EFFECT OF ARTIFICIAL INTELLIGENCE ON STRATEGIC PERFORMANCE IN THE BANKING INDUSTRY IN KENYA.

BY

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STUDENT'S DECLARATION

I, declare that the submitted work is my own and original work which is for the importance of my academic credit and has not been submitted to any other collage besides Strathmore University.

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This academic research has been presented for the purpose of examination with the approval of the appointed supervisor

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LIST OF ABREVIATIONS

AI	: Artificial Intelligence
ANI	: Artificial Narrow Intelligence
AGI	: Artificial General Intelligence
ATM	: Automated Teller Machine
CBK	: Central Bank of Kenya
DIT	: Disruptive Innovative Theory
HRM	: Human Resource Management
IT	: Information Technology
MLT	: Machine Learning Theory
ML	: Machine Learning
NLP	: Natural Language Processing
RPA	: Robotic Process Automation
R&D	: Research and Development
TCE	: Transaction Cost Economics
US	: United States

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Definition of terms

Artificial Intelligence

This is the using of computers which have been programmed to perform certain duties and this makes work easier for human (Fox, 2018)

Machine Learning

The application plus advancement of computers system which are capable of learning and also adjusting while ignoring explicit instructions through applying algorithms as well as statistical models in analyzing and concluding from patterns in datum (Landesman, 2018)

Robotic Process Automation

This refers to a software system that helps create, control and use soft robots that can mimic human behavior and interact with digital systems and software (Motamarri, Akter, & Yanamandram, 2017)

Natural Language Processing

NLP, the subfield of artificial intelligence that helps robots understand, interpret, and respond to human language, is a rapidly growing field (Kothapalli, 2019).

ABSTRACT

Artificial intelligence has become one of the most popular technologies in recent years and is being accepted by many organizations. The rapid development of artificial intelligence has also increased its application in the industry. Processes using artificial intelligence can not only increase overall profits but also revolutionize the financial sector. The aim of this study is to determine the level of skill development in the Kenyan banking sector and its effect on performance. The objectives of this study are: The effect of natural language processing technology on the performance of banks in Kenya, the effect of machine learning on the performance of the Kenyan economic furnace, and the effect of robotic automation on the banking sector. This study uses approaches such as AI trust and transparency, AI technology and machine learning to assess how AI impacts business performance. This study uses a variety of methods to examine its effect on skills and entrepreneurship. Studies show that AI increases productivity and customer satisfaction through the use of automation, but AI also faces challenges such as data security issues and reluctance to change. Future studies could investigate the long-term effects and economic impacts of various financial institutions. The findings suggest that banks should invest in AI-based information services, improve data security, and better integrate AI to provide competitive advantage. This study aims to influence public understanding of AI by demonstrating the potential of AI to improve banking services, reduce operating costs and simplify accounting. This study provides insight into the challenges and opportunities in AI implementation by offering recommendations to policymakers, banking leaders and AI developers.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Davis & Johnson (2020), banking is not only the heart of the economy, but also the financial intermediary that enables the economy to finance itself through capital investment, provides credit facilities, manages risk and supports the establishment of banks. As technology transforms Africa, banks remain indispensable to the economy. These are dept money which would be impossible to get if there was no efficiency in it, the money will cause the inflation of the market another thing at all (Smith et al.'s 2020). However, these days, this industry is also faced with challenges and alterations of the market. According to Jones and Brown (2019), would be consequences of shutting down for laborii programs. Hence, there is a conceivable a situation of a drop in the labor force of the economy as most people in the sector will be devoid of jobs Also sales might drop if businesses no longer need employees with certain skills, while companies could raise prices if employees wanted more money.

The banking industry becomes the AI and ML great by other than the products and the back-office work. They are the penetration of money through online mediums. Subsequently, allowing for the self-service of ATMs in different branches of the banking industry. For example, when the stock market crashes, the human driver will not require the researchers' immense intelligence for even the car to be safely escorted to a parking lot.

The information shared by Haroon Sheikh (2023) in his work that a lot of money is spent on a thorough search to determine what technology is the best to introduce into the marketplace. He explained that AI is a technology that deals with the issue of machines being able to share human skills that are beyond respective part of this field. By learning through all the ways humans learn, including through trial and conjecture through different situations, the computer is able to become a better learner. ML is a computer algorithm that enables it to perform tasks previously done only by humans" (EL Naqa, 2015).

Artificial intelligence that is based on capabilities has got 3 categories. Artificial Narrow Intelligence (ANI) also called weak AI are designed to perform specific or a set of closely related tasks; ANI operates under a coded algorithms i.e. Chat GPT and cannot exhibit the same level of understanding or adaptability as a human. Another terminology is the Artificial General Intelligence (AGI) which is often referred to as strong AI, is actually a formal concept that is particularly embodied in the human

brain. As proper beings are complicated, the creation and development of AGI are still under the experimental stage of their realization, according to Cannella (2018).

At the moment, the contribution AI makes to banks does not limit to the banking industry but also includes the part that credit card companies play which is a great advantage to them in demineralizing the fraudulent transactions. Visa enlists the use of advanced machine learning technologies with the help of their internally developed AI platform. Advanced Authorization for the real-time monitoring of suspicious activity which in turn saved them almost $25b in frauds only in 2019. The use of AI has also been influential in the case of banking apps transformation and improved customer experience as well as better technology adoption in this sector.

The banking sectors have very much been helped with the banking app's advantages i.e. SAP GUI, Vision and T24 in the finance departments. Every day there are a huge number of digital transactions when users download applications and log in to their online accounts to store money and this consequently leads to the occurrence of cybercrime and the fraudulent material. This process involves the deliberate exchange of incorrect information to take money from another person or entity (Associate of Certified Fraud Examiners, 2021). Undoubtedly, experts in fraud contend that the main issues which lead to fraud are pressures, opportunities, and rationalizations (Littman,2021). This is the point of time when AI and machine learning become extremely practical and effective since with the three types of financial fraud the table below provides an explanation and how AI and ML give solutions.

Table 1.1 below shows the types of financial fraud

Financial Fraud Type	Explanation	ML & AI-Based Solution	Source
Physical Attacks	This category includes common scams like check fraud, ATM fraud, and credit card theft. While these types of scams may seem simple, they persist because they are effective, especially when they target unsuspecting victims.	AI video analytics can detect suspicious behavior and alert security personnel in real time. Machine learning algorithms can analyze large amounts of data over time to identify patterns and anomalies that differentiate consumer behavior. If there is activity, you can intervene immediately	Littman, J. (2021). "Financial Fraud Prevention: The Role of Machine Learning." Journal of Financial Technology, 5(2), 99-112.
Violation of the Four Eyes Rule	The "Four-Eye Rule" is a security measure that requires two people to approve any major action or change in a company. This law helps prevent fraud because it is harder for two people to commit fraud together than for one person to commit fraud alone. However, the law can still be violated through accident (two people working together to commit fraud) or error (one	Machine learning algorithms monitor employee behavior, identify unusual patterns that could indicate fraud or inappropriate behavior, and ensure compliance with dual authorization. For example, if two people are consistently approving each other's work quickly without properly verifying it, the system will flag it as suspicious. This will allow companies to investigate and prevent fraud even after the Four-Eyes Act is passed.	Binns, J., & Hinton, S. (2020). "AI in Banking: Tackling Fraud and Strengthening Security." Banking Technology Review, 12(3), 78-85.

	person not knowing about the agreement).		
Digital Fraud	Digital banks are facing an increase in online account takeovers, phishing scams, and fraudulent money transfers. The speed and anonymity of the internet make these particularly difficult to investigate. AI systems are good at detecting online scams like identity theft and phishing by analyzing user behavior and business patterns.	AI systems detect online fraud such as identity theft and phishing by analyzing user behavior and transaction patterns, flagging anomalies for immediate intervention	Odhiambo, J., & Wambugu, G. (2021). "Reducing Digital Fraud in Kenyan Banks: Leveraging Artificial Intelligence." Journal of Cybersecurity in Finance, 9(4), 145-159.

Table 1.1 Financial Fraud

Kenya has 37 commercial banks, 1 credit union, 14 microfinance banks, 10 foreign bank correspondents, 72 foreign exchange offices, 19 referral sources and 3 credit sources (Cytonn Q1, 2023). All these banks are under the rule of CBK Act, the Banking Act all these were offered by the Central Bank of Kenya (CBK. 2020)

Kenyan banking sectors have experienced rapid increase on assets which has improved strategic performance amongst the banking organizations which has been propelled by the advanced technology that they have invested in when it comes to AI modifications and upgrades. The banking sectors have in most cases tend to work in an environment that they can adapt. Viadya (2011) stated that the world is becoming much captivated into performing their business/trade online in addition to the worldwide web.

1.2 Statement Problem

The paper discusses some challenges that confront the Kenyan banking sector in adopting artificial intelligence as a means to improve performance and strategic decision-making. Although AI, according to Ndung'u (2020), has immense potential in improving institutional capacity, its application within the banking industry remains at an embryonic stage. Works like Mutua & Oyugi (2018) have demonstrated the positive impact on performance, although with great knowledge gaps and strategic application deficiencies in its wide usage. Other works, such as Waweru & Kisaka (2019), discuss some of these limiting factors to AI adoption: issues in technological infrastructure, regulatory concerns, and a shortage of skilled personnel.

Other works, such as Mwangi & Waithaka (2021), emphasize that effective AI adoption will enhance operational efficiency, which indirectly enhances strategic performance. In a similar manner, Njenga & Waema (2019) talk about the role of AI in strategic management to enhance the process of making decisions in banks. Omondi & Kamau (2020) discuss how the innovations of FinTech have been causing disruption, hence challenges and opportunities with respect to the adoption of AI in this sector. Despite these openings, complete and full adoption remains limited by quite a number of factors.

The major challenges in integrating AI are resistance to change and a limited technical infrastructure; research by both Karani & Okello, 2020 and Muthoni & Gikonyo, 2019 affirms that most countries lack the pertinent infrastructure, an example being high-speed internet and adequate data centers. Moreover, Kariuki & Mbugua, 2021, identify the lack of a well-set strategic vision and commitment by leadership as limiting factors to AI implementation. Overall, though AI is poised to transform the Kenyan banking sector, its effective integration is hindered by technical, organizational, and strategic obstacles.

1.3 General Objective

The aim of this research is to analyze and evaluate the effect of Artificial Intelligence on strategic performance in the Kenyan banking sectors.

1.4 Specific Objectives

1. To assess the effect of Natural Language Processing on strategic performance amongst Kenyan commercial banks.

2. To assess the effect of Machine Learning on strategic performance amongst Kenyan commercial banks.
3. To assess the effect of Robotic process automation on strategic performance amongst Kenyan commercial banks.

1.5 Research Questions

1. How has AI technology improved access to banking service for underserved populations in Kenya
2. To what extent has AI contributed to the overall banking penetration in Kenya
3. In what ways has AI improved the quality and speed of service delivery in the Kenyan banking sector.

