

**THE IMPACT OF BARRIERS AND BENEFITS ON ADOPTION
READINESS OF ROBOTIC PROCESS AUTOMATION IN KENYAN
COMMERCIAL BANKS**

By

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DECLARATION

I declare that this research is my original work and has not been submitted for an award of a degree in any other academic institution.

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ABSTRACT

Players in the banking industry are facing significant internal and external challenges in the present business and technology environment. There is pressure on the players to improve operational efficiencies, reduce costs, improve on quality, demonstrate business value to stakeholders, meet compliance requirements, and more subtly achieve end-to-end customer service and satisfaction. The main objective of the study was to investigate the adoption of Robotic Process Automation in Kenyan Commercial Banks. Based on the nature of the study topic, the research was anchored on the theory of reasoned action, technology acceptance model, Igbarias model and diffusion of innovation theory. This study employed descriptive research over a population of 41 commercial banks. Primary data was collected for the research. A census was designed and targeted two employees in the Information and Technology and research and innovation departments from the 41 banks as per the research design. Both descriptive and inferential statistics were computed in data analysis process. With a unit advancement in perceived benefits, the study found that the resulting effect on RPA adoption is a positive factor of 0.507 which according to the findings, was statistically significant ($\alpha=0.000$). When commercial banks get to know that if implemented correctly RPA can very quickly bring greater efficiency to business processes, there will be enhanced implementation process due to perceived benefits. Based on the relation between barriers and the adoption of Robotic Process Automation in Kenyan Commercial Banks, the study established that every single unit of technology barrier reduces RPA implementation by 0.072 units although according to the findings, its effect is insignificant ($\alpha=0.068$). As a result, the study recommends that the management of commercial banks should consider implementing appropriate RPA process to increase benefits that accompanies implementation of the technology. Banks should incorporate Robotic Process Automation for faster process execution and operational efficiency. The study therefore recommends that it is time you switch to smart banking operations. Although the study established that barriers to RPA adoption reduces the speed of its implementation, the management of commercial banks should enhance research and development strategies to identify the best way of dealing with the barriers to ensure swift implementation process. Employees should also be trained to facilitate implementation RPA process

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CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Players in the banking sector are facing significant internal and external challenges in executing their day-to-day operations. This has been exacerbated by the dynamic changes in the business and technology environment. There is a great push on the players to improve operational efficiencies, reduce costs, improve on quality, demonstrate business value to stakeholders, meet compliance requirements, and more subtly achieve end-to-end customer service and satisfaction. In Kenya, mobile penetration and increased adoption of mobile banking has left banks with digitization as the only key strategy in achieving competitive advantage (Gakweli, 2019). The Covid-19 pandemic has further exacerbated pressure on banks to adopt new technologies.

Notably, we are now at the cusp of the fourth industrial revolution, a technological transformation phase that is transforming processes and the nature of jobs within the financial industry. Businesses need to be agile for them to survive. We have had technological breakthroughs that are coming at an exponential rate. Such include the Internet of Things, cloud computing, Artificial Intelligence and Robotic Process. These technologies are disrupting almost every industry in every country. According to the Economist (2016), “automation anxiety” has characterized the adoption of these new technologies.

For banks to create value for their customers and realize cost benefits, they need to work on achieving operational efficiency (Katke, 2020). According to Delloite research (2018), automation is the solution to this. For many years, Robotic Process Automation has been employed to automate various Information and Technology processes in several fields. Such fields include medicine, hospitality, logistics, manufacturing, and construction sites. Organizations that have achieved great leaps in enhancing their business processes and introduced use of RPAs into their processes have generated positive results on their strategic goals. They have reported increased staff productivity and improved their customer engagement levels (Willocks, 2016). According to Tarquini (2018), RPA has registered great success in sectors that have a great appetite in embracing new technology

and those with defined and iterative processes such as insurance and banking. Over, the years there has been an increase in the companies that vend robotics process automation. However, there still exists challenges in achieving successful implementation of this technology.

The year 2020 witnessed the beginning of an unprecedented phenomenon, the novel COVID 19 pandemic. The pandemic has changed the way many organizations execute their day-to-day functions. Many organizations and sectors have had to adopt new innovative ways to work. They have had to implement social distancing requirements, stay at home orders, cost-cutting, and achieve operational excellence (Rodgers, 2020). Experts revere that this pandemic could as well be the panacea that shall accelerate the adoption of innovative service delivery models like Robotic Process Automation technology. Banks and other financial institutions ought to take this as an opportunity to accelerate the development of remote and digital banking.

By the year 2022, pundits revere that with Compound Aggregated Growth Rate of about 30.14%, the RPA market would be worth about USD 2,467 million. (Market and Markets, 2017). This projected growth is attributed to the continued nexus between this new technology and the traditional business models and processes. Machines and software robots are now executing common tasks in organizations. They are enabling employee agility thus creating a digital workforce that can focus on higher-value tasks.

Compliance with regulations requirements against financial institutions has also become more stringent than ever with heavy fines being slapped on non-compliance. It is reported that banks spend more than \$321 billion on their compliance operations. This includes the fines faced due to violations (Efron, 2020). Adopting any powerful new technology has always been an onerous task for many organizations. Human beings react differently to new technology including resistance or slow adoption rate. There shall always be a clash in organizational culture, existing processes, governance, and management structures. To succeed, organizations need to adopt strategic approaches when introducing this new technology.

This study investigates the adoption readiness of Robotic process automation technology amongst commercial banks in Kenya, the potential barriers to adoption, derived benefits of the technology, and propose a model for successful adoption. The applicability of theories like the Theory of Reasoned Action, Technology Adoption Model, Igbarius Model, Diffusion of Innovation Theory that have been muted in the past to drive the adoption of new technologies have been reviewed as part of the study. Because of the nature of the study, employees from the information and technology, research and Innovation departments shall be used to provide the requisite information for this study. These employees are expected to give insights into the concerns and critical factors of consideration that can influence the adoption of this technology in the banks' day-to-day operations.

1.1.1 Robotic Process Automation

During the year 2012, Patrick Geary who worked for an RPA software company, Blue prism created the first Robotic Process Automation software (Hindle, Lacity, Willcocks, & Khan, 2018). Robotic process automation (RPA) is an automated computer-based software tool that can emulate human actions. It can execute tasks that are iterative in nature (Oliveira, 2016). For the common work force, this form of automation can help in executing routine tasks that do not necessarily require decisions to be made. It can be used as a replacement or aide to the human workforce.

Robotics Process automation works well in an organization that has efficient processes and where most of the tasks are iterative in nature (Sandeep, et al., 2017). In the banking industry such tasks include opening of bank accounts, mortgage valuations, reconciliations, accounts payable, know your customer, compliance management, etc. The overarching and potential benefits of Robotic Process Automation include cost reduction, improved operational agility, improved scalability, increased speed, improved quality because of more consistent and predictable output, improved collaboration between IT and business, and enhanced business planning and forecasting.

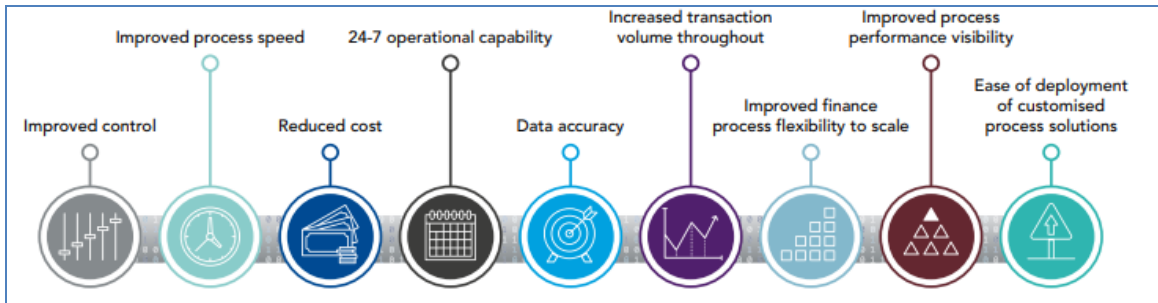


Figure 1: Embracing Robotic Automation during the evolution of finance

Source: KPMG

1.1.2 Information Technology Adoption

Information Technology (IT) adoption is the degree of acceptance of use of a new or emerged software or hardware technology (Thong, 1999). Successful integration of new technology in an organization involves more than just the new technology itself. Rather, it encompasses selection, planning, communicating, and training. There are key aspects to be considered that affect both the internal and external environments of an organization. According to Lai (2016), Changes to technology have a ripple effect in creating threats to business models that are already established. Opportunities are created by this new business models.

