banks.

To evaluate the bank's performance, the researcher collected both financial and non-financial performance data using a balanced scorecard technique. A form for gathering data intended to record quantitative and financial information was included in the questionnaire. The questionnaire was divided into three sections: section B evaluated the many technological innovations used by the bank in its operations, while section A included the commercial bank's demographic data. Section C evaluated the bank's sustainable competitive advantage position.

### 3.5 Data Analysis

Once the information is obtained, the questionnaires were cleaned with the aim of identifying those that will have conformed to the set criteria by the researcher in terms of completeness and consistency. Responses were analysed to obtain the mean, standard deviations and percentages, indicating the significance of similarities and distinction. To attain this objective, the primary analytical tool was the Statistical Package for Social Sciences (SPSS). The gathered data underwent assessment through descriptive statistics. Additionally, a regression analysis was employed to ascertain the extent of the correlation between the adoption of technology and the attainment of sustainable competitive advantage.

The regression equation assumed the following form:

$$\text{Bank competitiveness} = f(x_1, x_2, x_3, x_4);$$

Specifically, the regression was of the form;

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \varepsilon$$

Where        Y        =        Bank sustainable competitive advantage

$\beta_0$      =        Constant

$x_1$      =        Automation Level

$x_2$      =        Alternative channels

$x_3$      =        Optimization of human capital

$x_4$      =        Customer relationship management

$\varepsilon$     =        Error Term

### 3.7 Research Quality

High-quality research is crucial to the collection and creation of data that can be analysed (Kothari, 2015). The following research instrument sub-measures were monitored to raise the calibre of the study.

#### 3.7.1 Validity

Validity, according to McMillan and Schumacher (2014), is the extent to which the world's phenomena and the explanation of reality are equivalent. How effectively a test measures what it is supposed to assess is known as its validity. To enhance internal validity in this research, the commercial banks that are currently in operation and have branches in Nairobi were targeted. In addition, the researcher planned to target the bank staff with the requisite knowledge on the organization's technology adoption and its effect on the bank competitiveness. Staff in the ICT department, business development as well as finance were considered relevant in the study.

#### 3.7.2 Reliability

According to Jack and Clarke (2012), reliability, as applied to a questionnaire, refers to its stability, repeatability, or internal consistency. This study aimed to assess the reliability of the research instrument by utilizing Cronbach's Alpha, with a criterion set at a value greater than or equal to 0.7.

According to Zakariya, (2022), acceptable value of Cronbach's Alpha should be 0.7 and above. The study used this principle to determine the reliability of the research instrument, and the table below presents Cronbach's Alpha levels of the variables.

**Table 3.1. Reliability Test using Cronbach's Alpha**

VARIABLE	ITEMS	Cronbach's Alpha	Interpretation
Automation Level	10	0.926	Reliable
Alternative Channels	9	0.805	Reliable
Optimization of Human Capital	8	0.864	Reliable
Customer Relationship Management	8	0.861	Reliable

Table 3.1 indicates that all the variables had a Cronbach's Alpha coefficient above the acceptable threshold of 0.7, affirming the reliability of the instrument. Based on these findings the study instrument was deemed consistent in measuring the intended constructs.

### **3.7.3 Diagnostic Tests**

Various diagnostic tests were conducted, encompassing normality, multicollinearity, and heteroscedasticity assessments. The normality test was employed to ascertain the distribution of data based on established normality criteria. Achieving normality in data enhances the precision of findings, thereby improving the internal consistency of data values.

Multicollinearity, defined by Wooldridge (2013) as any correlation among independent variables in a sample, will be examined. Elevated levels of multicollinearity can inflate p-values in a regression model, leading to inaccurate predictions. The correlation matrix was utilized to evaluate the extent of correlation among predictor variables. Following the criterion outlined by Greene (2012), which identifies a significant degree of multicollinearity with  $r$  or  $r^2$  values exceeding 0.8 or 64%, variables exhibiting such correlations were excluded from the analysis.

Homoscedasticity, indicating that the error remains constant across values of the dependent variable, was also assessed. A scatterplot with residuals plotted against the dependent variable was used to check for homoscedasticity. The test involves examining whether there is a constant deviation of points from the center zero-line. If homoscedasticity was violated, indicating the presence of heteroscedasticity, adjustments were considered, potentially involving the removal of certain inputs from the model.

### **3.7.4 Ethical Consideration**

An introductory letter was dispatched to the Human Resources departments of each bank, outlining the research objectives and emphasizing that the collected data is strictly intended for academic research purposes. Formal communication channels and measures were consistently employed throughout the entire data collection process. This involved securing authorization from the National Commission for Science Technology and Innovation (NACOSTI) to collect data from commercial banks operating in Kenya.

Furthermore, the researcher sought explicit permission from the ethical review committee of Strathmore University, ensuring strict adherence to established conditions. Each participant was duly informed about their rights, encompassing confidentiality, anonymity, the right to skip certain questions, and the option to decline participation in the study. All information disclosed during interviews, including participant identities, were treated with the utmost confidentiality. As a gesture of appreciation, the researcher offered to share the research

findings with the respondents and express gratitude by sending a thank-you note upon the successful completion of the research.

### **3.8 Chapter Summary**

This chapter comprehensively outlines all the methodological approaches that were employed during the research process. It elucidates the research philosophy to be adopted, the research design chosen, the targeted population, and the sampling design. Additionally, it explains the data collection procedure to be utilized during data collection and outlines how the collected data will be analyzed. As a result, this chapter offers a detailed and systematic explanation of the methods and procedures that guided the study.

## CHAPTER FOUR

### PRESENTATION OF RESULTS

#### 4.1 Introduction

This chapter presents the results of the analysis, findings and discussions of the study on the research objectives. The objectives of the study were to establish the effect of technology adoption capabilities on the sustainable competitive advantage of commercial banks in Kenya.

#### 4.2 Response rate

The study target was 78 managers' in-charge of the Information and Communication Technology (ICT) and the Business Development departments or equivalent positions in the respective 40 commercial banks in Kenya. The researcher issued 78 questionnaires from which 73 were returned. Therefore, the response rate was 92.4% and it was considered excellent. This response rate concurs with stipulations by Mugenda and Mugenda (2003) that a response rate which is above 50% is representative for the target population. This is summarised in Table

**Table 4.1: Response Rate**

Category	Frequency	Percent
Returned	73	92.4%
Not returned	5	7.6%
<b>Total</b>	<b>78</b>	<b>100%</b>

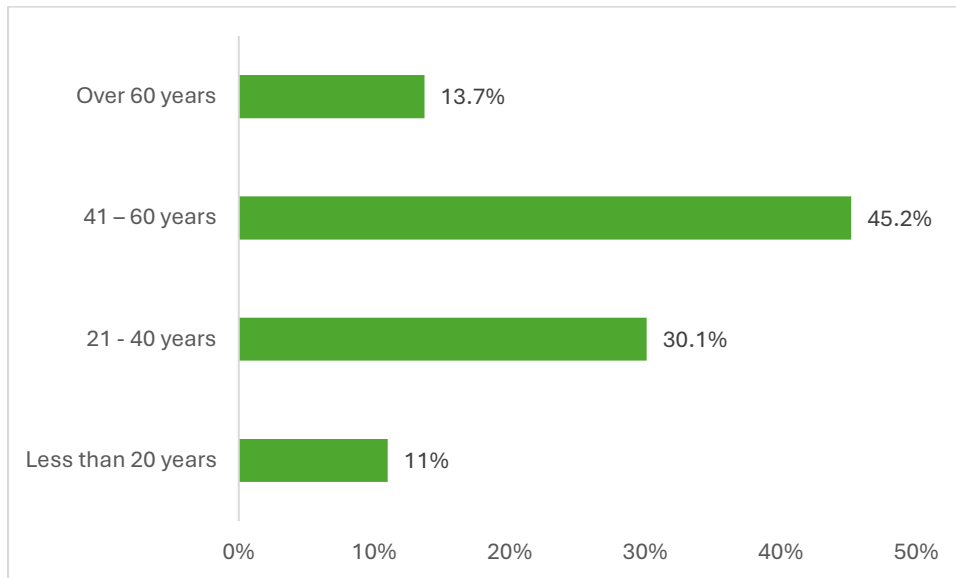
**Source: Researcher (2025)**

#### 4.3 Demographic Information Top of Form

To understand the background of the respondents and their experience within the banking industry, this section collects essential demographic details. These aspects help in analysing the influence of technology adoption capabilities across different banks and employee categories.

##### 4.3.1 Bank's Operational History

The number of years a bank has been in operation can influence its approach to technology adoption. Older banks may have well-established systems, while newer banks may be more agile in adopting new technologies. The study sought to determine the number of years a bank has been in operation. The results were as summarized in Figure 4.1.

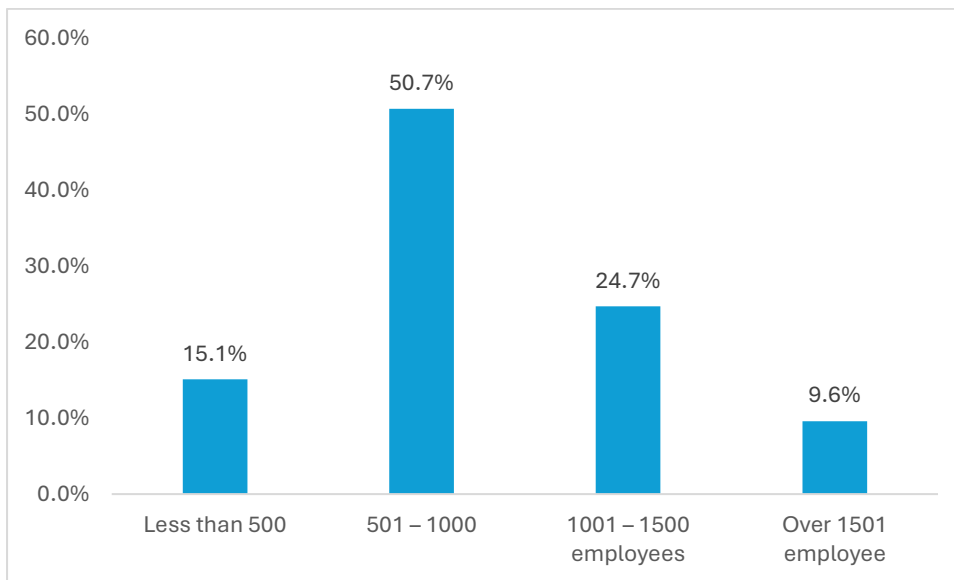


**Figure 4.1: Bank’s Operational History**

According to the study findings, most respondents (45.2%) indicated that their banks had been in operation for between 41 and 60 years, while 30.1% reported working in banks that had operated for 21 to 40 years. This suggests that a significant portion of commercial banks in Kenya have long-established operational histories, which may influence their approach to technology adoption. Older banks are likely to have well-developed systems, legacy infrastructure, and structured processes that could either facilitate or hinder the adoption of new technologies. On the other hand, only 11% of the respondents were from banks that had been in operation for less than 20 years, and 13.7% were from banks with over 60 years of experience. The presence of both well-established banks and relatively newer institutions in the banking sector highlights the diversity in technology adoption capabilities. Newer banks may exhibit more flexibility in integrating innovative solutions due to fewer legacy constraints, while older banks might face challenges related to transitioning from traditional banking systems to modern, technology-driven operations. These variations in operational history are likely to impact the strategic adoption of technology and its influence on sustainable competitive advantage within Kenya’s commercial banking sector.

### 4.3.2 Bank Size

The size of a bank, in terms of the number of employees, may affect its ability to integrate and manage technological advancements. Larger banks often have more resources for technology adoption, while smaller banks may face budgetary constraints. The study sought to determine the number of employees in each bank. The results were as summarized in Figure 4.2.