1.6 Significance of the study

1.6.1 Banks and Financial Institutions

In this case, by understanding the impact of intelligence on the quality of work, banks can achieve good business, service workers use products, decisions and new technologies to win the competition and grow. AI will also allow banks to manage risk, make their products more customer-friendly and increase the effectiveness of their strategies.

1.6.2 Regulatory Authorities and Policymakers

Regulators and policymakers such as the Central Bank of Kenya will benefit greatly from understanding how AI can impact the performance of banking operations. As AI continues to transform the way companies do business, regulators need to be knowledgeable about creating policies that support the responsible and ethical use of technology for security, finance, and consumer protection. By deeply understanding how AI can improve efficiency, productivity, stability, and customer service, executives can develop appropriate processes to balance innovation with security and integrity. Furthermore, knowledge of AI risks, such as cybersecurity issues or algorithmic bias, can help policymakers create regulations to mitigate negative impacts and protect consumers and stakeholders.

1.7 Scope of the Study

The study examining the effect of artificial intelligence on the performance of commercial banks in Kenya will focus on the adoption, use and effect of technology in banks. The level at which the applications of artificial intelligence are integrated into all aspects of banking will be established in

this study. The role of artificial intelligence in enhancing operational efficiency, customer experience and maximization of banks' strategic outcomes will be determined. The research will establish the challenges that face the banks in the country including technological infrastructure, regulatory hurdles, skill shortages and resistance to change.

The research scope has been limited to the banking sector of the country. It will focus on the main urban centers where technology is strong. The research will look at data over a period of five years to understand when the adoption of artificial intelligence in Kenya began. It will include a review of relevant policies, industry reports and academic literature in order to understand the strategic implications of artificial intelligence in the banking sector.

1.8 Summary

Chapter one provides an overview of how Artificial Intelligence may is used in the banking sector for increased efficiency, enhancement in customer service and fraud detection. This chapter identifies how AI technologies including Artificial Narrow Intelligence and Artificial General Intelligence are put into use to aid in controlling fraud and enhancing customer experience. While more digital transactions are being carried out in this digital era, little use have been made of integrating AI in handling financial fraud. There are a lot of issues that are considered to act as stumbling blocks in the adoption of AI in banks like lack of technical infrastructure, resistance to change and strategic vision among others. Thus, this paper seeks to among other issues evaluate how AI impacts the strategic performance in Kenyan banks placing key focus on technology such as NLP, ML and robotics process automation within the last five years-both challenges and opportunities facing the Kenyan banking sector.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

Literature review is the study of existing ontology data with the aim of identifying, evaluating and assembling them for a clear presentation. It likes to compare and contrast the predictive power of theories explaining the phenomena and to discuss which theory best explains the nature of the phenomena.

This paper presents a review of the research literature organized in accordance with the research objectives. The analysis was conducted with the following research objectives: To assess the effect of Natural Language Processing on strategic performance amongst Kenyan commercial banks.; To assess the effect of Machine Learning on strategic performance amongst Kenyan commercial banks and finally, to assess the effect of Robotic process automation on strategic performance amongst Kenyan commercial banks. This section also presents research studies in the field of research. It is the conceptual framework that guides the empirical research that allows us to reach the conclusions in this section.

2.2 Theoretical Review

2.2.1 Technology Adoption Theory

Technology Adoption Theory originated from Theory of Diffusion of Innovations written by Everett M. Rogers which began in 1960. It helps in explaining how the rate of new technologies and innovational offering get adopted.

According to the Technology Adoption Theory, there is a lifecycle stage through which organizations adopting and implementing new technologies transitions through. In his treatise on Diffusion of Innovations, 1962, Everett Rogers posited that organization passes through awareness, through decision making and then to implementation. I have found this theory to be useful in explaining how the implementation of NLP technologies is impacted with regard to Kenyan banks in an effort to optimize operations. Some of the activities that NLP incorporates are; Customer service through chatbots and auto-response, application of NLP to Rogers stages of adoption then follow.

Still, as an initial theory, there is a relatively significant amount of critique received by Technology Adoption Theory regarding its relevance and applicability in recent and rapidly evolving technological environments. For instance, Laney (2018) has non-categorically dismissed the theory

to adapt to fast up-and-coming changes that are capped with continuous movement in the receipt of innovations. The critique forms the theoretical rationale for the lack of a model in understanding fast-tech and innovative adoptions such as NLP in Kenyan banks. Nonetheless, it is crucial to acknowledge these criticisms in order to pat the theory in view of the large amount of gained knowledge for how NLP could be systematically introduced and utilized to increase operational performance, thus effectively supporting the purpose of this assessment concerning it implications in banking sector.

A good number of Kenyan banks have adopted and implemented ML models to help forecast and control for NPL's for instance, Equity bank and KCB have availed the artificial intelligence systems in the bank where the credit data past evaluations to determine the probability of non-performing loans. These systems improve the effectiveness of the credit scoring and also enables timely measures on NPL's through automating the risk assessment commercial banks have benefited from implementing the innovative technologies for improving on the credit scoring mechanisms of risk assessments hence strategic management of NPL's (Omondi and Kamau, 2020). organizations pass through a predictable patterns stage. According to Everett Rogers, who addressed the theory in Diffusion of Innovations, 1962, the organization moves through stages from awareness to decision-making into implementation. This theory has been helpful in understanding, within the context of Kenyan banks, how the adoption of NLP technologies is affected with a view to enhancing operational efficiencies. NLP automates activities such as customer service through the use of chatbots and automated responses and its application to Rogers' stages of adoption.

Though foundational, Technology Adoption Theory has received a fair share of criticism, more so on the aspect of applicability to modern and fast-evolving technological landscapes. For example, Laney (2018) criticizes the theory for its rigidity to rapid changes in technologies and continuous dynamics in the adoption of innovations. The criticism underpins the theoretical gap in explaining rapid technology adoptions like NLP in Kenyan banks. These criticisms notwithstanding, the theory still provides an exemplary framework for the understanding of how NLP can be systematically adopted to enhance operational efficiencies, consequently reinforcing the objective of this assessment in terms of its impact within the banking industry.

Many Kenyan banks have been able to integrate ML models to predict and manage NPL's more effectively. For instance, Equity bank and KCB have adopted AI driven systems that analyze historical credit data to assess the risks of loans turning non-performing. These systems enhance the

accuracy of credit scoring and allow for proactive measures to manage NPL's through the use of advanced technologies commercial banks have been able to automate risk assessment processes which has led to better decision making and strategic alignment in managing NPL's (Omondi and Kamau, 2020). The success of this adoption has largely been informed by regulatory environment, technical infrastructure and the advent of the workforce in the Banking industry.

2.2.2 Machine Learning Theory

Proper definition of Machine learning Theory was given as early as 1959 by Arthur Samuel, but had introduced this idea in 1952 as Learning from data, a way for computers to improve on their own without being told exactly what to do. Machine learning theory or Computational learning theory, as it is sometimes called in its broadest sense is an attempt to classify learning on the whole as a computational phenomenon. Ideally, it wants to know the most straightforward way of empowering AI to learn from data and enhance the performance via feedback. To the best of my understanding, MLT refers to the idea that algorithms can be taught, seen patterns and even make forecasts without having to be told why. I guess this is the theoretical background of how machine learning will enhance their performance by merely analyzing patterns.

In banking where ML has found its application, performance is enhanced by the ability of the technology to undertake complicated tasks like identifying frauds or categorizing customers. This has enhanced efficiency in business operations and risk assessment and thereby improving on the same. Jordan and Mitchell (2015) also agrees with this fact as does Biot and Sconet (2016). With ML applied to banking, the customers' behaviors shall be estimated accurately, and the Marketers shall improve their strategies to develop the financial products and service customers. It often involves processing of large transaction of data to detect risky behavior which cannot be easily detected with the help of advanced technology thus making risk management easier and analyzing customer behavior easier.

It can enhance the banking performance and, on the one hand, enhance satisfaction and customer loyalty (He et al., 2016; Schmidhuber, 2015; Bakar et al 2020). Machine learning enables immediate options appraisal as well as business procedures that have the effect of minimizing human mistakes and quickening the delivery.

For purposes of loan improvement and compliance monitoring particularly where insight is done based on historical data, ML is deployed in Kenyan banks. This efficiency is hoped will enable the banks to best allocate the necessary resources in different tasks as well as adapt more quickly to

changes that occurs in the market thereby resulting in a better performance. Machine learning Theory also known as Computational Learning Theory basically aims to understand the fundamental principles of learning as a computational process. It seeks to understand the basic algorithmic principles in getting computers to learn from data and improve performance with feedback. According to MLT, algorithms can learn from data and make predictions without explanations. This is the theoretical basis of how machine learning will improve their performance through analysis of patterns.

In the banking sector, ML improves business performance through performing complex tasks such as fraud detection and customer segmentation. This has increased the speed and accuracy of business operations and risk analysis. This fact has been reiterated by Jordan and Mitchell (2015); Biot and Sconet (2016). Banks using ML can better predict customer behavior and continuously improve their marketing strategies to create financial products and service customers. It analyzes large transaction of data to identify anomalies and patterns which are difficult to detect with advanced technology hence simplifying risk management and understanding customer behavior.

This measure can improve bank performance as well as increase customer satisfaction and loyalty (He et al, 2016; Schmidhuber, 2015; Bakar at al., 2020). ML provides a way for instant decision making and automation for business processes which tends to reduce manual errors and speeds up the delivery

In Kenyan banks, ML is used for different tasks such as loan improve and compliance monitoring especially where insight is based on historical data. This efficiency will allow banks to use the necessary resources in different roles and respond faster to changes in the market which will enable an improvement in the overall performance. Examples of such banks would be KCB and Equity Bank where ML-powered systems have been adopted in automating tasks as basic as entering data and processing, transferring and executing transactions as well as customer onboarding which otherwise would consume human time can now be handled by machines.

Other industries where these RPA systems could be applied were fraud detection and risk assessment through integration of machine learning algorithms in assessing risky activities that would help to bring down operation risks. Skills deficits, as well as regulations governing the use of ML in driving RPA continue to pose significant application hurdles to the broader propagation of these technologies in Kenya's banking sector.

2.2.3 Trust and Transparency in AI Theory

The author of this theory is Virginia Dignum (2019), she noted that, for unambiguously accepting and naturally integrating AI in all its aspects, there should be a designed way that is fundamentally trustful and transparent. Trust and Transparency theory revolves around two key principles: credibility and openness or a publication. Sufficiency is defined as the ability of users to rely on AI systems to perform tasks ethically, reliably and safely. Intricacy on the other hand is where the functioning of the AI system or the decision and data handling capacity is very much clear to the user.

Pasquale (2015) have elaborated that in order that the users and all the other stakeholders should trust, it is required that the intelligence system is and should be transparent in its character and that the decision making is comprehensible to all. From the RPA perspective, the theory means that while implementing assumed automated working process, there are no results that appear exotic. Confidence in the process of RPA in the banking sector is needed to improve the use of technology to support work to meet the requirements for integrity (Pasquale, 2015; O'Neil, 2016; Binns et al,. 2018).