Several models and frameworks have been used in various sectors to try understanding and predict users' reaction and acceptance of new technology. The beginning stage of any future development of any new technology is to ensure that users accept it ab initio. Organizations are more likely to derive the benefits of new technology if customers or users accept it (Kumar, 2020).

1.1.3 Commercial Banks in Kenya.

In Kenya, banks are supervised and regulated by the Central Bank of Kenya, which was formed by an act of parliament on March 24, 1966. On September 14, 1966, the bank

opened its doors to the public, and as of right now, Article 231 of the Kenyan Constitution enshrines it.

To establish and maintain price stability, the bank develops monetary policies. 41 commercial banks were active in Kenya as of 2020, according to the Central Bank of Kenya.

Over the years, Kenya has positioned itself as an emblem of financial technologies (FinTech). These technologies are driving financial innovations within this industry and radically transforming the delivery of financial services. Consumer experience has also greatly improved in this industry. In the period between January 1 and December 31, 2019, 80% of banks and 86% of Micro-Finance Banks (MFBs) released new FinTech products, according to the Central Bank of Kenya Banking Sector Innovation Survey (2019).

1.2 Problem Statement

According to (Darwiche, 2017), RPA is an emerging technology and has not yet been widely adopted and implemented by many commercial banks. Financial market surveys demonstrate that scholars have undertaken preliminary studies to determine the issues surrounding Chatbot's and robot use, adoption, and efficiency. We have success stories on Robotic process automation across the world. However, many banks still face a myriad of challenges in adopting this new technology. Several organizations have deployed several RPA's. Some have registered positive results while some have not achieved as much as was projected. Several pilot implementations have been done without strategic planning resulting in negative results (Berruti, et al, 2017).

Though several technology adoption theories have been studied relevant to technology adoption, a standard RPA adoption model designed and developed mainly for the banking industry has not been proposed yet by industry experts or by learned academic researchers. There is need to evaluate chatbots effects on companies' perceptions anchored on consumers pre-existing expectations and attitudes (Araujo, 2018).

According to Hertzfeld (2019), as much as there was positivity in perception of chatbots, customers in the banking industry still had a preference in interacting with human beings, hence resulting into low adoption. The finding is corroborated by the Kenya Banker's association survey report 2018, which showed that banking customers in Kenya wish to relate more to humans than an artificial intelligence model for customer services such as robots and chatbots. The survey attributed this to the banking public being used to traditional human models that encourage customer interactions. The report recommends further research to be carried out to establish whether this trend owes to low levels of awareness about the value of fourth-generation technologies such as Robotic Process Automation.

Adoption of RPA, buoyed by the technology's capability, implementation and delivery of RPA solution determines the benefits realization (Syed, et al., 2019). Currently, there are no established guidelines that can be used to achieve benefits realization. Gaps still exist that guide the deployment and adoption of this technology. Establishment of a methodical model of implementation remains an area of focus for researchers. Focus was placed on elements that affect customer experience, including data security, availability, reliability, privacy, data mining capabilities and usefulness, according to Kumar (2020), who conducted research on the effect of robotic process automation on customer experience in the retail banking industry. Organizational Intrinsic factors such as solution stability, ease of use, robustness, resources optimization, and employee productivity were not considered during the study and remained a gap to be explored.

Though not on RPA's adoption explicitly, one study by Kahiga (2019) on the chatbots adoption model for service providers with a focus on Zuku subscribers in Kenya established that the effort, performance, security and facilitating conditions were the main determinants for adoption of chatbots in Kenya service industry. The study suggested further research on why social factors are not as instrumental in adopting chatbots as a new technology in Kenya.

From these previous studies, adoption of Robotic process automation in the banking industry is still at a low. Past studies have focused on social and human-centric factors that influence Robotic process automation adoption. These studies have not focused on

organizations' technology adoption barriers. The question the researcher seeks to establish in this study is, "The impact of potential barriers to the adoption of Robotics Process Automation and whether there are benefits of adopting this technology for commercial banks?"

1.3 Research Objectives

The main objective of the study was to investigate the adoption of Robotic Process Automation in Kenyan Commercial Banks.

1.3.1 Specific Objectives

- i. Determine the extent to which commercial banks are using Robotic Process Automation.
- ii. Establish the impact of barriers to the adoption of Robot Process Automation.
- iii. Establish whether there are benefits of adopting Robotics Process Automation.
- iv. Establish a model that can guide commercial banks in adoption of this technology.

1.4 Value of Study

Kenya has a reputation for being a leader in implementing cutting-edge technologies. This study sought to determine whether RPA technology was being used by commercial banks in Kenya by evaluating the impact of adoption hurdles and whether there were any advantages to using this relatively new technology. The study also aimed at proposing a model that can guide banks in the implementation of this technology. The banks may leverage the findings to accelerate this technology adoption and continue maintaining Kenya's impressive record of technology adoption.

As noted earlier, research in the adoption of this technology is still limited, hence academicians and students shall find information from this study helpful in further research and filling any gaps that was identified during this study. Professionals involved in implementing this technology shall also find useful information that they can put into consideration to improve adoption levels of implementation.

Government and regulatory bodies such as the Central Bank of Kenya also gain insights that can help formulate guidelines in regulation and security of crucial banking systems in the wake of this technology's adoption.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Studies have shown that in the history of human civilization, there have been numerous eureka moments in innovation that have caused apprehension in people's minds (Binfield, 2004). This chapter reviews past studies carried out on Robotic Process Automation adoption, barriers to adoption, and benefits of this technology within the banking sector.

2.2 Theoretical Framework

This section highlights the theories have been applied in various domains to understand and predict user's behaviors when implementing new technologies. Various organizations are now implementing collaborative workplaces where humans and robots carry out tasks together. Below is a review of a few theories developed by researchers that assisted drive the adoption of RPA technology in the banking sector.

2.2.1 Theory of Reasoned Action

This theory was first formulated in the late 1970s by Martin Fishbein and Icek Ajzen. It is one of the most effective approaches to understanding and predicting intentional behavior (Hagger, 2019). It focuses on individuals' beliefs on future performance of a particular behavior. According to this model, any human action can be predicted and explained by considering three main cognitive factors: attitudes (a person's level of favorability or unfavorability toward a behavior), social norms (the influence of others), and intentions (the individual's choice to take or refrain from taking an action).

The theory posits that this human behavior should be systematic, rational and voluntary. RPA's being a new technology that requires the collaboration of the human worker and the software robots, means that the individuals' beliefs on the software robots' influence in executing the worker's normal daily tasks is key in determining its adoption levels. Some workers may get the feeling that the software robots could be "taking over" their jobs hence may end up resisting the new technology. Critiques of the theory posit a definitional stand on as to what exactly the definition of attitude is (Trafimow, 2019).