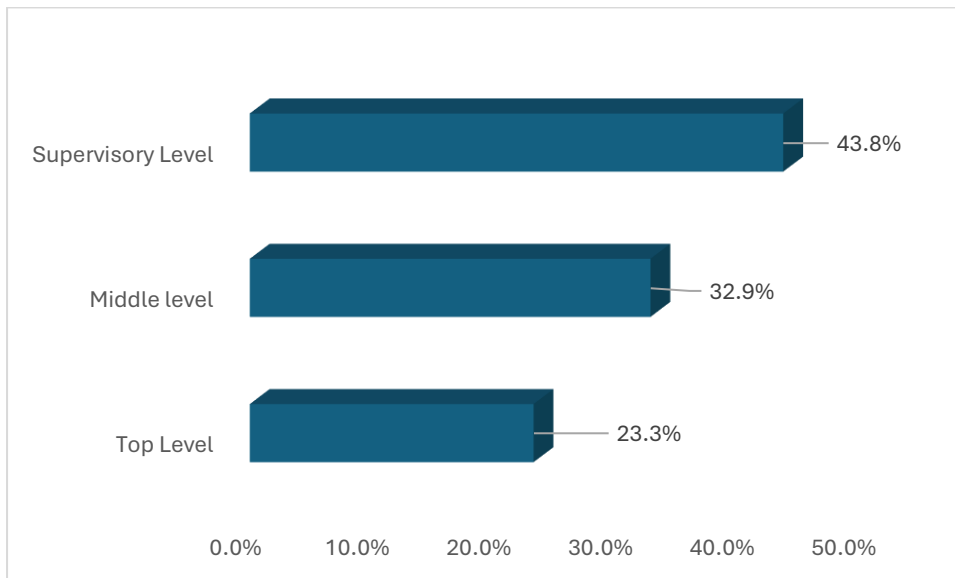


**Figure 4.2: Bank Size**

According to the study findings, the majority of respondents (50.7%) indicated that their banks employ between 501 and 1,000 employees, while 24.7% reported that their banks have between 1,001 and 1,500 employees. This suggests that most commercial banks in Kenya fall within the medium-to-large employee size category, which could have implications for their ability to adopt and implement new technologies. Larger banks often have more resources, structured departments, and specialized IT teams that can drive digital transformation and innovation. Conversely, 15.1% of the respondents stated that their banks have fewer than 500 employees, indicating the presence of smaller banks that may have leaner operations and potentially greater agility in technology adoption. Only 9.6% of respondents worked in banks with over 1,500 employees, representing the largest institutions, which may have more complex bureaucracies but also the financial strength to invest in cutting-edge technological solutions. The variation in workforce size among commercial banks in Kenya highlights differing capacities for technology adoption, which could ultimately influence their ability to achieve sustainable competitive advantage in the industry.

### 4.3.3 Management Level

Technology adoption decisions often vary across different levels of management. Senior executives may focus on strategic adoption, while middle and supervisory levels may be responsible for operational implementation. The study sought to determine the level of management of the respondents. The results were as summarized in Figure 4.3.



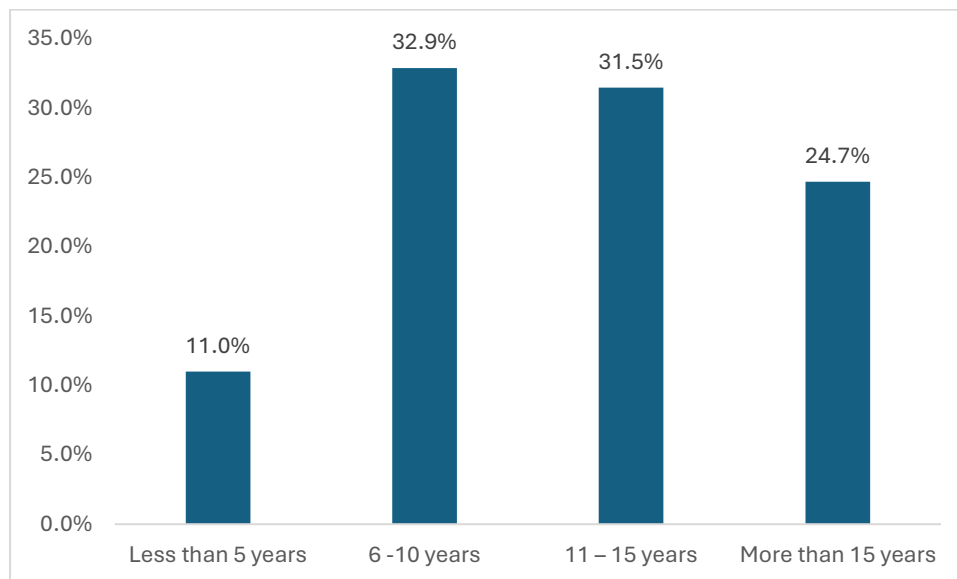
**Figure 4.3: Management Level**

According to the study findings, most respondents (43.8%) were from the supervisory level, followed by 32.9% who were in middle management, while 23.3% were in top-level management. This distribution suggests that the study captured insights from a diverse range of managerial perspectives within commercial banks in Kenya, with a strong representation from those directly overseeing operational activities and implementation of technology-driven initiatives. Supervisory-level managers, being more engaged in day-to-day processes, are likely to provide practical insights into the challenges and effectiveness of technology adoption. Middle-level managers, who act as a bridge between strategy and execution, offer a broader view of how technology aligns with business objectives. Meanwhile, top-level managers contribute strategic perspectives on how technology adoption impacts sustainable competitive advantage at the organizational level. The inclusion of all three levels of management ensures

a comprehensive understanding of how technology adoption capabilities influence banking operations and long-term competitiveness in the sector.

#### 4.3.4 Work Experience

Employee experience in the banking industry plays a role in technology adoption. Those with longer tenures may be accustomed to legacy systems, whereas newer employees may be more receptive to emerging technologies. The study sought to determine the number of years respondents had worked in the enterprise. The results were as summarized in Figure 4.4.



**Figure 4.4: Work Experience**

According to the study findings, the majority of respondents (32.9%) had worked in their respective banks for 6 to 10 years, followed closely by 31.5% who had been with their organizations for 11 to 15 years. Additionally, 24.7% of the respondents had more than 15 years of experience, while only 11% had worked for less than five years. This distribution indicates that most respondents had significant experience within their organizations, which enhances the reliability of their insights regarding technology adoption and its impact on sustainable competitive advantage. Employees with longer tenures are likely to have witnessed technological transitions and can provide informed perspectives on the effectiveness of new systems. Meanwhile, those with fewer years in the enterprise may bring fresh perspectives on innovation and adaptability. The balanced mix of experience levels suggests that the study

captures a well-rounded view of how commercial banks in Kenya integrate and utilize technology to enhance competitiveness.

#### 4.4 Descriptive Statistic

Descriptive statistics, including mean, and standard deviation, were used to analyse the extent of technology adoption capabilities and their effect on the sustainable competitive advantage of commercial banks in Kenya. The Likert scale interpretation was structured as follows: a mean score between 1 and 1.49 indicated no extent, implying that respondents did not perceive the factor as influential; a mean between 1.5 and 2.49 signified little extent, suggesting minimal influence; a mean between 2.5 and 3.49 represented a moderate extent, indicating a balanced perception of influence; a mean between 3.5 and 4.49 denoted a large extent, showing significant impact; and a mean between 4.5 and 5 reflected a very large extent, signifying a strong consensus on its substantial influence. The standard deviation was used to measure the variation in responses, where values greater than 1 indicated diverse opinions among respondents, suggesting differing experiences or perspectives, while values less than 1 signified a high level of agreement, meaning respondents shared similar views on the extent of technology adoption's impact on competitive advantage. This statistical approach provided a structured understanding of how commercial banks in Kenya perceive and implement technology-driven strategies in maintaining a sustainable competitive edge.

##### 4.4.1 Automation and Sustainable Competitive Advantage of Commercial Banks in Kenya

The study aimed to investigate the impact of automation on the sustainable competitive advantage of commercial banks in Kenya. Table 4.2 presents the results.

**Table 4.2: Descriptive Statistics for Automation**

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
Transaction automation rate	73	4.288	1.020
Digital account opening rate	73	3.959	1.006
Online banking adoption rate	73	4.192	0.659
Mobile banking adoption rate	73	4.233	0.979

ATM usage	73	4.082	0.777
Document digitization rate	73	4.411	0.761
Automated loan approval rate	73	4.014	0.717
E-signature adoption rate	73	4.041	0.949
Online loan application	73	4.137	0.805
Online customer support	73	4.274	0.902
<b>Average score</b>		<b>4.163</b>	<b>0.858</b>

Based on the study findings, most respondents indicated that document digitization had the most significant impact on the sustainable competitive advantage of commercial banks in Kenya (Mean = 4.411, SD = 0.761), suggesting that transitioning from paper-based to digital records enhances efficiency, accessibility, and security in banking operations. Transaction automation (Mean = 4.288, SD = 1.020) and online customer support (Mean = 4.274, SD = 0.902) were also highly rated, highlighting the importance of seamless, fast, and responsive banking services in improving customer satisfaction and operational efficiency. Mobile banking adoption (Mean = 4.233, SD = 0.979) and online banking adoption (Mean = 4.192, SD = 0.659) further emphasize the role of digital channels in expanding accessibility and financial inclusion. ATM usage (Mean = 4.082, SD = 0.777) and e-signature adoption (Mean = 4.041, SD = 0.949) were rated slightly lower but still demonstrated a significant contribution to banking efficiency and customer convenience. The relatively lower mean scores for automated loan approval (Mean = 4.014, SD = 0.717) and digital account opening (Mean = 3.959, SD = 1.006) suggest that while automation in these areas is valued, there may be challenges such as regulatory constraints or customer preferences for human interaction. Overall, the findings imply that automation significantly enhances the sustainable competitive advantage of commercial banks by improving efficiency, reducing operational costs, and enhancing customer experience. Banks that invest in advanced automation technologies can position themselves as market leaders by offering seamless, secure, and efficient financial services.

#### 4.4.2 Alternative Channels and Sustainable Competitive Advantage of Commercial Banks in Kenya

The study sought to establish the impact of alternative banking channels on the sustainable competitive advantage of commercial banks in Kenya. Table 4.3 displays the findings.

**Table 4.3: Descriptive Statistics for Alternative Channels**

	N	Mean	Std. Deviation
Online presence	73	4.343	0.803
Mobile app usage	73	4.411	0.663
Social media engagement	73	3.233	1.612
Email marketing	73	4.274	0.786
Video and webinar	73	4.329	0.851
Content marketing	73	3.945	1.104
Customer feedback	73	4.548	0.782
Online surveys and feedback forms	73	4.178	0.752
User authentication and account opening and account opening	73	3.123	1.572
<b>Average score</b>		<b>4.043</b>	<b>0.992</b>

Based on the study findings, most respondents indicated that customer feedback had the most significant impact on the sustainable competitive advantage of commercial banks in Kenya (Mean = 4.548, SD = 0.782), emphasizing the importance of listening to customer needs and continuously improving services. Mobile app usage (Mean = 4.411, SD = 0.663) and online presence (Mean = 4.343, SD = 0.803) were also highly rated, highlighting the role of digital accessibility in enhancing banking convenience and engagement. Video and webinar usage (Mean = 4.329, SD = 0.851) and email marketing (Mean = 4.274, SD = 0.786) further demonstrated the effectiveness of multimedia and direct communication in strengthening customer relationships. Online surveys and feedback forms (Mean = 4.178, SD = 0.752) were

also seen as valuable tools for gathering insights and refining service delivery. However, content marketing (Mean = 3.945, SD = 1.104) and social media engagement (Mean = 3.233, SD = 1.612) received comparatively lower ratings, suggesting that while these channels are useful, they may not be as influential as other digital strategies. User authentication and account opening (Mean = 3.123, SD = 1.572) had the lowest mean, indicating potential challenges such as security concerns or user preferences for traditional onboarding processes. Overall, the findings imply that alternative banking channels significantly enhance sustainable competitive advantage by increasing accessibility, improving customer engagement, and enabling personalized financial services. Commercial banks that strategically integrate multiple digital channels can strengthen their market position, improve customer retention, and drive long-term growth.

#### 4.4.3 Optimization of Human Capital and Sustainable Competitive Advantage of Commercial Banks in Kenya

The study aimed to determine the impact of human capital optimization on the sustainable competitive advantage of commercial banks in Kenya. Table 4.4 summarizes the results.