Criticality of developing transparency by AI to cope with possible ethical and biases' questions, which can also affect the possible performance in banking (Dastin, 2018). Many organizations that adopt RPA systems fail to take measures to ensure that there is transparency hence giving room for biases present in data or algorithms resulting to customer exploitation or ineffectiveness in the automated processes. When an RPA is not transparent it will be difficult to detect and correct these differences that can lead to activities such as credit scoring or marketing (O'Neil, 2016; Binns et al,. 2018)The Trust and Transparency in AI Theory has been noted to be implemented with more concerns of trust and transparency observed in the Kenyan banking sectors as RPA is implemented with growing concerns of trust.

The Kenyan banks have been able to adopt RPA in the management for the automation monitoring of the transactions, in cases of fraud and customer relations. Ndungu, (2020) also pointed out that it is indeed true that various different banks including the Equity Bank and the KCB had already deploy RPA-driven models for repetitive work. Nonetheless, transparency is still an issue, particularly concerning decision making from automated credit scoring. According to Mwangi and Waithaka (2021) explained how RPA enhances efficiency in the operation processes.

The algorithms are opaque and have been subjected to criticism from the users because they cannot explain how those algorithms arrived at certain conclusions. To such concerns, Mutua and Oyugi

(2018) opined that Kenyan banks must impel the implementation of robust AI governance frameworks to enhance the certainty of the RPA systems to run fairly and a promising that this advanced technology meets the expectations of customer trust.

The Kenyan banks have been able to adopt RPA in the management for the automation monitoring of the transactions, in cases of fraud and customer relations. Ndungu, (2020) also pointed out that it is indeed true that various different banks including the Equity Bank and the KCB had already deploy RPA-driven models for repetitive work. Nonetheless, transparency is still an issue, particularly concerning decision making from automated credit scoring. According to Mwangi and Waithaka (2021) explained how RPA enhances efficiency in the operation processes. The algorithms are opaque and have been subjected to criticism from the users because they cannot explain how those algorithms arrived at certain conclusions

2.3 Empirical Studies

Natural Language Processing has grown widely in the banking sectors due to the fact that helps machines understand and process human language hence turning it around to aid customers through voice integrations and chatbots. These technologies have been able to enhance efficient customer service where customer enquiries are responded to faster without utilizing extra human resources. Empirical studies have documented that banking organizations that use NLP solutions have reported an improved customer satisfaction and operational efficiencies (Kumar & Singh, 2020). The evident contrast is that while ML deals with systems designed to improve performance through learning from experiences that lead to predictive analytics and optimization. This has been due to the fact that it allows banks to engage in the prediction of customers' needs, assessment of credit risks and informed strategic decisions based on analysis for improved operativity performance (Brynjolfsson & McAfee, 2017). Additionally, RPA simplifies workflows through the automation of repetitive activities using software bots which is important in enhancing operational efficiency with minimal manual errors. Studies have shown that companies using RPA have been able to cut down the processing time and operational costs drastically, thus proving its effectiveness in the banking sectors also (Aguirre & Rodriguez, 2017)

The theories chosen for this purpose: Technology Adoption Theory, Machine Learning Theory (MLT) and Trust and Transparency in AI Theory are very important in understanding the integration of AI technologies like NLP in banking sector, its effect on operational efficiency and strategic performance. The Technology Adoption Theory describes the factors that drive banks to adopt new

technologies. This theory therefore gives an insightful analytical framework for various barriers and facilitators to the implementation of the AI solutions. Venkatesh et al. (2003) MLT provided an insight into how Machine Learning leads to superior operational performance through making decisions based on data analysis and predictive analytics which allow the bank to optimize its core processes and enhance its service provision. Jordan & Mitchell (2015). Trust and Transparency in AI Theory represent the ethical considerations and issues of trust commonly linked with the implementation of AI. This theory discusses how perceived trustworthiness and transparency of AI systems can affect the acceptance of such systems by stakeholders-a very important understanding toward potential obstacles in effective strategic performance.

Despite these aspects, several gaps still exist even though numerous empirical witnesses have supported NLP, ML, and RPA integration in banking. Much research focuses on positive impacts, including changing the dimensions of operational efficiency towards improved performance by applying this technology. Very few studies have explored long-term effect of these technologies on strategic performance within the context of the Kenyan banking sector as documented by Mutua & Oyugi (2018) and Mwangi & Waithaka (2021). Issues of resistance to AI adoption such as regulatory challenges, skills gaps and resistance to change have not been fully covered which brings a deficiency in completely understanding the scope of obstacles banks face when integrating these technologies. The absence of empirical data that could identify how trust in AI systems can facilitate its successful integration into banking and related ethical issues or bias, according to Laney (2018) and Waweru & Kisaka (2019). All these gaps give further grounds for conducting additional research with the purpose of providing an extensive view of how technologies of AI can be successfully integrated into banking practices by reducing associated risks and improving strategic results.

2.3.1 Impact of NLP and Strategic Performance

Technology particularly NLP has been realized to enhance the quality of the interaction and overall productivity and has transformed ways of handling automated banking customer services (Addimulam et al., 2020). By means of NLP applications, it is possible to create mobile means of increasing interaction between clients and banking, introducing changes to service paradigms (Yarlagadda et al., 2020).m et al., 2020). Current technological advances have further seen banks embrace chatbot which are NLP powered to educate their customers, reduce cost, time and human error (Fethi & Pasiouras, 2010). The models of NLP have been applied in financial sentiment to capture and understand bank customer feedback and market trends, and to facilitate strategic decision making. The management has been stressed due to NLP integration into the team to perform the

customer service, money has been saved, and efficiency is rated high. Best response cuts down the number of individuals in customer support, which has led to cost cutting without quality degradation (Rodriguez et al,. 2019; Sachani).

It is noteworthy that many banks are currently applying NLP, but there have been critics who have given reasons why it should not be implemented. The over dependence or over reliance on AI of technology type is seen to have the following dangers: it has led to erosion of human skills or decision making or human wisdom more so in the banking sectors where reliance on both trust and judgment is well discerned (Carr, 2014).The combination of NLP with automated customer support in efficient production structures contributes complicating challenges which are important to resolve to further improve performance and services (Anumandla et al,. 2020). Applications of NLP have enabled more complex and interactive automated systems in banking, altering customer service paradigms (Yarlagadda et al., 2020). Banks have been able to use chatbot which are powered by NLP to help handle customer inquiries, improve efficiency and reduce human error (Fethi & Pasiouras, 2010). The models of NLP have been used in financial sentiment to analyze and interpret customer feedback, market trends hence enabling banks on strategic decisions.

In review, NLP has been completely redefined automated customer service over the years which has vastly improved customer engagement. With the evolution of NLP, chatbots have transformed not just the way in which banks manage requests from customers but also how they can be used to handle such queries, improve service efficiency and accuracy with more sophisticated and interactive systems. Banks can leverage these NLP models for financial sentiment analysis to get market and customer feedback too. NLP can be more easily integrated in customer service and it has also saved costs through cutting the human support without compromising the level of support. It is important to accept that whilst the banking sector relies somewhat upon the adoption of AI solutions, there are critics out there who highlight that too much automation in any context threatens unique human skill sets and judgment. Some argue that the equation and raw feel of thinking is missing from these systems praising the NLP system as being effective.

2.3.2 Effects of ML and Strategic Performance

Many authors have explored the relationship between machine learning and strategic performance. Brynjolfsson and McAfee argued that ML significantly enhanced the strategic performance through the automation performance through the automation process. Other researches argued the fact ML systems are able to improve accuracy levels, decision making and efficiency which in return has

increased the performance levels (Jordan and Mitchell, 2015). With the high rates of risk levels that banking organization face they have turned to ML driven models which have highly improves the risk management (Berger and Hackney).

Despite the positives ML provides to the banking industries, there have been instances of authors contradicting ML for instance Laney (2018) argued that having too much confidence in the ML will easily undermine the judgment of humans which will lead to errors especial in the context of a complex environment. In addition to Laney, the cases of bias and ethical considerations not being able to be accounted for by ML in will reduce the organizational performance through alignment of key stakeholders (Pasquale, 2015)

Therefore, we have determined that authors have been able to explore the positives of ML in the context of its impacts on organizational efficiency where it has shown great importance through enhancing performance levels by automation process, decision making improvements hence increasing the overall efficiency. Many banking industries through ML have been able to manage the risk levels but with that much over reliance on the technology comes the critics who argued that it can lead undermining of human judgement particularly in complex situations.

2.3.3 Effects of Robotic Process Automation and Strategic Performance.

RPA has been a transformative tool in the banking sector which has made several authors to support it. Willcocks and Craig (2015) were able to emphasized that when an RPA automates repetitive tasks which has significantly reduced operational costs and increased efficiency. Similarly, Aguirre and Rodriguez (2017) highlighted have used RPA to streamline processes that have improved productivity and has enabled organizations to redirect human resources to more value adding strategic activities.

With the positives that RPA possesses there have been critics that pointed out potential pitfalls associated with it. Laney (2018) cautioned that's when there is an overreliance on automation technologies i.e. RPA there will be an undermined human judgement especially in critical and complex decision-making situations. Authors Davenport and Kirby (2016) also pin pointed out that the use of RPA technology will reduce the manual tasks hence it will be leading to job displacement in roles that involve repetitive tasks which leads to social and economic disruptions. RPA might not be flexible as being portrayed. Madakam, Holmukhe and Jaiswal (2019) identified how RPA relies heavily on pre-defined rules which makes them ill-suited at handling unstructured data in dynamic environments. In such cases when the system fails to adapt to unexpected scenarios errors will arise.

In other words, the use of RPA has proven to be a powerful tool in most banking industries. These applications can be seen through the automation of repetitive tasks which has reduced operational costs and hence leading to an improved efficiency. Most organizations have been able to streamline processes and reallocate HR towards more strategic and value adding activities. There have been critics who have laid out how an overreliance on the Robotic Process Automation could undermine human judgement in complex situations such as decision-making. The downside of RPA in handling unstructured data and adapting to dynamic environment results to error.

2.4 Summary of Literature and Gaps

It has been mentioned that different technologies of Artificial Intelligence such as Machine Learning, Natural Language Processing and Robotic Process Automation play a transformational role in strategic performance in banking sector Brynjolfsson and McAfee (2017) were able to shown that the adoption of different technologies of AI can enhance process efficiency through the reduction of unnecessary manual intervention and improving customer experiences.

Technology Adoption Theory explains how banks will be able to effectively absorb AI into their systems, boost productivity and have a greater chance at improving customer service through AI-powered automation. Jordan and Mitchell (2015) continue by explaining that with ML it is possible to optimize the process of risk management, credit scoring and fraud detection-all examples of enhancing the degree of accuracy in decision making and operational efficiency.

Despite these affirmative findings on the use of AI in banking, considerable information gaps still characterize the literature. While many studies report on the global impact of AI, few report on Kenyan banks. Even though scholars such as Brynjolfsson and McAfee (2017) and Jordan and Mitchell (2015) advance the general understanding of the benefits accruable from AI, few studies have assessed the challenges and opportunities facing AI adoption in Kenya. The regulatory environment, technological infrastructure and market conditions of Kenya have been identified to be characteristically different from those of developed nations. This has been captured in various literature including Davenport and Ronanki (2018) and Oyelaran Oyeyinka and Lal (2006).