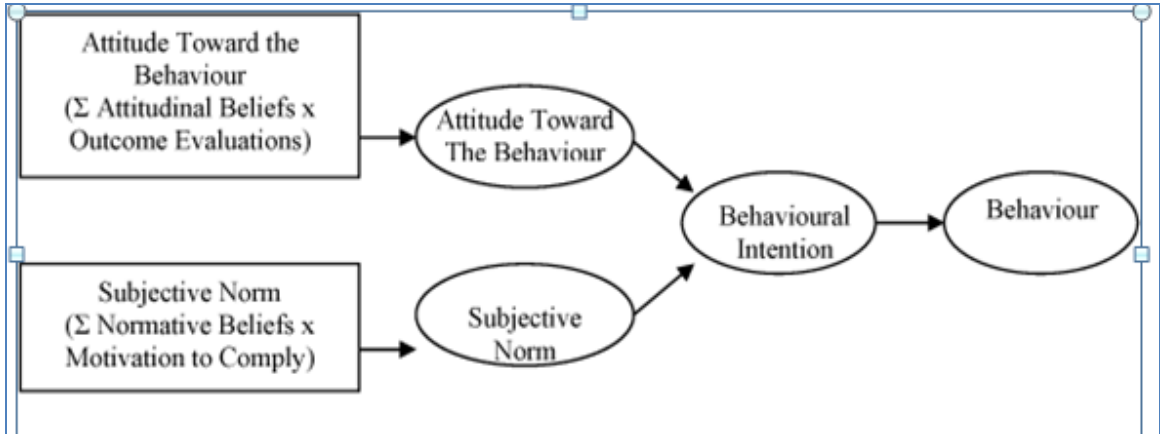


Figure 2: Theory of Reasoned Action

Source: Fishbein and Ajzen (1980)

2.2.2 Technology Acceptance Model (TAM)

This model is a derivative from the TRA model. TAM explains users' motivation by three factors: perceived ease of use, perceived usefulness, and attitude toward use (Venkatesh, 2000). The behaviors can be classified as unfavorableness and favorableness to a system. Employees are always bound to consider ease of use as a factor while adopting new technology. They expect tangible help from this software robot as they execute these tasks. TAM model has been criticized for only being able to explain individual behavior but lacks merit in explaining user behaviors about accepting or rejecting the use of this new technology (Hai & Allam, 2015).

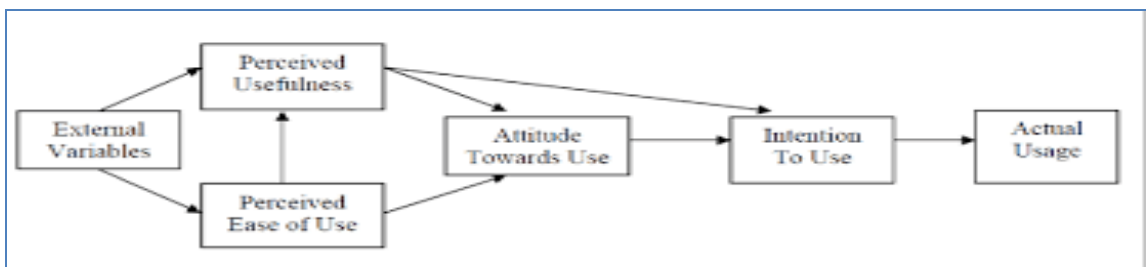


Figure 3: Technology Acceptance Model

Source: Bagozzi et Warshaw

2.2.3 Igbarias Model

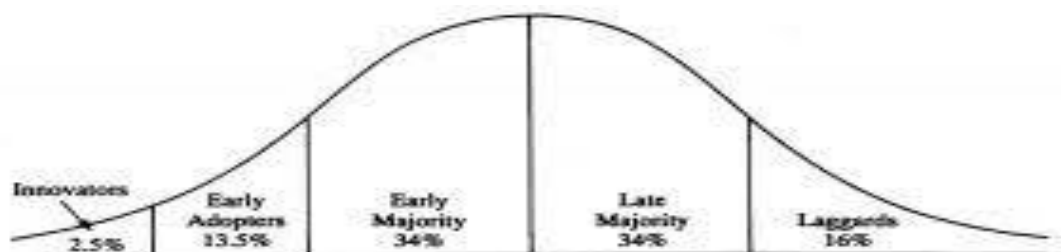
This concept suggested that user satisfaction is an internal motivator and perceived utility is an extrinsic motivator that affects behavior (using computers) and attitude (satisfaction with using computers) (Igbaria, 1990). In addition to these, perceived utility, perceived pleasure, and perceived enjoyment of the computer all have an impact on user acceptance (real behavior) both directly and indirectly. User satisfaction and perceived usefulness are affected because of computer anxiety. The introduction of Robotic process automation may or may not generate perceived fun and usefulness hence the need to establish whether there are any linkages of the introduction of RPAs to this theory.

2.2.4 Diffusion of Innovation Theory

This model looks at a variety of innovations while considering four variables that might affect how a new idea is adopted: time, communication channels, innovation, and social system. This theory has been applied not just at the human and organizational levels but also provided a theoretical framework for talking about adoption on a global scale.

The DOI model combines three key elements: the innovation-decision process, adopter characteristics, and features of an innovation (Oliveira, 2011). The theory places more emphasis on system traits, environmental factors, and organizational qualities.

This theory's fundamental flaw is that it ignores the fact that most customers are risk-averse, making it challenging to convince them to adopt novel concepts and services.



Source: Bagozzi et Warshaw

2.3 Robotic Process Automation Adoption

Adoption is defined as "antagonism to the term refusal and means the positive decision to use an innovation" (Hamta, 2019). According to Nash (2018), across the globe, 21 percent of banks did not have a clear digital business vision to adopt Robotic Process Automation but optimistic to adopt it. About 15 percent of banks are not effectively using digital technologies followed by 66 percent moderately effective and 19 percent very effective. It is estimated though that there will be over 4 million robots that shall be automating routine tasks by 2021 (Forrester, 2018).

Kenya has a reputation for being a trailblazer in the adoption of transformative technologies in various industries. Banking institutions are accelerating their efforts in embracing new technologies to remain competitive (Kaigwa, 2019). The future of banking is hinged on technology adoption.

2.4 Robotic Process Automation Adoption Barriers

Camilla, et al, (2016) investigated Norway's bank customer's potential barriers to adopting Robotic Process automation. The study gave some insights into the likely factors that impact the adoption of the Robotic process adoption. This study established individual behaviors such as anxiety, enjoyment, habit, and trust to be the main drivers of customer's intentions towards adopting cognitive Robotic in a retail banking setting. The bank customers were found to be moderately ready to adopt cognitive Robotic in banking services. The study suggests that adoption could be improved by focusing on potential barriers during the implementation of Robotics in banking services.

In their study on RPA in customer experience in the retail banking industry in Singapore, Karippur et al., (2020) revealed that availability and reliability had the most significant influence on customer experience. It further showed that early opinions of a new system's usability are influenced by elements including how well control, incentive, and emotion are included into technology acceptance models. Other organization intrinsic factors like

governance, compliance, investment costs, legacy applications, change management, skillsets, job security and privacy are to be considered too.

Therefore, it is crucial that banks consider adoption aspects that will improve the experience of their clients while deploying new technologies, such as RPA, to improve banking procedures and operations. In this study, the researcher shall investigate the organization intrinsic factors that may impact adoption of Robotics Process Automation.

2.5 Robotic Process Automation Adoption Benefits

The adoption of RPA's particularly for banks cannot be thrust aside. Banks have some straightforward processes that can easily be automated and executed via the adoption of Robotic Process Automation. Robotics can be used to generate high-quality responses to a myriad of complex questions. The ability to automatically respond to these questions can augment the digital worker. Banks can monitor workforce efficiency, customer behavior, and turnaround time to complete various banking operations remotely (Karippur, 2020).

Robotic process automation, or RPA, provides several benefits, including raising productivity, precision of operations, employee morale, lowering technical obstacles, consistency and compliance, and dependability of the technology, according to Buckowich (2016). Robot process automation technology has the tremendous benefit of being simple to configure, allowing even non-technical people to use it to solve any problems. Accounts payable and receivable, payroll, employee status changes, new hire recruiting and onboarding, invoice processing, inventory management, report preparation, software installs, data migration, and other fundamental banking business activities may all benefit immediately from RPAs.