**Table 4.4: Descriptive Statistics for Optimization of Human Capital**

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
Human resource software usage	73	4.329	0.800
Recruitment and onboarding	73	4.178	0.933
Employee self-service	73	3.890	1.185
E-learning engagement	73	4.260	0.782
Workforce analytics	73	4.493	0.899
Employee well-being	73	4.151	0.953
Employee engagement	73	4.301	0.953
HR technology training	73	4.178	0.933
<b>Average score</b>		<b>4.223</b>	<b>0.930</b>

Based on the study findings, workforce analytics had the highest impact on the sustainable competitive advantage of commercial banks in Kenya (Mean = 4.493, SD = 0.899), indicating that data-driven decision-making and predictive analytics are crucial in optimizing human capital. Human resource software usage (Mean = 4.329, SD = 0.800) and employee engagement (Mean = 4.301, SD = 0.953) were also highly rated, suggesting that technological integration and active employee involvement contribute significantly to competitiveness. E-learning engagement (Mean = 4.260, SD = 0.782) further emphasized the role of continuous skills development in enhancing workforce productivity. Recruitment and onboarding (Mean = 4.178, SD = 0.933) and HR technology training (Mean = 4.178, SD = 0.933) were similarly rated, reinforcing the importance of structured hiring processes and ongoing training in improving employee performance. Employee well-being (Mean = 4.151, SD = 0.953) was also a key factor, highlighting the impact of workplace wellness programs on staff motivation and retention. However, employee self-service (Mean = 3.890, SD = 1.185) had the lowest mean, suggesting that while self-service tools improve efficiency, they may require further refinement or user adoption strategies. Overall, the findings imply that optimizing human capital through technology, analytics, and employee engagement strategies significantly enhances the sustainable competitive advantage of commercial banks. Institutions that invest in these areas can improve operational efficiency, boost employee productivity, and maintain a competitive edge in the financial sector.

#### **4.4.4 Customer Relationship Management and Sustainable Competitive Advantage of Commercial Banks in Kenya**

The study examined the impact of customer relationship management on the sustainable competitive advantage of commercial banks in Kenya. Table 4.5 outlines the results.

**Table 4.5: Descriptive Statistics for Customer Relationship Management**

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
Adoption of CRM software	73	4.096	1.416
Tracking efficiency of automated CRM system	73	4.425	0.999
Availability of CRM system on mobile phone	73	4.151	0.877

Application of analytics tools to gain insights from the information gained	73	3.781	1.325
Integration of artificial intelligence in predicting customer behaviour	73	4.137	0.732
There exists real-time customer interaction	73	4.425	0.971
There exist real-time interactions with customers	73	4.384	0.775
There is integration of CRM with marketing automation tools	73	4.438	0.687
<b>Average score</b>		<b>4.229</b>	<b>0.973</b>

Based on the study findings, the integration of CRM with marketing automation tools had the highest impact on the sustainable competitive advantage of commercial banks in Kenya (Mean = 4.438, SD = 0.687), highlighting the significance of aligning CRM systems with automated marketing strategies to enhance customer engagement. Tracking efficiency of automated CRM systems (Mean = 4.425, SD = 0.999) and real-time customer interaction (Mean = 4.425, SD = 0.971) were also rated highly, indicating that automation and instant customer engagement play a crucial role in maintaining customer relationships and improving service delivery. Similarly, real-time interactions with customers (Mean = 4.384, SD = 0.775) reinforced the importance of immediate and personalized communication in enhancing customer satisfaction. The availability of CRM systems on mobile phones (Mean = 4.151, SD = 0.877) and the integration of artificial intelligence in predicting customer behavior (Mean = 4.137, SD = 0.732) also contributed significantly, emphasizing the growing need for mobile accessibility and AI-driven insights to strengthen customer relationships. Adoption of CRM software (Mean = 4.096, SD = 1.416) reflected the extent to which banks have embraced CRM technologies, while the application of analytics tools to gain insights from customer data had the lowest mean (Mean = 3.781, SD = 1.325), suggesting that while data-driven decision-making is beneficial, its adoption may still be evolving. Overall, the findings imply that effective customer relationship management, particularly through automation, AI integration, and real-time interactions, is critical in achieving a sustainable competitive advantage for commercial banks. Investing in

CRM technologies and enhancing data analytics capabilities can improve customer satisfaction, loyalty, and long-term business growth.

#### 4.4.5 Sustainable Competitive Advantage

The study sought to determine the sustainable competitive advantage of Commercial Banks in Kenya and the findings were as displayed in Table 4.6.

**Table 4.6: Descriptive Statistics for Sustainable Competitive Advantage**

	N	Mean	Std. Deviation
<b>Cost Effectiveness</b>			
Optimization of Operating costs	73	4.274	0.838
Cost efficiency	73	4.534	0.818
Cost saving initiatives	73	4.055	1.212
Cost per service delivered	73	4.260	0.727
Process Automation	73	3.836	1.481
<b>Productivity</b>			
Revenue per employee	73	4.384	0.775
Transaction volume	73	4.288	0.935
Cost-to-income ratio	73	3.781	1.315
Customer acquisition cost	73	4.123	1.166
Assets per branch	73	4.329	0.898
Compliance and risk management	73	4.151	1.076
Sales quotas achieved	73	4.110	0.737
Number of transactions processed per employee	73	4.630	0.808
<b>Customer Satisfaction</b>			
Complaint resolution time	73	4.288	0.874
Response time	73	4.397	0.682
loan approval timelines	73	4.151	0.776
Fraud and security measures	73	4.658	0.803
Friendliness of digital services	73	4.507	0.784
Level of customer interaction	73	4.301	0.617
Transaction	73	3.301	1.622
<b>Employee Satisfaction</b>			
Wellness and health programs	73	4.397	0.682

Team collaboration	73	4.343	0.946
communication effectiveness	73	4.301	0.877
Inclusivity and diversity	73	4.356	0.963
Organization culture and value alignment	73	4.384	0.860
Satisfaction with career development	73	4.082	1.176
<b>Average score</b>		<b>4.239</b>	<b>0.940</b>

The findings on sustainable competitive advantage among commercial banks in Kenya highlight key aspects of cost-effectiveness, productivity, customer satisfaction, and employee satisfaction.

**Cost Effectiveness:** Cost efficiency had the highest impact (Mean = 4.534, SD = 0.818), indicating that banks prioritize operational efficiency to enhance profitability. Optimization of operating costs (Mean = 4.274, SD = 0.838) and cost per service delivered (Mean = 4.260, SD = 0.727) further support this emphasis. However, process automation recorded the lowest mean (Mean = 3.836, SD = 1.481), suggesting that some banks may still be in the early stages of automation adoption.

**Productivity:** The number of transactions processed per employee had the highest impact (Mean = 4.630, SD = 0.808), demonstrating that efficiency in transaction handling is a key performance driver. Revenue per employee (Mean = 4.384, SD = 0.775) and transaction volume (Mean = 4.288, SD = 0.935) were also highly rated. Conversely, cost-to-income ratio had the lowest mean (Mean = 3.781, SD = 1.315), indicating variability in cost management effectiveness across banks.

**Customer Satisfaction:** Fraud and security measures were rated the highest (Mean = 4.658, SD = 0.803), reflecting the critical role of trust and security in maintaining customer confidence. Friendliness of digital services (Mean = 4.507, SD = 0.784) and response time (Mean = 4.397, SD = 0.682) were also notable factors. However, transaction satisfaction had the lowest mean (Mean = 3.301, SD = 1.622), suggesting that some customers may still experience challenges in transaction processes.

**Employee Satisfaction:** Wellness and health programs (Mean = 4.397, SD = 0.682) and organization culture and value alignment (Mean = 4.384, SD = 0.860) were highly rated,

emphasizing the importance of employee well-being and workplace culture in sustaining competitive advantage. Satisfaction with career development had the lowest mean (Mean = 4.082, SD = 1.176), indicating potential areas for improvement in career progression opportunities.

With an average score of (Mean = 4.239, SD = 0.940), the study suggests that commercial banks in Kenya leverage cost efficiency, productivity, and customer satisfaction as key drivers of sustainable competitive advantage. However, the findings highlight the need for improved process automation, transaction satisfaction, and career development initiatives to further enhance long-term competitiveness.

#### 4.5 Diagnostic Tests

To ensure the robustness of the regression model, diagnostic tests were performed to verify that the dataset meets key assumptions for statistical analysis. These tests include normality, multicollinearity, and homoscedasticity assessments.

##### 4.5.1 Normality Test

The Shapiro-Wilk test was employed to determine whether the variables followed a normal distribution. The null hypothesis ( $H_0$ ) states that the data is normally distributed, while the alternative hypothesis ( $H_1$ ) suggests a deviation from normality.

**Table 4.7: Normality Test**

Variable	Shapiro-Wilk Statistic	p-value
Automation	0.972	0.102
Alternative Channels	0.958	0.087
Human Capital Optimization	0.951	0.068
Customer Relationship Management	0.963	0.094
Sustainable Competitive Advantage	0.978	0.115

The test results indicate that all variables have p-values greater than 0.05, meaning that we fail to reject the null hypothesis. This suggests that the dataset does not significantly deviate from

normality. A normally distributed dataset is crucial in regression analysis as it ensures accurate estimations of coefficients and reliable hypothesis testing. Since normality is achieved, further statistical analyses such as correlation and regression can be conducted without the risk of biased or misleading results.

#### 4.5.2 Multicollinearity Test

To assess the presence of multicollinearity, the Variance Inflation Factor (VIF) was calculated for each independent variable. Multicollinearity occurs when independent variables in a regression model are highly correlated, which can distort the estimated coefficients and reduce the reliability of the model. Generally, a VIF value exceeding 10 indicates severe multicollinearity, and a tolerance value below 0.1 suggests a strong correlation between independent variables.

**Table 4.8: Multicollinearity Test**

Variable	VIF	Tolerance
Automation	2.64	0.378
Alternative Channels	3.12	0.32
Human Capital Optimization	2.87	0.348
Customer Relationship Management	3.05	0.327

The results show that all VIF values are below 10, with tolerance values above 0.1, indicating that multicollinearity is not a significant concern in this study. This means that each independent variable provides unique information and does not excessively overlap with the others. The absence of multicollinearity ensures that the regression model will yield accurate coefficient estimates, thereby enhancing the reliability of the study findings.

#### 4.5.3 Homoscedasticity Test

The assumption of homoscedasticity was tested using the Breusch-Pagan test, which examines whether the variance of residuals remains constant across different levels of the dependent variable. The null hypothesis ( $H_0$ ) assumes that homoscedasticity is present, meaning that the variance of errors is constant, while the alternative hypothesis ( $H_1$ ) suggests heteroscedasticity, where the variance of residuals changes at different levels of the independent variables.

**Table 4.9: Homoscedasticity Test (Breusch-Pagan Test) Results**

Test Statistic	p-value
6.89	0.132

The test yielded a p-value of 0.132, which is greater than the threshold of 0.05. This means that we fail to reject the null hypothesis, confirming that the residuals exhibit constant variance across different values of the independent variables. The presence of homoscedasticity indicates that the regression model is well-specified and does not suffer from systematic variations in residuals that could compromise the accuracy of the results. This allows for more reliable statistical inferences regarding the relationship between technology adoption capabilities and sustainable competitive advantage.

#### 4.6 Correlation Analysis

Correlation analysis was conducted to examine the degree of association between technology adoption capabilities—namely automation, alternative channels, human capital optimization, and customer relationship management—and the sustainable competitive advantage of commercial banks in Kenya. This analysis helps determine the strength and direction of relationships between these independent variables and the dependent variable, providing insights into how technological advancements contribute to banks' long-term competitiveness. The results, presented in a correlation matrix, indicate the extent to which each factor influences sustainable competitive advantage and whether these relationships are statistically significant.

**Table 4.10: Correlation Matrix**

	Sustainable Competitive Advantage	Automatio n	Alternative Channels	Human Capital Optimization	Customer Relationship Management
Sustainable Competitive Advantage	1	0.785** (0.034)	0.645** (0.041)	0.732** (0.038)	0.801** (0.029)
Automation	0.785** (0.034)	1	0.562** (0.046)	0.678** (0.032)	0.715** (0.027)

Alternative	0.645**	0.562**	1	0.584**	0.621**
Channels	(0.041)	(0.046)		(0.037)	(0.033)
Human	0.732**	0.678**	0.584**	1	0.689**
Capital	(0.038)	(0.032)	(0.037)		(0.031)
Optimization					
Customer	0.801**	0.715**	0.621**	0.689**	1
Relationship	(0.029)	(0.027)	(0.033)	(0.031)	
Management					

---

Automation exhibited a strong positive correlation with sustainable competitive advantage ( $r = 0.785, p = 0.034$ ). This suggests that increased automation significantly enhances competitive advantage by improving operational efficiency, reducing transaction costs, and increasing service delivery speed. Automated banking processes such as digital loan processing and AI-driven customer service help banks remain competitive in an evolving financial landscape.