The Trust and Transparency in AI Theory has identified ethical issues but there is limited research on how Kenyan banks address the trust issues and biases of AI systems. Few, however, have investigated how such risks are managed in Kenyan banks. The general absence of empirical investigations regarding the perception of AI stakeholders in Kenyan banking suggests a gap in terms of how AI

shapes trust and strategic alignment. Most studies have focused on the short-term operational benefits which have limited literature on long-term effect of AI.

2.5 Summary of Literature Reviewed Table

Author(s) and the Year	Theories	Methodologies	Measures of AI	Measures of Strategic Performance	Findings
Brynjolfsson & McAfee (2017)	Technology Adoption Theory	Case studies of leading organizations using AI	AI adoption rate, automation processes, and data analytics	Operational efficiency, customer satisfaction	AI adoption improves automation, enhances operational efficiency, and supports customer satisfaction.
Jordan & Mitchell (2015)	Machine Learning Theory	Empirical analysis of ML applications in banking	Machine learning algorithms, predictive analytics	Risk management, decision-making, financial performance	ML improves accuracy in decision-making, risk management, and financial forecasting.
Berger & Hackney (2020)	Risk Management Theory	Quantitative survey of banking institutions	AI-driven models for risk assessment	Risk reduction, fraud detection, regulatory compliance	AI enhances risk management through predictive analytics, improving overall risk mitigation in banks.
Laney (2018)	Trust and Transparency in AI Theory	Critical review of AI in banking	Trust in AI systems, transparency of algorithms	Human oversight, decision-	Overconfidence in AI can undermine human judgment, leading to potential

				making reliability	errors in complex environments.
Pasquale (2015)	Ethical AI Theory	Conceptual analysis of AI's ethical concerns	Bias in algorithms, ethical use of AI	Stakeholder alignment, organizational reputation	Bias and ethical issues in AI can reduce organizational performance by misaligning stakeholder interests.

Table 2.1 Literature Review table

2.6 Conceptual Framework

Based on this study, the conceptual framework will be delivered based on views of different authors. According to Encyclopedia Britannica (2010) a conceptual framework ascribes to a number of concepts explained in order to give focus, rational and an instrument for blending and explaining an information. This conceptual framework involves a connection between AI and strategic performance of banking industries. The above literature review led to the following conceptual model.

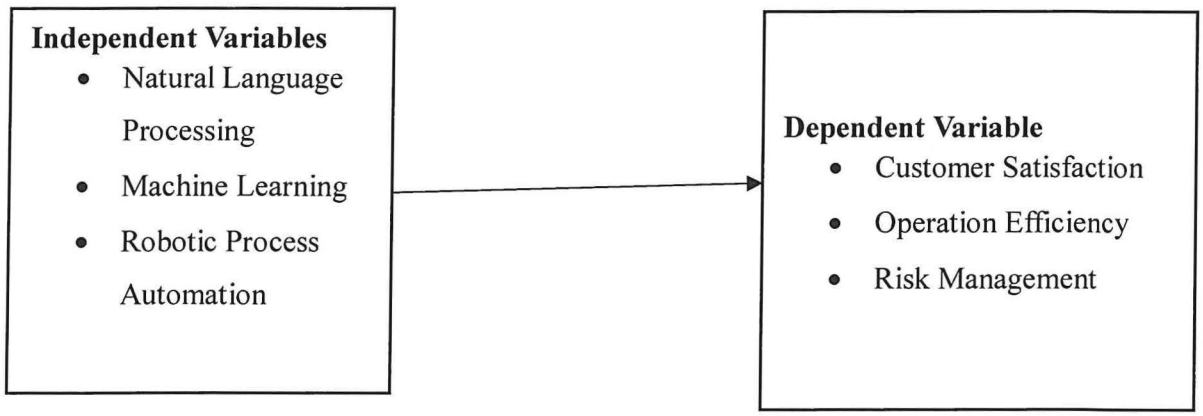

Figure 2.1 Conceptual Framework

2.7 Operationalization of Study Variables

Independent Variable	Measurement	Supporting Literature
Natural Language Processing	Intrinsic metrics Extrinsic metrics	Brynjolfsson & McAfee (2017)
Machine Learning	Regression model	Jordan & Mitchell (2015)
Robotic Process Automation	Operational efficiency metrics	Berger & Hackney (2020)
Customer Satisfaction	Net Promoter Score (NPS), Customer Retention Rates, Feedback Surveys	Brynjolfsson & McAfee (2017), He et al. (2016)
Customer Satisfaction	Cost Reduction, Time Savings, Process Optimization, Transaction Speed	Jordan & Mitchell (2015), Zhang et al. (2019)
Operation Efficiency	Fraud Detection Rate, Predictive Accuracy, Loss Reduction	Jordan & Mitchell (2015), Zhang et al. (2019)

Figure 1.2 Operationalization of study variables table

2.8 Summary of Literature

This chapter did research of the literature on how AI affects strategic performance in banking sector. A review of existing literature was guided by three research objectives. It entails a detailed explanation of the extent to which robotics process automation, Artificial Intelligence processing including machine learning affect strategic performance. The research indicates that an association exists between the three measures of artificial intelligence and strategic performance.

CHAPTER THREE

Research Methodology

3.1 Introduction

This chapter explains the methods used to conduct this study. This section covers the research design made by the researcher, the universe and design of the study, the methods used to collect data, the research method and methods review information. The key points of this section are also provided at the end of this section to illustrate the content of this section.

3.2 Research Design

According to Cooper and Schindler (2014) research design is where the researcher uses to consolidate various elements of the research in a given manner to ensure the research problem has been acted upon accordingly. This research used exploratory research design which refers to the scientific method of examining and describing behavior of a certain group without influencing it in any possible way (Janes, 2022). Descriptive research design is appropriate for this study since it contributes to high response rate, less time consuming and low refusal rates from the respondents when collecting primary data (McGrath & O'Toole, 2012).

3.3 Population and Sampling Design

3.3.1 Population

Population could also be defined as a well-defined collection of individuals, objects or things that share similar characteristics or behaviors (Simpson, 2014). Considering the population is comparatively small, a census survey was employed and all the branches will be studied. The unit of analysis was the branch managers, operational managers and the IT managers. This choice was due to the fact that they have a better understanding of their AI strategies. The population dispersal is shown in the table 3.1 below.

Table 3.1 Population Distribution

POSITION	NUMBER	PERCENTAGE
Branch Managers	89	**37.6**
Operation Managers	89	**37.6**
IT Managers	59	**24.8**
TOTAL	237	**100**

3.3.2 Sampling Design

3.3.2.1 Sampling Frame

Sampling frame basically means a sample of the study can be drawn by referring is the list or device from which a sample of the study can be drawn by referring to the correct list of the target population (Cooper & Schindler, 2014). In this research the samples consists of employees that is the top executives, the middle level managers and lower-level managers at NCBA Bank Kenya. The sampling frame was obtained from the human resources office at the head office of NCBA Bank Kenya.

3.3.2.2 Sampling Technique

Sampling technique is the process through which the researcher is able to select units of the population that will take part in the study and can represent the larger population (Cooper & Schinder, 2014). The study used census sampling technique, which is a method of statistical enumeration where all members of the population are studied (Jupp, 2006). The study used sampling size since the population was small in size and it ensured that all population items (elements) participate in the study (Simpson, 2014). This method was used to ensure that all the firm managers had the same opportunity to participate.

3.3.2.3 Sample Size

According to Cooper and Schindler (2014), sample size refers to the smallest unit of the analysis of the study representing the larger population of the study. This study made use of the census sampling technique since the population was small in size (number).

Below table shows the sample size.

POSITION	NUMBER	PERCENTAGE	SAMPLE SIZE
Branch Managers	89	37.6	70
Operation Managers	89	37.6	70
IT Managers	59	24.8	42
TOTAL	237	100	182

Table 3.2 Sample Size Distribution

3.4 Data Collection Methods

Data collection is the act of enabling measurement on the variable interest in a manner that is as systematic as to answer the research questions and objectives of the study (Cooper & Schindler, 2014). This work therefore employed primary data to respond to the framed research questions. In collecting primary data, an instrument known as structured questionnaire was used. This study employed questionnaires because with this approach data collection can be done effectively and for a short duration.

Structured questionnaires are advantageous in generating categorical data that has a quantitative characteristic. Consequently, the data subject responds on five-point Likert scale that should be accurate beside less possible the vagueness level to the respondents. The questionnaire is made up of five 5-point likert-type variables that run from one, the smallest point, to five, the largest point. The questionnaire consisted of five sections namely; The information, Robotics process automation and natural language processing including machine learning, and Competitive advantage. The following questionnaire was conducted through Google forms. In those instances where the respondents could not be reached through the Google form, the drop and pick later method was used.

3.5 Research Procedures

According to Creswell (2014), a research procedure encompasses all the steps undertaken in the research process, including data collection, data analysis, and the interpretation of findings to ensure a rigorous and systematic approach to scientific inquiry.

3.5.1 Validity

Validity is a concept that means that an experiment, measurement, or study measures what it is intended to measure (Heale & Twycross, 2015). In other words, it is checked whether the results are valid or whether the inferences are made in line with the learned ideas. For this study, the researcher designed a survey based on similar studies in accordance with the purpose and objectives of the study. Expert comments were provided by the research supervisors who carefully reviewed the survey and provided feedback to ensure that all research was received, thus confirming that valid conditions were known. They also reviewed the research studies and ensured that the theoretical dimensions were consistent with the observed findings.

3.5.2 Reliability

In its simplest terms, reliability depicts the extent to which measures, tests, or systems give consistent results over time (Creswell, J. W., & Creswell, J. D. 2018), To increase reliability of any research,

the measurement instruments or procedures used are standardized, so that their results are accurate over time and can reduce variation due to chance and increase the credibility of research outcomes.

In this case, internal reliability (Cronbach's alpha) is measured in a survey questionnaire that uses multiple items or multiple scales to determine how well each item in the scale measures the reliability of the scale. Measure the same. Cronbach's Alpha, a measure of reliability, provides a numerical "real" number. Although the questions were replaced with similar questions, Cronbach's Alpha is important for researchers to evaluate the accuracy and reliability of the survey (Khan, 2019). The researchers sent two survey questionnaires to evaluate the results.

3.6 Data Analysis

Data analysis refers to the process by which researchers use analytical and logical reasoning to examine all aspects of a given data set in order to evaluate the data collected (Davenport and Harris, 2007). It is the process of using statistical and non-statistical data to understand research data and provide useful information to those using the data (Saunders, Lewis, and Thornhill, 2016). Descriptive and statistical methods were not used in this study. Descriptive statistics were used to determine themes and patterns of variation, and inferential statistics were used to determine relationships and regression analyses.

The multiple regression model used is shown below.