Adoption of Robotic Process Automation can help banks address some of the other challenges faced that include dealing with statutory and regulatory compliance issues, data protection and regulation, heavy investment, governance, trust and reputational, silo organizational functions, complicated IT architecture, change management challenges, and standalone technology.

2.6 Empirical Review

According to (Deloitte, 2018), a good number of companies in the USA have commenced the implementation of RPA. It is reported that those companies that already started the implementation of RPA have achieved a payback period of about one year on average. They have recorded significant improvement in accuracy and reduced operational costs. They have also improved on turn-around times, and they now have agile business processes. They have also managed to improve on compliance to their regulatory obligations.

Australia and New Zealand (ANZ) banks are using RPA in mortgage processing, payroll processing, account payable process, and other human resource (HR) functions. The Industrial Credit and Investment Corporation of India (ICICI) Bank uses RPA to execute over one million back-end transactions daily. The bank has been able to reduce turnaround time by about 60% and they have greatly improved on accuracy of their operations.

Barclays Bank plc has also implemented RPA in various processes. They are now able to detect fraudulent transactions real time, monitoring of risks, managing the account receivables, processing and automation of loan applications. Piraeus Bank Romania has implemented an RPA solution from UiPath to assess retail credit and prevent fraud. A total of fifteen other applications have been integrated into the RPA. The bank has reduced the long and tedious process of retail and credit fraud prevention from about 45 minutes to about 20 minutes (The Asian Banker, 2019).

The Singaporean bank, Oversea-Chinese Bank Corporation (OCBC) has achieved reduction of the amount of time that it took to re-price home loans from 45 minutes to 1 minute. They have deployed a bot that verifies the customer's eligibility to have their loans re-priced, recommend various options for re-pricing, and draft a recommendation e-mail too (Finextra, 2017).

As at the time of this study, the researcher did not come across any scholarly case study on Robotic process automation use in any commercial bank in Kenya.

2.7 Summary of Literature review

Robotic Process Automation (RPA) is a valuable emerging fourth generation technology that banks can employ to achieve efficiencies and augment their digital transformation journey. The review shows that the technology is already being implemented in many banks worldwide with positive results being realized. Banks's ought to consider this technology as a strategic priority to augment the digital worker, gain a competitive advantage and improve on their efficiencies. The review shows that technological changes on the corollary create threats to already existing business models as they seek to offer new business opportunities and customer service models.

In Kenya, there is still apprehension about the use of this fourth-generation technology. Nevertheless, just like any new technology, the review proposes that banks need to take a strategic rather than a tactical approach in ensuring good adoption of the technology. Previous studies done on RPA adoption have focused on the customer reactions and the cognitive impacts of this technology implementation. This study seeks to extend previous work done by examining organizational potential barriers that may be leading to low adoption of RPA technology and the benefits of adopting this technology.

2.8 Conceptual Framework

In formulating the conceptual model, two independent variables are used to determine the robotics process automation *adoption*. The first variable of study was *Benefits of Adoption* while the second variable was *Barriers to adoption*. On the benefits, the potential benefits factors used for the study included *cost savings, operational excellence, and customer excellence*. On potential barriers to the adoption, the researcher chose eight intrinsic organizational factors. These include *governance, compliance, investment costs, Legacy applications, Change management, skill set, job security and individual behavior*.

Figure 5 below summarizes the conceptual model proposed in this study to establish the commercial banks' adoption to Robotics Process Automation.

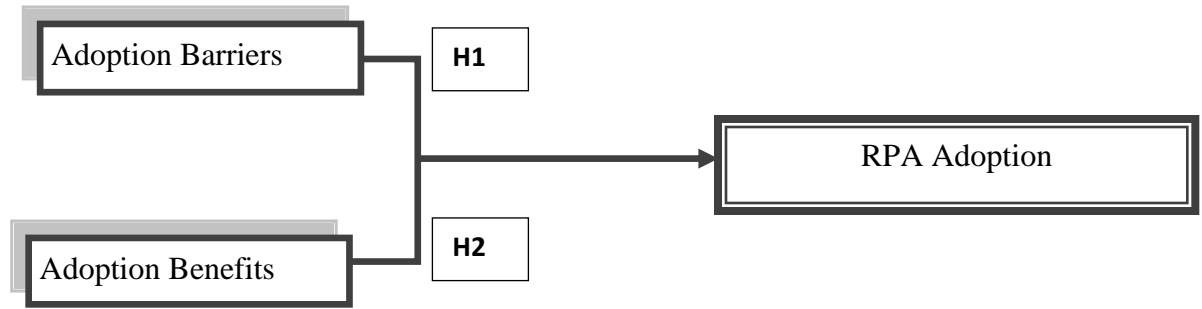


Figure 5: Conceptual Model

Source: Researcher

In order to achieve the objectives of the study, two hypotheses were set as below, and the findings presented using tables and charts.

Hypothesis 1(H1)-Barriers have no effect on the adoption of Robotics Process Automation

The hypotheses shall seek to determine whether barriers as posited in the conceptual model influence the adoption of Robotic process automation.

Hypothesis 1(H2)- There are no Benefits of adopting of Robotics Process Automation.

This hypothesis shall seek to establish whether there are benefits of Cost Savings, Operational Excellence, Compliance, and Customer Excellence derived from adopting this technology.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research methodology that has been employed in this study. It begins by describing the research design providing a justification for the selection of the design. The population of the study is then outlined including data collection techniques and tools that were used to collect the data. Finally, a preview of the data analysis is elucidated too.

3.2 Research Design

This study uses descriptive research. Descriptive research encompasses description of the characteristics of a particular group or individual (Mamun Habib et al., 2014). In this study, the potential barriers, and potential benefits of adopting Robotic Process automation were assessed by administering a census to explore the perceptions about the adoption of RPA. Because deployment of RPA is still relatively new, only a limited quantity of individuals that were deemed aware of the RPA technology were involved. Information and technology or persons holding equivalent positions in research and innovation or operations teams in commercial banks in Kenya were the primary target. The descriptive research design was determined as appropriate as the study focuses on a defined group.

3.3 Population and Sampling

Robotic process automation is still a relatively recent trend among Kenyan commercial banks. Primary data from information and technology teams or individuals holding comparable jobs in research and innovation or operations teams was gathered in order to meet the study's goals. There were 41 active commercial banks in Kenya as per the Central Bank of Kenya's 2020 report. This served as the study's population.

3.4 Data collection

Primary data was collected for the research. Primary data was chosen on the prescient that the technology is still relatively new amongst banks and secondly, primary data tends to give assurance on the relevance of the proposed model and findings as opposed to secondary data. A census was designed and administered across the 41 banks with the target respondents being the Information and Technology managers or persons holding equivalent positions in the research and innovation or operations in respective banks.

Section I: Demographic Information- This section was designed to establish general bank information. This included whether the bank is foreign or locally owned, age of the bank and the existence of target departments at the bank. This was projected to be able to give insights on the adoption of the technology based on these demographic attributes.

Section II: Benefits of Robotics Process Automation- This section sought to determine the whether the banks under study that had implemented Robotics Process Automation derived any benefits in operational performance, cost savings and customer excellence. A five-point Likert scale for agreement or disagreement with the center value as neutral was used to collect the responses.

Section III: Impact of Potential Barriers to adoption of Robotics Process Automation- This section sought to determine the impact of potential barriers to the adoption of this technology. The potential barriers investigated were those identified in the conceptual model. The focus of the barriers was centered around people, processes, and technology. A Likert scale was used to collect the responses based on the assessed potential barrier.

Section IV: Robotics Process Automation Adoption- This section sought to measure the adoption levels amongst the census population. It was intended to capture the feelings, concerns, and attitudes towards adoption of this relatively new technology in commercial banks. A Likert scale was used to collect the responses for the analysis.