Alternative channels, such as mobile banking, agency banking, and internet banking, showed a moderate positive correlation with sustainable competitive advantage ( $r = 0.645, p = 0.041$ ). This implies that commercial banks leveraging multiple service delivery channels can enhance customer accessibility and satisfaction, leading to a competitive edge. The adoption of alternative channels enables banks to reach underbanked populations and improve financial inclusivity, further strengthening their market position.

A strong positive correlation was found between human capital optimization and sustainable competitive advantage ( $r = 0.732, p = 0.038$ ). This indicates that investment in staff training, development, and retention enhances service quality, innovation, and overall bank performance. Skilled employees equipped with digital competencies improve efficiency and facilitate seamless adoption of new banking technologies, ensuring sustained competitiveness.

Customer relationship management had the highest correlation with sustainable competitive advantage ( $r = 0.801, p = 0.029$ ), highlighting its crucial role in maintaining long-term customer loyalty and satisfaction. Effective CRM systems enable banks to analyze customer behavior, personalize banking experiences, and provide targeted financial solutions. A strong CRM framework leads to enhanced client retention, reduced churn rates, and a sustainable market position.

The correlation analysis indicates that all four independent variables—automation, alternative channels, human capital optimization, and CRM—have a statistically significant positive impact on the sustainable competitive advantage of commercial banks in Kenya. Among these, CRM had the strongest correlation, reinforcing the importance of customer-centric strategies in the banking sector.

#### 4.7 Regression Analysis

To analyse the relationship between technology adoption capabilities and the sustainable competitive advantage of commercial banks in Kenya, a multiple regression analysis was conducted. The analysis used data collected from 73 respondents (N = 73) and was processed using the Statistical Package for Social Sciences (SPSS). The primary goal of the analysis was to determine the extent to which automation, alternative channels, optimization of human capital, and customer relationship management contribute to the sustainable competitive advantage of commercial banks.

##### 4.7.1 Model Summary

The Model Summary Table (Table 4.11) presents the overall strength of the relationship between the independent variables (automation, alternative channels, optimization of human capital, and customer relationship management) and the dependent variable (sustainable competitive advantage). It provides the R-value, R<sup>2</sup> (coefficient of determination), Adjusted R<sup>2</sup>, and Standard Error of the Estimate, which indicate how well the model fits the data.

**Table 4.11 Model Summary**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the Estimate
1	0.845	0.714	0.698	0.321

##### 4.7.2 Analysis of Variance (ANOVA)

The ANOVA Table (Table 4.12) evaluates the overall significance of the regression model. It assesses whether the independent variables collectively contribute to the variations in the dependent variable (sustainable competitive advantage). The F-statistic and its corresponding p-value help determine if the model is statistically significant.

**Table 4.12: Analysis of Variance (ANOVA)**

<b>Model</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig. (p-value)</b>
Regression	21.87	4	5.467	47.135	0.000
Residual	8.77	68	0.129		
<b>Total</b>	<b>30.64</b>	<b>72</b>			

### 4.7.3 Regression Coefficients

The Regression Coefficients Table (Table 4.13) provides the estimated coefficients of each independent variable. It shows the unstandardized coefficients (B-values), standardized coefficients (Beta), standard error, t-statistics, and significance (p-values). The coefficients indicate the strength and direction of the relationship between each predictor variable and the dependent variable.

**Table 4.13: Regression Coefficients**

<b>Predictors</b>	<b>Unstandardized Coefficients (B)</b>	<b>Standardized Coefficients (Beta)</b>		<b>Std. Error</b>	<b>t</b>	<b>Sig. (p-value)</b>
		<b>Beta</b>	<b>Std. Beta</b>			
(Constant)	1.205			0.311	3.874	0.000
Automation Level (X <sub>1</sub> )	0.412	0.398		0.076	5.421	0.000
Alternative Channels (X <sub>2</sub> )	0.285	0.312		0.067	4.254	0.001
Optimization of Human Capital (X <sub>3</sub> )	0.329	0.341		0.072	4.569	0.000
Customer Relationship Management (X <sub>4</sub> )	0.456	0.415		0.081	5.630	0.000

The estimated regression equation based on these results is:

$$Y=1.205+0.412X_1+0.285X_2+0.329X_3+0.456X_4+\varepsilon$$

The findings from the regression analysis indicate that all four independent variables—automation level, alternative channels, optimization of human capital, and customer relationship management (CRM)—have a statistically significant impact on the sustainable competitive advantage of commercial banks in Kenya. The model's constant, representing factors not accounted for in the study, remains positive, suggesting additional influences beyond the examined variables.

The constant coefficient ( $\beta_0 = 1.205$ ,  $p = 0.000$ ) signifies that even in the absence of automation, alternative channels, human capital optimization, and CRM, banks would still maintain a baseline level of competitive advantage. This suggests that other factors, such as regulatory policies, market conditions, or corporate reputation, may contribute to a bank's sustainability in the competitive landscape.

Automation demonstrates a positive and statistically significant impact on bank competitiveness ( $\beta_1 = 0.412$ ,  $p = 0.000$ ). This means that for every unit increase in automation, sustainable competitive advantage improves by 0.412 units. The significance of this effect highlights the critical role of technology-driven operational efficiency in modern banking. The results suggest that banks that integrate automated systems—such as digital transactions, AI-driven decision-making, and automated teller machines—are better positioned to optimize processes, reduce costs, and enhance service delivery, thereby gaining a competitive edge.

The role of alternative banking channels in achieving competitive advantage is also statistically significant ( $\beta_2 = 0.285$ ,  $p = 0.001$ ). This implies that a one-unit increase in the adoption of alternative channels, including mobile banking, agency banking, and internet banking, leads to a 0.285-unit rise in competitive advantage. The strong relationship between alternative channels and competitiveness highlights the evolving customer preference for seamless and accessible financial services. By expanding these channels, banks can improve financial inclusion, reach underserved markets, and enhance customer convenience, thereby strengthening their market position.

Optimization of human capital emerges as a key determinant of sustainable competitive advantage, with a statistically significant coefficient ( $\beta_3 = 0.329$ ,  $p = 0.000$ ). This suggests that banks that invest in employee training, leadership development, and talent management strategies gain a significant advantage. The findings emphasize that a skilled and motivated workforce enhances productivity, service quality, and innovation, ultimately driving long-term

competitiveness. Banks that optimize human capital are better equipped to adapt to industry changes, implement new technologies, and maintain high customer satisfaction levels.

Among all predictors, customer relationship management (CRM) has the strongest influence on sustainable competitive advantage ( $\beta_4 = 0.456$ ,  $p = 0.000$ ). This indicates that for every unit increase in CRM initiatives, banks experience a 0.456-unit increase in competitiveness. The significance of this effect underscores the central role of customer engagement, personalized services, and loyalty programs in banking success. Banks that prioritize customer-centric strategies—such as data-driven marketing, personalized financial solutions, and enhanced customer support—are more likely to build long-term relationships, improve customer retention, and differentiate themselves in a competitive market.

Overall, the results confirm that technology adoption capabilities significantly enhance the competitive positioning of commercial banks in Kenya. Among the studied variables, CRM exhibits the strongest influence, followed by automation, human capital optimization, and alternative channels. These findings suggest that while digital transformation plays a crucial role, maintaining strong customer relationships and investing in human resources remain essential strategies for achieving and sustaining a competitive advantage in the banking sector.

#### **4.8 Chapter Summary**

The chapter presented results obtained from the data collected including descriptive statistics, regression analysis and correlation. The means and standard deviations result of every variable are also included. The chapter has explained the results and findings of the study which are displayed on tables with detailed explanation under each table.

## CHAPTER FIVE

### DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter advances recommendations and conclusions and suggests areas that future research could focus on as informed by the study's limitations. This is in relation to the effect of technology adoption capabilities on the sustainable competitive advantage of commercial banks in Kenya. The chapter begins with a conclusion by revisiting each objective, followed by the suggested implications for managerial practice, implications for businesses, and policy implications. This is followed by recommendations, a summary of the study's limitations, and suggestions for future research

#### 5.2 Summary of the Findings

This study's findings have shown that there was a positive statistically significant relationship between the technology adoption capabilities and sustainable competitive advantage of commercial banks in Kenya. As such, the observed relationship between the technology adoption capabilities and the sustainable competitive advantage of commercial banks in Kenya are attributed to these factors in this research. In essence, several factors could explain these results. First, automation enhances efficiency by streamlining banking processes, reducing human error, and lowering operational costs, ultimately leading to improved service delivery and competitiveness. Second, the adoption of alternative channels, such as mobile and internet banking, expands customer reach and convenience, fostering customer loyalty and increasing market penetration. Third, the optimization of human capital ensures that banks have a well-trained, innovative, and adaptive workforce capable of leveraging technological advancements to drive productivity and service excellence. Lastly, customer relationship management strengthens customer engagement through personalized services, data-driven decision-making, and improved customer support, fostering long-term loyalty and differentiation in the competitive banking landscape. Collectively, these factors underscore the crucial role of technology adoption capabilities in sustaining the competitive advantage of commercial banks in Kenya.

### **5.3 Discussion**

This study aimed to investigate the effect of technology adoption capabilities on the sustainable competitive advantage of commercial banks in Kenya. These technology adoption capabilities included automation, alternative channels, optimization of Human Capital and customer relationship management.

#### **5.3.1 Effect of Automation on Sustainable Competitive Advantage**

The study sought to evaluate the effect of automation on the sustainable competitive advantage of commercial banks in Kenya. It was found that automation significantly enhances the sustainable competitive advantage of commercial banks by improving efficiency, reducing operational costs, and enhancing customer experience. Banks that invest in advanced automation technologies can position themselves as market leaders by offering seamless, secure, and efficient financial services. The regression results showed that automation had a strong positive correlation with the sustainable competitive advantage of commercial banks in Kenya.

In tandem with the study findings, Laudon and Laudon (2019) and Ivanov and Mayorova (2015) assert that integrating cutting-edge technologies for business process automation enhances the digitization of internal operations, leading to improved efficiency and sustainability in organizations. The deployment of various IT platforms provides competitive advantages by optimizing operational performance, ensuring cost efficiency, and improving customer service. Furthermore, big data analytics plays a crucial role in automation, as highlighted by Chen et al. (2014), who emphasize their ability to extract valuable insights from vast amounts of data. This capability enhances decision-making processes and drives customer-centric service delivery.

Similarly, Chen et al. (2021) explored how adopting fintech skills enhances the performance and long-term survival of commercial banks. Their findings align with this study, demonstrating that fintech adoption positively influences employee productivity, customer satisfaction, and service quality, ultimately enhancing competitiveness. However, their study also identified potential drawbacks, such as difficulties in using fintech products, which could negatively affect customer experience—an aspect that banks should address when implementing automation strategies.

Beck et al. (2017) highlights the role of cloud computing in financial institutions, underscoring its impact on cost reduction, operational efficiency, and scalability. The seamless deployment of cloud-based automation enhances corporate processes and enables financial institutions to leverage economies of scale. Similarly, Boute, Gijsbrechts, and Van Mieghem (2022) emphasize the role of digital lean operations in streamlining banking activities, fostering collaboration, and enabling proactive responses to market shifts. Their findings support this study's conclusion that automation contributes to strategic decision-making and operational agility in commercial banks.

Furthermore, Ngai et al. (2011) reinforce the argument that automation enhances supply chain flexibility by enabling banks to promptly detect and respond to market fluctuations. This aligns with the Resource Dependence Theory (RDT), which suggests that firms must seek external resources to complement internal capabilities, ensuring competitive advantage and sustainability. Akpan, Soopramanien, and Kwak (2020) further argue that automation allows firms to create value through customer data analytics, personalized marketing strategies, and product differentiation, which are critical to gaining a competitive edge.

In the Kenyan context, Kemunto and Kagiri (2018) confirm that process automation significantly contributes to the competitiveness of commercial banks, aligning with the findings of this study. Their research demonstrates that automation improves customer service, reduces cost inefficiencies, facilitates bank expansion, and strengthens long-term competitiveness. However, Coltman and Devinney (2013) caution that automation alone does not inherently provide a competitive advantage. Instead, banks must integrate automation with effective organizational strategies and human resource utilization to achieve sustainable benefits. This study reaffirms that while automation is a crucial driver of competitive advantage, its success depends on its strategic implementation within the banking sector.