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

Where; Y = Strategic Performance

X_1= Machine learning

X_2= Robotics process automation

X_3= Natural Learning Process

α = y intercept

β = model of the Coefficients

ε = term of an Error

3.7 Ethical Issues in Research

Research ethics is a concern that addresses how research procedures should be conducted to minimize harm or bias to participants or the broader community and all other participants in the scientific community. Researchers list some of the ethical issues that may be encountered in a study

Beauchamp and Childress (2013) stated that one of the principles of ethical research is to obtain consent, and that this does not interfere with individual decision-making processes, and that self-respect may be harmed.

All researchers are responsible for maintaining the anonymity of their participants. Sieber (2012) argues that confidentiality issues are important in ensuring the reliability of research proposals and preserving the ethical integrity of research. Steneck (2006) argues that one of the biggest crimes affecting research is data fraud and falsification.

These conflicts can however go unnoticed and this in itself can be an irresponsible consideration due to lost objectivity of the research. Thompson (1993), also stressed that it is equally important to declare such interests to increase ethical practice. As a measure of safety, it is expected that the researchers' exposure of the participants to any form of harm is either nil or discouraged i.e. psychological, physical and social harm. Emanual et al (2000), prescribed the idea of risk/benefit analysis, that is the ideamise and management of risks and benefits needed for specific studies so that participants do not undergo 'more than minimal risk'.

3.8 Chapter Summary

This chapter provided the research methods utilized by this study. The methods applied in data collection, sampling, study and the population under study, data analysis, study quality and the general summary of the research method were all discussed in this chapter. How the designs were chosen, the rationale of the approach utilized in this study has been demonstrated by the researcher. Chapter four contains the main discussion of the findings on the study.

CHAPTER FOUR

PRESENTATION OF RESULTS

4.1 Introduction

This chapter presents outcomes on Artificial intelligence on strategic performance using a case of NCBA Bank. This study was conducted among branch, operational managers and IT managers at NCBA Bank. The results are examined and explained in this section

4.2.1 Response Rate

The response rate is referred to as the completion rate and is usually expressed as a percentage. Response rate information for this research is shown in Figure 4.1 below, where a total of 182 surveys were emailed to respondents. A total of 142 responses were completed and returned. The response rate was 78.02%. Cooper and Schindler (2018) confirmed that studies with a response rate of 50% or more were sufficient for analysis and conclusions.

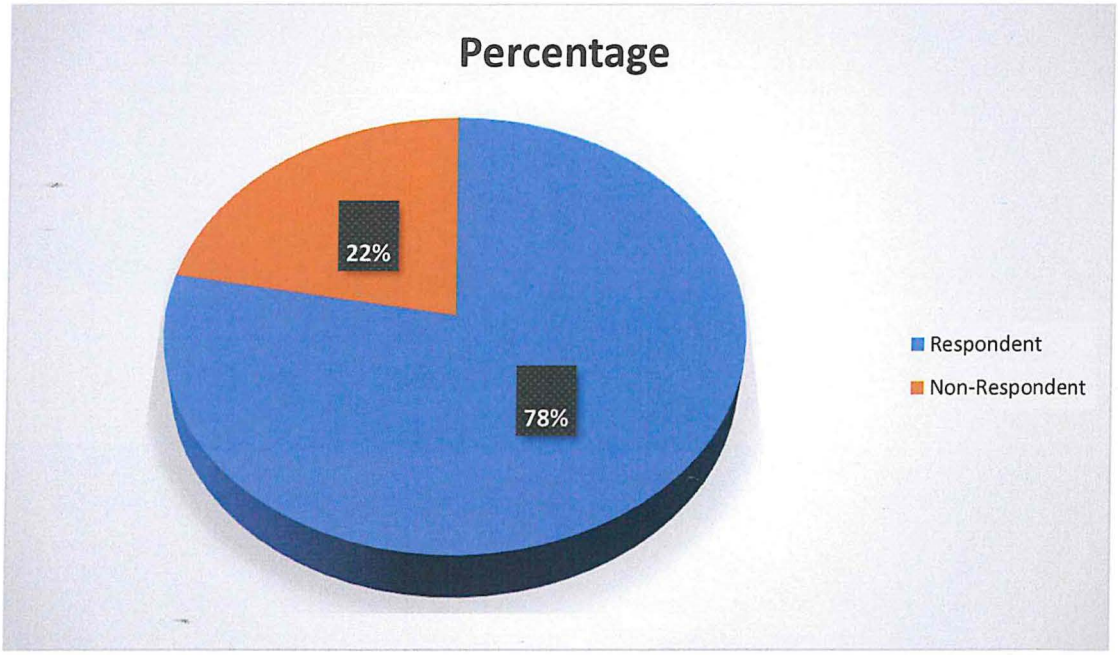

Figure 2.1 Response Rate

4.2.2 Background Information

This section contains basic information about the respondents, which includes their age, education, years of experience, position and years in their current role, the information is presented in the form of tables.

4.2.2.1 Gender of the Respondents

The researcher's aim was to know what gender the respondent was. Female response rate was at 47.62% while the male respondent was at 52.38% as shown in figure 4.2. the fact that there was no large margin between the male and female respondent shown how NCBA is dedicated to gender diversity.

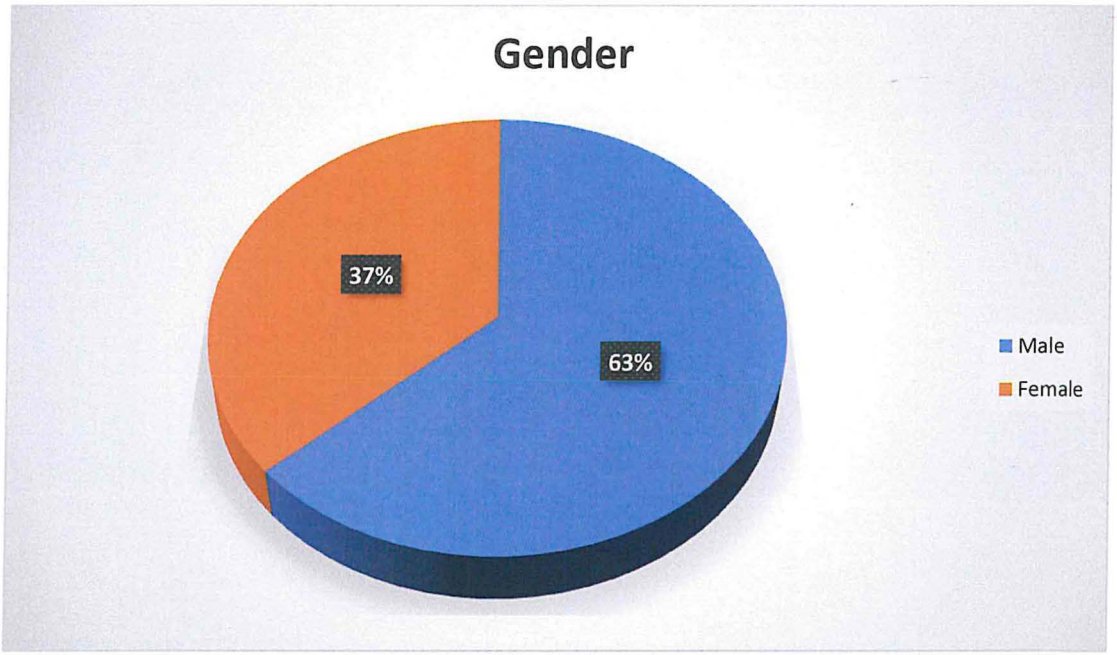

Figure 4.2: Gender Distribution

4.2.2.2 Age of the respondent

The goal was to determine how old the people who took part on the questionnaire were. It's crucial to know the respondents' age since age can influence the how they respond to the survey. The figure 4.3 shows that the respondent (17.61%) were between the ages 41-45, 21.13% were between the ages 46-50, 9.15% were between ages 36-40, 43.66% were above 50 years of age, 8.45% were between the ages 31-35.

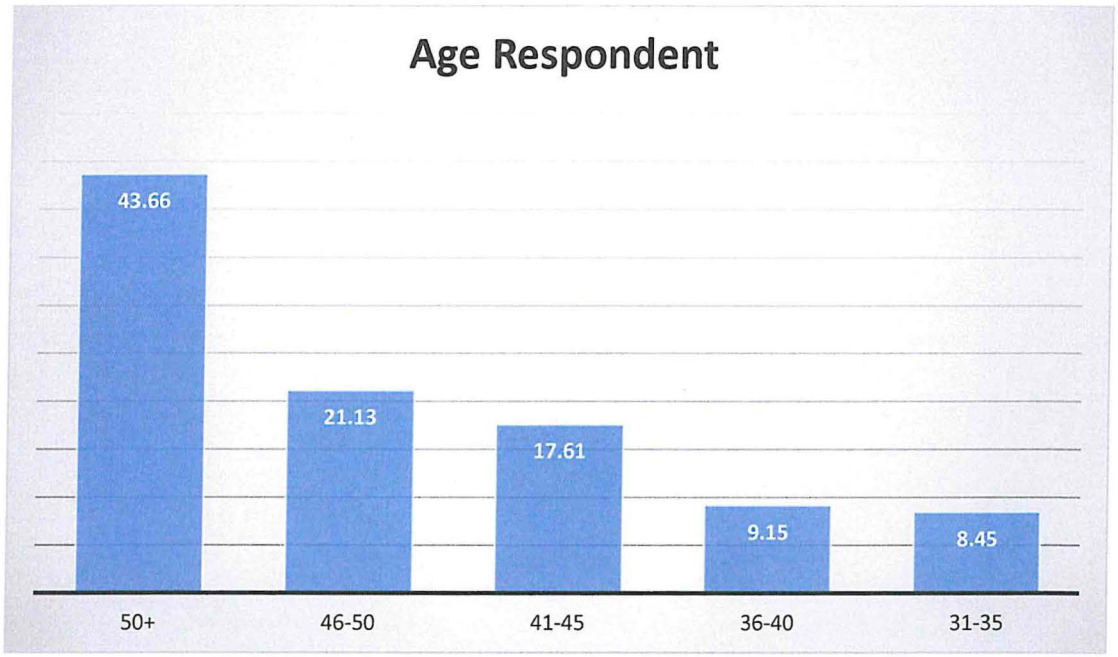

Figure 4.3: Age Respondent

4.2.2.3 Highest Education Level

The responses provided by the respondents regarding their highest level of education is shown in the below figure 4.4. Bachelor in Degree was held by a majority of the participants (52.82%) where's Masters was held by (28.17%) while diploma had (19.01%).