3.5 Data Analysis

Based on the parameters under examination, the conducted census produced discrete quantitative data. The replies were reviewed for completeness and consistency prior to processing. The rate of RPA adoption was then determined using a descriptive analytic technique. A simple linear regression was used to establish the relationship between potential barriers to adoption of Robotic Process Automation in Kenya's commercial banks while a multiple linear regression analysis was employed to establish potential benefits of Robotics Process automation adoption in commercial banks in Kenya. R-Squared, Multiple R-Squared and the standard coefficient of errors and other relevant statistical measures were obtained to establish a model as below.

$$Y (\text{RPA Adoption}) = K + a(\text{benefits}) + b(\text{barriers}) + \text{error term}$$

CHAPTER FOUR: RESULTS AND FINDINGS

4.1 Introduction

This chapter presents the findings of data analysis done using the technique described in Chapter 3 as a starting point. Organizational demographics, the advantages of robotics process automation, adoption hurdles for robotics automation, and the degree to which banks have adopted robotics process automation are the specific topics discussed in this chapter. Descriptive statistics is presented on the measures of benefits and barriers of RPA adoption, and the presentation of the findings is done using tables.

4.2 Response Rate

The statistical power of a test is determined by the response rate, and the higher the response rate, the greater the statistical power. In total 41 banks were targeted with two questionnaires distributed to each of the bank. The respondents were the ICT managers, Research and Innovation department or persons holding equivalent positions in the respective banks. A review of the respondents based on banks was carried out and there was at least a response from 32 banks. Table 4.1 shows the summary of the response rate among the banks.

Table 4.1: Response Rate

Questionnaires	Number	Percentage
Filled and collected	32	78
Non-responded	9	22
Total	41	100

According to the findings, a response rate of 78 was deemed appropriate for drawing inferences and drawing conclusions on the subject of the study. According to Mugenda & Mugenda (2003), a 50% rating response is adequate, a 60% rating is acceptable, and a 70% rating is very good. Additionally, Bailey (2000) determines that a response rate of 50% is regarded as satisfactory, while a response rate of greater than 70% is extremely good. Therefore, the representative sample's response rate of 78.0% was regarded adequate and sufficient in this respect.

4.3 Demographic Information about the Banks

The research sought to get general demographic data about the banks under study. The banks' ownership structure and age were the demographic variables under study. The following sections present the findings.

4.3.1 Ownership of the Bank

The respondents were asked to indicate the bank ownership. The options presented include local, foreign or a hybrid ownership. The results are presented in Table 4.2.

Table 4.2: Ownership of the Bank

Bank Ownership	Frequency	Percent	Cumulative Percent
Local	19	59.4	59.4
Foreign	5	15.6	75.0
Both	8	25.0	100.0
Total	32	100.0	

The results suggest that of the 32 banks that responded, 19 are locally owned while five were foreign owned. On the other hand, eight were both local and foreign owned. This implies that over 85% of the banks have a local ownership and the remaining banks are purely foreign, and this might have come about from the acquisition that has been witnessed over the last 5 years in the country.

4.3.2 Age of the Bank

This section sought to determine the age distribution of the banks under evaluation. The age of an organization acts as a measure, *ceteris paribus*, of the growth stage and therefore been able to undertake different operational activities with an aim of meeting the expectation of the business environment. The results regarding the age of the bank are presented in Table 4.3.

Table 4.3: Age of the Bank

Age of the bank	Frequency	Percent	Cumulative Percent
Less than 20 years	3	9.4	7.8
21- 40 years	14	43.7	53.1
41- 60 years	8	25.0	78.1
Over 61 years	7	21.9	100.0
Total	32	100.0	

From the findings in Table 4.3 less than a tenth (9.4%) of the banks sampled had operated in Kenya for less than 20 years. These are mainly the banks that have entered the Kenyan market through acquisition in their quest to expand their market coverage from their parent nation. On the other hand, half (50%) of the banks had operated in Kenya for over 41 years implying since independence or before. This bank segment is assumed to have initiated necessary automation of their process considering that the banking industry is a capital-intensive industry.

4.4 Benefits of Robotics Process Automation

RPA offers several and extensive advantages. Software robots may be used to make substantial and quantifiable improvements in all areas of an organization, from staff engagement and customer satisfaction to process speed, accuracy, and cost effectiveness. The study sought to determine the scope and advantages of RPA deployment in Kenyan commercial banks.

4.4.1 Implementation of Robotics Process Automation

The respondents were first asked whether their banks had implemented Robotics Process Automation as part of their business automation.

Table 4. 5: Implementation of Robotics Process Automation

Has your bank Implemented RPAs	Frequency	Percent	Cumulative Percent
Yes	12	37.5	37.5
No	15	46.9	84.4
Planning to do so	5	15.7	100.0
Total	32	100.0	

From the findings, the study established that 37.5% of the respondents indicated that their organization has indeed implemented Robotics Process Automation as part of their business automation. On the other hand, 46.9 % indicated that their firms are yet to implement while 15.7% stated that their organization were planning to implement RPA process.

4.4.2 Descriptive Statistics on Benefits of RPA Adoption

Under the descriptive statistics on the benefits of RPA adoption, the study aimed to establish the extent at which RPA adoption has brought beneficial impact under the six factors identified in the conceptual framework. The banks were asked to rate the statements provided based on a five-point Likert scale for agreement to disagreement with center value as neutral. On interpreting the results, the mean values of 3.5 and over implied that majority of the banks agreed with the statements while the means between 2.5 and 3.4 implied that majority of the respondents neither agreed nor disagreed. In addition, when the mean value of the statements fell below 2.5, then it is an implication that majority of the banks disagreed with the statement. The standard deviations ranged from 0-2. For standard deviations less than one, variation in responses within the rating scale was small while standard deviations greater than 1 implied that there is a significant dispersion in responses. These interpretation assumptions applied in all descriptive analysis in the study.

Table 4. 6: Results of Benefits of Adoption

Benefit effect	N	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation
		N(%)						
Improved Speed of Operation	32	11(34.3)	19(59.4)	2(6.3)	0	0	4.937	.2445
Improved Quality	32	10(31.3)	18(56.3)	4(12.4)	0	0	4.926	.2626
Cost Savings	32	8(25.0)	20(62.5)	4(12.5)	0	0	4.874	.3339
Customer Excellence	32	6(18.8)	21(65.6)	5(15.6)	0	0	4.842	.3665
Operational Excellence	32	5(15.6)	26(81.25)	1(3.1)	0	0	4.842	.3945
Regulatory Compliance	32	4(12.5)	28(87.5)	0(0)	0	0	4.832	.4291
Valid N (listwise)	32							

From the study findings on the benefits of RPA in commercial banks, majority of the respondents agreed that implementation of Robotics process automation can lead to improved speed of operation (mean=4.936), improved quality (mean=4.926), cost savings (mean=4.874), customer excellence (mean=4.842), operational excellence (mean=4.842) and regulatory compliance (mean=4.832) among other benefits. The low standard deviations implied that the dispersion of responses was small with majority of the responses on the higher side of responses as indicated by the mean values.

4.5 Potential Barriers to Adoption of Robotics Process Automation

Organizations will encounter a variety of internal impediments while evaluating and contemplating robotic process automation, which may have a negative impact on the adoption process. The study aimed to establish potential barriers to RPA adoption in commercial banks where people, process and technology were identified as the main potential barriers to implementation of RPA strategy.