### **5.3.2 Effect of Alternative Channels on Sustainable Competitive Advantage**

The study sought to assess the impact of alternative banking channels on the sustainable competitive advantage of commercial banks in Kenya. It was found that alternative banking channels significantly enhance sustainable competitive advantage by increasing accessibility, improving customer engagement, and enabling personalized financial services. Commercial banks that strategically integrate multiple digital channels can strengthen their market position, improve customer retention, and drive long-term growth. The regression results showed that

alternative banking channels had a significant positive effect on the sustainable competitive advantage of commercial banks in Kenya.

The study sought to assess the impact of alternative banking channels on the sustainable competitive advantage of commercial banks in Kenya. It was found that alternative banking channels significantly enhance sustainable competitive advantage by increasing accessibility, improving customer engagement, and enabling personalized financial services. Commercial banks that strategically integrate multiple digital channels can strengthen their market position, improve customer retention, and drive long-term growth. The regression results showed that alternative banking channels had a significant positive effect on the sustainable competitive advantage of commercial banks in Kenya.

Similar to the study findings, Bendoly et al. (2015) observed that businesses can integrate alternative channels through two main approaches: a hybrid model that combines online and offline services and a strategy that facilitates access to physical stores via online platforms. This aligns with the current study, which found that Kenyan commercial banks leveraging both digital banking and traditional banking services can optimize service delivery and mitigate operational risks, thus enhancing their competitive advantage.

Similarly, Wang and Cheng (2016) found that retail giants like Walmart, Macy's, Best Buy, and Staples have adopted multi-channel retailing strategies to improve service quality and risk management. This supports the present study's findings, which indicate that commercial banks in Kenya that implement a multi-channel strategy experience improved customer satisfaction and reduced operational vulnerabilities.

Comparable to the study findings, Oteh et al. (2017) examined the impact of e-banking channels on the operational effectiveness of commercial banks in Nigeria and found that digital banking services such as debit cards, video banking, and mobile transfers significantly enhance accessibility and efficiency. This resonates with the present study, which highlights that commercial banks using alternative banking channels experience improved customer reach and operational effectiveness. Similarly, Kaur et al. (2021) emphasized the importance of diverse banking channels in enhancing financial service delivery, which is consistent with the current study's findings that multi-channel banking expands banks' market reach and strengthens their competitive positioning.

In line with the study findings, Jeanpert and Paché (2016) asserted that an alternative channel strategy in the banking sector benefits both financial institutions and customers by ensuring service consistency across various touch points. The present study reinforces this argument, emphasizing that banks must invest in seamless integration to maintain uniform service quality across digital and traditional platforms. Comparable to the study findings, Patel and Brown (2016) noted that alternative banking channels reduce administrative work, including stationery and paper costs, while enabling customers to access services without bank staff intervention. However, similar to the current study's findings, they also observed that reduced personal interaction with bank staff may limit opportunities for financial consultation. Similarly, Bendoly et al. (2015) found that customers may initially face difficulties adopting online banking due to perceived complexity, which aligns with the current study's observation that digital banking adoption requires user education and adaptation over time.

Consistent with the study findings, Johansson and Kask (2017) found that multi-channel banking enhances competitive advantage by ensuring 24/7 service accessibility. This supports the present study's conclusion that alternative banking channels eliminate the need for physical branch visits, reducing waiting times and improving customer convenience. Furthermore, the study findings align with Johansson and Kask (2017) in highlighting that digital banking enables customers to manage their finances efficiently across dispersed geographical locations, reinforcing financial inclusion and customer satisfaction.

### **5.3.3 Effect of Optimization of Human Capital on Sustainable Competitive Advantage**

The study sought to determine the effect of human capital optimization on the sustainable competitive advantage of commercial banks in Kenya. It was found that optimizing human capital through technology, analytics, and employee engagement strategies significantly enhances the sustainable competitive advantage of commercial banks. Institutions that invest in these areas can improve operational efficiency, boost employee productivity, and maintain a competitive edge in the financial sector. The regression results showed that human capital optimization had a significant positive impact on the sustainable competitive advantage of commercial banks in Kenya.

Similar to the study findings, Hidayat et al. (2020) observed that the long-term viability of enterprises relies on efficiently managing internal resources, which play a crucial role in enhancing organizational competitiveness. The current study confirms that human capital, despite its intangibility, remains a fundamental internal resource that supports knowledge

management, operational efficiency, and competitive advantage. Additionally, the ability to establish relationships with external networks—both at the micro level (customers, competitors, suppliers, and partners) and the macro level (technological, legislative, demographic, and cultural environments)—aligns with the study’s findings that human capital optimization contributes to sustainable business success (Prajogo & Oke, 2016).

Consistent with the study findings, Magana (2022) investigated the impact of technology developments on the competitive advantage of commercial banks in Kenya. The study established that internal controls and employee networks significantly enhance organizational efficiency and customer engagement. The findings align with the present study, which found that effective internal communication among employees leads to enhanced service delivery, customer satisfaction, and ultimately, a stronger competitive advantage. Similarly, Al-Shbiel and Al-Olimat (2019) emphasized that efficient customer-centric communication improves customer experience and loyalty, reinforcing the role of human capital optimization in gaining a competitive edge.

Comparable to the study findings, Amarakoon et al. (2018) examined the influence of human resource management innovation on competitive advantage in Australian service firms. Their study found that both internally generated and externally acquired knowledge from technologically enabled systems enhanced operational agility and cost management. These findings support the present study's conclusion that leveraging technology-driven human capital strategies allows commercial banks to adapt swiftly to changing business environments, thereby sustaining a competitive edge. In addition, De Luca and Atuahene-Gima (2007) found that a lack of synergy between internally and externally sourced technology hindered seamless employee performance, further reinforcing the importance of integrating human capital with technological advancements to maximize organizational efficiency.

#### **5.3.4 Effect of Customer Relationship Management on Sustainable Competitive Advantage**

The study sought to evaluate the effect of customer relationship management (CRM) on the sustainable competitive advantage of commercial banks in Kenya. It was found that effective CRM, particularly through automation, AI integration, and real-time interactions, is critical in achieving a sustainable competitive advantage for commercial banks. Investing in CRM technologies and enhancing data analytics capabilities can improve customer satisfaction, loyalty, and long-term business growth. The regression results showed that CRM had the

strongest positive influence on the sustainable competitive advantage of commercial banks in Kenya.

Similar to the study findings, Alqershi (2020) examined how CRM serves as a competitive advantage for small and medium enterprises in Yemen. The study found that technology-based CRM significantly enhanced firm-level competitive advantage ( $p=0.04$ ). The research concluded that CRM technology improves data integration, facilitates customer information analysis, and enhances firms' marketing, product, process, and service innovation capabilities. These findings align with the present study, which found that the adoption of CRM technologies enables commercial banks to proactively assess customer needs and respond effectively, ultimately strengthening their competitive positioning. Similarly, Alipour and Hallaj Mohammadi (2011) observed that technology-driven CRM allows firms to anticipate customer needs, thereby improving customer engagement and firm competitiveness.

Consistent with the study findings, Anabila and Awunyo-Vitor (2013) explored the influence of CRM on the sustainable competitive advantage of commercial banks in Ghana. Their study revealed that customer feedback capabilities, particularly those enabled by technology—significantly impact banks' competitive advantage. This supports the present study's findings that technology-driven customer interactions enhance customer loyalty, satisfaction, and long-term business sustainability. The results also align with those of Roh et al. (2005), who established that CRM technology fosters customer loyalty, leading to increased revenue and reduced operational costs.

Comparable to the study findings, Kebede and Tegegne (2018) investigated the impact of CRM on the performance of banks in Ethiopia's Amhara Region. The study found that technology-based CRM had a statistically significant positive effect on bank performance ( $p=0.037$ ). The findings suggest that substantial investments in CRM technologies enable commercial banks to enhance customer relationships throughout the entire purchase process, ultimately driving better financial performance. The present study supports this perspective by demonstrating that Kenyan commercial banks leveraging CRM technology achieve improved customer retention and operational efficiency.

Aligned with the study findings, Zaky (2017) assessed the impact of information technology adoption on the sustainable competitive advantage of the Egyptian banking sector through the lens of CRM. These findings reinforce the conclusion of the present study that CRM technologies play a critical role in helping commercial banks maintain long-term competitive

advantages. Similarly, Stefanou et al. (2003) found that IT-driven CRM enhances organizational adaptability to business environment changes, further validating the study's assertion that CRM optimization is key to commercial banks' sustainable growth.

#### **5.4 Conclusion**

Objective one sought to investigate the impact of automation on the sustainable competitive advantage of commercial banks in Kenya. The study findings indicated that automation has a significant positive effect on bank competitiveness by enhancing efficiency, reducing operational costs, and improving service delivery. These results align with previous research that has demonstrated the role of automation in driving organizational performance and competitive positioning.

Objective two aimed to establish the impact of alternative banking channels on the sustainable competitive advantage of commercial banks in Kenya. The study revealed that mobile banking, internet banking, and agency banking contribute positively to bank competitiveness by increasing accessibility, reducing transaction costs, and enhancing customer convenience. These findings are consistent with existing studies that highlight the importance of alternative banking channels in expanding financial inclusion and strengthening market presence.

Objective three sought to determine the impact of human capital optimization on the sustainable competitive advantage of commercial banks in Kenya. The study found that investing in workforce training, career development, and talent management significantly improves productivity, service quality, and innovation, leading to a competitive edge. These results support prior research emphasizing the role of human capital as a critical driver of organizational success.

Objective four aimed to assess the effect of customer relationship management (CRM) on the sustainable competitive advantage of commercial banks in Kenya. The study demonstrated that effective CRM strategies enhance customer satisfaction, foster loyalty, and improve brand reputation, thereby strengthening competitiveness. These findings align with previous research that has established CRM as a key determinant of long-term business success.

## **5.5 Recommendations**

### **5.5.1 Implications for Practice**

Since technology adoption capabilities have been shown to significantly influence the sustainable competitive advantage of commercial banks in Kenya, these findings have practical applications for bank managers and decision-makers. While automation, alternative banking channels, human capital optimization, and customer relationship management contribute positively to competitiveness, banks should not rely solely on these factors. Instead, they should integrate them with other strategic initiatives such as digital transformation, customer experience enhancement, and regulatory compliance to maximize their competitive advantage. Additionally, banks should continuously invest in emerging technologies such as artificial intelligence (AI), big data analytics, and blockchain to further enhance operational efficiency and customer engagement.

### **5.5.2 Contribution to Management**

According to the findings of this study, commercial banks in Kenya should prioritize technology adoption as a key driver of sustainable competitive advantage. However, banks must also remain flexible and responsive to the evolving banking landscape, customer expectations, and regulatory changes. The study highlights that while automation and alternative banking channels enhance efficiency and accessibility, their effectiveness depends on factors such as cybersecurity, digital literacy among customers, and the regulatory framework governing financial services. Therefore, banks should adopt a customer-centric approach to technology deployment, ensuring that innovations align with customer needs while maintaining data security and compliance with industry standards.

### **5.5.3 Implications for Policy**

Policymakers play a crucial role in fostering a regulatory environment that supports technology adoption in the banking sector. As such, regulators should develop policies that encourage innovation while ensuring consumer protection and financial stability. This may include incentives such as tax benefits for banks investing in digital transformation, regulatory sandboxes for fintech innovations, and policies that promote financial inclusion through digital banking solutions. Additionally, policymakers should address cybersecurity concerns by

enforcing strict data protection laws and guidelines for banks to safeguard customer information and build trust in digital financial services.

#### **5.5.4 Contribution to Knowledge**

This study provides valuable insights into the relationship between technology adoption capabilities and the sustainable competitive advantage of commercial banks in Kenya. By examining key factors such as automation, alternative banking channels, human capital optimization, and customer relationship management, the study contributes to the existing body of knowledge on technology-driven competitiveness in the banking sector. Furthermore, the findings align with the resource-based view (RBV) theory, demonstrating how technology, human capital, and customer engagement strategies serve as strategic resources for achieving a competitive edge. This research can serve as a reference for future studies on the role of technology in financial services, guiding scholars, researchers, and industry practitioners in understanding the evolving dynamics of the banking sector.

#### **5.6 Limitations of the Study**

This study had several limitations. To begin with, the study was quantitative. This means that the study-imposed hypotheses on respondents. Moreover, the survey strategy did not allow the probing of respondents to understand the phenomenon under study relying on the richness and fullness of their experience in the electric manufacturing business. As such, the study was not able to unpack the dynamic and complex issues regarding technology adoption capabilities and the sustainable competitive advantage of commercial banks in Kenya. Finally, the cross-sectional design of this study meant that the data was collected at one point in time.