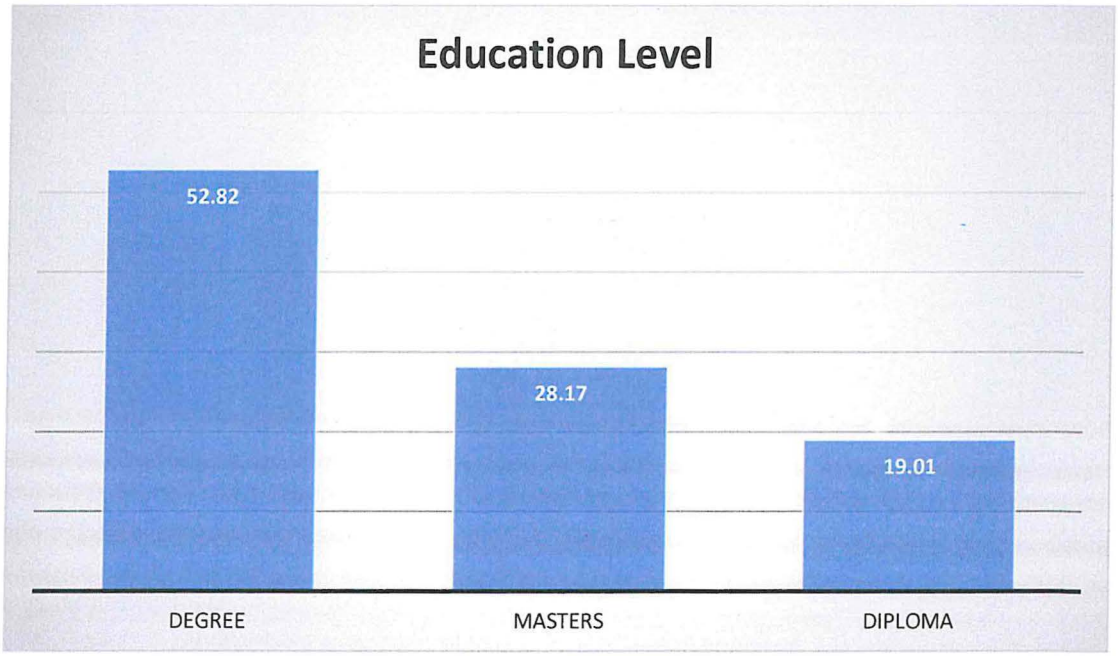

Figure 4.4: Level of Education

4.2.2.4 Period at NCBA Bank

Respondents were asked to indicate the length of time they had worked at NCBA Bank. Figure 4.5 shows that respondents have been working with their employer for many years. According to the findings, 33.098% have been working for 4-7 years, 29.03% for 1-3 years, 14.08% for less than a year, and 27.46% for 8 or more years.

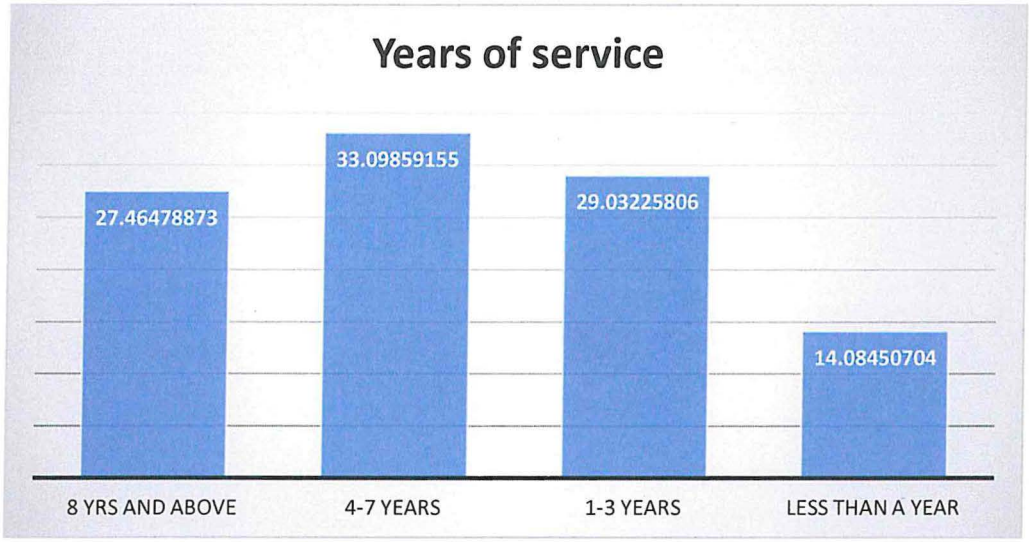

Figure 4.5: Yeas of service at NCBA

4.2.2.5 Position at NCBA Bank

The researcher was also interested in determining whether the respondent was a branch manager, operations manager or the IT managers since they were the target respondent. Figure 4.6 indicates that 56.33% were operations managers, 29.58% were branch and IT Managers were 14.08%.

Figure 4.6: Position at NCBA

4.2.2.6 Years in Current Position

Figure 4.7 shows that the informants worked in the bank for a period of time which indicates their level of knowledge regarding the internal organizational processes. There was a 35.21% for workers employed for 1-3 years, 23.24% for 4-7 years, 29.58% for 8 years or more and 11.97% for less than a year.

Figure 4.7: Years in current position

4.3 Machine Learning and Strategic Performance

This section presents the findings obtained in line with the objectives of the research. Descriptive statistics in terms of standard deviations and means, and inferential statistics for analysis and replication. Participants were asked to fill out a survey on a 5-point scale about machine learning at NCBA Bank.

4.3.1 Descriptive Statistics for Machine Learning

The table 4.1 depicts research conclusions. The findings reveal that NCBA applies machine learning to a moderate extent in a bid to remain competitive.

Statements	N	Mean	Std. Dev
To what extent does NCBA use machine learning in a bid to enhance strategic performance?	142	3.34	0.82
The bank has adopted machine learning in credit appraisal	142	3.52	0.75
The bank uses machine learning in marketing its products	142	3.34	0.93
The bank utilizes machine learning in its supply chain	142	3.14	0.81
The bank utilizes machine learning in human resource management	142	3.55	0.69
The bank uses machine learning in its information technology functions	142	3.41	0.81
The bank uses machine learning in customer service	142	3.45	0.86
The bank utilizes machine learning in its finance and accounting functions	142	3.36	0.80
Overall mean Score	**142**	**3.39**	**0.38**

Table 4.1:Descriptive statistics on Machine learning

4.3.2 Correlation Analysis for Machine Learning and Strategic Performance

We performed correlation analysis to reveal the connection between machine learning and performance. The results are listed in Table 4.2.

		Strategic Performance	Machine learning
Strategic Performance	Pearson Correlation	1	.378**
	Sig. (2-tailed)		.000
Machine learning	Pearson Correlation	.378**	1
	Sig. (2-tailed)	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=142

Table 4.2:Correlation Matrix for Machine Learning and strategic performance

4.3.3 Regression Analysis for Machine Learning and Strategic Performance

Regression determines the impact of machine learning on performance. The goodness of fit in Table 4.3 shows that the study found an R square of 0.143, indicating that the variance of performance strategies is 14.3% and therefore 85.7% of the variation can be explained by other factors not included in this study.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.378[a]	.143	.137	.538544

a. Predictors: (Constant), Machine learning

Table 4.3: Model fitness for machine learning and strategic performance

The regression coefficient results show that machine learning has a significant effect on strategic performance ($\beta = 0.575$, $p = 0.000$). This indicates that a one-unit increase in machine learning will lead to a 0.575 increase in strategic performance. The resulting pattern is seen below.

$Y=1.578+0.549X_1$

Where;
Y= Strategic performance

X_1 = Machine learning

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.578	.403		3.912	.000
	Machine learning	.575	.119	.378	4.828	.000

a. Dependent Variable: Strategic Performance

Table 4.4: Coefficients for machine learning and strategic performance

4.4 Robotic Process Automation and Strategic Performance

In this case the objective was to determine the effect of robotic automation processes on the strategic performance. Participants were asked to fill out a survey regarding NCBA Bank's introduction to Robotic Process Automation.

4.4.1 Descriptive Statistics for Robotics Process Automation

The table 4.5 below shows the statistics of Robotic Process Automation. The findings of the study showed that NCBA Bank uses Robotic Process Automation to maintain its performance.

Statements	N	Mean	Std. Dev
To what extent does NCBA use robotics process automation in a bid to enhance strategic performance?	142	3.34	0.67
The bank has adopted robotic process automation in credit appraisal	142	3.59	0.61
The bank uses robotic process automation in marketing its products	142	3.77	0.79
The bank utilizes robotic process automation in its supply chain	142	3.45	0.78
The bank utilizes robotic process automation in human resource management	142	4.05	0.74
The bank uses robotic process automation in its information technology functions	142	3.95	0.74
The bank uses robotic process automation in customer service	142	3.80	0.76
The bank utilizes robotic process automation in its finance and accounting functions	142	4.09	0.73
Overall Mean Score	**142**	**3.76**	**0.49**

Table 4.5:Descriptive Statistics for Robotics Process Automation

4.4.2 Correlation for Robotics Process Automations and Strategic Performance

This study was conducted to establish a strong relationship between RPA and operational excellence. The results are shown in the table 4.6 below. The data shows a positive and significant relationship between robotic process automation and operational efficiency.

		Strategic Performance	Robotics process automation
Strategic Performance	Pearson Correlation	1	.701**
	Sig. (2-tailed)		.000
Robotics process automation	Pearson Correlation	.701**	1
	Sig. (2-tailed)	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=142

Table 4.6:Correlation for Robotics Process Automation and Strategic Performance

4.4.3 Regression for Robotics Process Automation and Strategic Performance

This study was conducted to determine the impact of robotic automation processes on the effectiveness of strategies. The table below shows the search criteria. This shows that the R-squared value is 0.491 and RPA explains 49.1% of the variation in performance.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.701[a]	.491	.487	.414973

a. Predictors: (Constant), Robotics process automation

Table 4.7:Fitness Results for Robotics Process Automation and Strategic Performance

The ANOVA results in the table 4.7 below show that the model used to test the relationship between RPA and strategic performance is generally significant. This is supported at the 0.000 level of significance and below 0.05 at the 95% confidence level..

Model	Sum of Squares		df	Mean Square	F	Sig.
1	Regression	23.258	1	23.258	135.059	.000[b]
	Residual	24.108	140	.172		
	Total	47.366	141			

a. Dependent Variable: Strategic Performance

b. Predictors: (Constant), Robotics process automation

Table 4.7:ANOVA Results for Robotics Process Automation and Strategic Performance

The regression coefficient results show that RPA is positively related to performance ($\beta = 0.826$, $p = 0.000$), indicating that an increase in RPA will lead to an increase of 0.826 in performance at work.

$Y=0.515+0.826X_1$

Where;

Y= Strategic Performance

X_1 = Robotics Process Automation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	**Std. Error**	**Beta**		
1	(Constant)	.515	.260		1.980	.050
	Robotics process automation	.826	.071	.701	11.621	.000

a. Dependent Variable: Strategic Performance

Table 4.8: Coefficients for Robotics Process Automation and strategic performance

4.5 Natural Language Processing and Strategic Performance

The purpose of this study was to determine the effect of natural language processing on strategic performance. Participants were asked to complete statements about NCBA Bank's positive language practices using a 5-point Likert scale.

4.5.1 Descriptive Statistics for Natural Language Processing

The results in the Figure 4.8 below show that NCBA uses natural language to manage its performance at an average of 3.64.