Table 4. 7: Potential Barriers to Adoption of Robotics Process Automation

People	N	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation
		N(%)						
Lack of Skill set in use of RPA's.	32	8(25.0)	20(62.5)	4(12.5)	0	0	4.853	.3564
Fear of Job loss	32	6(18.8)	20(62.5)	3(9.4)	3(9.4)	0	4.811	.3940
Individuals' behavior	32	4(12.5)	19(59.4)	6(18.8)	3(9.4)	0	4.779	.5492
Valid N (listwise)	32							
Processes								
Poor Change Management processes	32	6(18.8)	21(65.6)	5(15.6)	0	0	4.526	.5806
Lack of Regulatory Framework	32	4(12.5)	24(75.0)	4(12.5)	0	0	4.337	.8581
Lack of Governance Process	32	3(9.4)	21(65.6)	6(18.8)	2(6.3)	0	4.263	.8778
Valid N (listwise)	32							
Technology								
Initial Technology Investments Costs	32	6(18.8)	26(81.3)	0	0	0	4.874	.3340
Legacy applications	32	5(15.6)	27(84.4)	0	0	0	4.863	.3455
Valid N (listwise)	32							

From a Peoples perspective, the results in Table 4.7 suggests that a lack of appropriate skills set by staff in use of RPA's (mean=4.853), fear of job loss (mean=4.811) and individuals' behavior are the main causes of barriers from human capital point of view.

RPA is often started by one or more strategic individuals in the organization who are familiar with the idea and see its potential. However, before the business case can advance, these individuals must push and sell the capacity to the larger internal community. Without the support of entire workforce in the organization, implementation of RPA will face a setback leading to collapse of process implementation.

From a process perspective, the study established that poor change management processes (mean=4.526), lack of regulatory framework (mean=4.337) and lack of governance process (mean=4.263) were the possible barriers that may obstruct implementation of RPA in the commercial banks. The majority of RPA providers will give some kind of opportunity qualifying system. The method is designed to identify an initial sample of processes that are excellent for automation, provide basic education to the company on which processes are eligible for automation, and provide some guidance on how many activities in an organization may be automated. However, without proper information on processes evaluation, implementation of the RPA may be a problem from the word go.

Technology was also found to play a significant role in implementation of RPA since the process at its own requires a vast technological framework. From the findings, the study established that initial technology investment costs (mean=4.874) and legacy applications (mean 4.863) were the potential technology antecedents that may negatively affect implementation of RPA.

4.6 Robotics Process Automation Adoption

4.6.1 Personal View on robotics process automation adoption

The banks were asked to indicate what best describes them when it comes to Robotics Process Automation technology based on the structured statements. The descriptive statistics are as presented in the tables below.

Table 4. 8: Personal View on robotics process automation adoption

	N	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Deviation
Statement on RPA adoption	N (%)							
I'm one of the first to try out and use this new technology since I adore it.	32	3(9.4)	22(68.8)	2(6.3)	5(15.6)	0(0)	4.200	.8455
I often utilize this new technology when the majority of my friends do	32	0	3(9.4)	8(25.0)	19(59.4)	2(6.3)	2.568	.9637
I'm Skeptical of the new technology and will only use it when I must.	32	0	0	7(21.9)	24(75.0)	1(3.1)	2.453	.9082
I frequently employ new technologies last among my peers.	32	0	0	3(9.4)	26(81.3)	3(9.4)	2.221	.6869
Valid N (listwise)	32							
Statement on Impact of RPA Adoption								
“Robotics Process Automation Technology has made the banking industry change too fast”?	32	11(34.4)	16(50.0)	5(15.6)	0	0	4.674	.6092
My organization is making the best use of Robotics Process Automation technology?”	32	0	4(12.5)	26(81.3)	2(6.3)	0	3.726	1.3717
Valid N (listwise)	32							
Statement on Awareness on new digital tools and technologies for automating Banking operations								
In my organization	32	2(6.3)	4(12.5)	19(59.4)	3(9.4)	4(12.5)	3.158	.9600
In my Industry	32	1(3.1)	2((6.3)	28(87.5)	1(3.1)	0	2.957	.9330

Valid N (listwise)	32							
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Regarding the adoption of this technology, the respondents were in agreement that they adore it and that they were among the first to use and experiment with it (mean: 4.200). Additionally, banks frequently employ the newest RPA technology when their acquaintances do (mean=2.568). Majority of the banks disagreed on the fact that they are skeptical of the new technology and will only use it when they must (mean=2.453). In addition, majority of the banks disagreed with the statement that usually they are one of the last people to use the RPA technology (mean=2.221). The findings imply that majority of the banks support the adoption of RPA and that they welcome its implementation because they perceive it will enhance convenience in service delivery to the customers.

The banks were invited to provide their thoughts on how the implementation of RPA will affect their operational practices. The data reveals that the majority of respondents (mean=4.674) felt that the banking industry's use of robotic process automation technology is changing too quickly. A good number of the respondents also agreed that their banks make the best use of Robotics Process Automation technology (mean=3.726). Therefore, the implication on these statements is that Robotics Process Automation Technology has greatly influenced operational performance of commercial banks.

The banks level of awareness on the new digital tools and technology for automating banking operations was also established. The results show that the majority of respondents were unsure about the new digital tools and technologies for automating banking processes at their business (mean=3.158) and throughout the overall industry (mean=2.958).

4.6.2 Sources of Information on New Tools and Technologies

The respondents were asked to indicate the sources they learn about new tools and technologies in the banks that they work for. The selection of sources was not limited to one source but rather to a maximum of six sources and a minimum of one source per bank.

Table 4. 9 Sources of Information on New Tools and Technologies

Source	Frequency	Percentage
From my company training department	16	51.563
From my company’s technology department	10	29.688
From my own research	23	71.578
From social media	27	82.813
From my peers	26	85.938

From the findings, slightly half of the banks (51.6%) indicated that the source of new information on new tools and technologies originated from their training departments and close to a third from the bank’s technology department – which acted as the source of new tools and technologies (29.688%). Similarly, the findings suggest that the source of new tools and technologies to the banks was social media (82.813%) and from the peer organizations (85.938%). These results suggest that the sources of new tools and information to the banks vary and therefore the commercial banks should explore the varied sources to have a rich composition of new ideas on robotics process application in the organizations.

4.6.3 Acceptance of Robotics Process Automation Technology among the Commercial Banks

The study sought to determine the RPA technology acceptance among commercial banks. The acceptance goal was measured based on the banks capacity to keep up with the technology, fall behind or not being aware of the technology. The results are presented in Table 4.14.

Table 4.10: Banks Robotics Process Automation Technology Acceptance

		Frequency	Percent	Cumulative Percent
Valid	Keeping up	17	53.1	53.1
	Falling behind	14	43.8	96.9
	I don’t know	1	2.1	100.0
	Total	32	100.0	

From the findings in Table 4.14, 51.6% of the banks indicated that they were keeping up with Robotics Process Automation technology. On the other hand, 45.3% indicated that they were falling behind while 2.1% were not aware of Robotics Process Automation technology. The findings implied that more than half of the banks were keeping up with the technology, which is a good indication for effective implementation process.

4.7 Chi-Square Tests

Chi-Square test was conducted to determine whether there was a significance difference between the observed and expected values between the variables age of the organization and adoption readiness of robotic process automation in Kenyan commercial banks.

Table 4. 11 Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.488 ^a	6	.483
Likelihood Ratio	6.347	6	.386
Linear-by-Linear Association	.090	1	.764
N of Valid Cases	95		

a. 8 cells (66.7%) have expected count less than 5. The minimum expected count is .05.

According to the findings, the significance value is 0.483, and the chi-square statistic is 5.488. If this number is less than or equal to the prescribed alpha threshold, the outcome is noteworthy (normally .05). We are unable to reject the null hypothesis, which states that the two variables are independent of one another, in this case since the p-value is higher than the accepted alpha value. Simply said, the outcome is insignificant. In Kenyan commercial banks, the data indicates that there is no correlation between the variables age and implementation readiness of robotic process automation. In essence, commercial banks that recently joined the market may have the highest capacity of adoption readiness of robotic process automation than banks with more years in

operation. Consequently, the higher the age of commercial bank does not dictate the higher the adoption readiness of robotic process automation.