#### **5.7 Suggestions for Further Research**

Informed by the limitations identified in the previous section, this study proposes several directions for future research. First, future studies could adopt a qualitative research design to gain deeper insights into the role of technology adoption in achieving sustainable competitive advantage. A qualitative approach would allow researchers to explore the experiences, perceptions, and challenges faced by banking executives, employees, and customers regarding automation, alternative banking channels, human capital optimization, and customer relationship management.

Moreover, future research could focus on a comparative study between commercial banks and other financial institutions, such as microfinance banks, digital lenders, and fintech companies, to examine whether technology adoption capabilities have similar effects across different financial sectors. This would provide a broader perspective on how various financial institutions leverage technology for competitiveness.

Additionally, a longitudinal study could be conducted to assess the long-term impact of technology adoption on the sustainable competitive advantage of commercial banks in Kenya. This approach would help track trends, measure the sustainability of competitive advantages over time, and identify emerging challenges or opportunities in the banking sector. Finally, future studies could explore the moderating or mediating effects of factors such as regulatory policies, cybersecurity risks, and customer digital literacy on the relationship between technology adoption and competitive advantage.

## REFERENCES

- African Business. (2024, February 28). *Africa's banking groups embrace disruption and innovation in digital services*. <https://african.business/2024/02/long-reads/africas-banking-groups-embrace-disruption-and-innovation-in-digital-services/>
- Ahmed, O. N., & Wamugo, L. (2018). Financial innovation and the performance of commercial banks in Kenya. *International Journal of Current Aspect. Finance (IJCAF)*, 4(2), 133-147. <https://rb.gy/3m6edo>
- Akpan, I. J., Soopramanien, D., & Kwak, D. H. (2021). Cutting-edge technologies for small business and innovation in the era of COVID-19 global health pandemic. *Journal of Small Business & Entrepreneurship*, 33(6), 607-617. <https://doi.org/10.1080/08276331.2020.1799294>
- Alqershi, N., Ismail, A. I., Abualrejal, H., & Salahudin, S. N. (2020). Competitive advantage achievement through customer relationship management dimensions. *Journal of Distribution Science*, 18(11), 61-67. <https://rb.gy/x5mhgo>
- Al-Shbiel, S., & Al-Olimat, N. H. (2019). Impact of information technology on competitive advantage in Jordanian commercial banks. *Strategic Management Journal of Academic Research in Accounting, Finance and Management Sciences*, 5(4), 206-217. <https://rb.gy/sdw6ud>
- Al Shobaki, M. J., & Abu-Naser, S. S. (2017). The Role of the Practice of Excellence Strategies in Education to Achieve Sustainable Competitive Advantage to Institutions of Higher Education-Faculty of Engineering and Information Technology at Al-Azhar University in Gaza a Model. <https://philpapers.org/rec/ALSTRO-9>
- Al-Tarawna, T., & Al-Salihy, N. (2004). The extent of availability of creative skills among employees Jordanian banks in the city of Arbad, an expletory study. *Jerash for Research and Studies*, 9(1). <https://rb.gy/cmo04s>
- Amarakoon, U., Weerawardena, J., & Verreyne, M. L. (2018). Learning capabilities, human resource management innovation and competitive advantage. *The International Journal of Human Resource Management*, 29(10), 1736-1766. <https://doi.org/10.1080/09585192.2016.1209228>

- Anabila, P., & Awunyo-Vitor, D. (2013). Customer Relationship Management: A Key to Sustainable Competitive Advantage and Organizational Survival in Ghana's Banking Sector. *International Journal of Marketing Studies*, 5(1). [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2689447](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2689447)
- Arifin, Z., & Fontana, A. (2015), August). The determinant factors of technology adoption for improving firm's performance. In *2015 International Symposium on Technology Management and Emerging Technologies (ISTMET)* (pp. 181-186). IEEE. <https://doi.org/10.1109/ISTMET.2015.7359025>
- Aryee, S., Walumbwa, F. O., Seidu, E. Y., & Otaye, L. E. (2016). Developing and leveraging human capital resource to promote service quality: Testing a theory of performance. *Journal of management*, 42(2), 480-499. <https://doi.org/10.1177/0149206312471394>
- Asiligwa, M., & Rennox, G. (2017). The Effect of internal controls on the financial performance of commercial banks in Kenya. *Journal of Economics and Finance*, 8(3), 92-105. <http://tiny.cc/pzx5wz>
- Barney, J. (2010): *Gaining and Sustaining Competitive Advantage*: Third Edition. Pearson Education, Ohio. <https://doi.org/10.1016/j.jbusres.2018.02.013>
- Beck, R., Avital, M., Rossi, M., & Thatcher, J. B. (2017). Blockchain technology in business and information systems research. *Business & information systems engineering*, 59(6), 381-384. <https://link.springer.com/article/10.1007/s12599-017-0505-1>
- Bendoly, E., Blocher, J. D., Bretthauer, K. M., Krishnan, S., & Venkataramanan, M. A. (2005). Online/in-store integration and customer retention. *Journal of Service Research*, 7(4), 313-327. <https://doi.org/10.1177/1094670504273964>
- Bohling, T., Bowman, D., LaValle, S., Mittal, V., Narayandas, D., Ramani, G., & Varadarajan, R. (2006). CRM implementation: Effectiveness issues and insights. *Journal of Services Research*, 9(2), 184–194. <https://doi.org/10.1177/1094670506293573>
- Boute, R. N., Gijsbrechts, J., & Van Mieghem, J. A. (2022). Digital lean operations: Smart automation and artificial intelligence in financial services. *Innovative Technology at the*

- Business Insider. (2024, May 3). *Goldman Sachs is already using AI in five key ways and will roll out tools to 10,000 employees this year.* <https://www.businessinsider.com/goldman-sachs-ai-uses-5-tools-employees-2025-5>
- Chen, M., Mao, S., & Liu, Y. (2014). Big data: A survey. *Mobile networks and applications*, 19(2), 171-209. <https://link.springer.com/article/10.1007/s11036-013-0489-0>
- Chen, X., You, X., & Chang, V. (2021). FinTech and commercial banks' performance in China: A leap forward or survival of the fittest?. *Technological Forecasting and Social Change*, 166, 120645. <https://doi.org/10.1016/j.techfore.2021.120645>
- Chimucheka, T., & Mandipaka, F. (2015). Challenges faced by small, medium and micro enterprises in the Nkonkobe Municipality. *International Business & Economics Research Journal (IBER)*, 14(2), 309-316. <https://doi.org/10.19030/iber.v14i2.9114>
- Chimucheka, T., & Mandipaka, F. (2015). Challenges faced by small, medium and micro enterprises in the Nkonkobe Municipality. *International Business & Economics Research Journal (IBER)*, 14(2), 309-316. <https://doi.org/10.19030/iber.v14i2.9114>
- Cho, J., & Lee, J. (2018). Internationalization and performance of Korean SMEs: The moderating role of competitive strategy. *Asian Business & Management*, 17(2), 140-166. <https://link.springer.com/article/10.1057/s41291-018-0036-8>
- Coltman, T., & Devinney, T. M. (2013). Modeling the operational capabilities for customized and commoditized services. *Journal of Operations Management*, 31(7-8), 555-566. <https://doi.org/10.1016/j.jom.2013.09.002>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-39. <https://www.jstor.org/stable/249008>

- Davis, G. F., & Cobb, J. A. (2015). Resource dependence theory: Past and future. *Stanford's organization theory renaissance, 1970–2000*. [https://doi.org/10.1108/S0733-558X\(2010\)0000028006](https://doi.org/10.1108/S0733-558X(2010)0000028006)
- Delery, J. E., & Roumpi, D. (2017). Strategic human resource management, human capital and competitive advantage: is the field going in circles?. *Human Resource Management Journal*, 27(1), 1-21. <https://doi.org/10.1111/1748-8583.12137>
- De Luca, L., & Atuahene-Gima, K. (2007). Market knowledge dimensions and cross-functional collaboration: Examining the different routes to product innovation performance. *Journal of Marketing*, 71, 95–112. <https://doi.org/10.1509/jmkg.71.1.095>
- Dewasiri, N. J., Karunarathne, K. S. S. N., Menon, S., Jayarathne, P. G. S. A., & Rathnasiri, M. S. H. (2023). Fusion of artificial intelligence and blockchain in the banking industry: Current application, adoption, and future challenges. In *Transformation for sustainable business and management practices: Exploring the spectrum of industry 5.0* (pp. 293-307). Emerald Publishing Limited.
- Florian, D. M. (2015). The effect of automation on the human behavior. In 9th International Management Conference, Management and Innovation For Competitive Advantage (pp. 468-475). <http://conference.management.ase.ro/archives/2015/pdf/50.pdf>
- Fraj, E., Matute, J., & Melero, I. (2015). Environmental strategies and organizational competitiveness in the hotel industry: The role of learning and innovation as determinants of environmental success. *Tourism management*, 46, 30-42. <https://doi.org/10.1016/j.tourman.2014.05.009>
- Frynas, J. G., & Yamahaki, C. (2016). Corporate social responsibility: Review and roadmap of theoretical perspectives. *Business Ethics: A European Review*, 25(3), 258-285. <https://doi.org/10.1111/beer.12115>
- Gyimah, K. N., Asiedu, E., & Antwi, F. (2023). Adoption of blockchain technology in the banking sector of Ghana: Opportunities and challenges. *African Journal of Business Management*, 17(2), 32-42. <http://www.academicjournals.org/AJBM>
- Haseeb, M., Hussain, H. I., Kot, S., Androniceanu, A., & Jermsittiparsert, K. (2019). Role of social and technological challenges in achieving a sustainable competitive advantage

- and sustainable business performance. *Sustainability*, 11(14), 3811. <https://doi.org/10.3390/su11143811>
- Herhausen, D., Binder, J., Schoegel, M., & Herrmann, A. (2015). Integrating bricks with clicks: retailer-level and channel-level outcomes of online–offline channel integration. *Journal of retailing*, 91(2), 309-325. <https://doi.org/10.1016/j.jretai.2014.12.009>
- Hidaya, N., Badawi, A., Nugroho, L., & Prihanto, H. (2020). Human capital and the use of information technology to enhance sustainable competitive advantages (case study on Sharia banking). *Archives of Business Review–Vol*, 8(6). [https://www.academia.edu/download/99087222/academian\\_7.pdf](https://www.academia.edu/download/99087222/academian_7.pdf)
- Hu, Z., Ding, S., Li, S., Chen, L., & Yang, S. (2019). Adoption intention of fintech services for bank users: An empirical examination with an extended technology acceptance model. *Symmetry*, 11(3), 340. <https://doi.org/10.3390/sym11030340>
- Husted, B. W., Allen, D. B., & Kock, N. (2015). Value creation through social strategy. *Business & Society*, 54(2), 147-186. <https://doi.org/10.1177/0007650312439187>
- Ivanov, G., & Mayorova, E. (2015). Intangible assets and competitive advantage in retail: case study from Russia. *Asian social science*, 11(12), 38. <https://pdfs.semanticscholar.org/c9f8/6c91669f17a439606d25d91842f1f444f817.pdf>
- Ivanov, S. H. (2017). Robonomics-principles, benefits, challenges, solutions. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2995365](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2995365)
- Jeanpert, S., & Paché, G. (2016). Successful multi-channel strategy: mixing marketing and logistical issues. *Journal of Business Strategy*. *Journal of Business Strategy* (2016). <https://doi.org/10.1108/JBS-05-2015-0053>
- Johansson, T., & Kask, J. (2017). Configurations of business strategy and marketing channels for e-commerce and traditional retail formats: A Qualitative Comparison Analysis (QCA) in sporting goods retailing. *Journal of Retailing and Consumer Services*, 34, 326-333. <https://doi.org/10.1016/j.jretconser.2016.07.009>