Statements	**N**	**Mean**	**Std. Dev**
To what extent does NCBA use natural language processing in a bid to remain ?	142	3.68	0.55
The bank has adopted natural language processing in credit appraisal	142	3.77	0.70
The bank uses natural language processing in marketing its products	142	3.57	0.81
The bank utilizes natural language processing in its supply chain	142	3.61	0.80
The bank utilizes NPL in human resource management	142	3.75	0.77
The bank uses NPL in its information technology functions	142	3.52	0.78
The bank uses natural language processing in customer service	142	3.57	0.81
The bank NPL in its finance and accounting functions	142	3.70	0.79
Overall Mean Score	**142**	**3.64**	**0.53**

Figure 4.8: Descriptive statistics for Natural Language Processing

4.5.2 Correlation Analysis for Natural Language Processing and Strategic Performance

This study was conducted to establish the link between NLP and effective work. The results are shown in the Figure 4.9 below. Correlation data showed a positive correlation between natural language processing and performance ($r=0.706$, $p<0.000$).

		Strategic Performance	Natural language processing
Strategic performance	Pearson Correlation	1	.706**
	Sig. (2-tailed)		.000
Natural language processing	Pearson Correlation	.706**	1
	Sig. (2-tailed)	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=142

Figure 4.9:Correlation Matrix for Natural Language Processing and Strategic performance

4.5.3 Regression Analysis for Natural Language Processing and Strategic Performance

Determining the regression helped in understanding the effect of natural language processing on strategic performance. The results are summarized in the table 4.11 below. The R squared is 0.498, indicating that NLP explains 49.8% of the variance in performance.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.706[a]	.498	.494	.412135

a. Predictors: (Constant), Natural language processing

Table 4.11:Model fitness results for natural language processing and strategic performance

According to the ANOVA results shown in the table 4.12 below, all models used to examine the relationship between natural language processing and the strategic performance of the basic concepts are significant. This is supported by a significance level of 0.000 (less than 0.05) at a 95% confidence interval.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.586	1	23.586	138.860	.000[b]
	Residual	23.780	140	.170		
	Total	47.366	141			

a. Dependent Variable: Strategic Performance

b. Predictors: (Constant), Natural language processing

Table 4.12: ANOVA results for Natural Language Processing and Strategic Performance

These results show a positive relationship between natural language processing and strategic performance (β=0.765, p=0.000), indicating that increased language processing leads to increased performance, as shown in the model below.

$Y=0.749+0.765X_1$

Where;

Y= Strategic Performance

X= Natural Language Processing

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.749	.237		3.160	.002
	Natural language processing	.765	.065	.706	11.784	.000

a. Dependent Variable: Strategic Performance

Table 4.13:Coefficients of Natural language processing and strategic performance

4.6 Artificial Intelligence and Strategic Performance

We conducted a multi-faceted assessment to determine the effect of AI (machine learning, robotic process automation, and natural language processing) on the strategic performance of NCBA banking strategies and the results are presented below. AI (machine learning, robotic process automation, and natural language processing) explains 56% of the variability in performance.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.748[a]	.560	.551	.388552

a. Predictors: (Constant), Natural language processing, Machine learning, Robotics process automation

Table 4.14: Overall Model fitness

According to the ANOVA results shown in the table 4.15 below, all models for analyzing the relationship between artificial intelligence (machine learning, robotic process automation, and natural language processing) and strategy are Good at it. This is supported by a significance level of 0.000 (less than 0.05) at a 95% confidence level.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.532	3	8.844	58.579	.000[b]
	Residual	20.834	138	.151		
	Total	47.366	141			

a. Dependent Variable: strategic performance

b. Predictors: (Constant), Natural language processing, Machine learning, Robotics process automation

Table 4.15:ANOVA Results on overall model

The regression coefficient results show that machine learning has a positive correlation with strategic performance ($\beta = 0.215$, $p = 0.021$), which means that a change in machine learning will lead to a 0.215% change in strategic performance as shown in the models. In addition,

the t-value of 2.342 supports this research, which is greater than the significance level of 1.96. The results also show that RPA is significantly related to job satisfaction ($\beta = 0.423$, $p = 0.000$). This shows that a change in RPA will lead to a 0.423 change in performance as shown in the model. This is also confirmed by the numerical t-value of 3.603, which is greater than the critical value of 1.96.

Many studies show that natural language processing is an important factor in improving performance ($\beta=0.393$, $p = 0.000$). This shows that a change in NLP, as shown in the model, will lead to a change of 0.393 in strategic performance. The t-value of 3.602 also supports this finding as it is greater than the critical value of 1.96.

$Y= -0.162+0.215X_1 +0.423X_2 +0.393X_3$

Where;

Y= Strategic Performance

X_1 = Machine Learning

X_2 = Robotics Process Automation

X_3 = Natural Language Processing

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.162	.332		-.488	.626
	Machine learning	.215	.092	.141	2.342	.021
	Robotics process automation	.423	.117	.358	3.603	.000
	Natural language processing	.393	.109	.362	3.602	.000

a. Dependent Variable: Strategic Performance

Table 4.16: Overall Model for Regression Coefficients

4.7 Summary

This section begins with the discussion of the results of the study, starting with the explanation of the response rate. The demographic characteristics of the respondents were discussed. Explanation of the statistics regarding progress and independence. First, we conducted correlation analysis and then statistically analyzed the validity of each variable and its effect on the response variables.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The discussion is based on research questions that aim to determine the extent to which machine learning, robotic automation and natural language processing affect the performance of strategies.

5.2 Summary of Results

The objective of this study is to determine the effect of Artificial Intelligence on strategic performance in the Kenyan banking sector. The objectives of this study are: To assess the impact of Natural Language Processing on strategic performance in Kenyan banks, to determine the effects of Machine Learning on strategic performance in the Kenyan baking sector, to determine the effects of Robotic process automation on strategic performance in the banking industries.

5.2.1 Natural Language Processing

The findings that related to the variable natural language processing established that NCBA applies Artificial intelligence in order to achieve an effective strategic performance. The study was able to find out that NCBA are continuously introducing new banking products to achieve. Natural language processing has been used in the marketing sector, the supply chain sector, Human resource sector, in customer service sector and the financial and accounting to a greater extent. This will explain the regression results obtained of the variation in strategic performance. Regression results in addition revealed that the positively and significant influence of natural language processing on strategic performance.

5.2.2 Machine Learning

Findings related to machine learning and strategic performance implied that NCBA bank applies machine learning to a moderate extent. NCBA has continuously introduced new banking products to a greater extent and that the bank uses robotic process automation in in the marketing sector, the supply chain sector, Human resource sector, in customer service sector and the financial and accounting to a greater extent. This will explain the regression results obtained in the variation in strategic performance. Regression results in addition revealed that the positively and significant influence of machine learning on strategic performance.

5.2.3 Robotics Process Automation

When it comes to robotics process automation and strategic performance the research established that NCBA applies robotics process automation in a moderate extent in a bid to retain its high strategic performance nature. NCBA has continuously introduced new banking products to a greater extent and that the bank uses robotic process automation in in the marketing sector, the supply chain sector, Human resource sector, in customer service sector and the financial and accounting to a greater extent. This will explain the regression results obtained in the variation in strategic performance. Regression results in addition revealed that the positively and significant influence of machine learning on strategic performance.

5.3 Discussion

5.3.1 Machine Learning and Strategic Performance

The results indicated that NCBA has adopted machine learning in credit appraisal to a greater extent. Kadam et al. (2021) examined banking systems alongside means that banks can utilize non-performing loans through the prediction of loan defaulters. By using records from prior customers from several banks who had qualified for credit facility using a specific method to obtain the data.

Additionally, findings revealed that NCBA utilizes machine learning in its supply chain to a moderate extent. Chen et al. (2017) noted that while studying and developing various products and services, it leads to product innovation and capability, improvement in research and development which shoes that there would be no need for R&D if there was no demand in the market for new product capabilities. This study provides useful information about the role of innovation in strategic performance but it was not specific on artificial intelligence or how ML can be utilized in banking sector to enhance strategic performance which was the main objective of the study.

There was also utilization of machine learning in the HRM to a greater extent. Mulusa (2020) urges that the capabilities of machine learning can provide means as well as opportunities to make more wealth where in this research it can be attained through the increase of an organizations capacity which will enable the organization to meet the needs of customers which will intern boost strategic performance.

The outcomes of the correlations demonstrated a positive association between machine learning and strategic performance. The results, supported by Herrera (2015) who analyzed the effect of

machine learning capabilities on strategic performance using a structural equation model amongst top companies in the United Kingdom over a 10- year period. Machine learning capabilities boost not only an organization's capacity to produce higher- quality products, but too its ability to reduce overhead expenditures in addition to production costs. Bharadwaj, Varadarajan and Fahy (2018), also contend that machine learning capabilities improves the application of new technologies in the production processes thereby enhancing plus enabling commercial banks to improve in provision of both product as well as services to customers. This study however did not relate AI with strategic performance which was the objective of this study.

5.3.2 Robotic Process Automation and Strategic Performance

According to the results, NCBA has gone to great lengths in applying robotic process automation in marketing its products. Businesses are starting to experience intense impacts from Robotic Process Automation. The study by Anagnoste (2018) identified the robotic stages into four levels. Orchestrated automation can be defined as 20% being automated. This is mostly rule based. 40% of tasks are automated in robotic process automation. System workflow automation and cross application are included in the RPA's rules. Process automation of legacy systems is required. More than 80% is considered to be intelligent robotic. Natural language processing can include cognitive virtual assistants, voice recognition, cognitive computer vision and voice assistants.

There is a degree of robotic process automation used in the supply chain. In relation to cost pressure and increasing competition, the purchasing and supply management has a tendency to be abandoned in comparison with other business functions. The advanced digital technology is being adopted gradually to automate, redesign and maximize the procurement processes or procedures. Business process automation and robotic process automation are combined into an umbrella term. This technology consists of software licenses-so-called bots-emulating the habits of people and is used for automating "swivel chair work" that is, rule-based and boring repetitive business procedures (Hofmann et al. , 2020; Syed et al. , 2020). The background to expand the use of the RPA on other functions of office work was established by the review of previous studies which showed how the technology is being used to improve efficiency in procurement processes.

It was found that the NCBA is using robotic process automation in its information technology functions. Knowledge work tasks have been rendered almost impossible due to the fact that they

need a higher level of cognitive flexibility and physical ability. Recently, there has been expansion in the scope and capacity of artificial intelligence. Work in retail (by 2031), drive a truck (by 2027), and work as surgeons (by 2053) will all be possible with the use of artificial intelligence by 2031. Administrative support work and the share of service work in the US are predicted by Frey and Osborne. Dramatic changes to the supply of knowledge and service work will be caused by the development of artificial intelligence.

The results showed that the effectiveness of strategies is associated with RPA. The regression coefficients show that RPA is associated with business performance. Support research on the role of research, development and innovation in achieving excellence for Asian companies. Dynamic innovation time is a model for product innovation capabilities as it combines business needs with appropriate R&D funding. Stable governments support businesses and people and authorities establish R&D centers to encourage the creation of new products in manufacturing or other areas. The increase in R&D is a result of product innovation. The new product on the market is the result of years of research and development of various prototypes in an effort to find a product or combination of products that is sufficiently insightful to meet the needs of the business. Prior studies linked RPA with other variables without considering competitive advantage, so the present study has filled a research gap.