4.8 Regression Analysis

Finding the linear equation that will link the variables under investigation is the goal of a regression study. The resultant linear equation from the analysis of multiple regression helps forecast the value of the dependent variable when the coefficients of one or more independent variables are set with a certain unit value.

When it comes to the effect of advantages and obstacles to the adoption of robotic process automation in Kenyan Commercial Banks, the multiple regression analysis' goal was to determine if there was a link between the explanatory factors and the result variable. Using the statistical software for social sciences, multiple regressions for the study's variables were entered and calculated (SPSS V 26.0). The coefficient of determination identifies the proportion of variation in the dependent variable, in this case the adoption of robotic process automation in Kenyan commercial banks, that can be accounted for by variations in the independent variables or the ratio of variation in the dependent variable.

4.8.1 Summary model

The model summary of regression findings is shown in Table 4.10, where adjusted R square, R square, and standard error of estimate are shown.

Table 4.12: Summary model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.515 ^a	.265	.249	.34186
a. Predictors: (Constant), Barriers, Benefits				

According to the study's findings (Table 4.15) and the coefficient of correlation (R value), the advantages and obstacles to technology adoption and robotic process automation in Kenyan commercial banks have a positive and moderate association with project success (0.515). The independent factors taken into consideration in the current

study accounted for 26.5% of the overall adoption of robotic process automation in Kenyan Commercial Banks, as indicated by the R squared, also known as the coefficient of determination, which was 0.265. This implies that 73.5% of the adoption of robotic process automation in Kenyan commercial banks is due to variables not taken into consideration in the current study.

4.8.2 Analysis of Variance

The statistical findings of the analysis of variance that explain the model's fitness based on the probability of the F-statistic and the significance level of the F statistic are presented in Table 4.11.

Table 4. 13: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.879	2	1.940	16.597	.000 ^b
	Residual	10.752	30	.117		
	Total	14.632	32			
a. Dependent Variable: RPA Adoption						
b. Predictors: (Constant), Barriers, Benefits						

As can be observed from the research results in Table 4.11 above, the F statistic is 16.597, and the threshold of significance was determined to be 0.000, which is less than 0.05. The findings imply that the model significantly predicted Robotic Process Automation adoption in Kenyan Commercial Banks using perceived benefits and barriers.

4.7.3 Coefficients of Regression Analysis

It cannot be overemphasized how crucial regression coefficients are for determining the strength of each independent variable's potential impact on the outcome variable. One of the outcomes of regression analysis is the regression model fixed with the coefficients associated the variables under study.

Table 4. 14: Coefficients of regression analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.565	.489		5.249	.000
	Benefits	.507	.097	.471	5.240	.000
	Barriers	-.072	.039	-.166	-1.845	.068
a. Dependent Variable: RPA Adoption						

As shown from the outcome of regression analysis, without perceived benefits and barriers to technology change in commercial banks, Robotic Process Automation adoption in Kenyan Commercial Banks will have a constant value of 2.565. However, increase in perceived benefits by one unit enhances Robotic Process Automation adoption in Kenyan Commercial Banks by a factor of 0.507 which is significant ($\alpha=0.000$). This imply that perceived benefits and Robotic Process Automation adoption in Kenyan Commercial Banks have a positive relationship. On the other hand, barriers to implementation of technology change have a negative ($\beta=-0.072$) and insignificant ($\alpha=0.068$) impact on Robotic Process Automation adoption in Kenyan Commercial Banks. This implies that an increase in technology acceptance barriers will negatively affect implementation of a new technology.

The resulting linear model there follows.

$$Y = 2.565 + 0.507(\textit{perceived benefits}) + \textit{Error term}$$

4.8 Discussion of the Findings

The main objective of the study was to investigate the adoption of Robotic Process Automation in Kenyan Commercial Banks. From the descriptive statistics, the study has established that majority of commercial banks are yet to fully adopt Robotic Process Automation with less than half of commercial banks indicating that some barriers to acceptance of the technology hinders its implementation. According to the findings,

majority of commercial banks have not integrated people, processes, and technology, which are the core factors that determine successful implementation of technology. Additionally, the study established that majority of commercial banks accepts technology implementation that facilitates convenience of service delivery to their organization.

Based on inferential statistics, the study established that perceived benefits enhance Robotic Process Automation adoption. RPA frees up human workers' time from tedious and repetitive tasks while also improving the accuracy and efficiency of business procedures. This enables them to focus on activities that call for human judgment and sensitivity. Employees will therefore typically be in favour of the technology's installation. The results are consistent with Buccowich's (2016) findings that the use of robotic process automation technology has several benefits, including increased operational accuracy, improved employee morale, increased productivity, low technical barriers, compliance, consistency leading to reliability, and non-invasive technology.

Robotic Process Automation adoption, on the other hand, is negatively impacted by perceived hurdles to technological acceptance. When there are potential drawbacks to utilizing RPA, especially when businesses don't think carefully or strategically about the automation initiatives they undertake, barriers to RPA adoption appear. To enhance implementation of RPA, there must be a significant framework and process that will facilitate its implementation. the technology should also be accepted by the people as a reliable framework that will enhance convenience of conducting routine business activities in the organization. According to Karippur et al. (2020), availability and dependability have the most effects on the way customers are treated. Early opinions of a new system's usability are influenced by elements including how well control, intrinsic motivation, and emotion are included into technology acceptance models. The opposite will result in rejection and a delay in the adoption of technology.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The summary and suggestions of the findings in respect to the study goals are presented in this chapter. The chapter also covers recommendations, drawn in respect with the study findings, for implementing policies and ideas based on the findings, as well as suggestions for future research built around the study's limitations.

5.2 Summary of the Findings

Investigating the use of robotic process automation in Kenyan commercial banks was the study's primary goal. Descriptive and inferential statistics were generated using the study's descriptive study design. From descriptive statistics, the study established that in commercial banks, RPA is still yet to be adopted by majority of banks. The main reason for slow adoption of the technology is lack of sufficient framework for process implementation. Successful implementation of new technology calls for an established framework especially in financial institutions where integrity and confidential of database information should be up to a given standard. Above all, the human capital needs vast knowledge base for the implementation of the technology. RPA cannot operate without the guidance of human being and according to the findings, lack of trained personal of operational process of RPA hinders its successful implementation.

Inferential statistics as far as RPA adoption is concerned established that perceived benefits enhance adoption of RPA in commercial banks. With a unit advancement in perceived benefits, the study found that the resulting effect on RPA adoption is a positive factor of 0.507 which according to the findings, was statistically significant ($\alpha=0.000$). Commercial banks will speed up deployment of RPA owing to perceived benefits once they learn that, when done properly, RPA can fast increase business process efficiency.

Based on the relation between barriers and the adoption of Robotic Process Automation in Kenyan Commercial Banks, the study established that every single unit of technology barrier reduces RPA implementation by 0.072 units although according to the findings, it effect is insignificant ($\alpha=0.068$). It takes time for businesses to adopt these changes and make adjustments as technology advancements reshape the financial sector. The

transition from manual to digital automation can be very abrupt and cause a variety of problems for a business. Barriers to technological changes and implementation of new technologies are some of these barriers. As a result, employees may not be willing to accept technological changes because the human labour may be at risk. Machines may take up the tasks done by humans hence jeopardizing employment positions and opportunities.

However, benefits combined with barriers to technological implementation explains 26.5% of the adoption of Robotic Process Automation in Kenyan Commercial Banks, according to the findings. Without barriers to the adoption of Robotic Process Automation in Kenyan Commercial Banks, the study concludes that perceived benefits alone could explain higher percentage of RPA adoption.

5.3 Conclusion

The specific objectives of the research were to assess the extent to which Kenyan commercial banks use robot process automation in their operations, establish the barriers to their adoption and finally determine the benefits of adopting the process. The banking industry being one of the dynamic fields requires that the banks adopt a varied pool of sourcing for new operational ideas. The results suggest that the sources of new tools and technologies range from social media, peer firms and own research by the banks. This implies that the commercial banks need not concentrate in one avenue of adopting and improving application of robotic process automation. The sourcing of these new technologies and information from different sources can explain the capacity of the banks to keep up or fall behind in terms of adopting robotics process automation.