- Johnson, G., Scholes, K., Whittington, R., Regn\_r, P., & Angwin, D. (2017). *Fundamentals of strategy*. Pearson UK. <http://tiny.cc/uey5wz>
- Kaur, S. J., Ali, L., Hassan, M. K., & Al-Emran, M. (2021). Adoption of digital banking channels in an emerging economy: exploring the role of in-branch efforts. *Journal of Financial Services Marketing*, 26, 107-121. <https://link.springer.com/article/10.1057/s41264-020-00082-w>
- Kebede, A. M., & Tegegne, Z. L. (2018). The effect of customer relationship management on bank performance: In context of commercial banks in Amhara Region, Ethiopia. *Cogent Business & Management*, 5(1), 1499183. <https://doi.org/10.1080/23311975.2018.1499183>
- Kemunto, E. R., & Kagiri, A. (2018). Effect of implementation of FINTECH strategies on competitiveness in the banking sector in Kenya: A case Of KCB Bank Kenya. *European Journal of Business and Strategic Management*, 3(3), 29-40. <https://www.iprjb.org/journals/index.php/EJBSM/article/view/628>
- Klein, L. L., & Pereira, B. A. D. (2016). The survival of inter-organizational networks: a proposal based on resource dependence theory. *RAM. Revista de Administração Mackenzie*, 17, 153-175. <https://doi.org/10.1590/1678-69712016/administracao.v17n4p153-175>
- Kharub, M., Mor, R. S., & Sharma, R. (2018). The relationship between cost leadership competitive strategy and firm performance: A mediating role of quality management. *Journal of Manufacturing Technology Management*. 2(2), 57-65. <https://doi.org/10.1108/JMTM-06-2017-0116>
- Kireru, J. N., Ombui, K., & Omwenga, J. (2016). Influence of product differentiation strategy in achieving competitive advantage in commercial banks: A case of Equity Bank Limited. *International Journal of Business & Law Research*, 4(2), 40-52. <https://seahipaj.org/journals-ci/june-2016/IJBLR/full/IJBLR-J-4-2016.pdf>
- Kombe, S. K., & Wafula, M. K. (2015). Effects of internet banking on the financial performance of commercial banks in Kenya a case of Kenya Commercial Bank. *International Journal of Scientific and Research Publications*, 5(5), 1-10. <http://tiny.cc/7hy5wz>

- Kombo, K.D. & Tromp, L.A. 2006. *Proposal and thesis writing: An introduction*. Nairobi, Kenya: Paulines Publishers. <http://tiny.cc/yiy5wz>
- Krishnaswami, O.R and Satyaprasad, B.G. 2010 *Business Research Methods*. Himalaya Publishing House, New Delhi. <http://tiny.cc/6ky5wz>
- Leonidou, L. C., & Samiee, S. (2012). Born global or simply rapidly internationalizing? Review, critique, and future prospects. *Handbook on Research on Born Globals*, 16-35. <http://tiny.cc/6ky5wz>
- Mang'ana, R. (2022). Strategic adoption of technological innovations on competitive advantage of commercial banks in Kenya. *Journal of Business and Strategic Management*, 7(2), 16-36. <https://doi.org/10.47941/jbsm.885>
- McDonald, R. M., & Eisenhardt, K. M. (2020). Parallel play: Start ups, nascent markets, and effective business-model design. *Administrative Science Quarterly*, 65(2), 483-523. <https://doi.org/10.1177/0001839219852349>
- Mugo, P. C., & Namada, J. M. (2020). Process Innovation and Competitive Advantage in Telecommunication Companies. *International Journal of Business Strategy and Automation (IJBSA)*, 1(4), 40-55. <https://doi.org/10.4018/IJBSA.2020100103>
- Muhindi, K. A., & Ngaba, D. (2018). Effect of firm size on financial performance on banks: Case of commercial banks in Kenya. *International Academic Journal of Economics and Finance*, 3(1), 175-190. <http://ir-library.ku.ac.ke/bitstream/handle/123456789/18501/Effect%20of%20firm%20size....pdf?sequence=1>
- Narooz, R., & Child, J. (2017). Networking responses to different levels of institutional void: A comparison of internationalizing SMEs in Egypt and the UK. *International Business Review*, 26(4), 683-696. <https://doi.org/10.1016/j.ibusrev.2016.12.008>
- Nderitu, N., Edabu, P., & Chui, M. M. (2020). Influence of institutional characteristics on competitiveness of private universities in Nairobi county, Kenya. *African Journal of Education and Practice*, 6(1), 60-71. <https://iprjb.org/journals/index.php/AJEP/article/view/1048>

- Ndung'u, N. (2018). The M-Pesa technological revolution for financial services in Kenya: A platform for financial inclusion. In *Handbook of blockchain, digital finance, and inclusion, volume 1* (pp. 37-56). Academic Press. <https://doi.org/10.1016/B978-0-12-810441-5.00003-8>
- Ngai, E. W., Hu, Y., Wong, Y. H., Chen, Y., & Sun, X. (2011). The application of data mining techniques in financial fraud detection: A classification framework and an academic review of literature. *Decision support systems*, 50(3), 559-569. <https://doi.org/10.1016/j.dss.2010.08.006>
- Obeidat, B. Y., Tarhini, A., Masa'deh, R. E., & Aqqad, N. O. (2017). The impact of intellectual capital on innovation via the mediating role of knowledge management: a structural equation modelling approach. *International Journal of Knowledge Management Studies*, 8(3-4), 273-298. <https://doi.org/10.1504/IJKMS.2017.087071>
- Ogesi, S. (2020). *Multi-channel Retailing Operations and Performance of Select Alcohol Manufacturing Companies in Nairobi, Kenya* (Doctoral dissertation, University of Nairobi). <http://erepository.uonbi.ac.ke/handle/11295/154388>
- Oliver, R. L. (1977). Effect of Expectation and Disconfirmation on Postexposure Product Evaluations: An Alternative Interpretation, *Journal of Applied Psychology* , 3(1). 480-486. <https://psycnet.apa.org/doi/10.1037/0021-9010.62.4.480>
- Oliver, R. L., Balakrishnan, P. V. S., & Barry, B. (2014). Outcome Satisfaction in Negotiation: A Test of Expectancy Disconfirmation, *Organizational Behavior and Human Decision Processes* , 5(2), 252-275. <https://doi.org/10.1006/obhd.1994.1083>
- Ooko, N. K., & Muchelule, Y. (2024). Digital banking technologies and financial inclusion among banks in Nairobi city county, Kenya. *International Journal of Social Sciences Management and Entrepreneurship (IJSSME)*, 8(2)
- Oteh, O. U., Ibok, I. N., & Nto, C. P. (2017). Adoption and usage of ebanking channels in Nigeria: implication for deepening financial inclusion. *International business and management journal*, 14(3), 1-8. <https://www.academia.edu/download/54355814/9610-21422-1-PB.pdf>
- Pauwels, Koen, Peter S.H. Leeflang, Marije L. Teerling & K.R. Eelko Huizingh (2011). Does Online Information Drive Offline Revenues? Only for Specific Products and

Consumer Segments!, *Journal of Retailing*, 87 (1), 1–17.  
<https://doi.org/10.1016/j.jretai.2010.10.001>

Prajogo, D. I., & Oke, A. (2016). Human capital, service innovation advantage, and business performance: The moderating roles of dynamic and competitive environments. *International Journal of Operations & Production Management*, 1(2), 62-66. <https://doi.org/10.1108/IJOPM-11-2014-0537>

Patel, K., & Brown, I. (2016). Towards a Theory of Multi-Channel Banking Adoption amongst Consumers. *Electronic Journal of Information Systems Evaluation*, 19(3), pp137-157. <https://academic-publishing.org/index.php/ejise/article/view/157>

Porter, M.E. (1998). *Competitive Advantage: Creating and Sustaining Superior Performance*". New York: The Free Press. <https://t.ly/VmRi7>

Pearce, J. A., Robinson, R. B., & Subramanian, R. (2010). *Strategic management: Formulation, implementation, and control*. Columbus, OH: Irwin/McGraw-Hill. <https://www.ncl.comp.nus.edu.sg/0duwzg8e98a4/00-prof-elmores-crooks-v-2/strategic-management-formulation-implementation--1-9780073054223-st.pdf>

Porter, M.E. (1980). *Competitive Strategy—Techniques for Analyzing Industries and Competitors*. Free Press, New York. <https://t.ly/Y5typ>

Raffiee, J., & Coff, R. (2016). Micro-foundations of firm-specific human capital: When do employees perceive their skills to be firm-specific?. *Academy of Management Journal*, 59(3), 766-790. <https://doi.org/10.5465/amj.2014.0286>

Saunders, M., Lewis, P. and Thornhill, A. (2015) *Research Methods for Business Students*. 17<sup>th</sup> Ed. Pearson Education: Essex. <https://t.ly/GHVPz>

Schweizer, L., & Koscher, E. M. K. (2021). Competitive Advantage. In *Encyclopedia of Sustainable Management* (pp. 1-3). Cham: Springer International Publishing. <https://www.proquest.com/openview/06483c9c44fb2d3811e775c1869e4066/1?pq-origsite=gscholar&cbl=2026366&diss=y>

Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*. John Wiley & sons. <https://t.ly/8QFym>

- Sindani, M. W., Muturi, W., & Ngumi, P. (2019). Effect of financial distribution channels evolution on financial inclusion in Kenya. *International Academic Journal of Economics and Finance*, 3(3), 148-173. [https://www.iajournals.org/articles/iajef\\_v3\\_i3\\_148\\_173.pdf](https://www.iajournals.org/articles/iajef_v3_i3_148_173.pdf)
- S&P Global. (2024, June 13). *Tech disruption in retail banking: Fintechs are fueling financial inclusion in Kenya*. <https://www.spglobal.com/ratings/en/research/articles/240613-tech-disruption-in-retail-banking-fintechs-are-fueling-financial-inclusion-in-kenya-13117846>
- Staflund, L., & Kersmark, M. (2015). Omni-Channel Retailing: Blurring the lines between online and offline. *Organizational Behavior and Human Decision Processes*, 2(2), 352-357. <https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A824960&dswid=-2404>
- Stefanou, C.J., Sarmaniotis, C. & Stafyla, A. (2003). CRM and customer-centric knowledge management: An empirical research. *Business Process Management Journal*, 9(5), 617-634. <https://doi.org/10.1108/14637150310496721>
- Susarla, A., Barua, A., & Whinston, A. B. (2018). Understanding the Service Component of Application Service Provision: An Empirical Analysis of Satisfaction with ASP Services, *MIS Quarterly* 91-123. [https://link.springer.com/chapter/10.1007/978-3-540-34877-1\\_17](https://link.springer.com/chapter/10.1007/978-3-540-34877-1_17)
- Thiong'o, P. N., Wasike, S., & Yano, R. (2021). Strategic choice and competitive advantage of private universities in Nairobi County: A case of Strathmore University. *Journal of Strategic Management*, 5(2). <https://t.ly/PmGzZ>
- Thuda, A., Sari, J., & Maharani, A. (2019). Employees Perception of Human Capital Practices, Employee's Productivity, and Company Performance. *Integrated Journal of Business and Economics*, 3(3), 240-250. <https://core.ac.uk/download/pdf/267807508.pdf>
- Venkatesh, V., & Davis, F. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), 186-204. <https://doi.org/10.1287/mnsc.46.2.186.11926>

- Vovchenko, N. G., Andreeva, A. V., Orobinskiy, A. S., & Filippov, Y. M. (2017). Competitive advantages of financial transactions on the basis of the blockchain technology in digital economy. *European Research Studies*, 20(3B), 193. <https://ersj.eu/dmdocuments/2017-xx-3-b-19.pdf>
- Wang, W., Li, G., & Cheng, T. C. E. (2016). Channel selection in a supply chain with a multi-channel retailer: The role of channel operating costs. *International Journal of Production Economics*, 173, 54-65. <https://doi.org/10.1016/j.ijpe.2015.12.004>
- Wang, W. C., Lin, C. H., & Chu, Y. C. (2019). Types of competitive advantage and analysis. *International Journal of Business and Management*, 6(5), 100. <https://www.academia.edu/download/32030806/10432-31523-1-PB.pdf>
- Zaky, A. H. M. (2017). Determinate customer relationship management (crm) and its effects on sustaining competitive advantage in the Egyptian banking sector. *The Business And Management Review*, 8(5), 266-275. [https://cberuk.com/cdn/conference\\_proceedings/conference\\_92021.pdf](https://cberuk.com/cdn/conference_proceedings/conference_92021.pdf)

**APPENDICES**

**Appendix I : Literature Map**

<b>Author (2) Year</b>	<b>Country</b>	<b>Theories Used</b>	<b>Sample Used</b>	<b>Methodology</b>	<b>Variables</b>	<b>Findings</b>
<b>Automation level</b>						
Fraj, Matute and Melero (2015)	Spain	-Dynamic capability  contingency theory	Stratified sampling was used to arrive a sample of 232 hotels	Mixed- methods and a comparative case study approach	Environmental strategies  Organizational capabilities  Organization competitiveness	Proactive environmental strategy has positive effect on performance  Internal automation of processes enhance performance