5.3.3 Natural Language Processing and Strategic Performance

Based on the results of the study, NCBA practices natural language processing in order to remain enhance and maintain a better strategic performance. Natural language processing is becoming famous in management study due to its ability to understand and analyze human language. In spite of its wide usage in management study, it lacks a detailed evaluation of existing literature on such applications and a thorough analysis of its application as an analytical tool and how it influences strategic performance. When it becomes cost effective and reliable, new and effective methods of data processing automation will be identified. Figuring out the nuances and complexity of human language will produce actionable data that can be used to aid in decision making. Information can be accessed in a variety of formats. The basis for huge databases to leverage is the development of digital channels being used by customers to communicate with businesses.

The survey results also show that NCBA uses effective language in many credit assessments. The company's survival depends on using NLP techniques to create strategies that align with its

customers, thus ensuring accountability and independence. International business must meet all expectations and needs. Meanwhile, customers expect a quick solution. While access also allows employees to easily access services, technology should allow brands to focus on targeting and understanding their customers (Morgan, 2016). However, Morgan's research was conducted in a different context and did not focus on the corporate sector. Improve customer service today by filtering irrelevant issues and conflicts through NLP, leading to improved performance (Accenture, 2019).

This study also supports the findings of Markins (2017). Research shows that the process affects employee performance goals. Research shows that the average company loses more than 20% of its production resources (more than one day per week); we call this "system drag." Complete the task. However, Markins' (2017) study is not context specific and does not link NLP to the strategic performance discussed in the current study of language processing. This is consistent with researchers who have demonstrated that data analysis capability leads to organizational innovation, research categorized by methods and technological innovations, or centralized and decentralized innovation (Wu, Lou, & Hitt, 2020). User behavior in online communities is influenced by personal communication, including the similarity between two related users in terms of purchase and its impact on the identities of other members (Adamopoulos, Ghose, & Todri, 2018; Hong & Pavlou, 2017). Community members can stimulate new ideas and share understanding through personal interaction (Hwang, Singh, & Argote, 2019).

5.4 Conclusion

5.4.1 Robotics Process Automation and Strategic Performance

Based on the results of the research and discussion on RPA and strategic performance, the research concluded that RPA has a positive effect on strategic performance. This study also concluded that NCBA uses robotic automation systems to manage its performance. This study also concluded that NCBA has developed new products and services and used robotic automation in manufacturing, supply chain, customer management and information technology to increase efficiency. Efficiency has been increased in the areas of customer service, finance and accounting in the bank.

5.4.2 Natural Language Processing and Strategic Performance

In terms of natural language processing and strategic performance, the study concluded that natural language processing is highly effective and beneficial for an effective strategic performance. The

study also concluded that NCBA uses language to enhance better performance. The study also concluded that NCBA is successful in using good language in the areas of credit assessment, product marketing, supply chain, human resource management, technology, customer service, finance and marketing.

5.4.3 Machine Learning and Strategic Performance

According to the results of the research and discussion, it was concluded that machine learning is very useful and has a positive effect on work quality. The study concluded that NCBA continues to introduce new products and services for many areas, NCBA uses Robotic Process Automation in products, supply chain, human resource management, IT functions, customer service and accounting functions to a large extent.

5.5 Recommendations for Improvements

5.5.1 Robotics Process Automation and Strategic Performance

When you adopt robotic automation, you gain a competitive advantage. The study recommends that NCBA should continue to implement robotic process automation. NCBA should also continue to use robotic automation in all its functions, such as credit assessment, marketing, supply chain, human resource management, technology, customer service, finance and marketing.

5.5.2 Natural Language Processing and Strategic Performance

This study found that natural language processing can increase strategic performance. Based on the results and conclusions, the research recommends that NCBA to continue using functional language in its work. Furthermore, NCBA should continue to use natural language in all its activities such as credit assessment, marketing, logistics, human resource management, technology output, customer service, finance and marketing.

5.5.3 Machine Learning and Strategic Performance

The aim is to improve performance when using machine learning. Considering the findings, results and implications of the study, the study recommends that management of NCBA Kenya should continuously embrace machine learning as this will lead to improved effective strategic performance. Further, NCBA should continue utilizing machine learning in all their functions such as credit appraisal, customer service and finance and accounting functions.

5.6 Limitations of The Study

One major limitation that was encountered during the research was availability and accessibility of reliable data. Considering the fact that the implementation of AI in the Kenyan banks is still in the phase of evolution, several banks will tend to consider specific data i.e. financial performance metrics which are linked to AI tools. When there is no transparency then the chances of obtaining data will be limited.

Another challenge that was faced was the aspect of understanding the direct impact of AI on strategic performance. Since many banks tend to employ a range of strategies and technologies which makes it difficult in isolating AI's specific influence. Moreover, with the lack of standardized metrics in the Kenyan banks, a student will find it difficult to develop a universal applicable framework which they can use to evaluate and interpret the data available.

Technical knowledge tends to pose a barrier for a student where understanding advanced AI technologies and their application within banking sectors will require a strong foundation on both AI and banking operations. When the student lacks expertise in either area, effectively linking the technical aspects of AI and measurable strategic outcome then it will prove difficult.

5.7 Recommendations for further studies

Using NCBA Kenya as a proxy, future research could examine the effect of artificial intelligence on strategic performance on other companies in Kenya. Future research should include comparative studies to validate differences or comparisons in AI across domains. This study investigates how skills are related to performance at NCBA Kenya. The research focuses specifically on machine learning, robotic process automation and natural language processing. Research suggests that different technologies should be examined to see if there are differences in how they affect performance. This study used only primary data. Further studies can be conducted using primary data collected through interviews in the textbook or secondary data as this will provide more information. They may or may not agree with the current findings.

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APPENDICES

APPENDIX I: QUESTIONNAIRE COVER LETTER

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Cell: +254 703 034 414/7, Twitter: @SBSKenya
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Email: info@sbs.ac.ke or visit: www.sbs.strathmore.edu

Strathmore UNIVERSITY BUSINESS SCHOOL

23rd October 2024

TO WHOM IT MAY CONCERN

Academic Reference for Magesa, Ludovick Laurence- Student Number 147352.

Strathmore University offers a degree in Bachelor of Commerce. In their 4th year of study, each degree student is required to work on a Management Research Project. The project involves reading literature that relates to the research topic; data collection and analysis and finally preparing a written document of the research findings and recommendations.

Ludovick is requesting to gather information to be used in his research. He is accountable for all information extracted from you and ensures that it will be used for research purposes only and will be kept confidential.

The research is entitled **"EFFECTS OF ARTIFICIAL INTELLIGENCE ON STRATEGIC PERFORMANCE IN THE BANKING INDUSTRY IN KENYA."**

We are looking forward to your co-operation and assistance to the above-named student.

Any assistance accorded to him will be highly appreciated.

Yours faithfully,

Mary Weremba
Manager, Undergraduate Programmes
Strathmore Business School
Email: mweremba@strathmore.edu

APPENDIX II: DEBRIEF FORM

Thank you for participating in this study. The aim of this study is to determine the effect of artificial intelligence on the strategic performance of Kenyan banks. Your participation will help researchers gain more insight and learn about the issues related to artificial intelligence and strategic performance. Share any concerns with me (Laurence Magesa **+254- 725003629)** or my supervisor **(Dr. Albert Abang'a),** Strathmore School of Business, Ole Sangale Road off Langata Road in Madaraka Estate, P.O. Box 59857-00200, Nairobi Kenya.
Email: aochieng@strathmore.edu

APPENDIX III: QUESTIONNAIRE

The purpose of this survey is to gain insight into the impact of intellectual capital on business performance in the Kenyan economy: It takes the example of NCBA Bank in Kenya. Please read the questions carefully and try to answer them to the best of your ability. The data obtained will be used for educational purposes.

Instructions

Do not indicate your name on the questionnaire

Tick only one answer (box) for each question.

PART A: ARTIFICIAL INTELLIGENCE

This part has three sections

1. Machine Learning

To what extent does NCBA Bank use machine learning in a bid to have an effective strategic performance? (please tick one)

a) None [ ]

b) A little [ ]

c) Moderate [ ]

d) Great [ ]

e) Much great [ ]

To what degree does NCBA utilize each of the following machine learning choices in reaction to variances in the market? Use 1. None, 2. A little, 3. Moderate, 4. Great, 5. Much great.

Component	**1**	**2**	**3**	**4**	**5**
The bank has adopted machine learning in credit appraisal					
The bank uses machine learning in marketing its products					
The bank utilizes machine learning in its supply chain					
The bank utilizes machine learning in human resource management					
The bank uses machine learning in its information technology functions					
The bank uses machine learning in customer service					
The bank utilizes machine learning in its finance and accounting functions					

2. Robotic Process Automation

To what extent does NCBA Bank use Robotic Process Automation in a bid to have an effective strategic performance? (please tick one)

a) None [ ]

b) A little [ ]

c) Moderate [ ]

d) Great [ ]

e) Much great [ ]

Appraise the degree of application of the following robotic process automation strategies at NCBA. Use 1- None, 2- A little, 3- Moderate, 4- Great, 5- Much great

Component	**1**	**2**	**3**	**4**	**5**
The bank has adopted robotic process automation in credit appraisal					
The bank uses robotic process automation in marketing its products					
The bank utilizes robotic process automation in its supply chain					
The bank utilizes robotic process automation in human resource management					
The bank uses robotic process automation in its information technology functions					
The bank uses robotic process automation in customer service					
The bank utilizes robotic process automation in its finance and accounting functions					

3. Natural Language Processing

To what extent does NCBA Bank use Robotic Process Automation in a bid to have an effective strategic performance? (please tick one)

a) None [ ]

b) A little [ ]

c) Moderate [ ]

d) Great [ ]

e) Much great [ ]

To what magnitude do the following inform natural language processing at NCBA? Use 1- None, 2- A little, 3- Moderate, 4- Great, 5- Much great

Component	**1**	**2**	**3**	**4**	**5**
The bank has adopted natural language processing in credit appraisal					
The bank uses natural language processing in marketing its products					
The bank utilizes natural language processing in its supply chain					
The bank utilizes natural language processing in human resource management					
The bank uses natural language processing in its information technology functions					
The bank uses natural language processing in customer service					
The bank utilizes natural language processing in its finance and accounting functions					

PART B: STRATEGIC PERFORMANCE

To what extent has the following improved at NCBA? Use 1- None, 2- A little, 3- Moderate, 4- Great, 5- Much great

Component	**1**	**2**	**3**	**4**	**5**
Total deposits					
Total loans					
Profitability					
Bank branches					
Client development					
Asset growth					
Market share					
Operational efficiency					

Thank you very much

APPRNDIX IV: TURNITIN REPORT

FINAL YR PROJECT 24-25 (1).docx

ORIGINALITY REPORT

19%	17%	7%	11%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

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2	effectiv.ai Internet Source	1%
3	Submitted to Midlands State University Student Paper	1%
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8	www.researchpublish.com Internet Source	<1%
9	core.ac.uk Internet Source	<1%