On the question of whether the banks had adopted the robots process automation, the results suggest that close to half of the banks had not adopted the technology in their process while only one –third had adopted the system. The results further sought to determine the benefits that had accrued to the banks that had adopted RPA and results suggest that the dominant benefits include improved speed of operation, quality of service and reduced cost of operations. This means that the adoption RPA adoption benefits is higher than the cost and this is supported by the significant effect in explaining

its adoption by the banks. Hence banks need to put in place mechanism aimed at increasing the speed of implementing the process in their organizations.

On the question of the main barriers to RPA adoption by banks, the results suggest that the common barriers include a lack of adequate skill set in the organizations and fear of job losses because of adopting the system came out prominently in the banks. Further, from the people perspective as a barrier, it can be concluded that adoption of an effective change process by the banks brings about a seamless and establishment of an effective regulatory framework forms and important move to the development of an effective RPA in the banks.

5.4 Recommendations

From the findings, it has been established that implementation of RPA brings several benefits to an organization. These benefits include improved speed of operations, improved quality, cost savings, customer excellence, operational excellence, and regulatory compliance. To maximize the benefits associated with the use of the technology, the research advises the management of commercial banks to consider creating an adequate RPA process. For quicker process execution and increased operational effectiveness, banks should implement robotic process automation.

RPA must be considered by banks as the technology for transformation due to its numerous benefits. With decreased costs and increased productivity, RPA may provide businesses a major competitive advantage. Despite the expense of RPA, you may undoubtedly see a return on your investment (ROI) within a few months of making the investment given the value it adds to an organization or business. The report so suggests that it is time for you to convert to smart banking practices.

Although the study established that barriers to RPA adoption reduces the speed of its implementation, the management of commercial banks should enhance research and development strategies to identify the best way of dealing with the barriers to ensure swift implementation process. Employees should also be trained to facilitate implementation RPA process.

5.5 Limitations

Even though the study was successful, various challenges had to be faced. First, since the respondents were providing feedback on their employer, it is impossible to confirm the respondents' level of integrity. It is also possible that they may have exaggerated their opinions regarding the perceived benefit or barrier that has been experienced in commercial banks' adoption of RPA.

Since the study's focus was just on Kenya's commercial banks, it is impossible to generalize its findings to other firms or organizations operating in other industries and also those in different countries. Like that, the study used a descriptive research approach, therefore different research designs may depict different findings although it is subject to prove. Nevertheless, despite the limitations, the results of this study will serve as a valuable resource for future research and managerial and policy-making decisions about regulations regarding RPA adoption.

5.6 Suggestions for Future Studies

The study recommends future studies generate various techniques and sources of data other than questionnaires and primary data due to the ambiguity of responses from the samples with reference to data collected relevant to the subject matter of interest. In addition, RPA adoption and technology changes is a huge field that is evolving day in day out. As a result, future studies should consider studying the same field to establish whether the findings change with time.

Future research should consider examining other economic sectors because the current study was limited to Kenya's commercial banks, to determine the significance of generalizing findings. The current study's descriptive research design was used to present its findings. Future research should, however, consider other designs that concentrate on the subject of interest for a longer period of time.

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APPENDIXES

Appendix I: Questionnaire

The questionnaire will seek to establish the extent to which Robotics automation process adoption by commercial banks in Kenya. Please fill appropriately.

SECTION I: Organization Details

1) Ownership

- Local
- Foreign
- Both

2) Age of the bank

- Less than 20 years
- 21 - 30
- 31-40
- 41-50
- Over 50 year

3) Number of Employees

- Less than 100
- 101 – 500
- 501 - 1000
- Over 1001

SECTION II: BENEFITS OF ROBOTICS PROCESS AUTOMATION

4) Has your bank implemented Robotics Process Automation as part of it business automation?

- Yes
- No
- Planning to do so

1. Based on the factors below, do you think the adoption of Robotics Process Automation can have benefits to the bank?

Factors	No opinion	Strongly Agree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
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1. Cost Savings						
2. Operational Excellence						
3. Customer Excellence						
4. Regulatory Compliance						
5. Improved Speed of Operation						
6. Improved Quality						

SECTION III: POTENTIAL BARRIERS TO ADOPTION ROBOTICS PROCESS AUTOMATION

5) In your opinion, to what degree can the below factors act as a barrier to the successful adoption of Robotics Process Automation in the bank?

a) People

Factors	No opinion	Strongly Agree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
1. Lack of Skill set in use of RPA's.						
2. Fear of Job loss						
3. Individuals' behavior						

b) Processes

Factors	No opinion	Strongly Agree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
1. Lack of Governance Process						
2. Lack of Regulatory Framework						
3. Poor Change Management processes						

c) Technology

Factors	No opinion	Strongly Agree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
1. Legacy applications						
2. Initial Technology Investments Costs						

SECTION IV: ROBOTICS PROCESS AUTOMATION ADOPTION

1. When it comes to Robotics Process Automation technology, what best describes you as an individual?

Factors	No opinion	Strongly Agree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
1. I'm Skeptical of the new technology and will only use it when I must.						
2. I am usually one of the last people to use this new technology.						
3. I usually use this new technology when most people I know do						
4. I love this new technology and am among the first to experiment with and use it						

2. What is your opinion on these statements?

Factors	No opinion	Strongly Agree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
1. "Robotics Process Automation Technology has made the banking industry change too fast"?						
2. My organization is making the best use of Robotics Process Automation technology?"						

3. In a scale of 1-5 (Where 1 means “Not at all aware” and 5 means “very aware”), how aware are you of new digital tools and technology for automating banking operations?

Sector	1	2	3	4	5
In my organization					
In my Industry					

4. How do you learn about new tools and technologies? (Pick all that apply)

- From my company training department
- From my company’s technology department
- From my own research
- From social media
- From my peers
- Other- Please specify

5. When it comes to Robotics Process Automation technology, what would you say. I’m

- Keeping up
- Falling behind
- I don’t know.

Appendix II: List of Commercial Banks in Kenya

1.	Victoria Commercial Bank Limited
2.	UBA Kenya Bank Limited
3.	Trans-national Bank Limited
4.	Standard Chartered Bank Kenya Limited
5.	Stanbic Bank Kenya Limited
6.	Spire Bank Ltd
7.	Sidian Bank Limited
8.	SBM Bank Kenya Limited
9.	Prime Bank Limited
10.	Paramount Bank Limited
11.	NCBA Bank Kenya PLC
12.	National Bank of Kenya Limited
13.	M-Oriental Bank Limited
14.	Middle East Bank (K) Limited
15.	Mayfair Bank Limited
16.	KCB Bank Kenya Limited
17.	Jamii Bora Bank Limited
18.	Imperial Bank Limited
19.	I & M Bank Limited
20.	Habib Bank A.G Zurich
21.	Gulf African Bank Limited
22.	Guardian Bank Limited
23.	Guaranty Trust Bank (K) Ltd
24.	First Community Bank Limited
25.	Family Bank Limited
26.	Equity Bank Kenya Limited
27.	Ecobank Kenya Limited
28.	DIB Bank Kenya Limited
29.	Diamond Trust Bank Kenya Limited
30.	Development Bank of Kenya Limited
31.	Credit Bank Limited
32.	Co-operative Bank of Kenya Limited
33.	Consolidated Bank of Kenya Limited
34.	Citibank N.A Kenya
35.	Chase Bank (K) Limited
36.	Charterhouse Bank Limited
37.	Barclays Bank of Kenya Limited
38.	Bank of India
39.	Bank of Baroda (K) Limited
40.	Bank of Africa Kenya Limited
41.	African Banking Corporation Limited