Mugo and Namada (2020).	Kenya	Disruptive innovation theory	Simple random sampling technique	Descriptive research design	Process innovation  Service delivery  Cost optimization  Organization structure	There exists a Positive and significant effect on competitive advantage  Automation of process though resulting in cost reduction had no effect on the firms competitive advantage
Beck, Avital, Rossi and Thatcher (2017).	Denmark	Disruptive innovation theory	-	Desk-top research – involving a meta-analysis of literature	-immutability  -fraud prevention	Blockchain technology enhance trust in business

					-credit analysis	Decentralization of businesses demands the use of blockchain technology
Kemunto and Kagiri (2018)	Kenya	Technology adoption Theory  Socio-technical system theory	Census	Descriptive research design	-internet banking  -mobile banking  -agency banking  -process	-positive and significant effect of banking automation on competitiveness
<b>Level of Alternative channels</b>						

Jeanpert & Paché, (2016).	France	Resource based view  Service – Dominant- Logic Framework	-	Desk-top research –	Sales staff  Logistics  communication	Information on how customers order is important  Marketing and logistics sharing has positive effect on firm performance
Kireru, Ombui and Omwenga (2016)	Kenya	-Product-Market Growth Matrix  -Porter competitive	Stratified sampling	Descriptive research design	-product cost  -product market	- product cost strategy had a positive and significant effect of bank competitiveness

		advantage theory			-product distribution  -product process	-product process had insignificant effect on competitiveness
Bendoly, et al., (2015)	Britain	-	simple random sampling	descriptive survey	perceived store availability  perceived online availability  integration of information	higher levels of integration between store and online channels is shown to be associated with greater loyalty  A mixed channel offering should be considered to

						take care of the interest of diverse base
Johansson and Kask, (2017)	Sweden	Contingency theory  Technology adoption theory	census	Exploratory research design	Differentiation strategy  Interactive  Online marketing	A blend of physical and online strategy resulted in better performance  business strategy and multi-channel focus had a mild relationship
<b>Optimization of human capital</b>						

Hidaya, Badawi, Nugroho and Prihanto, (2020)	Indonesia	Human capital theory  Porters competitive advantage framework	Correlation research design	purposive sampling design	knowledge  Skills  Ability  Tenure  Cost leadership  Differentiation  Focus	The use of IT has a significant effect on sustainable competitive advantage, rapid technological development, growth in the number of Sharia Banking and operational banking activities
--	-----------	--	-----------------------------------	---------------------------------	---	--

Raffiee and Coff (2016)	Korea and United States	Human capital theory	Correlational research design	Purposive sampling design	Organization commitment  On-job training  Investment skills  Tenure	firm-specific human capital, as perceived by employees, may drive behavior in ways with respect to investments in skills or turnover decision
Thuda, Sari and Maharani (2019).	Indonesia	Resource based theory  Human capital Theory	correlation research	stratified sampling	-human resource policies  -employee productivity  -performance	human capital and productivity does affect the performance of the company

<b>Technology Adoption</b>						
Vovchenko, Orobinskiy and Filippov (2017)	Russia	Institutional theory	Desk-top research – involving a meta-analysis of literature	-	Cost management  Innovation  Financial Security	Blockchain technology ensures competitive power of financial contracts  Financial security is ensured  Financial innovation is increased

						Increases economic agents
Herhausen, Schoegel and Herrmann (2015)	Belgium	Technology adoption theory  Diffusion theory	Desk-top research – involving a meta-analysis of literature	Purposive sampling	Perceived risk  Perceived service quality	Multi-channel shopping affects customer switching behaviour
Ogesi, (2020).	Kenya	Theory of cumulative capabilities  Theory of performance frontiers	Descriptive Research Design	Census	Capacity planning  Warehousing  Inventory management	Multi-channel distribution had increased market share, competitiveness and management of cost.

Kombe, & Wafula, (2015)	Kenya	Innovation Diffusion theory  Transaction cost innovative theory	Descriptive survey	Stratified sampling	cheaper internet cost  24-hour banking  ICT competence of customers	the dominant effect of internet banking was cost reduction and which had a significant and positive effect on performance.
-------------------------	-------	---	--------------------	---------------------	---	--

## Appendix II: Cover Letter

Clement Miano

P. O. Box 103893-00101

Nairobi, Kenya.

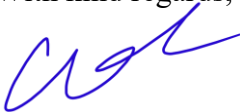
Dear Sir/ Madam,

I am a Strathmore Business School student who is now researching the topic "**Effect of Technology Adoption on the Sustainable Competitive Advantage of Commercial Banks in Kenya**" as part of a course requirement. I'd like to enlist your assistance in completing the accompanying questionnaire. Your answers to the questions will be kept strictly confidential and used exclusively for academic purposes. If you wish to get the results of the research, please get in touch with the undersigned.

For more information about this study, you can contact the Principal Researcher on Tel: 0721265431

I am looking forward to your cooperation.

With kind regards,



**Clement Miano**

## Appendix III: Questionnaire

### Section A: Demographic and Bio-Data Information

1. Name of the Bank (Optional).....

2. For how long has the bank been operating in Kenya?

- |                       |     |                  |     |
|-----------------------|-----|------------------|-----|
| a) Less than 20 years | ( ) | b) 21 - 40 years | ( ) |
| c) 41 – 60 years      | ( ) | d) Over 60 years | ( ) |

3. How many employees does your bank have?

- |                          |     |                       |     |
|--------------------------|-----|-----------------------|-----|
| a) Less than 500         | ( ) | b) 501 – 1000         | ( ) |
| c) 1001 – 1500 employees | ( ) | d) Over 1501 employee | ( ) |

4. What level of management are you?

- |                      |     |                     |     |
|----------------------|-----|---------------------|-----|
| a) Top Level         | ( ) | b) Middle level     | ( ) |
| c) Supervisory Level | ( ) | d) Others (Specify) | ( ) |

5. For how long have you worked in the enterprise?

- |                      |     |                       |     |
|----------------------|-----|-----------------------|-----|
| a) Less than 5 years | ( ) | b) 6 -10 years        | ( ) |
| c) 11 – 15 years     | ( ) | d) More than 15 years | ( ) |

### Section B: Technology Adoption

6. The following are areas in which technology has been adopted in your organization. Please indicate the degree to which you agree with the statement by marking the checkbox that corresponds to the option that you consider the most relevant in light of your perspective.

Indicate the extent using the scale:

**Key; 1) No extent; 2) Little extent; 3) Moderate; 4) Large 5) Very large extent**

Statement	1	2	3	4	5
<b>a) Level of automation</b>					
Transaction automation rate					
Digital account opening rate					
Online banking adoption rate					
Mobile banking adoption rate					
ATM usage					
Document digitization rate					
Automated loan approval rate					
E-signature adoption rate					
Online loan application					
Online customer support					
<b>b) Alternative Channels</b>					
Online presence					
Mobile app usage					
Social media engagement					
Email marketing					
Video and webinar					
Content marketing					
Customer feedback					
Online surveys and feedback forms					
User authentication and account opening and account opening					
<b>c) Optimization of Human Resources</b>					
Human resource software usage					
Recruitment and onboarding					
Employee self-service					
E-learning engagement					
Workforce analytics					
Employee well-being					

Employee engagement					
HR technology training					
<b>d) Customer Relationship Management</b>					
Adoption of CRM software					
Tracking efficiency of automated CRM system					
Availability of CRM system on mobile phone					
Application of analytics tools to gain insights from the information gained					
Integration of artificial intelligence in predicting customer behaviour					
There exists real-time interactions with customers					
There is integration of CRM with marketing automation tools					

### Section C: Sustainable Competitive Advantage

7. To what extent has the firm performed according to each of the following sustainable competitive advantage performance indicators. Using the scale below:

**Key; 1) No extent; 2) Little extent; 3) Moderate; 4) Large 5) Very large extent**

	<b>Statement</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Cost Effectiveness</b>	Optimization of Operating costs					
	Cost efficiency					
	Cost saving initiatives					
	Cost per service delivered					
	Process Automation					
<b>Productivity</b>	Revenue per employee					
	Transaction volume					

	Cost-to-income ratio					
	Customer acquisition cost					
	Assets per branch					
	Compliance and risk management					
	Sales quotas achieved					
	Number of transactions processed per employee					
<b>Customer Satisfaction</b>	Complaint resolution time					
	Response time					
	loan approval timelines					
	Fraud and security measures					
	Friendliness of digital services					
	Level of customer interaction					
	Transaction					
<b>Employee Satisfaction</b>	Wellness and health programs					
	Team collaboration					
	communication effectiveness					
	Inclusivity and diversity					
	Organization culture and value alignment					
	Satisfaction with career development					

**THANK YOU FOR YOUR TIME**

#### **Appendix IV : List of Commercial Banks in Kenya**

1. ABC Bank
2. ABSA Bank
3. Bank of Africa
4. Bank of Baroda
5. Bank of India
6. Stanbic Holdings
7. Citibank
8. Consolidated Bank of Kenya
9. Cooperative Bank of Kenya
10. Credit Bank
11. Development Bank of Kenya
12. Diamond Trust Bank
13. Ecobank Kenya
14. Spire Bank
15. Equity Bank
16. Family Bank
17. Fidelity Commercial Bank Limited
18. First Community Bank
19. Giro Commercial Bank
20. Guaranty Trust Bank Kenya
21. Guardian Bank
22. Gulf African Bank
23. Habib Bank
24. Habib Bank AG Zurich
25. I&M Bank
26. Jamii Bora Bank
27. Kenya Commercial Bank
28. K-Rep Bank
29. Middle East Bank Kenya
30. NCBA Kenya PLC
31. National Bank of Kenya

32. M-Oriental Commercial Bank
33. Paramount Universal Bank
34. Prime Bank (Kenya)
35. Sidian Bank
36. Standard Chartered Kenya
37. Access Bank
38. United Bank for Africa
39. Victoria Commercial Bank

Source: Central Bank of Kenya (2023)

## Appendix V: Approvals



12<sup>th</sup> February 2025

Mr Muriuki Clement,  
clementmiano@gmail.com

Dear Mr Muriuki,

**RE: Influence of Technology Adoption on the Sustainable Competitive Advantage of Commercial Banks in Nairobi Kenya**

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU-masters** proposal. Your application reference number is **SU-ISERC2562/25**. The approval period is from **12<sup>th</sup> February 2025 to 11<sup>th</sup> February 2026**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MTA) will be used.
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 72 hours of notification.
- iv. Any changes anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 72 hours.
- v. Clearance for the export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days of completion of the study to SU-ISERC.

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

Yours sincerely,

A handwritten signature in black ink, appearing to read "Ambrose Rachier".

**Mr Ambrose Rachier,  
Chairperson; SU-ISERC**

Ole Sangale Rd, Madaraka Estate,  
P.O Box 59857 00200, Nairobi, Kenya,  
Cell: +254 703 414/6/7, Twitter: @585Kenya  
Email: info@abs.ac.ke or visit www.abs.strathmore.edu



13<sup>th</sup> February 2025

To Whom It May Concern,

Dear Sir/Madam,.

**RE: FACILITATION OF RESEARCH – CLEMENT MIANO MURIUKI**

This is to introduce Clement Miano Muriuki, who is a Master of Business Administration student at Strathmore University Business School, admission number MBA/12703/21. As part of our MBA program, Clement is expected to do applied research and undertake a project. This is in partial fulfillment of the requirements of the MBA course. To this effect, he would like to request appropriate data from your organization.

Clement is undertaking a research paper on "Effect of Technology Adoption on the Sustainable Competitive Advantage of Commercial Banks in Nairobi, Kenya." The information obtained from your organization shall be treated confidentially and shall be used for academic purposes only.

Our MBA seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

We appreciate your support and shall be willing to provide any further information if required.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "Alois Njenga".

Alois Njenga.  
Manager—MBA Programs.  
Strathmore University Business School.

Association of African  
Business Schools



Strathmore Business School is a Proud member of





REPUBLIC OF KENYA

Ref No: 361502

RESEARCH LICENSE



This is to Certify that Mr. Clement Miano Muriuki of Strathmore University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: Effect of Technology Adoption on the Sustainable Competitive Advantage of Commercial Banks In Nairobi Kenya for the period ending : 25/February/2025.

License No: NACOSTI/P/25/416252

361502

Applicant Identification Number



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Date of Issue: 25/February/2025

Walter Wambui

Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code



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

See overleaf for conditions